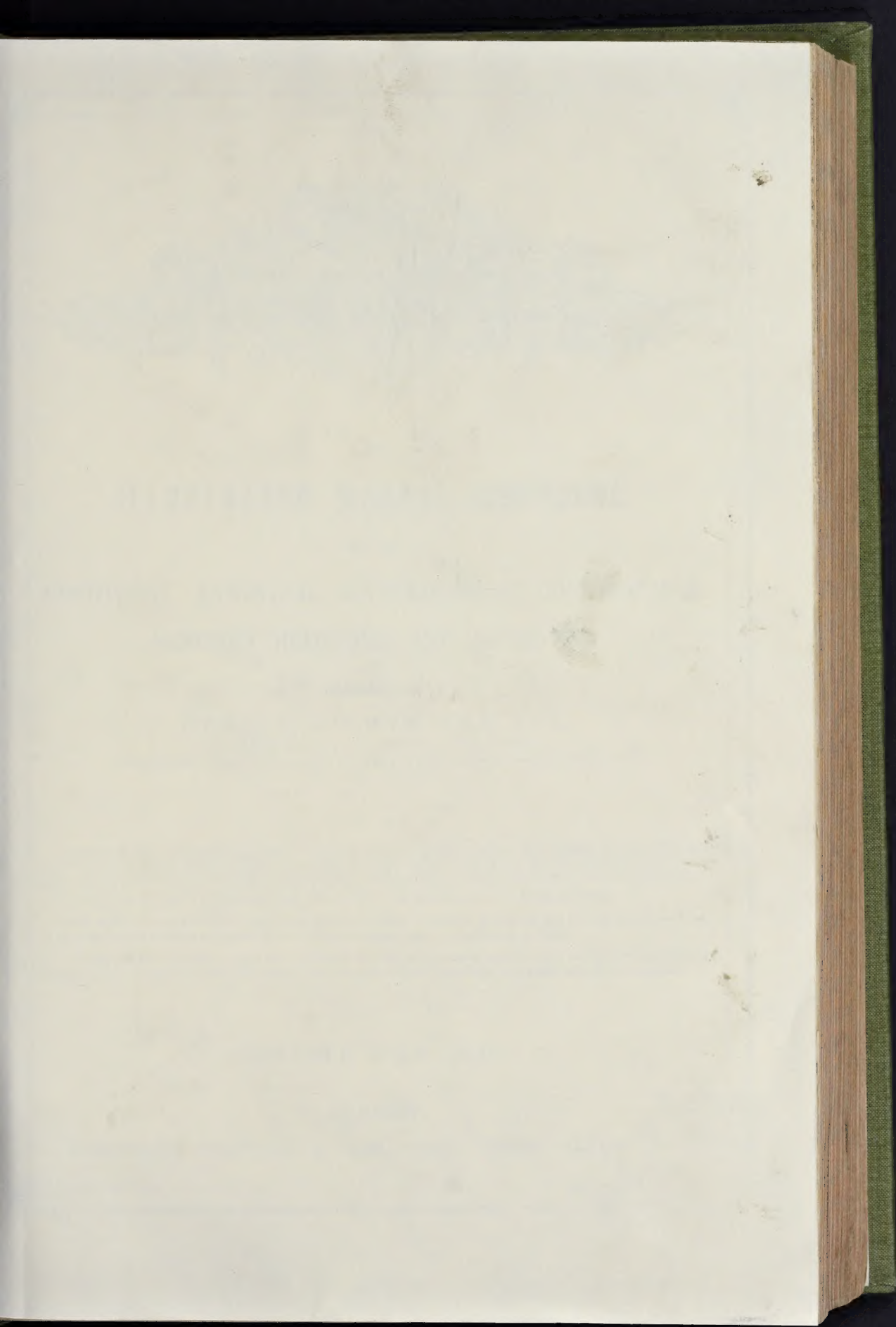




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AN

ILLUSTRATED WEEKLY MAGAZINE,

FOR THE

ARCHITECT, ENGINEER, ARCHÆOLOGIST, CONSTRUCTOR,
SANITARY REFORMER, AND ART-LOVER.

CONDUCTED BY

GEORGE GODWIN, F.R.S., F.S.A.

LATE VICE-PRESIDENT OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS;

*Honorary Member of various Societies; Author of "History in Ruins," "Town Swamps and Social Bridges,"
"Another Blow for Life," &c.*

"Every man's proper mansion-house, and home, being the theater of his hospitality, the seat of self-fruition, the comfortablest part of his own life, the noblest of his sonne's inheritance, a kinde of private principedome, nay, to the possessors thereof, an epitome of the whole world, may well deserve, by these attributes, according to the degree of the master, to be decently and delightfully adorned."

"Architecture can want no commendation, where there are noble men, or noble mindes."—SIR HENRY WOTTON.

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VOLUME FOR 1871.

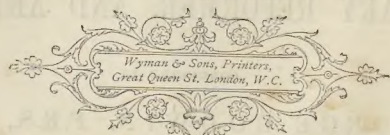
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THE BUILDERS



Sculpture in England.

IN the volume of the *Builder* just now closed, we commenced to treat of this subject. In resuming its consideration, it may be proper to observe, as a reason for introducing so much of the history of sculpture, that the conclusions hereafter to be drawn as to the position

and prospects of the art can only be fairly arrived at through a knowledge of the practice of the more prominent and influential ancient and modern schools. Without this survey—and it has been condensed as much as possible—it would be almost impossible to exhibit clearly the nature of the changes that have at different times been made, while such particular reference affords opportunity for explaining the causes that have led to the varieties noticed, and to the gradual departure from the Greek canon. The immediate object of the present remarks will be to examine the condition of the more modern practice.

The deterioration of sculpture in ancient times, even so early as the third century B.C., was shown to be attributable to the change in the feeling or impulse from that which had previously influenced its exercise. This deterioration went on unchecked, till, by degrees, the art fell into decrepitude. The few spasmodic attempts to revive it in the reigns of some of the Roman emperors had no favourable results on the general status of sculpture as a fine, or elevated art; and the occasional appearance of material or executive merit rather served to awaken with regret the memory of the past, than to raise a well-founded hope for the future. The effect of this on the sculpture of modern times is chiefly seen in the quality of the art produced; arising, as has been presumed, from the altered influence under which it has appeared. It will be sufficient here to refer to one cause of the difference between the two modes of practice. The nobler impulse, the religious, which incited the ancient Greeks to seek for the utmost physical perfection in the types or images of their divinities, cannot, for obvious reasons, similarly actuate the modern sculptor. With

the Greeks, every quality which was supposed to individualise the various immortal personages that constituted their Pantheon,—as majesty, power, wisdom, beauty,—had its distinctive material personification and recognised form in the individual statue of the god or goddess to whom the special attribute was appropriated: hence the multiplication of their representations, and the expressive variety found in their sculpture. The modern sculptor has no such field, of a material kind in part, but also associated with poetical motive, for the exercise of his art, and the consequence is seen in the lower forms of practice which have at different periods been introduced. If the universal opinion of the most competent judges, that the noblest object of art imitation is the human figure in its highest state of perfection or beauty be correct, all other exercise of art must, in so far, be inferior. Sculpture has felt the effect of this disease of the nude, and its followers have necessarily been led to give their attention to other studies by which they might assert and maintain a character for their art.

Great attention has thus been paid to the treatment of accessories; and the sculptors of the lower schools, as the Roman, very soon exhibited considerable power in the treatment of drapery, in which some of their statues offer admirable examples, not surpassed by any other school. That this was a special study is evidenced by the generally inferior quality of the naked with which it is associated, showing how the higher forms of art were then falling into neglect.

In the revival of art, as it has been called, when sculpture began to be employed in Christian monuments and illustration, the nude figure was, of course, proscribed; and, therefore, in all representations of religious subjects, drapery was a necessity. In the primitive exercise of the art in this country, the prevalence of draped figures is found; but it is little more than a mere covering, without any approach to skilful design. Ordinarily, the dress is a sort of gown, such probably as was worn at the time by persons in authority; but what is intended for folds is merely a succession of parallel lines cut into the stone; and it is extremely rare to meet with any attempt at artistic arrangement, or to give expression by means of this accessory—so capable, in the hands of the true artist, to assist the effect of his subject.

With respect to the quality of the earliest examples of sculpture used as decoration in religious buildings, no one with any real knowledge of art would think of quoting such performances as worthy of being classed in the category of fine art. They fulfilled their main purpose, in giving enrichment and in contributing to the effects the architect desired to produce; but it would be impertinent to class their authors, who were mere rude and un instructed carvers or stonemasons, as sculptors, in the

meaning of the term when applied to real masters of the art; or to compare their clumsy performances, executed for obviously very secondary though not unimportant objects, with works of true sculpture. They usually exhibit utter ignorance of all rules of art: the figures are gaunt and ill-proportioned, with large heads and faces expressionless and scarcely human; while the limbs and bodies often are painfully distorted, in order to be fitted, or rather squeezed, into niches, or into the hollows of mouldings; without regard to fitness or propriety, such as regulated the employment of similar accessorial decoration with the Greeks. Whatever interest is felt in their grotesque form and treatment of sculpture, and often legitimately felt for the motive of the designs, can only be owing to its association with a style of architecture which is highly attractive; but it is strange, and, indeed, discouraging, to find this interest occasionally taking, in the more fervent enthusiasts in Gothic, the form of unqualified admiration, as though the examples referred to were really good works of art, deserving commendation. It may arise from want of knowledge, or, as is more probable, the confusion of judging two arts together, as if there were a common standard of comparison for both; and assuming as of course that because the architecture is, to them, beautiful, all art connected or associated with it partakes of this quality. It cannot be too distinctly repeated that sculpture is imitative—with something more,—and that it must be judged by its success in reproducing the objects it professes to copy. For architecture there is no such test.

The extreme rudeness of the earliest attempts at sculpture, in the decoration of Gothic buildings in England, may be accounted for in some measure by the little opportunity there was at that time of seeing works of a better kind, which might have guided the native workmen. The date of Wells Cathedral, for instance, one of the earliest, is the thirteenth century; and at that time, certainly, there were no examples of sculpture to direct public taste. It seems never to have occurred to those who were employed to carve figures that the living persons around them could supply a general standard for their imitation. Even in the matter of proportion, it is curious to see the statues of saints, kings, and others, which crowd the front of this and other of our magnificent Gothic edifices, impossibly elongated to a scale of ten or twelve heads or nearly double the natural or normal proportions, when such extravagance ought to have been obvious to the most cursory observer. It would seem the most natural course that, in the imitative arts enlisted in the service of architecture, reference would have been made to the objects themselves as the best guides, as indeed was the case in foliage, &c.; but this evidently was not the practice with the human figure; and the so-

called sculptors appear to have preferred to work out here their own notions in forms of grotesqueness. It is more surprising that this obtuse blundering should also be found in Italy, as well as in the East, where remains of good art, however dishonoured and neglected, must have challenged attention at every turning. The degradation was, however, greatest in the art used in the seat of the Greek Church; and is the more striking because it was in that favoured region that the beautiful had both its birth and its crowning glory. These are anomalies in the history of art, and even of intellectual progress, which are extremely difficult of explanation; and here, at any rate, they must be left untouched, as it would be beyond our purpose to enter at sufficient length upon their discussion.

As the employment of sculpture was extended, that used for ecclesiastical decoration greatly improved; and, subsequently, its application to objects beyond architectural embellishment further advanced its progress. The introduction of portrait effigies, which at first were limited to ecclesiastical, led to the study of nature, inasmuch as the robes in which the recumbent figures were represented lying in their tombs were no doubt carefully copied from the dresses worn by the bishops, abbots, or monks during life. How greatly this even limited attention to truthfulness of imitation aided the progress of sculpture, albeit deficient in style, is seen in some of the beautiful arrangements of the costumes in these pious memorials when, at a later period, royal and noble ladies, richly habited, were the subjects on which the artist was called upon to exercise his skill; and, still further, in those more extended designs in which opportunity was offered for introducing groups of accessories, figures, of ministering angels, and attendants, and even in larger and more ambitious compositions.

There can be no doubt that great impulse was given to this improvement from without; and, however strong the reasons that may be adduced for believing that the greater part of the earlier sculptured works in England were the performance of native carvers, it scarcely admits of dispute that foreign artists visited this country, and from their superior practice contributed to improve the less-efficient works of the English craftsmen. This is easily accounted for both from the intercourse that existed between this country and Rome for ecclesiastical objects, and the attraction offered to Italian artists to seek employment in a country where it was well known the most magnificent religious foundations and cathedrals were being erected, and where their services would be acceptable, and sure to be well remunerated. This admission of obligation to artists who had had greater opportunities, at that time, of acquiring knowledge in the practice of sculpture than had been afforded to English workmen, may be made without casting discredit on native talent, or exhibiting any lack of patriotism. It was simply a repetition, with a difference, of what had already occurred when the more able artists who had wandered from Greece became the pioneers of art in Italy. Indeed, till the influence of the early Italian schools of art began to make itself felt, and to give a life to art, at first, under the impulse given by Niccolò and Giovanni Pisani, and, afterwards, by the remarkable body of artists who were created by the fostering care of the Medici family, in Florence, there is no safe ground for constructing a theory on the progress of sculpture in modern times. It is from the Italian schools,—varying, however, considerably in their fashion, or modes of practice,—that modern sculpture may be said to have its existence. Even at the present time are found imitations of the peculiarities which distinguish the features of the leaders of the different Italian styles; and yet not specially or exclusively, as if the artists believed that any one mode was the right one, but because art being looked upon chiefly, or perhaps entirely, from a material (rather than a sentimental) point of view, and the inventive power of sculptors not now being great, every style of art, however fantastic, is recognised as justifiable, and may be found issuing from the same hand or studio. No styles can occupy positions of wider divergence than that of Donatello, for example, and the Phidian school; or that of Bernini, or of Roubiliac, contrasted with fine Greek sculpture. Yet the very artists who profess to admit the unvaried excellence of the latter are found to produce works, which appear to be intended only to challenge comparison with some of the weakest examples of conven-

tionism; in tricky effects and what only deserve the name of curiosities of art.

German and Italian sculptors of deserved eminence are frequently found exercising their talents in this free and uncontrolled manner, heedless, perhaps, how unquestionably they are injuring, by such practice, the chances of ever restoring true taste in sculpture.

The popularity that such productions often command is to be attributed mainly to the want of education in the public in the principles of true art. Never having been taught in what excellence in sculpture really consists, and having no opportunity of acquiring this knowledge by the study of nature or of fine examples intelligently demonstrated, the generally low tone of public appreciation of art can scarcely be wondered at.

The application of art to religious objects, and the simplicity and earnestness that characterised the earlier works of the "revival," justifies the belief that sculpture might be brought to as noble a consummation in modern times as it attained among the ancient Greeks. Of course, objectively, it would appear under a different form. The representation of the nude figure would be denied it, as inconsistent with the feelings of a Christian community; and in this respect the ancient sculpture would still have its advantages. But in high purpose, elevated and affecting expression and in beauty, the art that aspired to illustrate the Christian sentiment, with its graces and charities, would have opportunities quite as favourable for its development and success as those at the command of any Pagan school.

The promise shown in the works of the Pisani and others of the time, supplemented somewhat later by the immense artistic power of the school which counted Michelangelo among its distinguished members, leaves no doubt that this lofty position would have been gained for art, but for circumstances, as remarkable as unexpected, which acted as a disturbing cause to the course sculpture was taking. This was the revival in Italy, in the fifteenth and sixteenth centuries, of the taste for classical literature. It was indulged in to such an extent, under the patronage chiefly of Lorenzo, the "magnificent," at Florence, that it became the fashion among scholars and certain of the higher classes to despise and ignore whatever was modern in art or literature, even to the disuse, among themselves, of their own native tongue; employing only Greek and Latin in their own writings and correspondence. The prejudice was soon extended to the domain of sculpture, and the artist was required to adopt the ancient style, and to illustrate subjects of Greek poetry and mythology, instead of those with which only the unlearned and common herd could be supposed to sympathise. This innovation sounded the knell of sculpture. It had the effect of drawing away from an original and yet a sound and elevated practice of art some of the greatest artists who had appeared since the decadence of Greek sculpture. But it not only directly checked the promise there was of establishing an original and most expressive school of art, but, as this pseudo-classical style was, in this instance, neither more nor less than a caprice, favoured by a party of pedants, it opened the field for the admission of every kind of fanciful novelty that fashion might be pleased to encourage. Modern sculpture has felt, and is still feeling, the consequences in the uncertainty and shifting which has everywhere since marked its practice.

It may be said, summarily, for it would be impossible here to notice all the eminent artists of these times, that three great masters led, in chief, the more remarkable and influential schools of art in the period included in the sixteenth, seventeenth, and eighteenth centuries. Among these Michelangelo stands pre-eminent. His works display a force and vigour of thought and sentiment, a breadth of treatment, and a profound knowledge which have never been equalled. The opinion that to Michelangelo attaches the reproach of having injured the progress of sculpture, is only partly true. His style wanted simplicity, and that freedom from effort which dignifies Greek sculpture; but his own productions exhibit his superior power in every class of art, and bear the stamp of genius of the highest order. Those who formed themselves on his practice, many of them artists of eminent ability, failed to develop what was really good in him; and, as is usually the case with imitators, only exaggerated his more striking peculiarities. It was they who caused the injury to sculpture that is often unjustly attributed to the great

master himself, by intensifying, and, as it were, perpetuating his tendency to some extravagance of manner.

The sculptors who next appeared as leaders of defined character, namely Bernini and Roubiliac, may with greater truth be considered the real causes of the corruption of taste in sculpture. Both were artists of indisputable genius, and both, after their manner, exercised their art with consummate ability. Unfortunately both were led away by the ambition to produce effect by originality and daring. The bold and portentous style of Bernini was based on the exaggerated manner of the followers of Michelangelo; and in his compositions he showed an utter disregard of all the laws of simplicity and pure taste so essential to the true character of sculpture. Roubiliac was equally inensurable to the restraints of a sound judgment in the exercise of his art. He had fertile invention, great facility in composition, and a marvellous power of execution which has never been equalled. He treated the marble in which he worked as if it were ductile as wax; but with all these undeniably great qualities, his was a practice that could only lead to the very worst results. While the ordinary spectator stands amazed before the proofs of Roubiliac's technical skill, the real critic is obliged to deplore the misdirected application of talent in one whose extraordinary gifts, had they been properly used, might have raised sculpture to a position of great honour. He was followed by a crowd of imitators of his worst peculiarities, who only helped on the degradation of sculpture.

False, moreritious, and deplorable in its consequences as was the taste introduced by those artists, respectively, yet the indisputable genius and surpassing power of execution they displayed in their works exercised a very wide influence, and procured them a large amount of patronage and favour, at a time when the true principles of sculpture were little understood. Roubiliac executed several important monuments in England, where, indeed, in the absence of any commanding or even mediocre native talent, he reigned supreme in his art. But it required the master mind and hand to sustain the prestige of his corrupt style. At his death a crowd of feeble imitators could only repeat all the worst features of the school, without any of the redeeming qualities which marked its individuality.

The very low state of sculpture quite at the end of the eighteenth century should be recognised by those who desire to understand the difficulties which surrounded the art, with reference to its possible return to a better condition. A very fair estimate of this may be obtained by inspecting the comprehensive collection of monuments of the period referred to, in Westminster Abbey. Not without merit of a certain kind, in invention and execution, they are, for the most part, only to be referred to as painful records of a thoroughly degraded taste.

It was at this critical period when sculpture seemed to have fallen, never to rise again, that two artists appeared who were able to infuse a new spirit into art. These were Canova, a native of Italy, and Flaxman, an Englishman. Though differing essentially in their own practice,—one rather affecting the more florid ancient school, the other having a strong leaning towards the simplicity of the Italian art of the revival,—they both recognised the value of the best Greek examples, and advocated the study of the antique as the best foundation for the education of an artist. A review of the works of these two remarkable sculptors might be useful here,—showing how one was too often tempted into a marvellous style and over-attention to a laboured surface execution; and the other, while exhibiting a deep knowledge of the laws of sculptural composition and exquisite sentiment in subjects of pathos, scarcely did justice to his works with respect to their execution; but to do this efficiently would require space beyond our limits.

The partial return to an improved style in sculpture soon bore fruit in England, where all the practice had hitherto been in the hands of foreigners. Native sculptors could now commence their studies from a new and, as it were, original starting-point, and the new school was in direct and healthful antagonism to the traditions of the Bernini and Roubiliac periods. But, still, there were almost insuperable impediments to establishing sculpture on a secure basis; for though the bad taste of the previous schools was recognised, it was by no means easy to create an interest in the subjects

now generally chosen for illustration,—called, usually, from classical dictionaries, or representing cold allegory,—although, technically, the works exhibited a purer style, greater simplicity, and, especially, improvement in the choice and character of form. The educated and pretentious dilettanti classes gave it partial support, but the general public had no sympathy with a style of art that appeared only to deal with subjects utterly beyond their comprehension. Thus the success of this innovation was by no means certain; while there were many rival modes of practice to which people were already accustomed. It was not easy, therefore, all at once, to suppress the tendency in artists and their patrons to continue in the beaten track, especially when no sufficient reasons or explanations were given to educate them in preferring what was sound and good to what was worthless. There was also another great difficulty hard to be met, where every artist and every employer claimed the right to assert his own independence in the exercise of art. This claim of freedom from law and prescription, which still influences the practice of sculpture, only shows that the art is not yet conducted on any sound general principle; and it increases the difficulty of pronouncing, even speculatively, on its future.

It is this looseness, or indispotion, or, it may be, incapacity, to recognise what is the true basis of sculpture as a fine art that makes it hazardous to offer an opinion on the prospects of the art in this country. If the Exhibitions of late years are to be taken as evidence of its condition, it is impossible to avoid the discouraging conclusions suggested by the mixture of modes rather than styles, the absence of elevated motive in subject and expression, and, with few exceptions, the want of knowledge of and feeling for the nobler class of form which characterise the majority of works. At the same time there is compensation in the technical merit displayed in certain directions; and which, rightly guided, is one of the elements of success; as a means for sculpture taking an honourable place in our national practice. It must be admitted that, in many respects, art in these days is become a trade, and is practised to meet the market demand. It must be so. Painting, however, can do this with greater licence and safety than can be permitted in sculpture; and it uses its facilities. But even here is it not done somewhat to the sacrifice of what is understood as high-art design? But when sculpture attempts this discursiveness,—in pseudo-Venuses and Nymphs and fancy-subjects on one side; portraits, in statues and busts of contemporaries, sometimes in semi-classical costume, sometimes in the extreme of realism, in coats, trousers, and neckcloths, on the other,—doubt may be felt, whatever may be the latent talent of the artist for effecting better things, whether a true school of sculpture can be looked for where such anomalies and contradictions are found in juxtaposition. An intelligent writer has lately said, "No amount of skill can make commonplace men, and commonplace accidents, and commonplace feelings fit subjects of high art. Phidias himself, set to carve in marble portraits of London aldermen, could not give the busts any heroic air or endurance as the best works of art." Without endorsing the whole of this opinion, it is impossible not to recognise the value of the principle enunciated.

Two important truths seem to crop out from what has been said, and they will apply to the condition of sculpture in England. The present practice of sculpture, as a fine art, is not constrained by any rule or canon as to principles; and there is no tribunal of sculptors who, devoting themselves to the higher forms of art, exercise any wholesome influence in regulating the general practice; or who, from the marked superiority of their productions, are competent to incite the ambition of younger students, or to guide public taste. And, secondly, that the public, not generally gifted with an acute sensibility or genius for art—especially sculpture—are indifferent as to its quality. When attention is given to it, it is rather for some cunning of the hand displayed in it than for any quality or exhibition of earnest and original impulse of mind or heart. This is a natural consequence of the neglect among us of public education, even of the most elementary kind, in the principles and practice of fine art; and it applies to all classes.

By treating this subject generally it has been possible to avoid particular and invidious reference to living sculptors and their works. At

the same time, it would be unjust and ungracious to close this paper without making distinct allusion to those of our departed worthies, and one especially but recently passed away, who have shown, in the best of their productions, that England is able to count among her artists some who, for true art sentiment, refined taste, and able execution, have established the claim of this country to take honourable rank with other nations in the exercise of sculpture. It must always be remembered that art is of very late growth in England; and it makes our progress the more remarkable. While Italy and France were producing, as far back as the fifteenth and sixteenth centuries, artists of great ability, this country could not boast any native sculptor, of even small pretension, till the end of the eighteenth.

A forthcoming trial of strength is announced in which our living sculptors may have the opportunity of showing how far they are able to uphold a character for England in their particular art. Though, it may be, from the unhappy and disturbed state of the Continent, that, as regards foreign schools, the contest will be limited, still, our sculptors will be called upon to show what England can now do; and, in the interests of the subject to which the preceding remarks have been directed, we will hopefully trust that the display will satisfactorily and honourably testify to the ability of our present race of sculptors. In the spirit of the classic competitor in the games,—

*"— Superent quibus hoc Neptune, dedisti;
Extremus pudent rediisse." Hoc vincite cives,
Et prohibete nefas."*

ART STUDY AND ART CRITICISM.

ARTIST and critic are names that seem to imply somewhat more than simple distinction; at any rate, the distinction is constantly apprehended as involving an opposition;—it is well if not the same obnoxious opposition that confronts herbivora with the carnivora in forest and field.

Such a view, however, so far as it may be supposed to represent more than a sarcasm, is essentially unsound; the office of criticism is not more to denounce faults than to indicate beauties that were hastily or unfairly neglected, and to set forth the relative value of works and styles that may be all and entirely admirable, though in different degrees.

Now, for due acquittal of this function, it is manifest that criticism is nothing unless endowed with sensibility to recognise whatever beauties of art are independent of any immediate exercise of studious reflection, as well as with the analytic faculty that can give some rationalised account of the laws on which these effects are ultimately dependent.

But we are here, it will be perceived, demanding for the critic certain qualifications that are no less indispensable for the artist—the artist who is bound to know beauty when it presents itself, to appreciate with refined exactness whatever forms of beauty he imagines, and who, in working his way to realisation, can spare no exercise of whatever analytic faculty he may fortunately be possessed of.

A true artist, therefore, may seem to require to be accomplished with all the qualifications of a critic, and with something—with, in fact, a great deal—more. He has to originate forms of beauty which the critic comes into possession of ready made; and by him must be practically travelled that difficult road that lies between the conception of a work of art and its perfect execution, while the best triumph of the critic is but to map—after all incompletely—a route already traversed. Natural enough, then, may it seem that critics should for the most part be a band composed, according to a familiar satire, of "those who have failed in literature and art." The ambitions, the would-be but infelicitous artist comes away from spoilt work with at least the jargon of the studio,—with a store of those technical phrases that are most in use, and ever convenient, if not indispensable, for indicating nice distinctions of effect and manner, but that as used by the ignorant and inept become jargon, nothing better.

But failure in art does not prove disqualification in the critic who, having taken his wrong turning at a branching road, has had the sense to turn back. Such an error is easy for one who, out of strong sympathy for what is excellent in art, has to learn by trial that the true bent of his endowment is not to create, but to enjoy, to understand and to expound. He may be well

enough content with his alternative as a good critic not to grudge the artists the laugh that they have never been slow to indulge. The satire of Lothair has been challenged as borrowed from Balzac; but Balzac had been anticipated by Pope, who pursues the story of those who are only critics because they have miscarried as poets, one disastrous stage further on: he says, they—

"Turn critics next, and prove plain fools at last."

There is then an artist element in the critic and the critic's studies—there is a critic element in the artist and in the artist's studies; but as there is a point at which the critic will do well to forego pursuit of practical art, so there is a point at which the artist must shake himself free from intellectual, from critical principles and supervision, and move on under the influence of pure imagination,—of imagination enriched it may be by previous intellectual discipline, but no longer referring to it for rule and sanction at every stroke.

Sensibility to beauty is a characteristic of both artist and critic, but with the artist lies the responsibility of stimulating the imagination with excitement, to which it is the critic's bond to be rightly and delicately susceptible.

Artist imagination has "to body forth the forms of things unknown," and when these hitherto airy nothings are turned by him to shape, and have a local habitation, it is for Criticism to approve itself by something more than the sympathy of an ordinary cultivated spectator,—by a responsive recognition of the product of "fine frenzy" and its import, so distinct as to be susceptible of verbal statement.

Verbal exposition even for the elucidation of his own works, is no part of the office of an artist whose triumph it is to deliver all his meaning by his proper art.

Still the exercise of a certain critical faculty is, as we have said, appropriate to an artist, and it has two forms of manifestation,—first, under the primary guidance of his teachers and instructors, who by this very character are critics, though they may be artists no less, and address him through the medium of criticism;—and secondly, during the progress of his independent work.

In the second case, he is, above all, his own critic, especially when engaged in original composition, or the last finish. He must subject himself continually to self-criticism of the most unsparring kind, as made up equally of ever-revolved comparisons of thoughts, plans, and devices bearing on the effect he strives for, and of alternating and tentative revivals of feeling and emotion in implicit combination with the movements of the hand.

No doubt, an artist may often do well even at this advanced position to invite and lend an ear to observations of professed critics; but such hints he should be very wary of allowing to take possession of him. The critic of an unfinished work has but half the case before him, and the very detail that justly offends him, as it stands, may involve the only unharmonised because as yet imperfectly-developed germ that is to give the whole composition its motive and value in existence. For the artist, in such case, to subordinate his native, though half-unconscious tendencies to what must be a guess of the critic, is to consent to make his work a joint work, and of workers who cannot by possibility be in effective concert. Such entire complaisance, I believe, not very frequent,—never on the part of those who make the best use of a suggestion from without, by so modifying it in harmony with that which is within as to transmute it sometimes almost beyond recognition. A true critic will be prepared and content to find his most prized suggestions come in for no more ceremonious treatment. A true artist, with just confidence in the assimilative power of his ideal, will never disregard a really pregnant criticism,—certainly never be so weak as to forfeit its advantage out of timidity or egotism, forbidding him to admit even to himself a foreign influence.

We come then to this, that a critical faculty of very high refinement is part of the nature of the artist; and wherefore, then, it may be said, should the world seek other critics? If for no other reason—as that artists are sufficiently occupied in art to undertake criticism, or too concentrated in purpose to range loose and at large,—very importantly on this ground,—Criticism must needs be exercised, however considerably, yet justly, and therefore with resolute stringency, upon contemporary art; and it were too much to expect that competitors should be

able to weigh their own merits, without bias, against those of others. Certainly it were unfair to call upon an artist, however candid, to proclaim the superiority of a rival whom he is still striving, and not unreasonably hopeful one day to surpass. Critics are, no doubt, far too much swayed by partiality to friends and allies; but the correction of critic by critic involves less acrimony than collision of principals. And so this reason stands, although with such precedents of artist writers on art as Reynolds, Richardson, Fuseli, not to allude to contemporaries, the rule can be made by no means absolute.

Again, Criticism proper in one of its fields intrudes upon that of metaphysics and most abstract philosophy. The theory of æsthetic is to art what that of logic is to science; the discovery and exposition of the nature of beauty, its varieties and limitations, and of our susceptibility of beauty,—of the mental operations that enter into imaginative enjoyment and subserve artistic invention,—this is the subject matter of the very highest criticism, to be developed only by a combination of a rare and peculiar aptitude of abstraction and familiarity with examples.

Still further, the philosophy of art inoculates with the philosophy of history, and the higher criticism comes equally into requisition, whether we trace art as developing amidst a sphere of circumstances of its own, or as affected by influences of general history, and having its own reaction upon general history again.

From these points of view, art can scarcely expect due honour but from the ministrations of those who can devote long days,—may we not say lives?—to the languages and literature, as well as monuments, of the ancients, and to the still more voluminous, if less difficult and recondite, memorials of the epochs of art in mediæval and modern history.

When Criticism, strengthened by the bracing air of these regions, addresses itself to interests and problems of the day, its functions are thus distributed:—First, to induct contemporaries to the best enjoyment of the accumulated wealth of the world in the art of bygone ages;—this is a store that the world cannot afford to want or to waste; but to enjoy it truly, much special information is required: ignorance otherwise will neutralise it in some directions; ignorance and fatuous prejudice in many more.

In the next place, Criticism represented by critics who neither are nor pretend to be artists, will have its way in claiming to pass sentence on the purport and value of contemporary works of art for behoof of the enjoyment of general connoisseurs, and also with very important consequences indeed at the invitation of purchasers, diffident of their own judgment, but concerned to acquire works that shall not pall upon them forthwith, but, in virtue of sterling merit, continue to please them, and constantly please them more and more.

Criticism, so applied, involves necessarily some pretension to teach; and to teach not only connoisseurs, but artists also. To tell purchasers what they ought to buy, or to commission, is to impose very forcibly on artists what they ought to paint, to sculpt, to build, and the power and the wholeness of this reaction accord with the qualities of the criticism. As regards power, even when the power of truth is not in question, there can be no doubt that merely pertinacious criticism exerts great influence in exciting and directing public interest, in justly or unjustly establishing or retarding reputations, and as effectively by silence as by clamour; and when not of cultivating public opinion, of fixing some enormity on a pedestal as a fashion. It is especially when eloquence, conjoined with authoritative positiveness, lends its help, that the work of gaining the public ear goes most gaily forward; it is well if the abuse does not shake faith in the value of criticism altogether; it seems too certain that when once the public ear is fairly got hold of by sophisticated criticism, death alone of the tenacious critics, or of their generation, can give true art its succour and release. The egotism of an individual of misdirected endowments may be as extensively mischievous as the concerted action of a clique. Fascinated, or bullied, or blindfolded, the world is subjugated by fashion in its worst phase, as the very inversion of natural and genuine taste, and has to take whatever is served out to it for truth, and beauty, and honour, and holiness, and what not, in respect of ancient and earlier art, as well as of the exhibitions of the day.

Let us, then, review and look fairly in the face

some of the abuses of Criticism that we had need be on our guard against, if we do not wish to spend time and trouble on some false scheme of study and practice,—to deprive ourselves for years of the enjoyment and instruction derivable from whole worlds of works of genius; lastly, if we would escape the humiliation of hearing, some fine day, from our guide that he has been wrong all the while, though we never found him out, and of being invited to follow the self-condemned Will-of-the-wisp in pursuit of a new promised land, tricked out in description as flauntingly as before, and just as certain to prove again either a desert or a quagmire.

A besetting temptation of the critic is paradox; true discoveries of such importance and novelty as to surprise are not always to be come by, and yet a large section of the public, like the audience in the prologue to "Faust," "longs to be amazed." *Sie sitzen da und wollen gern erstaunen.* Wanting a new truth for this end, the next best resource is the plump disavowance of an old one. By this stratagem one characteristic of every true step of progress seems imposingly manifest,—a distinct revulsion of opinion; but there is the vital difference, that the revulsion in this case is from a true opinion to a brazen-faced fallacy. The propounder of paradox, it may be,—may, we are bound to assume,—deceives himself before he misleads others; but it is with the resulting mischief, not with the precise moral position of the critic, that we are concerned:—

"His nature is known by the bay on his horn. Have a care of him, Roman!"

Now, it is certainly by no means an unhealthy exercise of thought to test, from time to time, whether for the faith that is in us we have a reason within us,—to challenge ourselves to give our most time-honoured convictions a good shake, prepared to take the consequences if they shake to pieces; but this is quite another thing to wantonly abusing the glib faculty of speech to the detriment of others,—to soothing weak self-complacency by playing first one tune and then another, without care for sequence or coherence on the magic flute, and watching composedly the pitiable efforts to keep time in strings of puppet-like admirers.

Masters of words are too apt to abuse words, as if they were not free servants, engaged with guaranteed rights, but slaves; at a nod of caprice a phrase of the dignity of "the Ideal" has found itself, not so many days ago, commanded to interchange meanings with "The Realistic." Each phrase is paraded, rigged out in its borrowed definition, and the mutation conducted with the ostentatious candour of a thummatargist, might pass for a true transformation, but that we have been present at such pantomimes often before, watched every artful shuffle to the side scenes, and seen each string hooked on. We know exactly the kind of tricks that are to follow, and the older children among us think it time to go away. Therefore, so please ye, we will continue to think and talk of the art of Raffaele and of Phidias as ideal—the critic notwithstanding.

Words, it has been said, are the counters of the wise and the money of simple folk. I can only desire that the clever people will keep their counters for themselves, and leave me and my friends to employ our words under the condition of all sound currency as having an ascertained and reliable value in exchange.

The instincts of critical paradox attack reputations as readily as phrases, and find free scope in speaking unavailingly of time-honoured dignities, and in magnifying insignificance. Whether a critic declares with a tart phrase, and an air of sung infallibility, that Shakespeare was not the great writer he has been taken to be, or that Dekker, Webster, Middleton, and the rest were worthy to rank upon a line with him,—I care not which form of paradox the comorbidity of criticism presents to me,—*Incredulus odi.* I will believe as readily that the whole *Summa Theologia* of Thomas Aquinas may be interpreted out of one twirl of an illuminated Mediæval capital, as that the total effect of Veronese's Marriage of Cana depends, as the world has been assured, and seems to have been drilled into remaining seated after hearing it, in one white whisker of the cat in the corner.

Perhaps the denunciation of Raffaele is the most—it is difficult to choose the epithet, let us say inoffensively—the most conspicuous exemplification of critical paradox that has been ventured on our time, and that if the spirits of the wise really do sit in the clouds, to mock us must

have supplied their best amusement. I have lived to hear him spoken of by a critic of repute as "an ill-educated young man, living as a bad time." In what terms of super-subtle, of super-curious paradox, covering equal emptiness of feeling and information, some of the works by which he enriched the world and ennobled human nature have been spoken of by accepted teachers in Israel, I should be almost ashamed to quote,—fortunately, may be, time forbids to do so. Students of artistic literature know where to find them.

Beware, then, of critical paradox; suspect it not alone when ignorance or worse vituperates "great heirs of glory, due to deathless fame," but in every case of unqualified denouncement or exaltation of a period or a style.

Extravagance betrays itself at once when a single style is proclaimed as encompassing all possible merit or defects. When Gothic architects are proclaimed to the sound of shawms, as alone impossible, it is not only that the immortal merits of the Greeks are disallowed: the dust that is thrown in our eyes disables us from making due distribution of honour, even as among the Goths themselves, and refined delight inevitably perishes with suppressed discrimination.

One of the strangest examples of confusion in criticism has arisen in our time in what has been called the Battle of the Styles. Classic art has not only been denounced as Pagan,—the stigma is as fairly applicable to Geometry and Algebra,—but the disparagement has been extended to the modifications it received at the hands of men of great original genius at the so-called Renaissance. Bad works enough there are, no doubt, that belong to the period; but the denial of its high services,—of any merit whatever, led on to the denouncement of the movement simply as a Renaissance,—as a false attempt to bring back the obsolete, to galvanise the dead.

And what was the alternative proposed,—to a great extent realised? With amazing inconsequence a highly modified modern classic style was denounced as vicious, because a revival, and the world was to be rescued by another,—the revival of Gothic; and thus for one Renaissance we now have two.

And if the second justifies itself, it may be objected, as well as the first,—and why should it not?—wherefore complain?

It lost its best chance of doing so from the irrational spirit in which the first had been disallowed—its nature misrepresented. Had but just honour been conceded to the men who, out of fragments and records, equally ruined, developed Italian palaces and the Townhall of Vicenza, we might have seen, perhaps, equal or superior powers of organic development displayed upon modern Gothic; we might have been spared much of what we have, as we have it, and more that we are imminently threatened with that I forbear to specify.

Art, however, it is but fair to say, has a liability to paradox,—that is, somewhat akin to the paradox of Criticism.

Novelty has to be obtained, and an easy way of compassing, at least novelty for the moment, is by turning the world of art upside down, reversing positions generally, and leaving proprieties of everything to struggle through as they may. So mouldings only appropriate for a cornice come to be applied to the base, and meet us at every turn; columns are made to diminish downward instead of upward; whatever was continuous is broken, whatever vertical is bulged. Finely felt drawing hardens into Mediævalism for the sake of a change, and pains are taken to misdraw the figure,—perspective, aerial and linear, are forgotten, as if Masaccio and Brook Taylor had never lived; and sculpture, as much in horror of graceful drapery as of the glory of the nude, comes forth in whatever symmetry may be consistent with corsets and corintheums, with breeches and buttons.

It were ill counsel to make no daring experiments beside the beaten track,—great advance, no doubt, can only be made by defiant innovation; but the error lies in taking experiment for result, in expecting that right can consist with the reverse of right, or even in accepting reverse of wrong for right,—the recon founding of the already confused for anything but chaos worse confounded. Certainly, portents so generated present themselves professing to be works of art, that are only suited to symbolise either ugliness or anarchy. Thus buildings grow up before us that are justly said to be of no style; they have analogy with nothing that has gone

before, and, destitute of a scheme of novel harmoniousness within themselves, do not attain to a style of their own.

The secret of true invention is not easy—it is not quite to be reached by simple invention; let those who think so repudiate old habits of locomotion, and try conclusions at once by standing on their heads.

So let the student of Art beware of following high-flown *effrondis* rhetoric of critical paradox, or of adopting paradox of his own motion. Another warning might be given to him to mistrust some more prosaic critics who profess to be teachers of art in the sense in which Sir Edwin Landseer truly told the Commons' Committee art is beyond teaching;—to lay down rules how beauty will certainly result, or must infallibly be forfeited.

During the term of rudimentary exercise the student can only advance at all by giving implicit faith to his instructors, and literally and loyally working through their proscribed and well-considered courses. But the time comes to the artist, as to the man, when his first and last counsellor must be within his own breast; there is a time when he must assert independence,—not repudiating criticism, but accepting it for consideration, and be emboldened as an artist to put his own questions to Nature direct.

In conclusion. It is most true that the artist who has to live by his art is differently placed to the connoisseur or critic; the latter has opportunities of criticism assured, and may stand loftily aside, indifferent how long a blast of fashion may take to blow over; but the artist has to measure its continuance against the scope of the career he can look forward to, according to the hackneyed but ever pertinent quotation,—“Those who live to please must please to live.” There is great truth in this, and yet nothing shall persuade me that there is not at any period a noble career in art open for those who, given the endowment of genius, do not degrade it by ministering indulgence to bad taste, but who set themselves to reconcile the inevitable drift of their day with a truthful beauty that, however, taking colour from it, will continue beyond it.

We must live,—artists especially must live,—in our time and by our time; but those artists will not have the worst chance of living in it and after it too,—which is no more an inconsistent than an unworthy ambition, who are not content merely to get along easily by hanging on, not always over-gracefully, behind the chariot of fashion,—public opinion if you will,—but who can grid up their resolution to make a dash at the leaders in full career, and govern it perforce in some degree to a direction of their own.

W. WATKISS LLOYD.

HOMES IN THE EAST OF LONDON.

A VISIT TO WAPPING “ISLAND.”

How many persons in London, Central or West, amongst those who have heard of “Wapping,” or who have passed through its leading Thames-side thoroughfares, are aware that one of its oldest portions has been known for many years by the name of “The Island.” An island, in sooth, there exists, but one not formed by a convulsion of nature, but by the artificial handiwork of man. The formation of the London Docks several years ago displaced a thickly-populated district running between East Smithfield and on and beyond the foot of Loman-street on the one side, and bounded by the straight line of Hermitage-street, parallel with High-street and the River Thames, on the other. Between the two dock-gates that open into the river, there is an extent of inhabited territory extending about a quarter of a mile in length, and less than half that in breadth.

This singular spot of London East is an artificial island, and, comprised within its space, it exhibits the two extremes of great commercial wealth and importance, and the lowest phases of human suffering and indigence.

Wapping Island is entered from the City by two inlets, one leading by the side of the Tower, and the other through Nightingale-lane.

Passing over the dock-gates, the street to the right is the main thoroughfare, and is known as the High-street; the principal one to the left is Great Hermitage-street, as a tablet tells on a corner house dating from 1726. Once upon the island, a sanitary tour of two or three hours in duration will unfold a microcosm of social life to the daring visitor so multifarious in character that he can scarcely hope often to meet with it again in the same compass. On

the river-side are the large shipping wharfs, with their Babel of noise, their din of cranks, cranes, and hydraulic lifts. The long street is lined with hosts of jabbering carmen, grumbly cabbies, touting porters, and provoked policemen, who are vainly appealed to, and who are as vainly appealing in turn to obstinate obstructives to “Move on, I tell ye,”—realising to the mind the Irish taxman's vow of vengeance.

“I call'd three times before, and
I've found I've call'd in vain;
By the Hokey, you will rue it
If I have to call again.”

Foreigners in numbers are passing us by; refugee French and German, with their luggage, an inexpressible look of anxiety being marked in their faces; numbers of native-born British and alien passengers are hurrying “onward bound.” Leaving the exciting scene, where so many sorrows, joys, and feverish expectations are surging, we dive into one of the dismal courts that connect the two before-mentioned thoroughfares. There are heaviness and gloom around us. We move on notwithstanding in the thick unwholesome atmosphere, by the light of one glimmering lamp which lights the entry to this dismal court. There are open doors on each side of us, and damp, grimy walls. There are open channels and open sinks at our feet, and odours inhuman and horrible. Our outstretched hands in experiment can nearly touch the hovel fronts on either side, and infants' screams and mothers' bewailings are ringing in our ears. Our presence soon brings around us many forms, and our inquiries tell of our supposed mission. Civility, communicativeness, and supplication make up the epitomised tale at the threshold, but the embraced invitations to enter reveal pictures of human pain and tribulation that Dante might have included. Three types, made to the image of God, inhabit the room we have entered,—a father, in the last stage of consumption, and two daughters nearly marriageable, with hardly sufficient rotting clothing “to cover their shame.” The rags that hang around their attenuated frames flutter in stripes against their naked legs. They have no stool or chair upon which they can sit. Their father occupies the only stool in the room. They have no employment by which they can earn even a pittance; they are at home, starving on a half-chance meal a day, and hiding their raggedness from the world. The walls are bare; there is one bed in the room, and a bundle of dirty rags are upon it; but we doubt if the most sympathetic of the broker fraternity were to insist upon a bill of sale, one half-crown would, or could, be realised. The dying father will shortly follow the dead mother; and when the parish coffin incloses his wasted form, and a pauper grave closes above him, what shall be his daughters' lot?

There are voices and visitors on the creaking stairs; hands are laid upon our shoulders, and we follow to the other side of the court. Here misery is not so apparent, nor is the hunger glare so observable; yet sorrow and suffering, sickness, and incurable maladies reign, and will have no ending save in death. “Come here, sir, please; look at the sorrow that God has pleased to inflict upon us. Look at my poor boy, Johnny,” stripping the bed-clothes down, and baring the limbs of a crouched skeleton in the bed.

We withhold description. It was a sore family trial, in sooth; in addition to the other severe trials of the household, the father had worked but little for thirteen weeks. There were some young children in the room, and the mother had sufficient to attend to in the caring for them, and the poor paralytic. The thick, close air of the room would kill a giant who was not inured to such an atmosphere; it must be by some of the inscrutable designs of Providence that the back is fitted for the burden. We left after hearing a narrative that might well excite wonder and sympathy in a callous heart, and help to furnish a key to unlock the mysteries of some of our social problems.

Where next? We are ushered into a small back room. The tenant is a young woman, whose husband is at sea. He is gone for months. She may hear from him soon, or she may never hear. In the meantime she must live. She is making canvas sacks, or sacking, and covers, for a firm near to St. Paul's. Were she to work sixteen consecutive hours, she might earn eightpence; but some days, through other home duties, her earnings are from fourpence to sixpence. Think of it, English ladies, ye whose

generous sympathies are at present with the victims of a wicked war; think of your sisters in the swamps of Wapping, where fever, small-pox, scarlatina, measles, and other deadly diseases are making havoc, fraught with peril, too, for the future of our country! There is scope at home for Christian benevolence; there are battle-fields in London where ambulances would not be out of place.

Pass we on again, and up another narrow and rickety staircase: more fever and small-pox, more rage and wretchedness. We fancy by the soft Celtic brogue, and peculiar and idiomatic expressions that fall upon our ears, that we are within a Munster peasant's cabin. The Munster accent is here, but not the mud walls. The “mavrone,” the “winsthrue,” the “ullagone,” break out in sobs, and blend into each other in rapid succession. And “yer bonnor” has to listen to tales that would break the heart of a lump of granite. The endearing “alanna” and the expressive “aroon” are uttered by the Celtic mother, and little Mike in the corner is coaxed into quietness. Of a verity we are among the O'Donovans, the Driscolls, the Dempseys, and Cavanaghs, of the Sister Island; but instead of the thatched cabin of Skibbereen or Macroom, with its peat fire, with its hook and suspended pot, we stand in a London room about 8 ft. by 6 ft., or scarcely more in appearance. There are few coals, or rather cinders, in the grate, and, with the boxes, beds, and other trumpery, there is scarcely a passage free from the door to the fireplace. Yet within the confines of this narrow pest-room, a family of six “live, move, and have their being.”

Fever and small-pox rage “next door, and next door, and over the way, and next door to that, and further down.” This is the language we are told it in, and the corroborative evidence is our own eyes, and the replies of many persons whom we ask. There are snowdrifts and icebergs upon the river, and there are delays in the arrival of the screw colliers, and there are poor coal-heavers in this court who have earned but little for weeks. The room we have just left is rented by one of them. “The good Sisters of Mercy and the Passettes of — have been very kind, and they do all they can for us.” This acknowledgment comes from more than one woman whom we question. Honour to those to whom honour is due.

Let us sum up at this point of our narrative the conditions in the first alley we entered. The nightside aspect of the court is a “cut-throat” one; the daylight view is but little better. The backyards are receptacles, in most instances, for all sorts of filth and refuse; the old barrels or vessels that contain the supply of water are thickly coated on the sides with slime, and there is an undisturbed deposit of mud at the bottom. There are ashes and night-soil on the flags in front, there is dirt within the threshold, and there is but little decency apparent anywhere. The husbands and wives, in many instances, whether much or little is earned, drink. The men who mostly work on the river, or by the river, work hard when at it, for they have to work uncertain hours. The majority of the women and the children are in rage, and seldom above the reach of starvation. Wife-beating, oaths, Billingsgate, drunkenness, contagion, and death would make up the bulletin; and yet, side by side, and in the midst of this dreadful carnival, there are little oases of purity, of womanhood, and manhood, that help to relieve the dark picture.

Places and neighbourhoods like those of which we are speaking, and which we will presently notice, require instant parochial and Government inspection. The living, perforce, are huddled among the dying and the already dead, and are soon to be victims. Local mortuary-houses are an actual necessity, that contamination and contagion may be cut off. However harsh the removal may seem, it must be insisted on, and the nursing and “waking” of the contagious dead put an end to. Daily inspection is a necessity.

Another court visited is nearly a second edition of the first. It enjoys no thorough ventilation: it is one of those places that our grandfathers were wont to term a “turn-again lane.” Small-pox, and sickness, and want are here; and children, and tumour, and rags in abundance. The visitor is summoned, and walked around, and looked up at, and “interrogated,” before he has time to put a question. The invitations to walk in, and “see for yourself,” are many; and once in, there is little attempt indeed at cloaking the stark, staring truths that are visible

in every room. We shall not tire our readers with pictures of poverty, many of which possess a uniform sameness in outline, but whose depths are of ever-varying hues, deeper, darker, deadlier. In the houses to our right three in family are stretched in the small-pox: in that below, near the corner, the only hop of the family is waiting to be confined. He is *waked*, as is the custom of this country, and two dips are burning on a deal table near his head. A little crucifix is laid on the heart of the corpse; and, as we wait, neighbouring women, "his own kith and kin," and of his own province, are dropping in to the little room. The new-made widow and heart-broken wife, who has been out nearly all the day, preparing for the funeral, has come in. The burial society of which her poor husband had been a member for years, has disputed her claims. They have told her her husband was in arrears, and his benefit is forfeited, and that if they would like to exercise their right by rule, they might not give her one penny, but taking compassion upon her, and in view of her late husband having been a good-paying member once, they would allow her a moiety. It is a suspicious affair, and wants light. The collector knew for several weeks that the poor man was dying; and in pursuance of advice, avoided calling for a number of weeks for the money, so as to let the poor man run out of benefit by his lapse of payment. This inhuman dodge is often practised.

In the funeral gloom, and stumbling over heaps of snow, we take our leave. A body of watermen and two of the Thames Police emerge from one of those narrow river gorges known as "water-stairs." A stretcher is borne on the shoulders of four of the party, and the human freight they carry is a swollen, dripping, and ghastly corpse. The dishevelled hair hangs adown between the two foremost handles of the stretcher, and the upturned face hangs back unsupported. It was the face of a young woman of perhaps five-and-twenty, and she must have been for some days in the water. Enough!

We leave "the Island" unbroken in its dismal outer silence, save by the odd shout of some drunken seaman staggering towards his lodging, followed at a safe distance by a solitary constable. Within the heart of that island there are, however, wakeful lamentations;—death, disease, want, and many unutterable miseries.

To exhibit the wounds, ulcers, and social abcesses of our lowest strata of domestic life, is to do little more than to proclaim our sanitary wants. The honest and simple exposition of the one is the natural and certain evolution of the other. To give back to man the primitive health that nature intended him to enjoy—to accomplish this would be an emprise worthy of the world's highest prize. We dare to add that, in this age of all-conquering science, the solution of the difficulty and the complement of the task ought not to be remote.*

THE IDENTIFICATION OF STREETS AND HOUSES IN TOWN DISTRICTS.

Sir,—In reply to your correspondent of last week on this subject, I refer him to my suggestion which appeared in the *Builder* for 1869 (or 1868), "That minutes and seconds of latitude and longitude be marked upon all buildings in town or country." If this were done everywhere, no one street or house in the world could be mistaken for another, and strangers would be able to count their way about large towns, without the miserable expedient of asking those whom they might meet.

WALTER SCARGILL.

* Since the above was written, and before it could be published, the local authorities have taken us by the forelock. Nine of the houses in the first court we have alluded to in our article have been condemned as being unfit for human habitation. The whole of the families in them have been turned out, and the doors and lower windows boarded up. The remaining dwellings still inhabited are not in much better sanitary condition. The families dispossessed have broken themselves, fevered and plague-stricken as they are, to the second court mentioned, a few yards distant. Here disease is also rampant, and the dead and the dying are waked together. For the last four or five years, fever was seldom absent for a month from court number one, and now, and now only, when a whole populous neighbourhood is threatened with conflagration, action is taken in the matter to prevent exposure. The transplantation of the evicted from court number one to court number two is but the heaving up of one plague-stricken Osse upon another fever-dull Pelion. Outside the confines of "the island," but within sight, and under the shadows of old Wapping Church, there are other lanes and alleys quite as bad as those we have already described. The sooner the houses lose their tenants the better. Several humble yet useful lives may be saved, and the local authorities may escape the grave censure that their dereliction of duty merits, if immediate action be taken.

EARLY ENGLISH STATUTES CONNECTED WITH BUILDING.

AMONG the Early English statutes are to be found many enactments bearing upon subjects connected with the building trades, sanitary laws, and other matters coming within the limits of an architect's experience, that give quite a mellow antiquity and rare racy flavour to what we might suppose to be devoid of archaeological interest. Some of them are still law; but others have fallen into abeyance, or have been repealed; and as a study of the law is generally considered dry, dull, heavy, and unattractive to the last degree, and quite unlikely to be pursued as a recreation, I dare say I may assume that some of the last-mentioned Mediæval statutes may have the charm, if we may say so of anything that is old, of novelty.

I must premise that I have taken all my extracts from a small volume, with a calf-skin cover as brown and glossy as a chestnut, published in the reign of Charles II., which purports to contain an exact abridgment of all the statutes then in force and use.

Just as the ancient commerce, the coal trade of Newcastle has its archæology, so have the building trades. The histories of both are, indeed, coeval, as near as may be, with that of the grand old castle. Here is a clause from the Magna Charta:—"No town or freeman shall be distrained to make bridges and tanks, but such as of old time have used to make them in the time of King Henry, our grandfather." Does not this give us a very doleful picture of this branch of the building trade in the centuries immediately succeeding the Conquest? But as we go on, we shall see this and every other branch emerge from the shadow of compulsion, and come out into the light of free industry. The masons, for instance, must have been a considerable body to call for special legislation. In the reign of Henry VI. there was a statute passed to the effect that it should be felony for masons to plot confederacies, and that such as assembled upon such confederacies should be imprisoned, fined, and ransomed at the king's will.

Later, some of the endeavours of workmen to better their condition appear to have been looked upon as encroachments, for there was further legislation to meet their case in the reign of Edward VI. This young king's advisers enacted that:—"Artificers, workmen, and labourers, that conspire together concerning their work or wages, every of them so conspiring shall forfeit for the first offence 10*l.* to the king; and if he pay not within six days after conviction by witness, concession, or otherwise, he shall suffer imprisonment, and during that time shall have no sustenance but bread and water. For the second offence he shall forfeit 20*l.*, and that not paid within six days as aforesaid, shall suffer the pillory; and for the third offence shall forfeit 40*l.*, and that not paid within the said time shall again suffer the pillory, lose one of his ears, and be ever after taken as a man infamous and not to be credited."

After this, things appear to have gone on pretty quietly. In the reign of Queen Elizabeth we may see that whereas members of some trades were not allowed to take as apprentices the children of people who were not possessed of freehold land to the value of 3*l.* per year, an exception was made in favour of smiths, carpenters, rough-masons, plasterers, sawyers, brickmakers, bricklayers, tilers, tilemakers, thatchers, and shinglers, who were allowed to take apprentices whose parents had no land.

And when thus apprenticed, the law still looked after the king's eleven shillings. Henry VIII. enacted that every master, as well as parent, should provide for each of his servants or sons (between the age of 7 and 17) a bow and two shafts, and cause them to exercise shooting in pain of 8*s.* 6*d.*; and that the inhabitants of every town should keep their butts in good repair in pain of 20*s.* for every five months default. Were there butts on New-castle Moor, I wonder?

The plasterers were looked after, specially, as well as the masons; for I find they were restricted from exercising the art of a painter unless they were servants to painters, or had been apprenticed to one for seven years. James I. enacted that plasterers might use whiting, blacking, red lead, red ochre, and russet, provided they mixed them with size only, and not with oil; and that painters were not to charge more than 1*s.* 4*d.* a day for laying flat colours, whether mingled with oil or size, and applied to either timber, stone, or lead.

Glaziers appear to have travelled from place to place with licences under the hands and seals of three justices of the peace. They are frequently alluded to as exempt from penalties incurred by persons who wandered about without any ostensible means of obtaining a livelihood,—such as persons who pretended to tell fortunes, or collect money for charities, or were common players, minstrels, or bear-wards, or labourers who wandered and would not work for the wages settled by other enactments. All these, if caught begging, were to be stripped naked from the middle upwards, and openly whipped till their bodies were bloody, and then sent from parish to parish till they reached that in which they last dwelt for the space of a year. But the glass-men were not to be confused with them, but allowed to pass on their way unmolested. A change of luck came to them, as it comes sometimes to most of us, and James I. declared that noble personages hitherto in the habit of giving authority to persons to travel about should do so no more, and that even glass-men were to be repented rogues, notwithstanding previous statutes to the contrary. Once, I think, we catch sight of ancient stained glass; for in a list of articles Richard III. would not allow foreigners to import, such as beaten gold and silver for painters, occurs "painted glass."

Looking now to early sanitary regulations, we see that under the Plantagenets it was as unlawful to sell diseased meat as it is now. Edward II. enacted that a "butcher who sold swine's flesh, muzzled or dead of the murrain, for the first offence should be amerced, for the second have the pillory, for the third be imprisoned and fined, and for the fourth turned out of the town."

Henry VII. enacted that no butcher in any walled town, Cambridge, Berwick, and Carlisle only excepted, should kill any flesh in his scalding-house, in pain to forfeit for every ox so killed the sum of 12*s.*, and for every other beast, 8*s.*

Overcrowding was taken into consideration by Queen Elizabeth. She enacted that none should erect or convert a building to be a cottage for habitation unless he laid four acres of freehold land of his inheritance so near to it, that they might be conveniently occupied therewith, in pain to forfeit 10*l.* to the Queen for every such erection or conversion. No owner or occupier of any cottage was allowed to place or suffer any more families than one to live in it in pain to forfeit to the Lord of the Lees 10*s.* for every month they so continued to co-habit. But, unfortunately, an exception was made in favour of cottages in cities, boroughs, and market towns, and those provided for labourers in mines and quarries within a mile of such mines or quarries, and hence we have overcrowding after all.

Adulteration of food, too, was always jealously watched, and apparently, continually attempted, if we may conclude so from the repetition of enactments relating to it. There appears, indeed, to have been no end to the ingenuity of our predecessors in inventing adulterations, or to their skill in detecting them. Here is an enactment in the apothecaries' department, made in the reign of Henry VII.:—"None shall put to sale in fairs or markets any feather-beds, bolsters, or pillows, except such as are stuffed with one sort of stuff, viz.—dry-pulled feathers, or clean down, and not with scalded feathers, fenn-down, or any other unlawful corrupt stuff, in pain to forfeit the same." The apothecaries took no heed; for Edward VI. brought the matter up again in terms that proved they progressed in their audacity, and stuffed their feather-beds with sand, lime, gravel, fenn-down, thistle-down, with anything, in fine, but feathers.

Pollution of waters and bad smells from decaying garbage were recognised as injurious to the public health as early as the reign of Richard II. One of the statutes of his reign is thus abridged:—"None shall cause to be cast dung, garbage, entrails, or any other annoyances into the ditches, rivers, waters, or other places within or near any city, borough, or town, or the suburbs thereof, in pain to be called by writ before the chancellor, and, if found guilty, to be punished at his discretion." Ditches were particularly considered in the reign of Elizabeth, and ordered to be scooped, and their contents removed from the highway immediately. All hedges were to be kept low, or the owner of them was to be fined 10*s.*

Most of the statutes I have quoted are

restrictive; but there are many more that urge on great undertakings and structural works. Act after Act was passed for the paving of towns, repairing of bridges, rebuilding of decayed houses, building of new houses on waste lands, the making of rivers navigable that were unnavigable before, the conveyance of water in "trunks" or vaults, as conduits were called, the reclamation of land from the fens and from the sea, the maintenance of highways, and the erection of colleges, hospitals, and other institutions.

Englishmen, it is some consolation to find, were not always at knightly tournaments, or at great banquets, or mustering under the standard of their feudal lords, or even assisting in grand religious festivals in our superb cathedrals, but had their every-day work as well as ourselves. They dug and delved; they piled up great embankments; dug hundreds of miles of sewers; made harbours, havens, coast works, and defences innumerable. Henry VI. appointed a company of gentlemen, to be called a Commission of Sewers, to visit the different sea defences and superintend their repair. Edward IV., Henry VII., and Henry VIII. followed in the same course. Henry VIII. set forth that the sea walls, ditches, banks, gutters, calties, bridges, and sewers by the sea-coast, and marshes had suffered inestimable damage, as much by the rage of the sea as by the making, erecting, and enlarging streams, mills, bridges, ponds, fish-garths, mill-dams, locks, hebbing-wears, becks, flood-gates, and they were then "dimpt lacrate, and broken."

Here is a simple Elizabethan outline of one of these considerable undertakings,—prim and stiff, like the walks and knots in an Elizabethan garden.—"It shall be lawful for the mayor and commonalty of Plymouth to dig a trench, 6 ft. or 7 ft. broad, through all grounds lying between Plymouth and any part of the river New, for conveying that river thither; and to repair it, and to do all other things necessary for the same, they paying the owners and farmers of the grounds so to be digged, the value thereof, to be assessed by two Justices of Assize. Howbeit that water shall not be conveyed through any orchard, garden, or to the hindrance of any mill without the owner's consent."

Sometimes we are shown our old parish churches in associations with which we do not now regard them. Edward I. enacted,—"*Fairs and markets shall not be kept in churchyards.*" "Every lord at the beginning of his fair was to cry and publish how long it would last, in pain of being grievously punished,"—decreed Edward III., by the way. There was to be no fighting in churchyards. Edward VI. enacted that, he who was convicted of striking with a weapon there, or of drawing it with intent to strike, should have one of his ears cut off, and in case he had no ears,—not an uncommon calamity in those times it would seem,—he should be burned upon the cheek with the letter F, and be excommunicated. No one was to use chiding words in the church or churchyard, in pain of suspension for such a time as the ordinary should think fit. Parsons of churches were forbidden by Edward I. to cut down trees growing in the churchyards, unless for the necessary repair of the chancel, or, in charity, of the body of the church. Elizabeth enacted, that all moneys recovered for dilapidations should be employed upon the buildings for which they were paid within two years, in pain to forfeit to the Queen double as much as should not be so expended.

Although people were beaten, burnt, and mutilated for small offences, there was not an utter callousness concerning their implements of punishment; for, among other items, I see Edward I. was particular to decree that every pillory, or stretch-neck, was to be made of convenient strength, so that execution might be done upon offenders without peril of their bodies.

Notwithstanding the large amount of engineering, architectural, and artistic work indicated in the many objects enumerated in the Early English statutes, I only find mention of the word "artists" once. And what do you think was required of them?

It was not a monumental tomb for a dead prince, or a gold cross to hang upon the neck of a radiant princess, or a gift for some ambassador to be honoured or foreign potentate to be propitiated. The only two artists mentioned—*they were to be "able artists,"* according to a statute of Charles II.—were to compute the contents and gauge of all brewing-vessels for the information of the Excise!

F. R. WILSON.

PASSION PLAYS, TRADE PLAYS, AND EARLY ENTERTAINMENTS.

THE press, through special correspondents, lately gave the public an account of some religious plays and festivities still enacted in a corner of the Continent every ten years. The Bavarian Passion plays had their counterpart in these kindreds for many centuries; and, indeed, from extensive travel through various parts of the three countries, we can safely affirm that many vestiges of these Easter, Whitsuntide, and Christmas observances have not yet completely died out. Religious rites, lay and clerical, are still performed. Christmas carols and Easter hymns are still sung by the peasantry. Thousands of homes have still a Christmas-tree, and nearly all our churches and homes have their festival decorations. Let us look back, however, for some centuries at the custom, and let us reckon up its influence on the social character of our people. There is no denying the fact that the modern drama had its foundation in religion, and, more or less, in miracle-plays and mysteries.

Early Christianity was bitterly antagonistic to the drama as it existed in Pagan Rome; and the fathers of the church first severely censured all the ordinary dramatic entertainments existing in their time. The censures of the church, however, were unable to stop the strong desires that existed for witnessing the exhibitions of circuses, amphitheatres, and other arenas. Even the heavy anathemas of the church was hurled in vain. There seemed to be something so very strong and attractive in the drama, and the fascination it exercised was so very subtle, that it grew and prospered, though intermittently, and remains down to our own time proof almost against attack.

When, after a long and heavy and a well-sustained crusade, the church at last confessed, by its action, that it was powerless to cope with the tastes of our ancestors, it adopted the strategy of fighting the enemy with its own weapon. Here we have in a nut-shell the creation of the miracle and Passion plays, and other observances of a cognate character, long famous on the Continent, equally famous in these countries, ever changing, always lapsing, blazing forth anew sometimes, sinking out of sight again, but always leaving sufficient vestiges of their nature and scope to enable them to be re-habilitated in one form or another, and so transmitted to us.

Let us give some historical incidents not generally known, confining our subject mostly to the observances practised in our own islands. The custom of decking churches, religious houses, and domestic dwellings with holly, box, laurel, ivy, mistletoe, and other evergreen plants and shrubs dates back to the beginning of the Christian era, and it was doubtless an imitation, with modifications, of Pagan manners and customs. The cypress, yew, palm, olive, and laurel all appear to have been used, and each to have symbolised some virtue, in death or in victory, by our Pagan forefathers; plants, or flowering shrubs, that held ever green, were typical of the soul or of a life everlasting; and we need scarcely wonder that they were chosen by a Christian race to perpetuate a remembrance, or recall by their usage, at Christmas time particularly, an ever-living joy. The winter was but a seeming death, from whose bosom was shortly to burst forth a spring-time of hope.

We are told that the first speaking sacred drama was that called "*Della Passione de nostro Signor Gesu Christi*," by Giuliano Dati, bishop of San Leo in 1445. This could not be, because we have sufficient evidence to show us that even in England and Ireland miracle plays and mysteries were performed long anterior to this. As to their perfectness as dramatic compositions, we will not speak. In a disjointed form, at all events, they existed, and have been transmitted to us, and they have been retained amongst our people.

In the seventeenth and down to the close of the eighteenth century many profane and sacred plays and mysteries were acted in the houses of our people, more particularly amongst the peasantry. They were prevalent in the Highlands and Lowlands of Scotland, and were most general over Ireland. In this country we had the Chester Mysteries performed publicly in England in the thirteenth century. At a later date we had a series of Irish plays and mysteries, sacred and otherwise, known by the following titles, "*The Cottoning of the Frieze*;"

"*The Marriage Act*;" "*The Servants serving our Lord at Table*;" "*The Falling or Thickening of Cloth*;" "*Sir Sop or Sir Soplin, the Knight of Straw*." Some of these plays passed into Wales, the West of Scotland, and the North of England, in the various migrations of the Irish.

The above plays indiscriminately have been performed at Irish wakes, weddings, and festivities, and at Christmas, Easter, and, indeed, throughout the year, whenever occasions offered for a solemn representation, the religious ones have been introduced and performed. Mirth and joy have now for many years been associated as much with Christmas time as miracles and religious rites. Stowe writes that "in the feast of Christmas there was in the king's house wherever he lodged a Lord of Misrule or a Master of Merry Disports, and the like had ye in the house of every nobleman of honour or good worship, were he spiritual or temporal." The corporations of London, Dublin, and some of the Scotch cities were mixed up with many of these olden ceremonies, the mayors and members figuring prominently in them at Christmas, and at other stated intervals.

The trade guilds helped to keep these old religious observances alive, for hardly a trade but had its patron saint, motto, and banner. From the communes and boroughs of the Middle Ages, when trade and manufacture, and the artificers were more protected by special enactments within walled towns, trade guilds exercised great influence, and received much public and corporate favour. Before the Reformation, the Roman Catholic clergy had a voice and a veto for all performances that they liked or disliked. They could command in their corporate character the attendance of associated bodies of men, to give *déclat* to public, religious, or other ceremonials in which they were interested. The English and the Irish clergy, in the reign of Henry VIII., often exhibited mysteries and moralities, and previously to that reign these were exhibited not only, we think, as a church observance, but as a counterblast against the profane drama, as it was denominated. The following record, preserved amongst the MSS. of Robert Ware (not Sir James Ware), gives us an insight into Christmas customs and observances practised nearly 350 years ago. The record is an Anglo-Irish one, for Dublin, where the play was enacted, was one of the counties of the English pale.

"Thomas Fitzgerald, Earl of Kildare, and Lord-Lieutenant of Ireland, in the year 1528, was invited to a new play every day in Christmas, Arland Usher being then mayor, and Francis Herbert and John Squire, bailiffs; wherein the tailors acted the part of Adam and Eve; the shoemakers represented the story of Crispin and Crispianus; the vintners acted Bacchus and his story; the carpenters that of Joseph and Mary; the smiths Vulcan, and what related to him; and the comedy of Ceres the Goddess of Corn, by the bakers. The stage was erected on Hoggin-green (now St. Andrew-street and College-green), and on it the priors of St. John of Jerusalem, of the Blessed Trinity, and of All Hallows, caused two plays to be acted, the one representing the Passion of our Saviour, and the other the several deaths which the Apostles suffered."

By the above interesting record, we see that three religious establishments, Trinity, St. John of Jerusalem (the priory of Kilmalmainham), and All Hallows took part in the Christmas ceremonies and processions. Several of the minor corporations or guilds both of London and Dublin, some centuries back, were in the habit of inviting their chief magistrate or governor (lieutenant) to a play on the anniversary of their patron saints. The corporation usually supplied the performers, and the City also supplied mostly the scenery, dresses, and machinery. Many trade bodies, however, appear to have kept a stock of portable fixtures for their yearly displays themselves. In every case they supplied their own banners and flags, and took a peculiar pride in their display. In the library of Trinity College, Dublin, which, by the way, is rich in MSS., we find another record, from which we give an extract:—

"That in an expedition against James M'Connell by the Lord Deputy Sussex, in 1557, he was attended by John Usher, captain, and Patrick Bulkely, petty captain, with sixty of the trained bands, and upon their return '*The Sir Worthies*' was played by the city, and the mayor gave the public a goodly entertainment upon the occasion, found four trumpeters' horses for the

solemnity, and gave them twenty shillings in money."

These exhibitions had, doubtless, the sanction of the clergy, and were assisted by them.

All the trade guilds, both in London, Dublin, and other large cities, had similar performances, and every regular trade had its guild, banner, and patron saint.

It is evident from the different patron saints, and the sacrifices personated, and the passages from both the Old and New Testament, that the clergy in the sixteenth century had a powerful hold on the people, and that Passion plays, mysteries, and moralities fought a tough fight with the profane drama. To Jeremy Collier and John Bale, two English divines, we owe much; by their writings and censures the modern drama got a more decent representation. But Bale was the precursor by two centuries and a half. Bale was originally a Carmelite monk, but afterwards turned Protestant, and wrote fiercely against Roman doctrines. He was born in Suffolk in 1495, was appointed Bishop of Ossory, in Ireland, in 1552, and we may add that he died in 1563, and was buried in Canterbury Cathedral. John Bale was a very resolute writer. He wrote several dramatic pieces to counteract the Morality on the stage. Two of the most remarkable of those productions were "God's Promises" and "John Baptist." These pieces were acted by young men at the Market Cross in Kilkenny, on a Sunday in the year of 1552. "God's Promises" was written to ridicule the doctrine of grace against such as held the doctrine of free will and the merit of works. Adam, Abraham, Noah, Moses, Isaiah, David, and John the Baptist, in this piece, are all introduced on the stage with the Almighty.

Notwithstanding Bale's writings, or the thunders of the Church on the other side, the comic muse still continued to make sport with religion at Christmas and Easter times, as well as on other occasions. By an Act, however, passed in the reign of Queen Elizabeth, entitled "An Act for the Uniformity of Common Prayer and the Service of the Church, and the Administration of the Sacrament," a stop for a time was put to previous outrageous abuses. It was then enacted, that anybody who was guilty, after the feast of St. John the Baptist, by "interludes, plays, songs, rimes, or other open words," of declaring or speaking anything in derogation of the same book should forfeit, for the first offence, 100 marks; the second offence, 400 marks; and if the offence were repeated the third time, all his goods and chattels were forfeited, and himself was to be imprisoned for life.

Under the first Charles the poor wandering players and minstrels had "hard lines." Both the English and Irish stages suffered a collapse, and strolling players were classed indiscriminately with the idle and vicious. Houses of correction were instituted by Charles for the punishment of rogues, vagabonds, sturdy beggars, and other lewd and idle persons, in which all the justices of the peace of the different counties were instructed to deal according to law with "all fencers, bear wardens, common players of interludes, and minstrels wandering abroad." Poor Shakespeare, and wert not thou one of these strolling players? Though Parliament pushed coercive measures against the liberty or licentiousness of the stage, the Court continued to countenance it in various ways. John O'Gilby, originally a dancing-master, afterwards teacher to the children of the Earl of Straford, who was at one time Lord-Lieutenant of Ireland, was appointed by the latter as Deputy Master of the Revels in Dublin. O'Gilby built a theatre in Dublin, but subsequently returned to this country. He was a voluminous writer. At the king's coronation in 1661 he conducted the ceremonies, and he has left us a pretensions account of them, with illustrations. O'Gilby went through extraordinary vicissitudes as an author, teacher, dancing-master, leech, traveller, and we must add, a translator of Homer and Virgil. The theatre which John O'Gilby built in Werburgh-street, Dublin, was betimes under the sanction of the Government; but during the disturbances in Ireland in 1641, it was closed for ever.

No regular dramatic production appears in the Irish language previously to the Middle Ages, although in the customs, dances, and entertainments still existing amongst that people dramatic phases and forms can be observed in the motions, expressions, and accompanying music, songs, and recitations.

If we accept Maepherson's translation of

Ossian as a *bona fide* reproduction of an original, we have then "Comals" as a dramatic poem. The Italian poet Cesarotti has given us a translation of this, along with the rest of Ossian's poems (Maepherson's version), in Italian blank verse. The Italian poet seems ravished with the melody of the Celtic bard.

The Mummings as a body may be said to have been for years extinct. The dialogue of the English Mummings in the reign of Edward III. had a counterpart in the Irish Mummings in many things. The Irish Mummings were always accompanied by a buffoon, and his dress and antics, it has been observed, bore a fair resemblance to the Vice of the old English comedies, the acknowledged precursor of the still undying *Punch*. This character remained in many of the pageants of the Irish peasantry and rustics, and it might be observed, particularly in the celebrations of the 1st of May, and the May-day and May-pole sports, as we have witnessed ourselves some years ago. In the mummings of Gay Fawkes day in England we can distinguish something in the dress and action that reminds us of older observances in this country.

We are digressing, but it is pardonable on such a subject. Between Easter, Whitsentide, and Christmas observances of the past and the present there is a vast difference; what was localised once is now generalised, and what was formerly generalised has now disappeared—customs, pastimes, habits, rites, ceremonies, entertainments, exhibitions. We welcome Christmas and Easter now not as the early Christians welcomed it, yet we welcome these bright festivals more or less in the same spirit that our great-grandfathers did.

Thomas Warmstry, in his tract in "Vindication of the Solemnity of the Nativity of Christ," published 1648, writes:—

"If it doth appear that the time of this festival doth comply with the time of the heathen *solstitialis*, this leaves no charge of impiety upon it, for some things are beatified by their contraries: it was both wisdom and piety in the ancient Christians (whose work it was to convert the heathen from such as well as other superstitious and misapprehensions) to vindicate such times from the service of the devil by appropriating them to the more solemn and especial service of God."

The customs at Christmas and Easter time have varied much, and still vary in the three kingdoms.

The Yule, or what is generally now called the Christmas block, is not so often burned as formerly, except in country districts. For several weeks before Christmas, in Ireland, the peasant proprietor is on the look-out for his Christmas block. The rotten or decayed root of an old tree, or the stump of an old thorn, is forced or dug out of a roadside hedge, and carried home and kept in readiness for the event. A general whitewashing of the outside and inside of the walls of the house takes place also some time before Christmas. The potatoes in the crib beside the chimney corner get an overhauling from bottom to top, and the buds, if strong in the eye, are broken off; the manure heap is also tacked in and made look tidy; and the gains of the year, if in the old stocking instead of the bank, are counted over with the assistance of Molly.

We should observe that Christmas is not generally observed as an institution or festival in Scotland amongst the Dissenting portion of the Scotch; but the English and Irish contingents keep up where they can the custom of their own home and native land. New-year's day is the more general rejoicing day of the holiday Scotch, and Hogmanay-day, the last day of the old year, is the day for presents.

BRASS FONT: BOIS LE DUC CATHEDRAL.

The Cathedral of Bois le Duc, or St. Herlogen Bosch, as it is called by the Dutch, is in the largest and most important town in the province of North Brabant. This town contains about 35,000 inhabitants, and is very strongly fortified. It is well built, with good broad streets and a large market-place. It possesses, however, little to interest the architect or antiquary, except the magnificent Cathedral of St. John, which is certainly the finest church in Holland. Of its exterior we shall, before long, give a view which has been made for us on the spot, and some descriptive particulars.

The interior is no less interesting than the exterior. The general effect, upon entering at the west door, is singularly noble and striking: a nave of great loftiness (above 100 ft. high), with double aisles on either side; deep transepts;

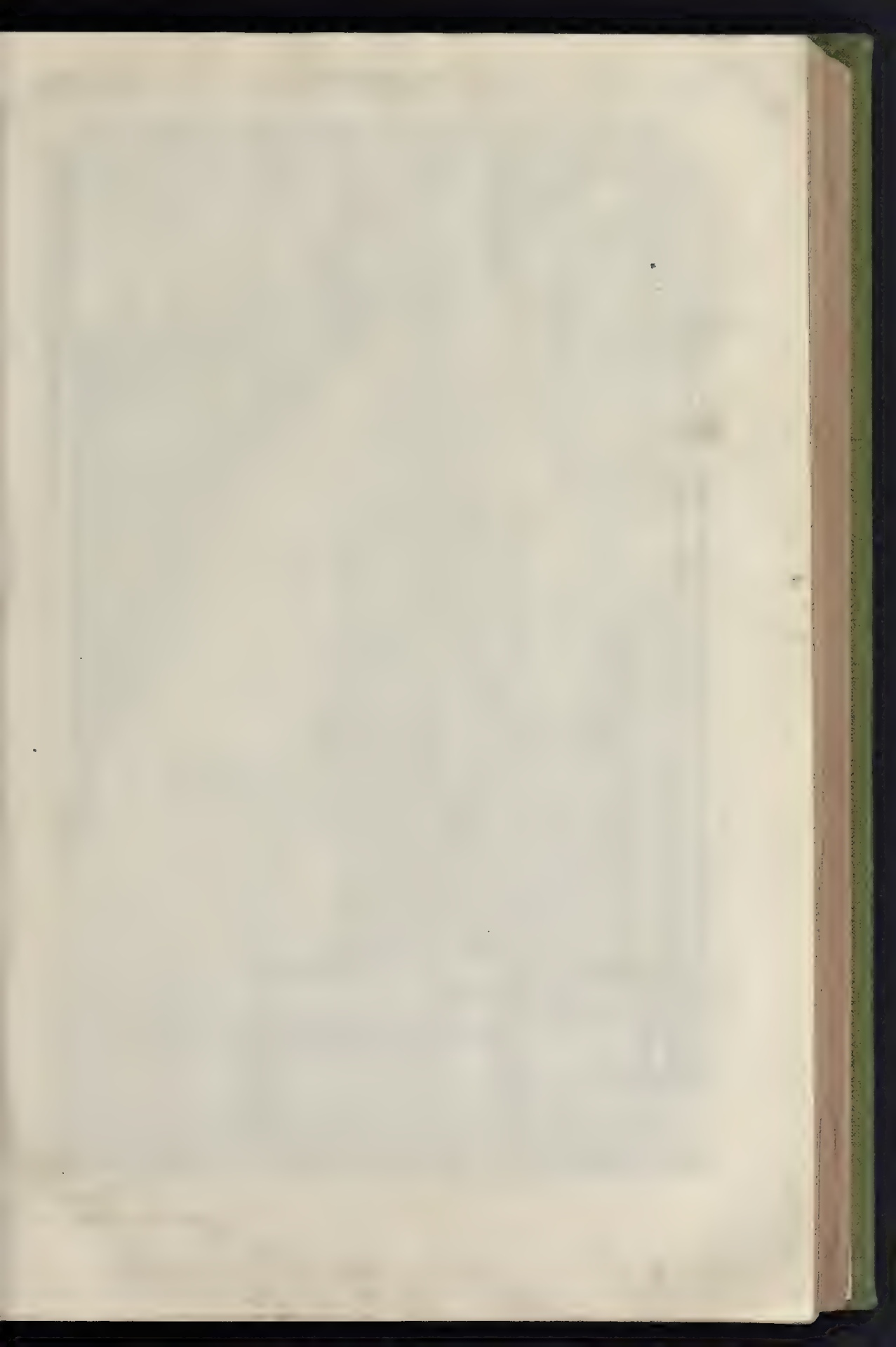
and a spacious choir, with double aisles, radiating chapels, and lady-chapel to the east, form a magical and magnificent perspective, such as is rarely to be seen, except in the great cathedrals of Northern France.

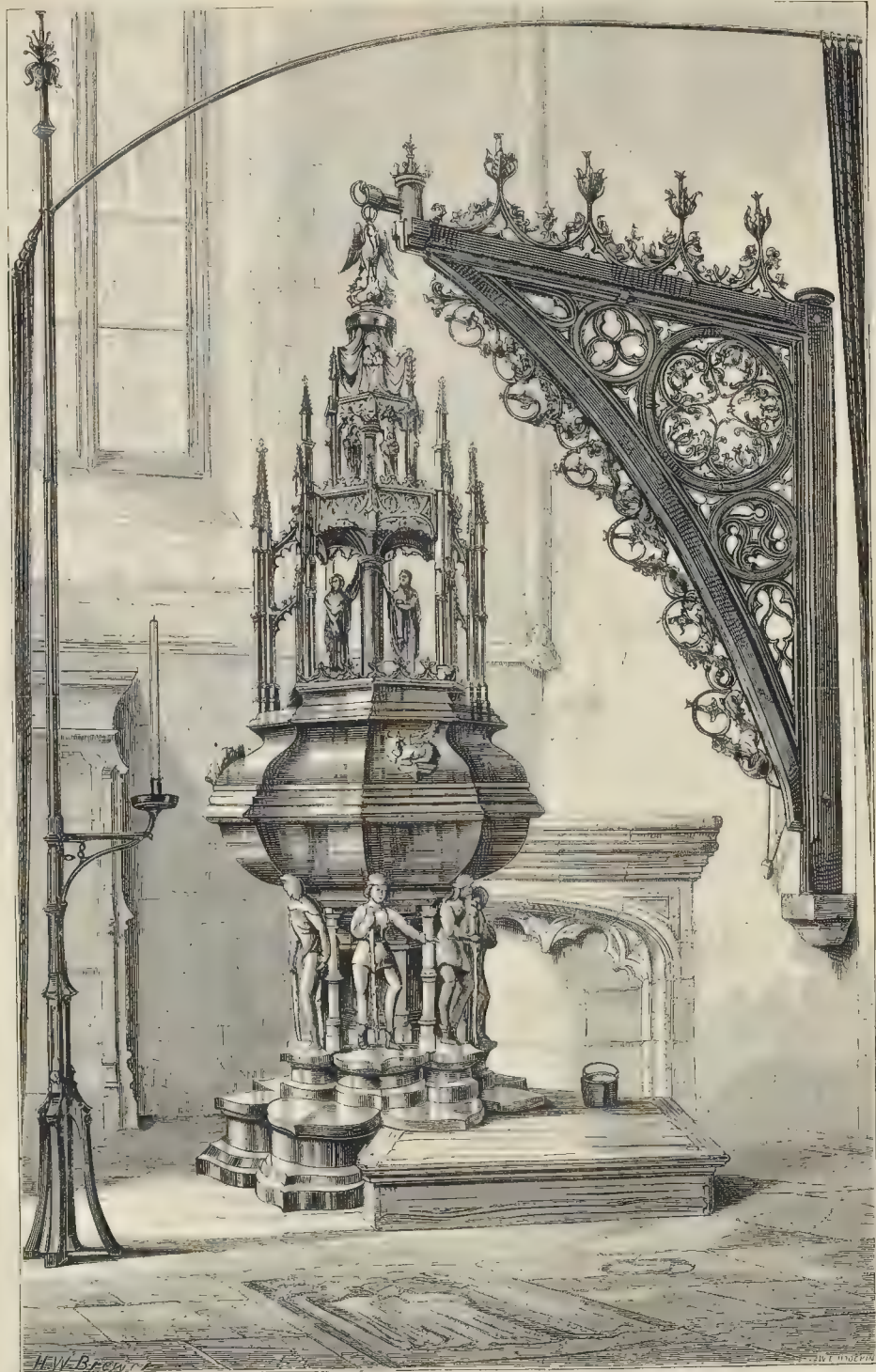
Had the Cathedral of Bois le Duc been erected half a century earlier, a more beautiful interior could scarcely be imagined; and even as it is, with the drawback of wiry and poor mouldings, the entire absence of capitals, the confused and ill-designed paralling which occupies the spandrels of the main arches, and the thick coat of yellow wash which covers the whole church, few cathedrals can boast a more striking interior. By far the best part of the church, internally as well as externally, is the choir, the apex of which bears a striking resemblance to that of Cologne; but even here the absence of capitals is painfully felt, and even the excessive grace and beauty of the proportions scarcely make up for the poverty of portions of the detail. The triforium is (as is usual in Holland and Belgium) a kind of continuation of the cloareatory windows. It is here very much better treated than at Louvain or Antwerp, and is one of the best features of the interior of the church. The cloareatory is lofty and fine, but suffers from the tracery having been removed from most of the windows; however, as it is being now replaced, and the windows are filled with stained glass, this defect will soon disappear. The vaulting is very simple and good, with well-carved bosses and good scroll-work decoration, which has been restored in a creditable manner. The furniture of this church is very rich and magnificent; and here we must protest against the removal of the rood-screen, which was the finest example of Renaissance work in the whole of Holland. However much it might have been out of place in a Gothic church, its own immense value as a work of art, and the intrinsic merit of the sculpture with which it was adorned, to say nothing of its costly material (black marble and alabaster), ought to have saved it from destruction; and we cannot but regret its removal. Portions of this noble screen have been purchased by the South Kensington authorities, and we regret that the whole has not fallen into their hands, as in that case our readers might have judged for themselves of the great beauty of this work of art. However, enough is to be seen there to convince any man of taste of the correctness of our strictures upon those who removed this noble screen. The choir-stalls are of the fifteenth century, and are good examples. The side screens of the choir and chapels are works of the early part of the seventeenth century, and are most charming examples of Renaissance work. They are composed of oak, with brass rails. In the chapel of the Holy Sacrament is a fifteenth-century chandelier, very similar to the celebrated one at Angsburg, only smaller. The pulpit and organ are fine examples of Early Renaissance work, excessively elaborate and intricate, and adorned with delicate arabesques worthy of Buonvanti Cellini. There are also numerous chandeliers, and a good deal of quaint and interesting metal-work of the earlier part of the sixteenth century.

The font and cover (of which we give an illustration) are entirely of brass, and date from the fifteenth century. They are very beautiful and perfect. The figures at the base, representing the Cripples at the Pool of Bethesda, are exquisitely modelled; but what is most remarkable is the fact that this baptistery contains the whole of its ancient furniture. It is cut off from the aisle by a very rich metal screen of the fifteenth century, in very perfect condition.

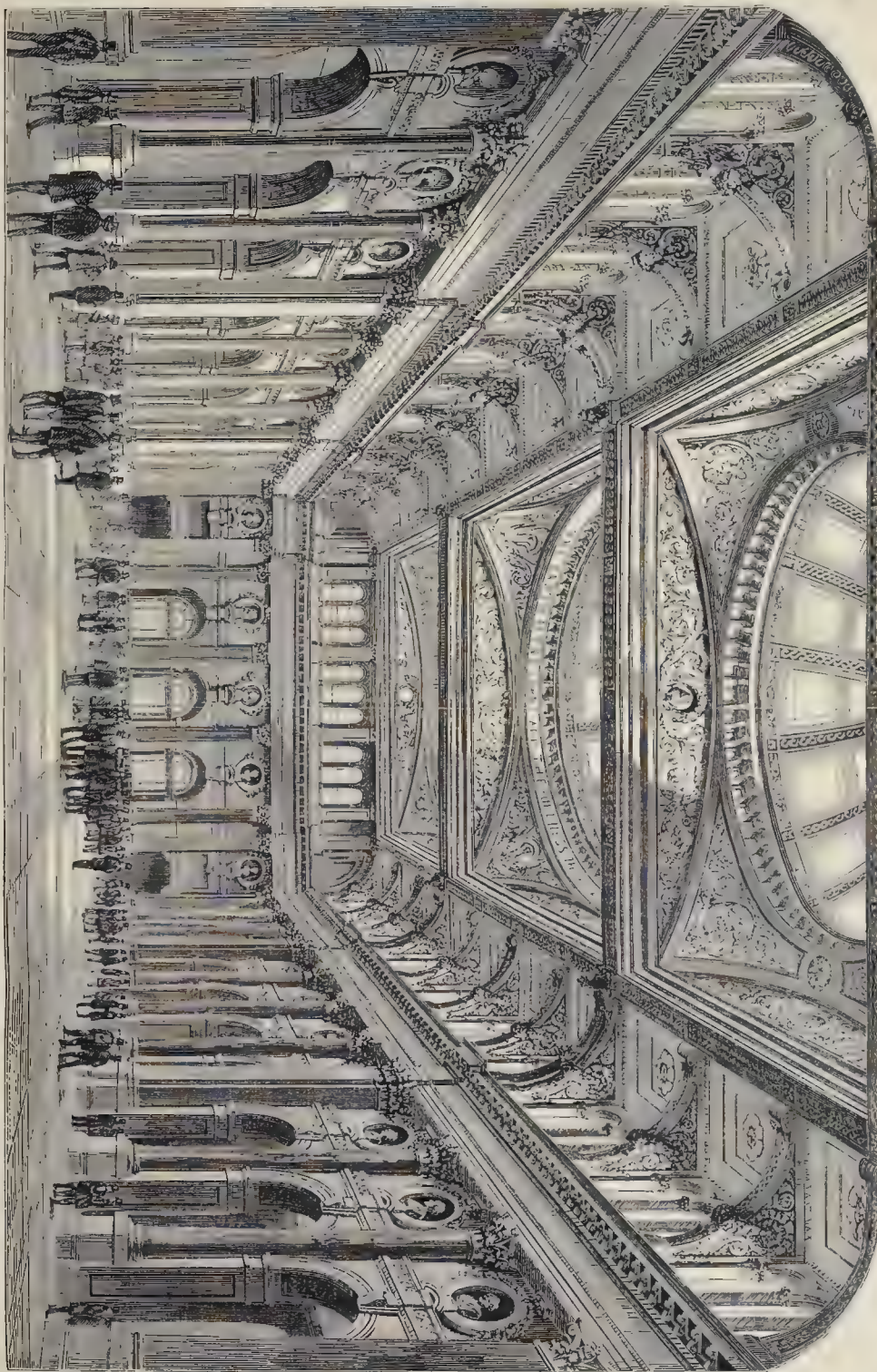
The whole of the interior of this church is by degrees undergoing repairs, under the superintendence of Messrs. Heneman & Keallman, and a general scraping off of the yellow wash and restoration of the windows are now being proceeded with. A new high altar, of stone, has been erected; it is, however, too small and poor for such a church, and looks paltry and insignificant when compared with the magnificent pulpit and organ. There is a good deal of modern stained glass, which is not so bad as most of the modern glass we have seen in Holland, and were it not for a certain opaqueness, would be really good.

A throne for the bishop, of very elaborate design, has just been erected; but it is not quite satisfactory, and a most pretentious confessional of positively bad design was set up some few years back in the Holy Sacrament Chapel. On the whole, the restoration of this cathedral may be said to be well intended, but not very ably carried out.





BRASS FONT AND COVER IN THE CATHEDRAL OF BOIS LE DUC, HOLLAND.
FIFTEENTH CENTURY.



MANCHESTER ROYAL EXCHANGE.—MESSRS. MILLS & MURRAY, ARCHITECTS.

THE MANCHESTER NEW ROYAL EXCHANGE.

Our present illustration represents the interior (of the central portion only) of the Manchester Royal Exchange, now in course of erection by Messrs. Mills & Murgatroyd, of Manchester, architects. In our last year's volume (October 29th), we published a view of the exterior from the north-east, accompanied by a description, in which the dimensions and some particulars of the internal arrangements are stated.

It may be interesting to some of our readers if we now give a short history of the buildings in Manchester which have been used for exchange purposes, as illustrating in some measure how the trade of the manufacturing districts of which Manchester is the centre is extended, and how important the work in question is to that community.

Previously to 1806 Manchester may be said to have been without any room especially used as an exchange. The merchants used to meet in a kind of market-hall, or in the open street, as most convenient, and the space almost opposite the northern end of the old Exchange, then known by the name of Penmiles-hill, was the place mostly so used. This condition of affairs at length became so inconvenient, that a few gentlemen formed themselves into a company, with the view of erecting a more suitable building, where merchants might congregate for the transaction of business, and in 1806 architects were invited in a limited competition to send in designs for a building proposed to be erected at the lower end of Market-street, upon a site that had been purchased of Lord Ducie for the purpose. Mr. Harrison, of Chester, whose name as an architect of the day must always be mentioned with honour and respect, was the successful competitor, and he received the commission to carry his design into execution. It will be remembered that Mr. Harrison was the architect who constructed the stone bridge over the Dee, at Chester, and of which it is not speaking too highly, even in the present day, to say that there are few works of the kind which show more skill.

The new Exchange of 1806 comprised within its walls a post-office, and some large rooms fitted for assemblies and receptions: it was opened with some ceremony in 1809, the capital raised being 32,000*l.* The area of the room was 452 square yards, and for the first five years the average number of subscribers was 1,447 per annum. The numbers varied from time to time, and in 1838 having risen to 2,000, the shareholders thought it desirable to bestir themselves to provide increased accommodation for the subscribers. To accomplish this, they retained the services of Mr. A. W. Mills as architect, who recommended the removal of some of the walls and floors which separated the post-office from the rest of the building, and at a very small outlay an area of 800 yards was secured. The possibility of this enlargement had evidently engaged the attention of the original architect, as the walls and other portions of the building which had to be interfered with seemed to be especially arranged, so as to be easily removed. The capital was raised to 54,000*l.*: the committee at that time contemplated the erection of a new post-office on a plot of land purchased by them for the purpose; but some differences of opinion as to the position having arisen, the Government referred the question to the Manchester corporation, and the site then proposed was abandoned.

The enlarged room, however, had been opened but a very short time before the committee became satisfied of the necessity for a further extension, and in 1844 steps were taken with that object. With the consent of the corporate authorities, some narrow streets were absorbed, and the building extended very much to the limits of that which in its turn is now being superseded, and which contains a floor area of about 1,630 square yards.

It was in this room that her Majesty, attended by the Prince Consort, the Prince of Wales, some other members of the royal family, and the late Duke of Wellington, graciously received the address of the Manchester Corporation, in the year 1851, upon the occasion of her visit to the then borough. An elegant throne was erected in the room, and some important alterations were made in the interior of the building for the purpose of the reception. In the presence of the assembled citizens, the honour of knighthood was conferred on the late Sir John Potter,

who was then in office as mayor, and, to mark her approval of the reception she met with, her Majesty directed that Manchester should be designated as a city (up to that time it had been a borough under a charter granted in 1301, by Thomas de Gresley, fourth Baron of Manchester), and that the Exchange should be designated as the Manchester "Royal" Exchange.

The subscribers rapidly increasing in numbers, until they reached nearly 6,000, it became a question with the proprietors whether they should proceed to a much more extensive enlargement than any that had hitherto been made, or permit the Exchange to be removed to another part of the city. The difficulties of continuing it in its present neighbourhood and site were considered; and, as it was impossible to enlarge its borders without a very extensive interference with the public thoroughfares, the representatives of the public had to be consulted. After a number of almost insurmountable obstacles had been overcome, the committee determined to proceed; arrangements were made with the corporation for stopping up some streets and widening others. The capital of the proprietors was raised to 450,000*l.* Valuable property was purchased from various proprietors, none of which had been erected more than forty years, and about an acre of additional land was procured upon which to erect the new building. The value of the land which had to be purchased may be estimated by the fact that some portions cost at the rate of 459,000*l.* per acre. In addition to the cost of the land and the proposed building, the comparatively recently erected Exchange had to be entirely sacrificed, inasmuch as the new building must extend over the site occupied by the old one; and as the subscribers must be temporarily accommodated in a portion of the new building before the old one can be pulled down, the difficulties of construction have been considerably increased and the design of the architects materially influenced by these considerations. Nevertheless, it is expected when the room is completed that it will satisfy the requirements of the public taste and the convenience of the subscribers for many years to come.

When finished the building will form a nearly square block, the four streets which inclose it being the most important in the city; and although the surrounding space is circumscribed for so large a structure, the way in which the principal features of the design have been dealt with, placing them as much as possible opposite the ends of the leading approaches to the building, will enable the general outline and most salient points to be seen to the greatest advantage.

BUILDERS' TENDERS.

A WORD or two may, perhaps, be said on this head that, though probably in everybody's thoughts, have not been repeated in the recent correspondence on a part of the subject.

Our true friends, the public—comprising the sacred class of clients in *esse* or *posse*, and too many architects, in speaking of estimates for the works of their brethren—seem loth to allow that there may be various creditable, or possibly creditable, causes of considerable differences in the amounts of builders' tenders. A work—to be undertaken on the same conditions, under the same architect, and paid for in the same way—is competed for: fifteen tenders made on the same quantities, drawings, and specification, are found to range from x to $x + 25$ per cent., let us say. Sly chuckles, or undisguised merriment, or vague bewilderment begin to make themselves heard, or to show themselves in sundry faces!

Assuming, as we would hope we have a perfect right to do in the majority of such instances, that the tradesmen concerned have enough rectitude of purpose and intelligence to carry on their trade according to its current methods and average standards: can such a variation of result be accounted for otherwise than as simple error? Contractors, when not on high stilts, or venting their very proper indignation that fortune has not favoured them in a becoming way, do not seem themselves to see much difficulty about the matter.

The basis as to description and quantity being the same, it will rarely follow that the estimation of the *quality* does not differ. In works of the same kind, what a range is possible! How much larger a range in those of widely different kinds.

The excellent M. Cesar Daly (for whom and such as he are now all our regrets and all kindly

feelings) says, oddly enough, of our English buildings, contrasting them with those of France,—"In a country where liberty is the law (such as England), men and the classes of society are not classed like the items of an inventory, but the things connected with them; the English law which regulates buildings (the Building Act) distributes houses into several classes—each house according to its class having walls of such or such a thickness."*

Without insisting on the details of this as bearing on the class divisions of our society, it may serve at least to introduce the fact that we really have in practice several classes of buildings with degrees of quality in materials and workmanship. Might not these be called by distinctive names, so that any legitimate doubt in a contractor's mind would be cleared up—as to this point?

In joining work on to that already existing in a building, it would commonly be a mistake to pitch the quality of the new higher than that of the old. Personal inspection might often supply the requisite information in these instances, but it cannot always be made. A phrase would equally in this case, and in the case of new work, supply a valuable additional clue to the architect's real intention.

Architects are often able to give this by word of mouth, and of course then very thoroughly; but this also can only occasionally be done, and the words do not remain on record to aid others equally in the future, and possibly be a substantial protection to a contractor. In the case of the death of the architect they would often be so.

As to such phrases, it might be suggested that the classes should be:—

1.—*Superior*,—indicating, to use the phrase of specifications, "the best materials and workmanship of their respective kinds," and this literally and throughout the work. This class would (or should) comprise monumental buildings of all sorts, the higher kinds of residences, and occasionally alterations in buildings where the work existing is of a lower class, but where, for special reasons, or on account of the personal feeling of the employer, a superior class of addition is to be made; or we might suggest as names,—First-class, monumental, high-class, or as in shipping, A1.

2. *Average*,—to include good sound careful work, not of special excellence, but maintaining a good general level of finish and material. The regulation, 1,500*l.* paragon-house and offices would generally be in this class.

3.—*Ordinary*,—to include a less complete style of finish. Eight-roomed houses in towns (built under an architect), light warehouse buildings, and so on.

4.—*Rough*,—where cheapness (small cost), is studied very much, and a servicable building of considerable size must be furnished for temporary, experimental, or other similar purposes, where suitable old materials might be permitted to be used, &c. Contractors at the present time call this, rather aptly, "field-ranging" work; the prices must almost always vary much.

Of course, any names so suggested may be open to considerable criticism: by a little use, however, they would acquire the shades of special meaning required, to the exclusion of others, one of the utilities of language being (not speaking after the manner of Trilby and *not*) the draping our ideas so as to bring some feature strongly into view at the time that we conceal a good deal more. It would not be wise to make the phrases by any chance imply a reproach. "Third or fourth-class building," or "inferior" (antithetic to "superior"), might not in this view be deemed happy names.

Supposing that the professional delineators and describers of proposed buildings have classed them either thus, or in some other definite way, or with modifications suited to special circumstances, and supposing quantities of undoubted

* L'Architecture Privée, sous N. III. Par C. Daly. Paris, 1861. Page 32. This statement will no doubt be a revelation to many who know their 18 & 19 Vict., cap. 122, pretty thoroughly. The schedules of 7 & 8 Vict., cap. 54 (act of 1844), might perhaps to an outsider originate the belief at the root of it, which should not, however, have lasted after it was perceived that determining the rates and classes to which buildings should belong was only a routine step towards ascertaining (roughly and readily) the thicknesses necessary for walls. The area of the building in combination with the height of the wall was then supposed to be a good working basis for types of buildings constantly being erected. The present Building Act, with much the same practical result, but with a better show of reasonableness, puts the length of a wall, with its height, in similar tables.

accuracy applied or obtained, there will still remain among the causes of differences of prices of "seeing" as opposed to "blind" tendering, the special facilities of one contractor over another, his command of money, his personal energy, knowledge, or powers, or those of his staff, in the case of works of difficult nature, without much heavy labour or materials, a very important cause of difference. There will also be his immediate business position, his need for new employment, or otherwise. It may be worth his while to do work at almost cost price, rather than lose indispensable men for whom he foresees certain employment for a long time after two or three months have gone by.

On the whole, the system of competitive tendering—worked in perfect fairness and honesty all round—seems likely, better than any other method, to place work (as a good system should place it) in the right hands, so that the work may be undertaken according to the capacity to execute it with credit and honour; the labour and the reward of it falling to those who "play the game with skill, and strictly according to the rules."

It should never be kept too much in the background that contractors, who (like lawyers, and probably for about the same reasons) are looked on as a class with humour a little acid, have their keen sense of the conventional point of honour in competition tenders: to decline to carry out a contract at a price tendered, even when that price is founded in error (of the contractor's own), is deemed as iniquitous as to have omitted to fight a duel when the quarrel was wholly *en règle* would have been in old times.

AN ARCHITECT.

BRADFORD.

The angle formed by Tyrryl-street, New Market-street, and Bowling-green, is now adorned by piles of buildings and by the new Mechanics' Institute, all of which are approaching completion. The latter structure, says the local *Observer*, looks better than was at one time anticipated, the directors having determined to spend more money on the upper portion of the building than was originally intended. Although ornamentation is sparingly employed, the frieze that will encircle the building and the cornice above will impart a harmonious effect to the three façades. On the opposite side of Bowling-green, on what is known as the Bank-street block, the architect and builder are busily engaged in rearing shops and offices superior to the old edifices that formerly encumbered the land. The back has been covered in, New Igate carried forward to Market-street, and New Tyrryl-street opened out to Hustler Gate. Messrs. Brown & Muir's extensive premises, plain in character, are being roofed in; about a dozen other smaller buildings are either erected or about to be commenced; and amongst these is Mr. Thorp's warehouse, at the corner of Hustler Gate and Tyrryl-street. The land in this block, with one exception, fetched the highest price that has yet been realised of late years for property in the centre of Bradford, and the purchasers were bound to erect buildings within a certain time, and to make them, however plain externally the structures might be, not less than a prescribed height, and equal to Brown & Muir's. In the Bank-street block will be the new premises of the Yorkshire Banking Company, shortly to be built on 452 yards of land at the angle of Bank-street and Hustler-gate, having frontages to both thoroughfares, and opposite the Exchange buildings. The original premises of the company in Market-street are too small for the purposes of the bank, and hence the erection of the new pile. A design, in which no expense appears to have been spared, has been prepared, in the French-Italian style, by Messrs. Lockwood & Mawson. The principal feature of the design is in the angle formed by the two streets, where the grand entrance to the bank is placed. Coupled fluted Corinthian columns, supporting a pediment, form a recessed portico, in the centre of which is the doorway. Above the portico is a projecting three-light window, with columns of the same order carrying a smaller pediment, the tympanum of both pediments filled in with carved work. Above this, again, is a coupled two-light window, with shafts; then a frieze, cornice, and parapet, flanked by ornaments at each angle, terminated by finials; and from the centre rises a mansard roof, surmounted with iron cresting and finial, the front of the roof enriched with a kind of dormer, carrying figures. The lower story of the bank is rusti-

cated up to the first floor, the same feature marking each of the angles in Bank-street and New Tyrryl-street, the rustication being continued up to the frieze, both there and on each side of the principal entrance. The banking apartments are on the ground floor, lighted by lofty square-headed windows, masks forming the key-stone to the window-heads. The first-floor windows are terminated with circular pediments, and have balconies, and on the second floor the windows are coupled. A cornice and frieze are carried round the building, and above that, again, is the parapet, forming square panels, filled in with paterae. A distinctive character is given to each angle of the building, as well as to the central portion. The line of the parapet is broken by chimney-stacks and ornamental terminals. The banking-room, 33 ft. by 52 ft., with a height of 22 ft. 6 in., is approached through a porch, fitted with double doors. The room is divided at one end by three scagliola columns, with responding pilasters at each side. The ceiling will be finished in carton-pierre. The strong-room is placed in the centre of the building, surrounded on all sides by the bank premises. The private entrance to the bank is in New Tyrryl-street; and the rooms above, which are intended to be let for offices, will be approached by a doorway and staircase in Bank-street, at the other extremity of the building. The floors above the bank will be fireproof, iron and concrete being used in their construction. Communication will be obtained with the basement and the banking-room by a hoist. The cost of the land was about 10,000*l.*, and the expense of the building is estimated at 10,000*l.* The site of the old bank, in Market-street, built some twenty years ago, was under 61*½* a yard, although it fronted one of the best streets in the town; while that of the new site was 211*½* ft. per yard. Messrs. Lockwood & Mawson were the architects of the old bank.

A LARGE MALTHOUSE, CANTERBURY.

MR. BEER, of "The Star" brewery, in this city, has recently caused to be erected, for the purpose of his trade, a new malthouse; and the size of the building, and the many modern improvements it possesses, call for notice. The situation of the malthouse is at the rear of St. Augustine's Missionary College. The builder was Mr. John Knowler. Mr. J. G. Hall was the architect. The entire length of the building is 225 ft., and its width 65 ft., built of brick, and having a span roof, supported by iron girders almost throughout. There is an office inside of the entrance gates, communicating with the main structure; and in the interior, at this end of the malthouse, is erected an iron stage, termed a "barley bin." It is here that the raw material is deposited, and, after having been screened, is rushed thence into a cistern beneath, which is capable of wetting sixty quarters of corn at one time. When the bulk has attained a certain degree of germination, it is transferred from this immense trough to the "couch," and subsequently spread over the floor of the building, which is laid with Portland cement. After remaining here the necessary time, it is removed to the further end of the enclosure, and placed upon a tiled floor, supported by iron joists, beneath which are the kilns. The roof of the malthouse up to the kiln, as we have mentioned, is supported by iron girders; it is boarded in, and covered with hard felt, and slated. Of course, where the drying process is carried on, draught and ventilation are required, and this is provided with a lofty roof, surmounted by cupols, covering the drying-floor, the furnace passages, coal-slores, and large room for the storage of malt. The cupols admit light to the drying-floors, and this is provided in other parts of the building, by means of screened windows on each side.

SCHOOLS OF ART AND OF SCIENCE.

The Manchester School of Art.—The annual meeting and distribution of prizes in connexion with this school took place at the Manchester Royal Institution, Mr. R. N. Phillips, M.P., in the chair. There was a numerous attendance. The report of the committee for 1870 was read, in which the committee regretted that they had again to come before the friends and supporters of the institution under the same depressing influence as to finance as they had experienced for some years past, and with the same general

complaint of the want of sympathy and support with regard to the promotion of pure art in this commercial community. The annual subscriptions had decreased from 458*l.* in 1864, to 280*l.* in 1869-70; but, on the other hand, the fees from the students had never exceeded 700*l.*, the present amount. It had been proved that external support had been continually diminishing, and but for the increase of fees, the school would have been more in debt than it was at present. Mr. Wm. T. Munkley, the head-master of the school, read his annual report, in which it was stated that the works of the pupils had exhibited greater power and ability during the past year, and there was every reason to suppose that the standard of excellence would be raised still higher. The number of pupils attending the classes had been much about the same as in the previous year. At the present time the teachers connected with the institution were giving instruction in twelve schools in the district, and had about 800 pupils under them. The chairman said the documents showed that the institution was becoming more and more self-supporting. He congratulated them on that being the state of things, and he believed that was a basis for the future prosperity of the school. Professor Williamson said they had a great deal about the existence of a genuine love of art among the richer classes of the people of Lancashire; but he considered it was only a genuine love of humbug, a mere gratification of vanity and pride in being the possessors of magnificent collections of pictures—otherwise much greater support would be extended towards that institution.

The Lincoln School of Art.—The annual exhibition of this School has excited more interest than usual this year, the number of visitors during the week having exceeded 4,000. On two evenings, the rooms were open free to the public, and were crowded by the working classes, who manifested the greatest possible interest in the drawings and paintings which covered the walls. Over 800 of the elementary works could not be hung. Except several works by the head master, the exhibition was confined to the productions of the art students of Lincoln during the past year, and eight years ago no such opportunity of work, or display of such work, existed in the city. At the distribution of prizes to the students a large and highly respectable company assembled. The mayor (Mr. C. Pratt) presided, and there were also upon the platform the Bishop-Suffragan of Nottingham, the Rev. the Precentor, the ex-Mayor, and other gentlemen. Mr. E. R. Taylor, the head master, read his report for the past year, according to which the number of students in each class is as follows:—Morning class, 30; afternoon class, 20; evening class, 99; pupil teachers, 51. Among the students are 10 joiners, 18 fitters, &c., 15 draughtsmen, 19 pupil teachers, 13 clerks, 2 printers, 4 painters, 3 stonemasons, and 3 carvers. The work of the past year, as represented by the awards of the Department of Science and Art, is again in advance of the preceding year.

IMPROVED HOUSE ACCOMMODATION FOR THE POOR.

In his official "Report on the Sanitary Condition of the Whitechapel District, for the Quarter ending 1st of October, 1870," to the district Board of Works, Mr. Liddle, medical officer of health for the district, brings up this most subject, in the hope of solving the problem. He points attention to the very high mortality of the district,—32 per 1,000; and proposes a further improvement in the laws affecting the habitability of poor dwellings. He says:—

"The last scheme proposed for obtaining a better class of house accommodation for the working people,—and it is the one which meets my views upon this subject,—is to the following effect, viz., that the Legislature should invest the Home Secretary or the Privy Council with power to appoint a certain number of skilled medical men only as inspectors who should be required to inspect the unhealthy localities in each district, and to determine what houses are unfit for habitation; and, upon their report, the Home Secretary or the Privy Council, as the case may be, who shall appoint the inspectors, shall take the necessary steps, either to cause the owners to put such houses in a state fit for habitation, or to cause them to be demolished. But in every case in which the demolition of property is concerned a power of appeal to a court of law should be given. In order to render this plan effectual, it would be necessary to afford compulsory power of purchase to the local authority, who might either throw open to the public the plots of ground rendered vacant by the demolition of the houses thereon, or they might have the power of selling the ground.

In order to prevent hardship or inconvenience to the poor occupants of such places by distressing them of their homes, this plan must be carried out gradually, so

that the poor residents might, without difficulty, find other houses, either in London or in its suburbs, as they now readily do when a multitude of houses are at one time demolished, for the carrying out of improvements, or for railway extensions.

The better class of artisans and labourers may be induced to reside a few miles from London, if they can obtain cheap railway conveyances; but that is not the class who inhabit these wretched localities; and nothing short of pulling such places down will benefit the public health, and so diminish pauperism.

The condemning of houses which, upon competent authority, are considered as unfit for human habitation, cannot be an injury to any person; inasmuch as, a house unfit for habitation ceases to be property; and, of course, the owner, when called upon to close such house, is not entitled to compensation. The ground and the materials of the house will, of course, be the property of the owner, which he may dispose of to his own advantage. As the law now stands, no compensation is given to a landlord when a magistrate, upon sufficient proof being given as to the unfitness of a house for habitation, orders the same to be closed; and the owners of all such houses may deem themselves as fortunate in not having to pay a penalty for letting unwholesome houses. Many of the landlords of small house property fully understand and practise the rights of ownership, but fail to carry out the duties which are enjoined upon them as owners.

One of the errors of the existing laws, in relation to unhealthy houses, is the placing of the power of determining as to the unfitness of a house for habitation upon a single medical officer of health. . . . A great deal of the worst class of house property is now in the hands of poor people; the richer class of owners, finding that property of this description occasioned them no much trouble and expense, have sold it, and the result has been that a poor class of persons have purchased it who are not able to fulfil the duties of ownership; who, when pressed to do the necessary work to render their property fit for habitation, plead their poverty, and so excite the sympathy of the public. But the plea of poverty is not allowed to prevail in mitigating the penalty incurred by persons selling or exposing for sale unwholesome food, although the injury to public health, arising from the eating of such food, is not nearly so great as the letting of houses unfit for habitation."

As a proof that the existing laws relating to the closing or the pulling down of houses unfit for habitation require some amendment, in order that they may be better carried into effect, Mr. Liddle adduces the fact that, in London, where there are so many houses unfit for habitation, very few have either been closed or demolished; and that it is only in two or three districts that the Artisans and Labourers' Dwellings Act has been successfully, but only on a very limited scale, put in force.

THE OLD YEAR.

December 31, 1870.

Who said that the year now ending,
Should far happier prove to be,
Than all others gone before it,
In this nineteenth century?

Call'd it "happiness to mortals,"
Pride, Ambition, War, and Woe?
Armies vanquish'd; Rulers captive?
Drought and Scarceness; Frost and Snow?

These last may be minor evils,
Blessings in disguise to some;
(But they bring the cup of suffering,
When to Hunger's door they come.)
Oft the generous Earth thus hoarded,
Pours anon a double gift;
And from Heaven's ways mysterious,
Time alone the veil can lift.

But an old man's wicked craving
To usurp God's place to man,
Laying those who cross his purpose
'Neath his "apostolic" ban;

Stretching out his wither'd fingers,
Earthly vanities to clutch:
None can say these deeds are blessings:
And this year has brought us such.

Then, an Emperor defying
Justice, honour, friend, and foe;
Can this render mortals "happy"?
Go to Wilhelmshöhe, go!

Does that lonely captive, think you,
Much enjoy his gilded cage?
Are his former subjects "happy,"
Cursing him with idle rage?

Or that banish'd boy and mother,—
Son and Empress of proud France?—
But into their sad retirement
We forbear th' inquiring glance.

Tho' we pity, well-nigh love, them,
Exiles on our friendly shore,
Could our wishes reinstate them
In the place they fill'd before,

Yet those wishes were unspoken;
Viewing all the misery brought
On a grand and sister-nation,
By their unwise counsels wrought.

Peace or war time, neither taught them
Man's best earthly boon to grant,
Liberty of speech and action. . . .
That for which all peoples pant!

Liberty! God-given blessing!
How dare man thy laws control,
Fixing gyves on thought and conscience;
Binding down the heav'n-born soul!

Thus they left their subjects helpless
To withstand misfortune's tide;
Paralyzed by forced restrictions;
Untaught e'en themselves to guide.

See the end of all this plotting,
This false wisdom and foul shame!
Driven from their place of honour,
Curses heap'd upon their name.

France, the beautiful, beleaguere'd,
Her brave sons, by thousands, dead;
And far happier they, than others
Sick and maim'd, or captive led!

Peaceful peasants, hopeless, starving,
Homesteads burn'd and fields untill'd;
Half-clad homeless widows, orphans:
With such sights the land is fill'd!

And the workers of these horrors,
Paying back their own foul wrongs,
Heap'd upon them by this nation;
Not to them the blame belongs.

Insults, taunts, unjust invasion,
Forced them to unsheath the sword.
When War's floodgates once are open'd,
Who can stay the tide abhor'd!

Yet can Germany be "happy"?
Thousands of her bravest, best,
Laid down life for love of country,
And in bloody war-graves rest!

Oh! the eyes all dim with watching
For dear ones they ne'er shall see!
Oh! the hearts all crush'd with weeping!
Oh! the life-long misery!

* * * * *

Still the battle rages wildly;
Still the heroes fall and die;
Still surrounding nations shudder;
Still goes up the pleading cry,—

"Stay the carnage! Own thee vanquish'd!
Bow thy proud, defiant head! . . .
And thou, Victor, sound the trumpet,
Let thy warriors home be led!"

* * * * *

Can the year, thus fill'd with anguish,
Mark'd as "happy" henceforth be? . . .
God forbid that in our lifetime,
Such another we should see!

E'en its latest hours are sullied
By a further deed of blood:
Prim! Spain's noble soldier—statesman,
Who withstood anarchy's flood,—

Dies by dastard felon-bullet,
'Mid the new king's gala-shout! . . .
. . . Close the windows, draw the curtains,
Shut the cruel Old-year out!

R. F. H.

THE OLD MASTERS AND THE ROYAL ACADEMY.

THE dense canopy of smoke that has hung over London, during the opening days of 1871, while country villages are bright with the wintry sunshine reflected from the pure veil of snow spread over roof and field alike, is not very favourable for the winter exhibitions. In a pecuniary sense, indeed, it must be most unfavourable. Those who know how much difference is made in the illumination of a picture even by the change effected in a couple of hours by the movement of the sun, on a clear day, may be well excused for waiting for a bright day for picture seeing. While the empty rooms of Burlington House bear witness to the truth of this remark, those whom, like ourselves, duty, rather than pleasure, led to the Exhibition found their account in the uninterrupted opportunity

afforded of examining the finest collection of pictures, we should imagine, ever brought together in London. True, the inevitable big-man in the blue coat would insist on poking between one and the object of attention. But even he was to be dodged by beginning at the other end of the room, and then all was fair sailing. It is extraordinary how little the pictures suffered from the gloom. Perhaps it may be more to the point to say, it is extraordinary how so many pictures, of a quality that bears inspection even in bad weather, can have been collected in response to the invitation of the Royal Academy.

Not that this is quite the first impression. In walking through what the academicians persist in calling Gallery No. 1, and Gallery No. 2 (as if to assure us that they do not know what a gallery means), it is easy to draw comparisons between this year's and last year's collections. The pictures that take you by storm are rare in the first two rooms, which contain together ninety-nine paintings. On entering the large room, No. 6, you come to the conclusion that this is the post of honour. 112 pictures here hanging, with few exceptions fairly on the line of sight, afford a glorious treat. Nor does the meric decline as you go on. Whatever was the order and principle of selection, the Hanging Committee seem to have kept the best wine till the last, so that in spite of the fatigue,—to the legs rather than to the brain,—incurred in visiting and re-visiting the 426 paintings now generously lent for the instruction and delight of London, the unrivalled treasures belonging to Earl Dudley assert their claim to rank as the *chefs d'œuvre* of the whole goodly exhibition. Familiar as we have become, owing to the courteous liberality of the Marquis of Westminster and of Lord Ely, with the high stamp of some of our English private galleries, we think that this display of the wealth of that of Earl Dudley (though often before seen) will strike most visitors, especially foreign visitors, with surprise. The noble earl has lent to the Academy no less than 139 pictures, and among which are to be found some of the best known and most famous works of the greatest Italian masters in (and we may add, or out of) England.

The space at our command is altogether inadequate to do anything like justice to this collection. To give a fair idea of the whole would involve making notes on the entire catalogue,—a work that, if well done, would be of no ordinary interest. We can only briefly note a few of the chief gems of a remarkable assemblage.

The most life-like and striking portrait in the first room (allowance being made for the light at the time of observation) is that of a Polish officer, by Sir H. Raeburn, R.A., lent by Sir Henry Holland. Much of the brilliance of its effect is due to careful preservation; but the fact that this painting can at all hold its own beside the works of Gainsborough, Moroni, Reynolds, and Lawrence, is worthy of note, and is a proof of the good taste that has presided over the selection. There is an admirable likeness of Dr. Johnson, by Gainsborough, lent by Lord Overstone, in which the noble and more genial aspect of the great lexicographer comes pleasantly to the surface. The satiric and thoroughly evil face of Sterne, and the struggle of Baretti, foreign secretary to the Royal Academy, with his shortsightedness, are happy examples of Reynolds. Henrietta, Countess of Grosvenor, by Gainsborough, has the coiffure of the day, with an *esprit* and intelligence less rare, we believe, in the days of our grandfathers than in our own. Titian's schoolmaster, an old man in a square cap, by Moroni, lent by the Duke of Sutherland, and a Spanish warrior, lent by the Earl of Warwick, are fine examples of this master. A noble and characteristic face is that of Mr. Hart Davis, by Sir Thomas Lawrence, lent by Mr. Vaughan Davis. They are the features of one who has in him the making of a man of no ordinary temper. English artists are in the majority in this room, and are well illustrated, as a question of style, even when their pictures are not the most pleasing, as in the *Lydiads* of Fuseli, who looks as if he had died of cholera. There are some beautiful landscapes also on the walls,—a "Pool," by Jacob Ruysdael; a landscape, with a dim hill in the distance, by Gainsborough; two well-known Claudes, lent by the Marquis of Westminster; and Mr. Wynn Ellis's "Italy," a sunny composition by Turner, in which, however, some of the evils of imaginative architecture are very striking,—an aqueduct leading no whither, and terminating in a fortress.

Among the smaller pictures we call attention to a portrait sketch of John third Earl of Bute, by Sir Joshua Reynolds. The features are put into the corner, like a naughty boy. The velvet coat comes out in a rich crimson, such as rarely lingers on the president's canvas, and the gleams of light falling from the windows behind the figure make the whole a most interesting study.

In Room No. 2, Sir H. Raeburn again strikes us in the first picture on entering,—a portrait of Mrs. Gregory, in a loose white dress, bound with a simple green sash, that contrasts most happily with the charming rose of lips and cheek. Close by Jacob Ruysdael tumbles down on us a very avalanche of turbid water, "The Miller opening the sluices after a Wet Night." The most remarkable picture in this room is a "Christ crowned with Thorns," by Murillo, lent by Mr. Francis Cooke. Unmeaning degradation is given to the figure by representing it partly nude. The type is Spanish rather than Jewish, and the features are not of heroic proportion. But the depth of loveliness, and wonder in the shadowy eyes, and the resignation expressed in the whole agonised countenance, are very grand and touching. From the same artist we have the well-known and lovely picture of the Infant St. John with the Lamb, belonging to the Marquis of Westminster. Then we have a Burgomaster, by Rembrandt; an unnamed portrait, by Titian; a portrait of Monsignor Lorenzo Pucci, by Raffaele; and a very curious and somewhat repulsive Virgin and four Saints, by Giovanni Bellini. St. John the Baptist is neither more nor less than an Italian beggar, young, strong, idle, and obstreperous. Mary Magdalene leans at her vigorous neighbour in a manner anything but saintly, and the Bambino is a little old man. Giorgione's "Lady Professor of Bologna" is more remarkable for the beauty attributed to her in the poetry of Lord Byron than in that portrayed by the Venetian master. There is a clever Maclise,—Salvator Rosa showing his picture to a dealer.

Portraiture seems to increase in dignity and in lustre as we enter Room No. 3. Here we have the Countess Cowper's portrait of the daughter of Titian holding a casket, so well known from engravings. Her Majesty lends the portraits, on one canvas, of the second Duke of Buckingham and his brother, as children, by Vandeyck. From Windsor also comes the noble Holbein, portrait of Thomas Howard, third Duke of Norfolk,—an instance of that style of excellence through which this branch of art had to pass before it culminated in Vandeyck. Two early works of Rembrandt,—a portrait of a man with a hawk, and of a lady with a fan, both lent by the Marquis of Westminster,—are rich with the golden hues of the less sensational period of this artist's power. A garden-scene, with musicians, by Watteau, may be compared with a Spanish Fête, by Velasquez. We must not overlook the beautiful Fortune of Guido,—at home, as the bodices may be thought, among fair women and grave men. In Vandeyck's "Countess of Brignolé and Child," notice the stately dignity of the lady, and its shrill echo in the pursed-up face and struck attitude of the boy, who, hand on hip, looks as if he thought the portrait of Henry VIII. the model chiefly to be studied for an example of manly grace, appropriate for his imitation. The portrait of Thomas Howard, Earl of Arundel and Surrey, by Rubens, lent by the Earl of Warwick, is an example of the rare excellence of that great master when he stopped short of the allegoric style of treatment.

We must hurry through the fourth room, attractive as are its walls with the works of Vandeyck, Claude, Titian, Giorgione, Poussin, Salvator Rosa, and Murillo; of Cnyp, Teniers, Ruysdael, Wouwermans, Gerard Dow, Peter de Hooge, Gabriel Metz, Paul Potter, and Adrian Ostade. A Virgin and Child, with St. Catherine, by Vandeyck; Van Eyck's "Philosopher in his Study;" Titian's "Daughter of Herodias;" and a "Cavalry Skirmish," by Wouwermans, are the most remarkable of these pictures.

In Room No. 5 the most striking work is "The Assumption of the Virgin," by Murillo, lent by Mrs. Colling Hanbury,—a large picture, 91 in by 80½ in., with graceful central figure and adoring boy-angels. From the same great artist we have a work rarer than the ordinary series of saints and Madonnas, "The Boyhood of St. Thomas Villanueva." The sturdy little arch-bishop has reduced himself to shirt and breeches,—with a remarkably stout pair of shoes and stockings,—by donations of his cloak, coat,

and vest to four ragged and hungry lads of about his own age, who are looking with eyes of wonder, gratitude, and love at their unexpected benefactor. Another Madonna, called *de la Foy*, by Murillo, is lent by Mr. E. W. Billings. There is a very fine and very discontorted portrait, called in the catalogue "Cardinal Lorraine," without indicating which of the great princes of the Church to whom the house of Guise gave birth is intended, by Tintoretto. A parrot sits on the grated bars of the window behind the scarlet-vested prelate. Two views of Venice, by Canaletto, are lent by Mr. Wynn Ellis, the larger one, 58 in. by 78 in., representing the procession of the Doge from the church to the Adriatic. A grand and gloomy storm-piece, by Vandervelde, belongs to the same owner. There is a dog snarling over his food, by Francis Snyder, to remind the public that Landseer does not stand alone as portrait-painter to the animal kingdom.

Mr. Robert Holland has lent "St. Augustine and his Mother, Santa Monica," by Ary Scheffer, one of the best of the productions of that artist; it has been engraved at the expense of the owner. The saintess, if we may so distinguish the sex, recalls the portrait of Mrs. Holland by the same artist. The portrait of John, third Earl of Bute, with his secretary, Mr. Jenkinson, afterwards first Earl of Liverpool, by Sir Joshua Reynolds, lent by the Marquis of Bute, is rendered still more interesting by being hung close to the sketch of the composition, belonging to Lord Wharncliffe.

Room No. 6 opens with a bold crayon, by Leonardo da Vinci, a Head of Christ, lent by the Baroness North. Another treatment of the same subject, attributed to Bernardino Luini, seems to be either a study for a study from the well-known National Gallery Leonardo. Contrasted with these fine imaginative heads is a forcible, naturalistic, and atrociously vulgar work by Hubert Goltzius, the only unpleasant picture of Earl Dudley's loan,—Plato washing his Hands. The details of modern armour, the arraying the Roman Procurator in an impossible sort of cap, and priestly vestments, with a parchment scroll bound on the forehead, the unsparring fidelity to a life which is not that of Palestine, are not redeemed by the excellence of the mere manipulation of the painter. We must remember the curious Nativity by Sandro Botticelli, the angels dancing in the air, to the music of three of their number, who are perched on the roof of the inn, while "peace on earth" is indicated by three other angels, each affectionately embracing a shepherd. We have a St. Sebastian, attributed to Raffaele, from the Earl of Crawford and Balcarres; a portrait of Queen Joanna, of Naples, ascribed to the same artist; Francis the First, of France, by Holbein, the top of whose head is crisscross left out of drawing; and thus arrive at the magnificent series lent by Earl Dudley, of which this is the first. Chief among them we meet with the well-known and lovely "Reading Magdalen," by Corregio, on panel, 11 in. by 15 in. The no less widely-known group of "The Three Graces" by Raffaele, on panel, 6½ in. by 4½ in.; "The Resurrection," "The Baptism," and "The Conversation with the Woman of Samaria," by Perugino,—marvels of pure, full, unfeaded colouring, with the formal scenic balance of the figures that may, down to a certain date, be detected in some of the works of Perugino's great pupil himself.

The Seventh Room, by an oversight in printing, is not distinguished from the sixth. Earl Dudley's pictures fill the whole of this apartment. The Four Elements, and Noah entering the Ark, the former picture on copper, and the last on panel, by Peter Breughel, are fine examples of the velvet touch of this master; of the care and skill with which he sought to represent all known forms of bird, and beast, and fish; of the beauty and fidelity with which he drew those which he could see alive; and of the quaint motion he imparted, of his own accord, to those he only saw stuffed, as in his man-like ostrich, and his flying-fish soaring and floating among the birds and the sylphs of the air. Portraits of Pope Pius VII. and Cardinal Caprera, by Jacques Louis David,—almost a solitary example of the French school, except three or four charming works by Greuze,—are life-like and dignified. Again, we have a Burgomaster by Rembrandt, and a Cardinal by Titian. A Virgin and Child, with saints, by Bonifacio, in which the eyes and mouth of the principal figure,—evidently a portrait,—are very soft and sweet. A Susanna and the Elders, by Titian, is

the most incomprehensible mode of representing this favourite apocryphal story yet hit upon. The fair Jewess is reclining, quite nude, on a sumptuous couch in the midst of a park,—with shepherds in the distance. Her two elderly evil counsellors, richly clothed in velvet and embroidery, attempt to recommend themselves to her good graces,—one by holding before her a mirror, which reflects a face very different from the profile which she turns to us,—the other by arranging a light veil on her head. There is a lovely Danae, by Titian, and a companion Venus,—painter unknown,—which looks very like the school of Leonardo da Vinci, both in face and in treatment of the figures. A portrait of a Lady by Paris Bordone is very charming.

In the lecture-room, also filled by Earl Dudley, is a very remarkable Murillo—the Virgin and the Saviour, attended by a choir of palm-bearing angels, descending to cover the body of St. Clair with a celestial mantle. Monks and nuns kneel behind the dying or dead saint, and either do not see the vision, or do not think it matter of much moment. The Virgin has the air of a royal bride, and the sacred figure at her side bears a strong, though a flattering, likeness to H.R.H. the Prince of Wales. A Venus and Cupid, by Sobidone; a series of six pictures, by Murillo, representing the history of the Prodigal Son; and a grand landscape by Salvator Rosa, are the last pictures we can find room to notice out of this very fine collection. The gratitude of all lovers of art is due to the Academy which has brought together, and to the Royal, noble, and gentle owners who have for a time parted with, pictures which any country might be proud to possess.

WORKMEN'S TRAINS AND WORKMEN'S HOUSES.

SIR,—Within the last few years great changes have been made in London. All along the route of the Metropolitan and other railways having their termini in London, the homes of the working classes have been demolished, and their inmates dispersed. I have heard many times the question asked, Where are the people gone? A simple question, but a truly serious one, when considered in all its bearings. It is evident to every thoughtful man, and the workmen more especially are painfully aware of the fact, that the demolition of workmen's dwellings for railway and other improvements has inflicted great hardships upon the working classes; and, to make the case worse, they have not received any compensation or equivalent in the shape of cheap trains. The injurious effects of bad houses and dirt on the condition of the people have been so often told in the columns of the *Builder* that the wonder is so much dirt and unhealthiness is still allowed to exist. The paper, in a recent issue, on the "Sanitary Condition of Glastonbury" recalls to my mind the general custom of the country, in allowing the fetid dung-holes close to the door of the houses; and I think every countryman knows that the present state of Glastonbury is but a repetition of what exists in every small town and village in England. The muck-hole—that is the name given to it in Norfolk—is an institution. Its principal purpose is to provide manure for the gardens. Its being close to the door is a convenience; it saves trouble. The smell is, in the estimation of the inhabitants, nothing. I am afraid it will take a long time to eradicate dirt, and teach the people that the muck-hole close to the well and door means disease, and dirt in the house furnishes King Death with many premature victims. Ranning my memory over the past, I recollect my being, with many of my playfellows, stricken with fever; and, although our village was a long, straggling one, the houses standing, in most cases, a good distance apart, epidemic diseases were not unfrequent, and every year had its complement of victims. It thus shows that fever does not respect the ill-managed and ill-drained village any more than it does the over-crowded town.

How necessary it is for the health and well-being of the working classes that the houses where they are forced to reside should be well ventilated and supplied with proper sanitary arrangements. Much has been made by some people about the advantages that workmen receive from the running of cheap and early trains. Under present circumstances, their connexion with better homes for workmen is of some importance. I have many times been solicited by my fellow-workmen to write to the papers on the present mode of running these trains. They fancied the workmen had nothing

to do but to write a statement of their grievances, and all the papers would be ready to insert it; and, farther, I have heard many of the better class of workmen threaten they would do so, and some have told me they have sent their communications to Radical and Tory organs, and no notice has been taken of them. The Metropolitan during summer months runs three trains up and down, and in winter two, the latest to the west, and arrives at King's-cross at 5.40. They are so far of some advantage, and I am not going to disparage their value. These trains are always over-crowded, or were when I used to ride. I now prefer walking two miles night and morning rather than run the gauntlet to get a place. Compartments constructed to carry ten persons have often fifteen pushed into them; and, what with tobacco-smoke and other exhalations, the condition of the carriages on a summer's morning is something fearful to contemplate.* A strange feature,—in fact, it strikes the workmen as being almost wonderful,—is that the manager, directors, or Act of Parliament, actually puts the same number of first and second class carriages to the early trains as are put to the ordinary ones, although the guard in general opens the second class for the workmen. The result is that the two classes of carriages are not sufficient to contain the workmen, and the rush for a place, during the busy time at the stations, is something not to be forgotten. Curses loud and deep are uttered against the managers in the first place for destroying their homes, and in the next place for providing such accommodation as I verily believe Old Nick himself, were he a railway director, would be ashamed of; and the worst purgatory I should like to see provided for them is, that they should be forced for a short time to ride third-class in a workmen's cheap train, and get up at King's-cross. Were an accident to happen it would indeed be something fearful, and the Underground is not yet proof against that form of management. Some letters have lately appeared in the *Builder* asking the question, "Whether a Joiner can be a Gentleman." I am not going to open that question, but I think it has a relation to the one above. And if a large number of workmen who ride in the early trains are to be taken as a specimen of working-class gentlemanliness, I should say decidedly not, as a gentleman would respect the rights of his neighbour. Many of the workmen who ride in workmen's trains are in the habit of smoking. They, with the greatest nonchalance, light their pipes as soon as they are seated, and puff away as though it were a race for life or death, and that their existence depended upon it, the smoke smothering those who sit next to them, and also those in front. It is well known pulmonary affections are habitual to Englishmen, and London has more than its share. The tobacco-smoke irritates the organs of respiration, and however a workman suffers no notice is taken of it by the smoker. Most of the passengers by the workmen's trains are engaged in the building trades. During summer the trains start none too early. In winter their working hours are changed, and instead of starting at six to work, the time is changed to seven in the morning, but no alteration is made in the trains, and they are landed in many cases an hour and a half before work-time. I suggested a requisition to the manager stating the circumstances, and asking for an alteration during winter. The workmen say it is no use; the company is too independent, and cares nothing about the convenience of workmen.

One word more, and I have done. To show how workmen are scattered, I may state that on our job there are six Jack Planes: one from Hammersmith; another from Battersea; one from Kilburn; another from Notting-hill; the other two are from King's-cross and the further end of Harrow-road. Within these last few days we have seen notices hanging on the lamp-posts, stating that the Tramways Company are going to apply to Parliament for powers to extend their system. It has interested us not a little, and some speculation has taken place as to the course the House will take,—more especially those M.P.s who are interested in opposition. It is, I believe, an axiom in legal affairs that no one pecuniarily interested in a criminal or civil question is eligible to adjudicate thereon. The

same rule ought to apply to Members of Parliament. At any rate, it is the workmen's duty to watch their proceedings. Monopolies are in no case good; and it applies to public conveyances as well as to other things. Stage-coaches are abolished, and the world now goes by steam. As yet the workmen have not received their fair share, although it is the third class which pays the dividends. It is the first and second class riders who are the pets of directors. My mates say it is our duty to petition in favour of the Tramways Bill, as our leaders are too busy to notice such small matters. I have been requested to apply to you, sir, to give us an opportunity to make our grievances known, and to ask all those concerned to make a united effort to obtain cheap conveyances for all workers, no matter whether they begin at six or eight o'clock in the morning, as upon that hinges the question of the improved sanitary condition of the people; for, without cheap trains, there must be over-crowding and continued unhealthy homes for the working classes. JACK PLANE.

ELEMENTS OF SCIENCE.*

A SERIES of elementary works on Physical and Mechanical Science, forming a series of Text-Books of Science, adapted for the use of artisans and of students in public and other schools, is in course of publication by Messrs. Longmans & Co., under the editorship of Mr. T. M. Goodeve, M.A.

The reports of the Public Schools Commission and of the Schools Inquiry Commission, as well as the evidence taken before several Parliamentary committees, have shown that there is still a want of a good series of text-books in science, thoroughly exact and complete, to serve as a basis for the sound instruction of artisans, and at the same time sufficiently popular to suit the capacities of beginners. The foundation of the Whitworth scholarships is in itself an evidence of the recognition of that want, and Messrs. Longman give these facts as a reason for the production of a series of elementary scientific works adapted to that purpose. Two of the series are before us. They are practical treatises, and appear to be sound and exact in their logic, and with theory and process reduced to the stage of direct and useful application, and illustrated by well-selected examples from familiar processes and facts.

We shall select from Professor Bloxam's treatise on the metals, as a specimen of this valuable class of books, a small portion of what he says on the subject of zinc; and also his account of aluminium and of magnesium.

Zinc.

Metallic zinc is not met with in nature, and though its combinations with other substances are abundant in certain localities, they are by no means universally diffused over the earth's surface. England is not particularly rich in ores of zinc, and the extraction of the metal is carried out in this country to a very limited extent, most of the zinc required in the arts being imported from Silesia, Belgium, and Poland.

The ores of zinc from which the metal is extracted are enumerated in the following table:—

Ores of Zinc.		
	Composition.	Zinc in 100 parts of pure ore.
Blende.....	Zinc, Sulphur ...	67
Red Zinc Ore	Zinc, Oxygen ...	80
Calamine.....	{ Zinc, Oxygen, Carbonic Acid }	53

Blende derives its name from the German *blenden*, to dazzle, in allusion to its lustre. It usually occurs in black shining crystals which owe their colour to the presence of sulphuret of iron, since the pure compound of zinc with sulphur is white. Blende is also met with of a brown or yellow colour. Black blende is sometimes regarded as a definite compound of sulphuret of zinc and sulphuret of iron, containing fifty-two parts of zinc in the hundred. The chemical name of blende is sulphide, or sulphuret, of zinc, and the miners often call it *Black Jack*. It is found running in veins through limestone or sandstone, and is commonly associated with galena (sulphuret of lead), and with

iron and copper pyrites. Blende occurs in Cornwall, Devonshire, Cumberland, Derbyshire, Ireland, Wales, and the Isle of Man; also at Freiberg, Aix-la-Chapelle, and in North America. It sometimes contains a considerable proportion of cadmium.

Red Zinc Ore is the oxide of zinc, which would be white in the pure state, but is coloured in this ore by the oxides of iron and manganese. It sometimes forms red translucent prismatic crystals, and is found chiefly in New Jersey, in the United States, where it is first smelted for zinc, and afterwards for white pig-iron.

Calamine appears to be so called in allusion to the columnar structure of some specimens of the ore, which gives them some resemblance to a bundle of reeds (*calamus*, a reed). It is a compound of the oxide of zinc with carbonic acid, which would be white if pure, but is usually of a buff or brown colour, due to the presence of oxide of iron, which is objectionable, because it corrodes the clay vessels employed in smelting the ore. Calamine occurs in veins, commonly traversing limestone rocks, and is associated with blende, galena, and *electric calamine*, which resembles calamine in appearance, but becomes electric when heated. The electric calamine is a compound of oxide of zinc, silica, and water (hydrated silicate of zinc), and though it is pretty abundant and rich, it can scarcely be regarded as an ore of zinc, for it does not yield its zinc in the ordinary process for extracting the metal. Calamine is found in Flintshire, the Mendip hills in Somersetshire, in Flintshire, in Cumberland, at Lead hills in Scotland, at Aix-la-Chapelle, at Tarnowitz in Silesia, in the north-west of Spain, and in many other places. It sometimes contains more than two parts of cadmium in the hundred. In Spain, the carbonate of zinc is found in combination with the *hydrated oxide* of zinc, so that the ore contains as much as fifty-seven parts of zinc in the hundred. Beds of calamine are reported to have been recently found in Sardinia.

The chief English zinc-works are situated in Birmingham and Bristol, where the ores from the Mendip hills and Flintshire are smelted; in Sheffield, where the ore is procured from Alston Moor; and at Swansea, Wigan, Llanelly, and Wrexham.

In order to extract zinc from its ores, advantage is taken of the comparative facility with which the metal is converted into vapour, since it boils and distils freely at a temperature estimated at about 1,900° F., a bright red heat, somewhat below the melting point of copper. The ores are calcined so as to obtain the zinc in the form of oxide, which is then mixed with carbon and distilled, when the oxygen passes off in combination with the carbon as carbonic oxide gas, and the zinc is given off in vapour which is condensed again. The mode in which the operation is carried out differs in different works, but the principle of the process is always the same.

Calamine is the principal ore treated in this country, and is sometimes smelted without previous calcination, because the carbonic acid which is combined with the oxide of zinc can be driven off in the smelting process itself; but the calcination or roasting of blende is indispensable, to enable the oxygen of the air to convert the zinc into oxide, and to carry off, in the form of sulphurous acid gas, the sulphur previously in combination with the metal. Care is taken to pick out as much of the galena (sulphuret of lead) as possible, because the oxide of lead which would be formed from the oxide combine with the silica of the earthen crucibles employed in the smelting process, and would seriously corrode them. The blende is also stamped to powder and washed to free it from earthy matters before calcining.

The ore having been broken into fragments of the size of a nut, the calcination or roasting is effected, as usual, by the flame of a coal fire, in a reverberatory furnace about 10 ft. long and 8 ft. wide, about a ton of ore being spread upon the hearth, and occasionally raked over. The roasting is completed in ten or twelve hours.

Blende is sometimes subjected to a preliminary roasting in heaps to expel a part of the sulphur before introducing it into the reverberatory furnace.

Aluminium.

This metal, which is now often called *Alumium*, although discovered by Wöhler in 1828, has only within the last few years been found capable of useful application in its metallic form. Though

* The over-crowding and smoking are annoyances of common occurrence on this line with the ordinary trains also, and complaints seem to have no redress. Many passengers are compelled to walk or take the omnibus rather than run the risk of the irritating ordeal of a journey by the Metropolitan railway.

* Metals: their Properties and Treatment. By Charles London Bloxam, Professor of Practical Chemistry in King's College, &c. London: Longmans, Green, & Co. The Elements of Mechanism, designed for Students of Applied Mechanics. By T. M. Goodeve, M.A., Lecturer on Applied Mechanics at the Royal School of Mines. London: Longmans, Green, & Co.

never found as a metal in nature, it is probably the most abundant of all metals in a state of combination, since it exists in every variety of clay (silicate of alumina), its quantity varying from twelve to twenty parts in a hundred. Another mineral containing aluminum is *kryolite*,* in which the metal is combined with sodium and fluorine, and forms 13 per cent. of the mineral, which is found in abundance in Greenland.

Aluminum is extracted from a particular variety of clay known as *bauxite*, which is found at Baux, near Arles, in the south of France; this mineral contains about one-third of its weight of aluminum, combined with oxygen (forming *alumina*), together with silica, oxide of iron, and water. At Newcastle, where the metal is extracted from *bowcite*, the following process is adopted:—

The ground mineral is mixed with *soda-ash* (containing carbonate of soda and caustic soda), and heated in a reverberatory furnace, when the soda combines with the silica and alumina, forming compounds known as *silicates of soda* and *aluminates of soda*, whilst the carbonic acid is expelled in the form of gas. The mass, after cooling, is treated with water, which dissolves the aluminates of soda. This solution is mixed with enough hydrochloric (muriatic) acid to remove the soda, when the alumina is separated as a gelatinous precipitate composed of *hydrate of alumina*, a compound of alumina with water. This is mixed with common salt (chloride of sodium) and charcoal powder, to a stiff paste, which is made up into balls as large as an orange, very thoroughly dried, and strongly heated in earthen cylinders through which perfectly dry chlorine gas is passed.

The carbon of the charcoal combines with the oxygen of the alumina, escaping as carbonic oxide gas, whilst the aluminum unites with the chlorine to form the chloride of aluminum; the latter enters into combination with the chloride of sodium, producing a *double chloride of aluminum and sodium* which distils over and condenses to a solid salt. Ten parts of this salt are mixed with two parts of sodium in small pieces, and with five parts of kryolite or of fluor spar, to form a liquid slag which shall cover the surface of the metal. This mixture is thrown upon the red-hot hearth of a reverberatory furnace, which is then immediately closed to exclude air. The sodium acts violently upon the chloride of aluminum, abstracting its chlorine and liberating the aluminum, which collects, in the melted state, beneath a layer of slag containing the chloride of sodium and kryolite. The metal thus obtained always contains silicon and iron in considerable quantity.

Aluminum is a white malleable metal about as hard as zinc, and fusing at a somewhat lower temperature than silver. It is remarkably light, having a specific gravity of only 2.5, and is unaffected by air; unlike silver, it is not even tarnished by air containing sulphuretted hydrogen. A bar of aluminum suspended from a string sounds like a bell when lightly struck. In manufacturing objects of ornament from aluminum, a solder is employed which contains ninety parts of zinc, six parts of aluminum, and four parts of copper.

At present, the principal demand for aluminum in this country is for the manufacture of *aluminum-bronze* or *aluminum-gold*, which is an alloy of aluminum with nine times its weight of copper.

An alloy of silver with two-thirds of its weight of aluminum is used in France, under the name of *tiers-argent*, as a substitute for silver, being much harder than that metal and less than half the price.

Aluminum is sometimes employed for making small weights, for which it is well adapted by its lightness and resistance to the action of air. The beams of small balances have also been made of aluminum.

Magnesium.

Like aluminum, this metal has only been extracted in any quantity during the last few years, a considerable demand for it having arisen in consequence of its property of burning with a very brilliant white light which is found useful for the illumination of microscopes, magic lanterns, &c., as well as for taking photographs at night or in places where daylight does not penetrate.

Magnesium occurs abundantly, in combination with oxygen and carbonic acid, in *magnesite*

(carbonate of magnesia) and *dolomite* or *magnesian limestone* (carbonate of lime and magnesia). Another source of the metal is the recently-discovered mineral *carrollite*,* which is found in large quantity above the rock-salt in the salt mines of Stassfurt in Saxony. This mineral is composed of magnesium, potassium, chlorine, and water, and contains about one-twelfth of its weight of magnesium. The water may be expelled by heat, leaving the *double chloride of magnesium and potassium*.

Magnesium may be extracted from the dried *carrollite* by mixing it with one-tenth of its weight of fluor spar, to act as a flux, and one-tenth of its weight of sodium in small pieces. By fusing this at a moderate heat, the chloride of magnesium is made to give up its chlorine to the sodium, and the magnesium collects in the melted state beneath a liquid slag composed of chloride of sodium, chloride of potassium, and fluoride of calcium. The magnesium may be purified by distilling it, in an iron crucible, as practised in the case of zinc. Magnesium bears considerable resemblance to aluminum, but is a whiter metal, and even lighter than aluminum, its specific gravity being only 1.74. It may be liquefied below a red heat, and, as stated above, may be readily distilled. It is a little more tarnished than zinc when exposed to air. The magnesium wire is made by forcing the heated metal through holes in a steel plate, and magnesium riband, by passing the wire between heated rollers. When the end of a piece of wire or riband is held in a flame, it catches fire and burns with a dazzling light, the magnesium combining with the oxygen of the air to form a white earthy mass of magnesia.

The sodium required for the extraction of aluminum and magnesium is extracted directly from carbonate of soda, which is itself made from common salt (chloride of sodium). The well-dried carbonate of soda is mixed with powdered charcoal, some chalk being added to prevent the fusion of the mixture, which is strongly heated in wrought-iron cylinders protected from the fire by a coating of clay. The carbonate of soda contains sodium, oxygen, and carbonic acid; the carbon of the charcoal combines with the oxygen, and the sodium is converted into vapour and condensed in vessels containing petroleum; for sodium cannot be exposed to the air, even for a few minutes, without combining extensively with oxygen, and it even takes up that element, with great violence, from water, in which the oxygen is united with hydrogen. Sodium would scarcely be taken for a metal by an ordinary observer, in the state in which it is found in commerce, where it occurs in greyish earthy-looking light masses; but when these are cut with a knife, the fresh surfaces exhibit a brilliant lustre.

The volume on Mechanism, by Mr. Goodeve, is a standard one, two editions of which have already been published as a separate and independent work. It has been re-written, and enlarged for the Text-Book series.

FLAXMAN.

In a recent notice of Signor Raffaelli Politi, of Girgenti, Professor Donaldson said,—Politi excavated among the Greek sepulchres, untrapped by the heauteous forms of the ceramic vases covered with exquisite historical paintings. He pored over the few books he had purchased with his humble savings to find out the subjects; he delineated them, and wrote descriptions of his findings. Himself composed the type, and printed many of them in a press he had set up in his own house. He also engraved the plates, and struck off impressions in the like manner. He did not get rich by such works, there being little or no sale for them at Girgenti, and he distributed them freely among his friends. There is an incident connected with one of his pamphlets of peculiar interest to us. From his study of the vases, and a comparison of the subjects with the outlines of our own Flaxman, a copy of which he possessed and cherished as a treasure, he entertained the deepest reverence for the talents of our countryman. A false report was current in 1826 throughout Europe, as even previous ones had been, that Flaxman was dead; but he had been only seriously ill and was recovered. Politi, with his usual characteristic impulse, was struck with sorrow for the

supposed death of a man whom he considered to be one of the most illustrious of artists. He had recently extracted from a tomb a unique Greek vase with a beautiful subject, and had completed a description, which he had illustrated by a plate. He dedicated it as a fitting tribute to the *shade* of Flaxman, and sent over to me twenty copies to distribute among our sculptor's friends and admirers. But here was Flaxman living! and I felt embarrassed. However, I soon made up my mind; knowing Flaxman personally, and assured of the calm religious philosophy of his nature, I called upon him and frankly told him my commission. He answered me with his usual placidity, "I value your frankness, and appreciate fully this warm-hearted act of the Signor Politi. Be not disquieted, it does not otherwise affect me, for a man at my age ought always to be prepared to die." Within a month Flaxman was laid in his grave!

CO-OPERATIVE EXPERIMENT IN KANSAS.

A CORRESPONDENT of the *New York Herald* describes a co-operative settlement which has been begun by M. de Boissiere, a Frenchman of large fortune:—

"With a view to test his ideas of socialistic reform, this gentleman last winter purchased five sections of land (3,200 acres) in the southern part of Franklin county, sixty miles from Leavenworth, and, naming it the Kansas Co-operative Farm, erected a workshop and a few tenements to provide for the few experts who accompanied him, and set to work on the manufacture of velvet ribbon. M. de Boissiere is simply an idea man, and there is no necessary antagonism between capital and labour. To secure a harmony of relation between capital and labour he proposes to adopt the following formula as the basis of a self-sufficient, compactly joint-stock property, co-operative labour, equitable distribution of profits, mutual guarantees, association of families, integral education, and unity of interests."

The domain whereon this scheme is to be carried out is now in process of preparation for the proposed colony. At the present about 200 acres are enclosed, upon 40 acres of which good crops were raised, and 50 acres in addition are broken with the plough; an orchard of about 800 fruit trees of various kinds planted; seed beds for forest trees and for a plantation of mulberry trees have been sown, which have already made a very promising start. The dwelling-house is of frame, two and a half stories, 52 ft. by 30 ft., with outhouses; a farmhouse and barns have also been erected. He is also building a stone factory 25 ft. by 80 ft. for the silk business. The plan of the family mansion is not as yet fully determined; but a preference is shown for a parallelogram of the dimensions of 72 ft. by 120 ft., with a central covered court and tenements on the four sides; the public offices to be on the first floor, the tenements above, after the plan of the celebrated Familistère of M. Godin-Lemaire, of Guise, in France (described by Mr. Godwin in the Transactions of the Social Science Association). The work thus far has been done by the old-fashioned plan of hired labour, as the arrangements are not sufficiently advanced to establish a co-operative organisation, nor to invite associates into the enterprise. The founder intends to endow the domain (with his own means, if necessary), with all the materials for fencing, timber groves, orchard, family mansion, shops, teams, tools, machinery, &c., sufficient to employ, house, and educate a society of 2,000 members. Their occupations will consist of agriculture, fruit-growing, stock-raising, dairying, the mechanical arts, manufacturing and domestic labour.

ARCHITECTS AND CLAUSES OF CONTRACT.

THE Honorary Secretaries of the Royal Institute of British Architects, in forwarding to members a copy of the general headings for clauses of contract, which have been agreed to by the Council, write as follows:—

"The Council have had under consideration certain heads of clauses for contracts between builders and their employers, as proposed by the Builders' Society, and have referred them for examination to a committee. The Council, upon the report of this committee, submitted to the Builders' Society modifications, which they thought necessary to make in the heading suggested by the Builders' Society, so as to render them acceptable to the architect and his employer.

The attention given by the committee and Council has been limited to the clauses submitted to their consideration by the Builders' Society; but, of course, other clauses are necessary to establish fully all the relative responsibilities of the employer and employed. At the same time, it is to be observed that the Council cannot pretend to bind its members to the adoption of any headings of clauses of contract which the Council may

* So called from the Greek for *foet*, on account of its resemblance to ice.

* From *carnis*, Latin for *flesh*, alluding to its pink colour.

think either reasonable or expedient; for, in such a legal document, the employer must rely wholly on the opinion of his architect and legal adviser, both as to specific heads and matters of the contract, and as to the form in which they should be drawn, in order to give them the proper legal efficacy.

The responsibilities of the contract lie between the employer and contractor alone; the architect being merely the adviser of the employer, and acting as equitable medium between the two. Any responsibilities, which he may professionally have, rest between him and his employer. Consequently, all obligations in the contract lie between the contracting parties only.

The absolute control of the execution of the work, in all its particulars, must rest with the architect, who is expected to exercise a just and fair judgment between the two parties; though a reference is but equitable, if desired, in questions as to the quantity, extent, or value of extras and omissions, alterations or additions, subject to any special provisions in the contract on this head, as to written authority, periodical delivery of accounts, &c."

MONUMENTAL.

The Marshall Family.—The inhabitants of the parish of Denham have shown their great sympathy for the cruel and barbarous murder of this family by erecting to their memory a monument in the churchyard. It consists of a large block of grey marble, resting on a slab of Bath stone, and inscribed as follows:—

"Beneath this stone lie the remains of Emmanuel Marshall, and Charlotte, his wife, also Mary Ann, his sister; Mary Thirre, and Gertrude, his children; who, together with his mother, Mary Marshall, were all barbarously murdered on Sunday morning, May 22, 1870, by John Owens, a travelling blacksmith, who was executed at the county goal at Aylesbury, August 8, 1870. Mary, aged 9 years; Thirre, aged 6; Emmanuel, aged 35; Charlotte, aged 34; Mary Ann, aged 32; Gertrude, aged 4."

John Wesley's Mother.—A white marble monument in memory of Mrs. Susannah Wesley, the mother of the founder of Wesleyan Methodism, has just been erected by subscription in the yard adjoining the chapel belonging to that community in the City-road, London. It was solemnly uncovered by Mr. William M'Arthur, M.P., who delivered a suitable address on the occasion; as did also Mr. Charles Reed, M.P. for Hackney, and Vice-Chairman of the Metropolitan Education Board.

George M'Callum, Sculptor.—There has just been erected, in the Dalry Cemetery at Edinburgh, a monument to this promising young sculptor. It consists of a simple slab of freestone, in the centre of which is a bronze medal portrait, by D. W. Stevenson.

Smith O'Brien.—The statue of William Smith O'Brien has been unveiled in Dublin. It stands at the junction of Carlisle Bridge and Sackville-street, the latter being one of the widest streets in the empire. The statue is of marble, and is accounted a striking likeness. It is the work of the Messrs. Farrell, of Dublin. By an odd lapse of party favour, or frisk of fortune, Smith O'Brien is honoured now in the Irish capital, almost on the very spot where his far greater countryman O'Connell's monument remains as yet but marked out. The intended site of the O'Connell testimonial can still be recognised, but the public statue of the "Great Agitator" is still, as it was seven years since, not forthcoming. The late Smith O'Brien boasted a lineage from the ancient kings of Munster, the southern province of Ireland. His former friends and whilom enemies raise a statue to his memory in accordance with subtle Celtic distinctions that sober Englishmen cannot understand.

THE CONSISTENCY OF THE INSTITUTE.

Sir,—I know not whether your correspondent, "F. R. I. B. A." of your last number of the 31st of December, considers it consistent with the loyal allegiance which every one owes to a public body of which he is a member, to seek so slight a pretext for casting discredit upon its officers and regulations. The series of rules and practices to which he refers was drawn up most carefully, after a consideration by leading experienced members of the profession, for (I may say) many years, and with due regard to the interests and rights of employer and employed; and founded upon what was assumed to be consistent with equity and the law of the land. With one of the regulations a recent decision in court seems to be at variance, after long and learned arguments on one side and the other. Of course, the Council have had it under consideration to make this hitherto moot point conformable to law. I need not observe that this is no unusual circumstance even in the courts of law, where we find that not only the practice of the courts themselves, but even previous decisions as to law have been overruled. It occurs every term. But, sir, if one regulation

relating to property has required revision, does it necessarily follow that another should become obsolete upon quite a different matter relating to professional practice, upon which no point of law occurs, but only the regulation of the Institute to ensure an upright line of conduct in the members.

I agree with "F. R. I. B. A.," that every architect would act wisely (were the opportunity to occur) to let his employer frankly know his terms; but I think he will find it less questionable to adopt one concurred in by the leading body of the profession than to have his own separate set of charges, which at every step, for want of such concurrent authority, may be liable to serious objections, if differing from the conditions of the Institute.

I would rather not go through the whole alphabet of querists in regard to the Institute. I have therefore to request that in future gentlemen who may wish publicly to interrogate me will be pleased not to shield themselves under an irresponsible anonymity, but will give me the advantage they themselves possess of having a fearless and not nameless correspondent, to whom I may have to reply. This I will endeavour to do in a courteous manner, and consistently with the honour of the Institute and of the profession; for I consider it the duty of every architect to uphold, and not to cast discredit upon, his professional brethren.

THOS. L. DONALDSON.

THE STRENGTH OF SLATE.

Sir,—I do not profess to know much more about this subject than that which I have already told you; but as Mr. Braby, in last week's *Builder*, disputes my conclusion, and as it is a new subject, I think it is due to your readers that Mr. Braby should state how he arrives at the conclusion that the slab of slate, 5 ft. 6 in. bearing all round, with a hole in the centre 15 in. diameter, can have its breaking weight so much as 9 tons 8 cwt. in the centre. If Mr. Braby means that the breaking weight would be 9 tons 8 cwt. distributed uniformly over the surface, then the breaking weight in the centre would be half of that, or 4 tons 14 cwt., which is not far from the conclusion I arrived at, viz., five times 18 cwt., or 4 tons 10 cwt., taking the safe load to be one-fifth of the breaking weight.

I suppose I am correct in estimating the mechanical action as follows. It makes no difference in the result whether the slab be circular 5 ft. 6 in. in diameter, or square, with a bearing of 5 ft. 6 in. and a width of the same. Taking it then as a square slab of those dimensions, I deduct from the width the diameter of the hole in the centre, that is to say, 5 ft. 6 in. — 1 ft. 3 in. = 4 ft. 3 in. effective width. If the strength be reckoned in this way, and the formula that I gave in my former letter be applied to this case, the result will be that which I stated.

The writer seems to overlook the fact that slate rises from its bed as a laminated material, and may be expected to follow something like the same laws of strength as timber; and when he says that its having a bearing all round "must give an immense accession of strength" I think this oversight tells against his conclusion, because the strength crosswise of the grain is small in comparison with that lengthwise.

C. S.

RESTORATION OF DUKINFIELD OLD HALL AND CHAPEL.

The late proprietor rescued this chapel from the indignities to which it had been subjected by former occupants of the premises, and now the Rev. W. Heffli, M.A., vicar of St. Mark's, Dukinfield, proposes to purchase both hall and chapel, and to have the chapel fitted up and restored to its original sacred purposes, as a chapel of ease to his parish church. To effect this about 2,000l. will require to be raised. It is a work in which the surrounding parishes of Stockport, Ashton-under-Lyne, Mottram, and Manchester, may well be called upon to help.

The *Manchester Courier* gives an interesting account of the hall and chapel, in which the writer says:—"One of the most ancient and interesting buildings in Dukinfield is the Old Hall, a spacious half-timbered edifice, oblong in form, though it is said to have once been quadrangular. Irregular in outline, and erected at different periods, it is beautifully picturesque, with characteristic gables, crested with fantastic ridge-posts, and fancifully-devised black and

white walls. An ancient oratory or domestic chapel forms a wing of the hall, standing at right angles with it. In other words, it abuts against the north-easterly front, at the westerly end, which partially seems to have been an extension of the ancient pile. Though the little edifice makes few architectural pretensions, yet it bears an extremely picturesque appearance from a mantling of luxuriant ivy which climbs the antique walls and reveals in shrub-like form on the roof. The structure is a parallelogram in form, and consists of a nave and chancel, well proportioned. The building is in what is known as the debased Gothic style, but the masonry is admirable; the walls are 2 ft. thick, faced externally with tooled ashlar, backed with rubble stone, and originally plastered over inside. Strange as it may seem, after the lapse of several centuries, the masonry marks, such as crosses, lozenges, and semi-circles, still remain on many of the stones almost as legible as when first inscribed.

This interesting relic, though of a date probably not older than 1620, and may not be so old, has been sadly battered some time by wilful, thoughtless persons. Both nave and chancel have had a flat inner roof or ceiling, the plaster of which has either fallen or been rudely stripped off in the latter, and in the former remnants are hanging in strips from the joists. The floor had been uprooted for the sake of the flags, but the late Mr. Ogden inserted a neat brick pavement."

BROKEN IRON PIPES.

Sir,—Can any of your correspondents tell me the best method of repairing cast-iron water-pipes when burst with the frost? W. E. H.

QUERIES.

Sir,—Can any of your numerous readers inform me,—1st. If I lay a pipe 2 in. in diameter, and five pipes of 1 in. in diameter, what will be the difference in the discharge of water? In each case the water is to be taken from a reservoir, and at the head or inlet it will be 1 in. above the top of the pipe or pipes, and at the outlet it will have a fall of 1 in. The pipes to be 10 ft. long, and to be placed in a horizontal position.

2nd. If we take pieces of red, black, green, and yellow glass, and expose them when the dew is condensing, we shall find that moisture will show itself first on the yellow, and then on the green glass, but that none will appear on the red or black glass. Why is this? "EXQUIET."

THE SNOW.

MANY consider that the cleansing of the footways is a duty cast upon the parishes, and one which can be more efficiently and economically performed by them, than by the individual householder. We are rated for paving and cleansing, and a small augmentation of that rate would not be objected to by many, if for so laudable an object. Legally we have no control, or business, or concern with the footways, which belong, like the highways, to the parishes. R. S.

BURLINGTON HOUSE.

MR. HENRY BAKER, as a pupil of Samuel Ware, is peculiarly fitted to criticize the chapter on Burlington House in "Round about Picaresque and Pall-mall," and I am much obliged to him for pointing out, in the *Builder* of December 24, certain mistakes which he believes me to have fallen into.

I will remark on Mr. Baker's charges in the order that he has set them forth in his letter to you. With regard to the first, I am unable to explain how the blunder of calling Samuel Ware the architect of Chesterfield House could have occurred, but any one who turns to the remarks on that house on another page will see that it was a slip, and did not arise out of ignorance. Next, I am sorry to have fallen into the mistake of supposing Samuel Ware to have been originally a chimney-sweep, as Mr. Baker denies such an origin for his master. I cannot find my authority for the statement, but it appeared to me at the time to be a good one, and I believe that it was one of the communications of the late Mr. Peter Cunningham to the *Builder*.

Mr. Baker complains that my engraving of the front of Burlington House does not show the "numerous bedrooms" built in the roof by Ware, but he fails to remember that it is impossible to show in a truthful engraving what is not seen in reality. Moreover, the "numerous bedrooms" to which Mr. Baker refers consist principally of lofts.

Mr. Baker is very severe on my ignorance as to the alterations made in the interior of the mansion by Samuel Ware, but I believe that he himself is not free from error in his remarks. The ceilings may have been regilded by Ware, but there can be little doubt in the mind of any one who has seen them that the ornamentation is of the time of the third Earl of Burlington, more particularly as the pictures are known to be of that date.

I cannot but admire Mr. Baker's omniscience when he writes that the Burlington Arcade was "designed solely with the object of shutting out the hundreds of windows in Old Bond-street." There is no doubt that this was the principal object, and it is so stated in my book; but I presume even Mr. Baker would not say that the building was the only mode of curing this evil, more especially as he states that the building of a solid screen wall was proposed, to shut out the windows of the Albany. It follows, therefore, that the profitableness of the scheme may have entered into the heads of Lord George Cavendish and his architect. It was not I, but a contemporary writer in the *Gentleman's Magazine*, who states that the

object of building the arcade was to give employment to young women. However careful an author may be, it is almost impossible for him to bring together a large number of facts on the history of places either destroyed or passing away without occasionally falling into error; and it is some satisfaction to find that the mistakes, that they are found to be assuming by so intelligent a reader as Mr. Baker.

HENRY B. WHARTLEY.

CHARGES FOR VALUATIONS.

Sir,—May I beg the favour of information as to the custom and rights of architects and surveyors under the following circumstances:—

A survey, valuation, and report, have to be made of one person's *entire* interest in property situated in three different localities. No. 1. Ten houses, say of the total value of £300. No. 2. Five houses, say of the total value of £600. No. 3. Land, say of the total value of £100.

Now the question is, what per centage should be charged for such survey, valuation, and report; and whether estimated upon the amount of the three valuations together, or upon each of them separately; and whether upon the whole amount of the valuations, or upon the one-third interest only in each case. No. 1, say 1,500s.; No. 2, say 80s.; No. 3, say 50s.? And what additional amount, if any, for correspondence, interviews, travelling expenses, &c.?

ARCHITECT AND SURVEYOR.

SEWAGE PURIFICATION.

DURING the past twelve months a series of experiments has been carried on at the Ealing Sewage Works to test the system there adopted for the purification of the sewage of Ealing. These experiments have been carried out by Mr. Jones, the local surveyor, under the superintendence of Professor Way, who, after paying more than thirty visits, has drawn up a favourable report, which has been published by the local board authorities. The sewage of Ealing is dealt with by means of filter beds, of which the Professor thus speaks:—

"These filter beds are, in my opinion, of very great importance in carrying out any process of purification of the sewage previous to its discharge into the Thames. Without them it would be impossible, by the best precipitants known, to clarify the sewage in the tank; for, no matter how perfect the system of precipitation may be, there is always some portion of flocculent matter which will not settle, and which can only be removed by filtration. These filter-beds are an excellent feature of the Ealing Sewage Works."

Speaking of the use of chemicals to precipitate the use of sewage, the Professor says:—

"Several years since I expressed the opinion that if to the system of filtration that of previous precipitation were added, the Ealing Works would be among the most perfect, if not the most perfect, of their kind in the country. I have seen nothing recently to alter that opinion."

The precipitants employed are lime and a cheap salt of iron, the latter made on the premises by a process suggested by himself. With the lime is used a preparation of tar; but the chief effect in the clarification of the sewage is regarded as being undeniably due to the lime and the iron salt. Slaked lime is mixed with water and the tar compound; the lime is kept in suspension in the water by air pumped into it by a small steam-engine, which is also used to pump water. The lime and tar compound are added to the sewage as it enters the works. It then passes to the tanks, where the greater part of suspended matter is deposited. At the last of the subdivision tanks a solution of iron salt is allowed to flow into the sewage water, and advantage is taken of a slight fall to move a small water-wheel which assists in the mixture of the iron salt with the water. The water then passes by upward filtration through two filter-beds. It is not for a moment asserted that the effluent water at the Ealing works is pure; but it is rendered so far free from offensive matter as to allow of its discharge into the Thames.

YOUR NEIGHBOUR'S MUSIC.

In answer to your correspondent from Manchester, stating that music can be distinctly heard in his house from the one adjoining, although the party-walls are 9 in. thick, and that every expedient has been tried to prevent it, but without success; allow me to suggest that the nuisance does not in a general way rest with the party-walls, or, as another correspondent writes, with connecting timbers, but that the real fault lies with the half brick chimney backs, which in town houses are invariably loosely and badly built, thereby forming an unsound partition between adjoining houses; and as the registers of our stoves in present use are often large and placed at the back, these, when open, assisted by the heated air, form a complete communication between houses. Also I have noticed when the registers are closed, and no fires in the grates, the

nearer the instrument is placed to the chimney-opening or fireplace, the more distinctly will the music be heard in the adjoining house. Again, when your neighbour is stirring or coaling his fire, as a rule, how plainly you can hear the sound; therefore, I think the fault generally rests with the half-brick badly-built chimney-backs, and not with 9 in. party-walls, if fairly bonded and constructed.

JOHN ELLIS.

AGE OF THE SANCHI TOPE AND ITS GATEWAYS.

I, SANKA MUNI, son of Mayā, by Buddhodana, born in 623 before Christ, founder of Buddhism, greet thee, *Builder*, for the useful interest you create in my old-forgotten buildings. Let those who would know the date of them at Bhilsa first read the legends of Priyadasi, in his Pillar edicts, and study the works in their original tongue of Kaṭṭhayaṇa, my disciple. That Christian only who knows the language *Māgadhī*, and the differences of the Buddhist inscriptions, can pretend to teach his fellows the chronological mysteries of my buildings, and must certainly pass an examination in the *Kārikā* before the Civil Service Commissioners of your country, O *Builder*!

Be warned against hasty theories, to be solved only by

SANKA MUNI.

WATFORD BOARD OF HEALTH.

TENDERS for the low-level, storm-water, and intercepting sewers, and other works in connexion therewith, were opened as follows:—

Capper (Stoke Newington)	£3,108 0 0
Philips (Westminster)	2,500 0 0
Munday (Limehouse)	2,253 0 0
W. Wignmore (Fulham)	2,645 0 0
Wilson, Brothers (Southall)	2,627 0 0
W. Miskew (Plawton)	2,513 11 0
W. Strickson (Colney Hatch)	2,471 8 1
Moore (Belsize)	2,317 10 0
Pearson (Lambeth)	2,337 0 0
Carter (Ainley)	2,355 13 0
Hullard (Bromley)	2,311 10 0
J. C. Clark (Warwick)	2,278 10 0
G. Fikin (Watford)	2,223 4 2
Bughere (Huddell)	2,154 19 0
J. Pizze (Hornsey)	2,135 0 0
Dickenson & Oliver (Canterbury)	2,063 0 0
C. Ford (Wolverhampton)	2,055 6 10 3
P. Porter (Clapton)	1,891 0 0
Hayno (Kilburn)	1,866 0 0
R. Hoobam (Highgate)	1,837 0 0
H. A. Marshall (Epping)	1,800 0 0
Vickers & Crane (Lambeth)	1,805 0 0
G. Young (Battersea)	1,763 0 0

Mr. George Young's tender was accepted, provided his references and sureties prove satisfactory.

CAUDEBEC LADY CHAPEL ROOF.

I AM glad to be able to confirm the statements of my fellow pupil, Mr. B. Ferrey, which appeared in your journal of December 31st, respecting the construction of the groining of the Lady Chapel at Caudebec, as we both were engaged drawing at the church as pupils of Mr. Augustus Pugin, he sketching the sacristy, and I doing the same and measuring the chapel in question.

I, as well as my friend, Mr. B. Ferrey, have a "very vivid recollection" of everything connected with the remarkable pendant of this chapel, and had additional cause for it, as, having got into a hole made in the inner arch, for the purpose of examining and measuring this pendant, I ran the risk of immolation for the cause of Gothic art by a total inability for some time to get out again; and I would warn other students in art to avoid over-zeal, which had nearly been fatal to me, and converted that very interesting groining into a very uninteresting museum for myself; but as it was not so, I am able to give the information respecting it which Mr. J. B. Cohen so much requires, as, not being able to see the top of the groining, he considers this as difficult a problem as did a certain king, when he was so much puzzled to know how apples got into dumplings, where no opening was visible by which they could enter.

Now I will assist your correspondent over his difficulty, and relieve his mind of any supposition that Mr. Pagworth has dreamed a dream, or has been deluded by statements of some party without a name. I am able to take the responsibility on myself, as the plate of the Lady Chapel published in Pugin's "Architecture of Normandy," was drawn by me from my own sketches and measurements, in which there is but one omission, and that is,—the junction of the large arch with the wall was filled in and weighted to hinder the upward thrust.

The section of this, given in Gwilt's "Supplement to the Encyclopædia of Architecture" (published in 1851) does not fully explain its peculiarities, and would lead to the supposition that the whole of the top of the groining is 3 ft. 1 in. in thickness, whereas there are only six large ribs of that size, starting from the internal angles, meeting in the centre, and holding up this pendant stone of 17 ft. long, from which the moulded groings and ornament are suspended. Mr. Pugin's plate gives two sections, one showing how the spaces between these large ribs are arched in with tuffa of 6 in. thick, and into this a small hole was made, by which I got into the space, where by candle-light I could examine and measure it all. I must further state that a part of the high-pitched roof was taken off to allow of entrance to top of groining.

Having explained how the examination was made, I must direct attention to the very bold and yet careful construction here carried out. To avoid any pressure on the moulded ribs of the interior of the chapel from the subsidence of the large arch, a space has been left between them, and this has had the desired effect, for the joints of the moulded groining were as perfect when I saw it as if the hand of the mason had just left it; and all glory to those Medieval men who designed so beautifully and built so well.

TALBOT BURY, F.S.A.

RESTORATION OF ALL HALLOWS CHURCH, LOMBARD-STREET.

THIS church, which has been re-opened, has been repaired, and its interior restored and decorated. The works were undertaken in consequence of the provisions of the Union of Benefices Act being applied to the parishes of All Hallows, Lombard-street; St. Benet's, Gracechurch-street; and St. Leonard's, Eastcheap; by which St. Benet's Church and frehold were pulled down and sold, and the proceeds appropriated,—1st. To the creation and endowment of a church in one of the poorest parishes at the east of London; and 2nd. To the repair, improvement, and decoration of All Hallows Church, which now becomes the church of the three united parishes. The present church was reconstructed in 1694 by Sir Christopher Wren and its main features have been preserved in the restorations. The west galleries have been removed, and also the room at the north-west corner, throwing open the vestibule, the west window, and the groined ceiling. The cost of the restorations has been £4,000. The architects have been Messrs. Francis, and the contractors Messrs. Dove. We may find an opportunity of examining the edifice.

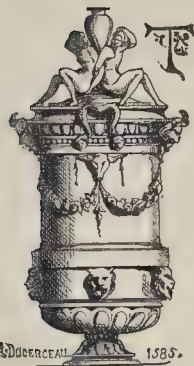
MINERAL STATISTICS OF THE UNITED KINGDOM.

THE minerals raised from the earth in the United Kingdom in 1869 were of the value of no less than 35,252,120l. This amount exceeds that of the preceding year by upwards of 1,600,000l. The coal produced in 1869 told up to 107,427,557 tons, of the value of 26,856,182l., without adding any charges for movement. The returns for 1868 showed only 103,141,157 tons of coal produced, being less than in 1869 by above 4,000,000 tons. The advance was in our home consumption, and is attributable chiefly to the renewed activity of our manufactures. It is accounted for to some extent by the increase in the make of pig iron. The production of our blast furnaces in 1867 was 4,761,023 tons; in 1868, 4,970,206 tons; in 1869, 5,445,767 tons. The production of iron ore in 1869 advanced to 11,508,525 tons, of the value of 3,732,560l.; the quantity is about 1,340,000 tons more than in the preceding year. The great increase is in North Staffordshire and in Scotland. The copper ore produced was 122,953 tons, of the value of 519,912l. The lead ore, 96,866 tons, of the value of 1,189,030l. The zinc ore, 15,533 tons, of the value of 49,366l. The metals obtained in 1869 from ores were of the value of 17,162,767l., or 1,400,000l. more than in the preceding year. The pig iron obtained was, in 1868, of the value of 12,381,280l.; in 1869 it advanced to the value of 13,614,297l. at the place of production. The number of iron works active in Great Britain was 174 in 1868 and 199 in 1869, and the furnaces in blast increased from 560 in 1868 to 600 in 1869. Of the other metals obtained in 1869, lead amounted to 73,259 tons, of the value of 1,397,416l.; copper, 8,291 tons, of the value of 644,065l.; a decrease

The Builder.

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Thomas Brassey.



THE death of Mr. Brassey, which occurred on the 8th of December, is an event not to be dismissed with the ordinary common-places of obituary notice. The great wealth which his energy and sagacity enabled him to acquire may be said to constitute the least of Mr. Brassey's claims to posthumous respect. His life was one marked by unstinted industry, by unspotted integrity, by capacity of a high order, and by a kindly and benevolent spirit. Engineering works of unprecedented magnitude were carried out, by the admirable organisation which he instituted, in almost every quarter of the world. His life was spent to the benefit of his country, and his name will never be forgotten in the future records of the triumphs of genius and of perseverance.

Thomas Brassey was born on the 7th of November, 1805, at Baerton, near Chester. His father, John Brassey, of Bulkeley, farmed his own paternal estate, and traced his name to a Norman origin; a De Bracey, or De Brassis, having been one of the noble cadets who followed the fortunes of William Duke of Normandy. Taken, at the age of sixteen, from school at Chester, Thomas Brassey was articled to a surveyor in that quaint old city; by whom, on the termination of his apprenticeship, he was taken into partnership. The professional occupation thus afforded constituted a practical education of the utmost value, as introductory to a career of a character absolutely unprecedented. Young Brassey was engaged, among other surveys, on that of the road from Machynlleth to Aberdovey, which runs along the valley of the Dovey. In the skill and experience which his assiduous attention to this duty enabled him to acquire, Mr. Brassey laid the foundation of his future eminence. He undertook, shortly after his marriage, the entire responsibility of the business previously carried on by the firm of Lawton & Brassey; and added industrial enterprise to the professional labours of a surveyor, by the establishment of lime-kilns and of brick-yards, and by the execution of a road from Tranmere to Brownborough. It thus befell that when, in 1835, Mr. Joseph Locke, then just appointed engineer of the Grand Junction Railway (from Liverpool to Birmingham) was looking out for competent contractors to execute the works, Mr. Brassey was admirably prepared to fulfil such a task. He undertook a length of ten miles of that line, known as the Stafford Contract, and carried out his engagement at the same time to his own pecuniary benefit and to the complete satisfaction of the engineer.

The directors of the London and Southampton Railway, becoming embarrassed with the difficulties of their undertaking, called in Mr. Locke

as engineer, who at once entrusted the completion of the works to Mr. Brassey; the amount of the contracts thus entered into exceeding four millions sterling. While employing as many as 3,000 men in the South-western district, the enterprising contractor undertook portions of the Chester and Crewe, and of the Manchester and Sheffield Railways; and, in partnership with Mr. W. Mackenzie, the execution of the Glasgow and Greenock line.

In 1840, Sir John Easthope, and other directors of the South-Western Railway, formed, together with M. Laftite and a few French capitalists, a company for the construction of a railway from Paris to Rouen. Mr. Locke, naturally, was named engineer; and Messrs. Brassey & Mackenzie were entrusted by him with the execution of the works. The prolongation of the line to Rouen (after Mr. Robert Stephenson, with a delicacy which did him honour, had declined to undertake it as engineer, on the ground that Mr. Locke might think he had a prior claim to the post) was carried out under arrangements similar to those for the Paris and Rouen line. Between 1844 and 1848 Messrs. Brassey & Mackenzie contracted for five other French railways; and the former also undertook, in whole or in part, the works for three lines in Scotland, and two lines in England and Wales. At this time the industrial army set in motion and controlled by Mr. Brassey amounted to 75,000 men; and his weekly payments must have distributed, as the price of labour, from 15,000l. to 20,000l. every Saturday. The capital involved in these various contracts amounted to some 36,000,000l. sterling.

The Great Northern Railway, the last of this series of contracts, was completed in 1851. In the same year Mr. Brassey commenced works in Shropshire, in Somersetshire, and in the county of Inverness. In 1852 he undertook, in Belgium, in Holland, in Prussia, in Spain, and in Italy, the several lines of the Sambre and Meuse, the Dutch Rhenish, the Barcelona and Mataro, and the Maria Antonia Railways. In partnership with Messrs. Peto & Betts, Mr. Brassey constructed the Grand Trunk Railway of Canada, a line upwards of 1,100 miles long, which crosses the St. Lawrence by the largest and most expensive bridge which has yet been anywhere erected. Between 1853 and 1857 he constructed six more railways in France, as many in Italy, and the very difficult Bilbao and Miranda line in Spain. He further undertook contracts in Norway, Sweden, Denmark, and Switzerland. He constructed and maintained (at a considerable loss, it may be added) the temporary Railway over the Mont Cenis Pass of the Alps, a line which the approaching opening of the tunnel under that great natural barrier will shortly supersede. In Turkey he undertook contracts which are still in course of execution. In Austria he received distinguished testimony to the value of his exertions. In India he constructed the greater part of the East India Railway, the Calcutta and South-Eastern, and other works. In Australia he constructed several hundred miles of railway. He contracted for the first railways projected in South America; and one of his last undertakings was a contract for docks at Callao, amounting to more than half a million sterling, which has to be carried out by his executors. It would occupy unnecessary space to give the names of thirty-one English and Welsh railways, which, during the period in question he was making, extending, or widening. The Barrow Docks and the important Runcorn Viaduct must not be omitted from a summary of his most important enterprises. The subsidiary or private undertakings, by means of which he constructed his enormous plant, and ministered to his home and foreign contracts, were in themselves enough to overpower the capacity of any ordinary man. Coal-mines, iron works, dockyards, the great establishment on the

margin of Wallasey Pool at Birkenhead, "Canada Works," where the Victoria Bridge for the St. Lawrence was constructed, all owed their existence to his energy. The railway contracts executed by Mr. Brassey and his various partners, from 1848 to 1861, extended over 2,374 miles, and amounted to a total value of 28,000,000l.

The patient sagacity and calm resolution which he had laid down for his own conduct, which enabled Mr. Brassey thus to perform, at the same time, an amount of work equal to that of three or four Ministers of Public Works put together, may be illustrated by an anecdote never until now put forth.

In the year 1862 Mr. Brassey was in Turin. Some Italian notables of that day called upon him, at the Hotel Trombetta, in order to obtain his support for one of the great enterprises by which it was then sought to enrich the Peninsula. Mr. Brassey was conversing with an English engineer (who had himself been served by an Italian Government much as a captive kite is served by the gamekeeper, who suspends him as a terror to other predatory birds), when the deputation arrived,—a lawyer of eminence, a member of the administration, more than one deputy of the Chamber. Encosnecing his companion in the inmost chamber of the suite, where every word that passed was distinctly heard, and where he was asked to wait for half an hour, Mr. Brassey received his visitors. Nothing could be more apparently satisfactory than the commencement of the interview. The advantage of the project was set forth by the projectors, and admitted by Mr. Brassey, whose brief occasional remarks showed that he had thoroughly mastered the subject. When the whole matter had been presented in its fairest light, by one and another of its advocates, Mr. Brassey remarked that it might save time if he explained the invariable principles on which he conducted business. He was willing to afford a large measure of support to any enterprise of which he undertook the works. He was prepared, in such case, to subscribe to the capital, and to hold, without forcing on the market, a certain proportion of shares, or bonds, or both. But such financial arrangements must be entirely distinct from those made for the execution of the works. For that he must receive monthly payment in cash, according to regular monthly certificates by the engineer, of from 80 to 90 per cent. of the value of work done. If the directors were prepared to deal on these terms, he should be ready to enter at once into the details of prices.

The deputation were delighted. Nothing could be more to the point, or more in accordance with their ideas of business and habits of action. Then they commenced a review of the features of the scheme, and travelled, a second time, over the ground already covered, rising, however, in enthusiasm as they dwelt on the unrivalled advantages which the shareholders would enjoy. They considered the contract as settled with Mr. Brassey. The terms were fully acceptable to both sides, and they would send their engineer to meet Mr. Brassey's engineer, and settle the details of the schedule, as to which no difficulty could arise, as there were ample precedents to follow. They would take their leave of their honoured friend with the utmost content. The little noise which accompanied the rising of half a dozen persons succeeded. The door opened, and, just in backing out, "Of course," said the first speaker, "Mr. Brassey had no objection to accept, as cash, the shares of the Company for which he had promised to subscribe!"

"Stop, gentlemen," said Mr. Brassey. "I am sorry that I have failed to explain my meaning. You must not go away under a mistake. I told you, that, if we agreed to the details, I would subscribe for a certain proportion of shares."

But I told you that this must be kept quite distinct from the monthly payments. They must be regularly made in cash, to my bankers, on no other consideration will I look at the business. I have large sums to pay every month, and I cannot allow any uncertainty to ensue as to the regularity of my receipts. Pray understand that. It is a *sine qua non*."

"Of course, if Mr. Brassey put it in that way, the directors would be delighted to meet his views. They had merely intended to avoid trouble, by proposing one transaction instead of two. But it was for Mr. Brassey to decide." Then followed a second repetition of the entire argument, to which Mr. Brassey listened with great patience. Again, the leave-taking process was gone through; and, again, as if a mere casual remark,—"The directors understood that the company's obligations were equivalent to cash, as, in point of fact, they were at 3 per cent. premium, and therefore worth more than bank notes."

"In that case," Mr. Brassey rejoined, "it would be easy for the company to convert them, and to pay him in money. He did not wish for more than his price. The advantages to be derived from the premium on the obligations might be very large. So much the better for the company, but he had explained his own invariable system."

It would be intolerably tedious to attempt a more detailed account of the entire conversation. In a word, the half-hour for which Mr. Brassey had imprisoned his countryman, lasted from a quarter to six till nearly ten p.m., when the deputation at length retired, making arrangements for a second interview. The Italians were thoroughly beaten and tired out with their own efforts. They had not made an inch of way. The regular payment insisted on by the Englishman they had never dreamed of really making. They brought their fullest experience of legal and Parliamentary tactics to bear on the unaided common sense of the great contractor, whom they endeavoured to use; and they came to grief against his clear-sighted honesty. He never undertook their contract.

The systematic and orderly execution of works, to so vast an amount as those undertaken by Mr. Brassey, brought in, even at the moderate rate of calculated profit, wealth that was counted in millions. It is not to be supposed, however, that no reverses occurred. Never, claimed by his unrivalled prosperity, Mr. Brassey met loss with composure, and, what is more rare, without attempting to throw it upon others. In 1846, the Barentin Viaduct, on the Rouen and Havre Railway, 100 ft. high, and consisting of twenty-seven arches of 50 ft. span, fell like a house of cards. The responsibility of a failure of this kind, the result either of faulty design, of slovenly execution, or of both combined, rests rightly on the engineer of the works. Mr. Brassey spared Mr. Locke any annoyance. He quietly rebuilt the great bridge at his own expense,—an expense of some 30,000*l*. The Grand Trunk Railway, again, conferred immense benefits on the Dominion, at the cost of those who found the money for the enterprise. The failure of Messrs. Peto & Betts was very costly to Mr. Brassey. For one line of railway, from the construction of which he had received no pecuniary advantage whatever, he had guaranteed a half-yearly interest, for a certain time, of 14,000*l*., which he had to pay. He had taken the wise precaution, at a time when the disasters of 1866 were altogether unlooked for, of placing a million sterling in the hands of trustees. It came out in the evidence on Messrs. Peto's bankruptcy that more than a third part of this provision against a rainy day had been lent to that firm. It is probable that Mr. Brassey lost, during the dark days of 1866, more than any other man of business could have lost,—of his own money, that is to say. Notwithstanding that reverse, he probably died a richer man than he had been at any earlier period.

Mr. Brassey's charity is said to have been as extensive as it was unobtrusive in its exercise, and well directed in its application. An unusual instance of largeness of heart was mentioned, about the time when it occurred, exclusively in the columns of the *Builder*. A little before Messrs. Peto & Betts's failure, Mr. Brassey, having become aware that the firm was hard pressed, called upon Sir Morton and offered, as simply as if it had been the most ordinary transaction, to lend him a hundred thousand pounds,—and not only so, but, with the aid of Mr. Lucas and two or three other friends, to raise the loan to half a

million, if he received the assurance that that sum would entirely relieve the recipients from embarrassment. To the honour of all parties this generous offer was declined, on the ground that it would not be sufficient.

The nature of the relation which subsisted between the engineer of a public company and the contractors who undertook the execution of the works, was, at the commencement of Mr. Brassey's career, very different from that which subsequently obtained. The early contractors were, for the most part, men of strong natural abilities, insight into the cost and method of executing work amounting to instinct, low tastes, violent habits, and grasping tenacity of purpose. A contract being once made, it seemed to be regarded as natural that the contractor should set his wits to work to make the most of it. This was to be done, on the one hand, by grinding his labourers under the pressure of the truck system and the "tommy shop," and on the other hand by "scampering" his work. Under the three grades of engineers ordinarily engaged ranked an array of inspectors. These were not men, like the *conducteurs des travaux* on the Continent, who discharged the drudgery of the engineer's work, took the levels, and set out the works. They were, purely and simply, men set to watch that the requisitions of the specifications were not eluded, that the mortar had the proper proportion of fresh lime, that bats were not used in place of bricks, that spruce was not substituted for larch in the fencing, and so on. Very frequently these men began by displaying extreme severity, greatly to the cost of the contractor. As a rule, vexatiously minute inspectors were open to bribes. They gave trouble unless they were bought off. This matter once arranged, the less scrupulous contractors and sub-contractors often drove a roaring trade, the engineer being sold by his own watchmen.

Against this system of scampering and of bribery Mr. Brassey was one of the first to make a stand. In all questions that he was called on to decide, he had the wholesome habit of inquiring "how the thing would look if it came before twelve men in a box." The time-honoured institution of the jury was ever present to his imagination, and it may be questioned whether that English method of arriving at justice was ever more useful than in this anticipatory appeal to its possible result. Bribing and scampering being thus discarded, Mr. Brassey adopted a method of his own of dealing with that natural enemy (as some regarded him) of his class,—the engineer. It was his plan,—using an expression now perhaps forgotten,—to "smother the engineers." This smothering, however, consisted only in extinguishing all just causes of complaint. To do his work fairly and faithfully, to render inspection superfluous, and thus to annihilate the power of the inspectors, was the system which led to the attainment of such a character of reliability for the performance of work as proved to be one main element of Mr. Brassey's extraordinary success.

With a man of this nature, the relations of an engineer soon became more confidential than was at all ordinary in the early days of English railway work. Establishing his character by the first contracts which he effected under Mr. Locke on the Grand Junction Railway, we have seen how Mr. Brassey subsequently accompanied that engineer to the South-Western line, to Normandy, and to other districts. The influence of that engineer was enormously increased by the practical backing thus afforded. An estimate by Mr. Locke meant a price at which Mr. Brassey would tender. In some instances, indeed, the support thus given to what was no longer mere scientific opinion, rendered Mr. Locke rather a dangerous adviser for his brother engineers to call in. On one considerable line of railway, as to which, in 1837, there was a question of prosecution or abandonment, the engineer appealed to Mr. Locke to support estimates which afterwards proved to be grossly inadequate. The report took the form of condemning the details of the estimate, but intimated that for the gross sum contractors might be found to execute a well-devised line between the points. The engineer in question narrowly escaped having to pay a very heavy price for the support which he thus invoked. At no part, however, of Mr. Brassey's career has he been accused of endeavouring to take the bread and cheese out of a brother contractor's mouth.

The modest taste of Mr. Brassey led him to shun distinctions which many other men so anxiously seek. He wisely declined to waste

his well-employed time by entering the House of Commons. The Government of France acknowledged his services in constructing the railways of that country by the Cross of the Legion of Honour. The King of Italy evinced his sense of the value of Mr. Brassey's labour in that country by sending him the Cross of the Order of St. Maurice and St. Lazarus. The Austrian Emperor bestowed on him the rare distinction of the Order of the Iron Crown, a decoration never, it is said, before conferred on a foreign subject. Mr. Brassey probably valued still more highly the testimonial presented to him, in 1851, as an expression of gratitude, by his numerous agents, sub-contractors, and tradesmen, which cost the handsome sum of 10,000*l*. No English Minister honoured himself by commemorating the great services rendered by Mr. Brassey to his country. As he was only a great industrial benefactor, and not a political partisan or agitator, he was left to the rarer distinction of the respect of all good men. The hereditary Order of Knighthood, which owes its origin to the exigencies of the House of Stuart, would have been illustrated by the association of a name that was known wherever industry was active or English spoken. But it would be out of place to expect a Cabinet Minister of the present day to waste honours, that might be useful to secure political support, on an independent and non-political man, merely because he was such a one as deserved any distinction that his Sovereign could bestow.

Mr. Brassey has been spoken of, in what we fear must be called the fashionable cant of the day, as a representative man. Nothing can be farther from the truth. It would, indeed, be a happy thing for the country and for the age if the expression were correct. On the contrary, Mr. Brassey was to the unquestioned leadership of his calling by the possession and the exercise of qualities which are not only, in the degree in which he possessed them, rare in themselves, but which are still more rare in combination. His character presented a happy equilibrium between forces of opposite tendency. He was remarkably keen and sagacious in perceiving and in maintaining his own interest, at the same time that he was unimpeachably just with regard to the interest of others. He was eminently kind-hearted, at the same time that he was quite dead to the voice of wheedling. He undertook, and carried out, not a few large operations, rather for the sake of the employment of his dependents than for his own emolument; and he largely increased his wealth by so doing. He was bold to audacity in the magnitude of his operations, at the same time that he was cautious, even to timidity, in the preliminary investigation of details. Fully conversant only with the English language, and making no pretension to a critical acquaintance with that, he not only so expressed himself as invariably to avoid misconstruction or confusion, but found himself almost as much at home in the principal Continental capitals as he did in London. Modest and unassuming in his manners, he was yet fully aware that he was an industrial power of the first magnitude. Liberal, on a large scale, in his dealings with the public companies for which he executed such wholesale works, he was exact to the utmost minuteness as to the regularity of certificate and of payment. He was at once generous and exact, energetic and calm. While ever to be found at the spot when his presence was required, he was free from that drive and bustle by which some persons endeavour to hurry their subordinates, and to obtain the reputation of men of business. Probably no man, in the history of the world, ever at once amassed and deserved so much wealth. He never, it has been said, lost a friend, and never made an enemy. He has left his country the witness of a well-spent life, a life not less memorable for the number and magnitude of his gigantic works than for the worth and excellence of both his public and his private character.

ON THE SELECTION OF BUILDING SITES.*

BUILDINGS are, of course, constructed on all kinds of sites; but for many reasons modern towns generally occupy valleys, and are thus distinctly contrasted with towns of other days, which were much more commonly, and for equally good reasons, perched on eminences. Valleys now traversed by rivers are far more convenient than plateaus, as more accessible

* From a paper by Professor Austed, F.R.S., read at the Royal Institute of British Architects on the 9th inst.

both by land and water, and if less safe in a military sense than plains in some respects, they are much more so in others. But whatever the reason, it is a fact that all important and large cities are on or very near large rivers. Thus the condition of the rocks on the surface of valleys has important significance.

It may be assumed, in the present state of geological science, that all such open valleys as now form or contain the beds of rivers have been reduced to their present shape, and have derived their present condition, from the passage of water through them. The beds or bottoms of the valleys have been cut out by water, the transported material with which they are covered has been moved by water, the cliffs or slopes of the enclosing hills, at whatever distance, have been brought into their present state by weather action, and small as the stream may be that runs along a narrow channel in a winding course between these cliffs or slopes, it has been sufficient in the course of time to bring about the result we see before us. All that lies immediately beneath the surface in the valley often to a great depth consists of material removed very gradually by this water, while below that there is often another deposit of water-transported material, consisting of clay, stones, and sand, due perhaps to ancient glaciers, or left behind by icebergs that have floated over or have been stranded upon it when many fathoms below the sea level. Sometimes there are streams entering the main river from side valleys, and each of these again has formed its channel and left its mark. The more sluggish the main stream, and the further it is from its source, the greater in proportion is the effect of such feeders. When they are torrents they sweep all before them, and deposit large stones with smaller gravel, clay, and sand. When they have had a more even course, they deposit fewer large stones and more mud and sand.

From this account of the history of river deposits, given in a very few words and requiring to be varied in detail for every stream without exception, you may understand the nature of the material that you have to deal with in preparing foundations for a large and massive construction, in almost every part of England which such buildings are likely to be erected. The clay you find may be alluvial clay deposited by the stream, or it may be boulder clay left behind by ice. It may thin out at any point, and give place to gravel, to loose stones, or to fine sand. Beneath it may be a quicksand. A certain number of tons pressing on the square foot of surface may and will cause the clay to slip away from the sands, or the run of an open drain through such sands may, by removing them, remove all support. When in the bed of the main stream, there may be a very regular deposit of clay, capable of supporting any weight that could be put upon it, but the intervention of one of the old and forgotten tributaries may have cut away part of this clay for an interval, or prevented its formation, and thus one part of a building may be on a good clay and another part on loose shifting sands.

It is exceedingly important that the exact physical conditions of the formation of the alluvial beds of rivers should be clearly understood by practical men. It is by no means the case that the present bed of a river is the only part where loose and uncertain material exists, nor is it at all necessary to assume any change of level, still less any great convulsion of nature, to account for the phenomena. They may be studied in every valley where the stream is left to take its natural course; but in England, and in many other countries where land is valuable and cultivation carried on extensively, the rivers are never left to themselves, and, therefore, the changes that explain and illustrate these conditions are not perceived. In a natural state a river rarely follows the same course through its valley many seasons in succession. Either it chokes up its old bed and steps aside to form a new one, or, owing to a torrent, it cuts itself a new course altogether, and leaves the old bed dry. All our river beds have been formed in this way. It is not that the quantity of water brought down varies very much, but that the circumstances change, and new channels are cut, the deposits of course shifting. The whole width of the valley through which a river runs is of the same nature, and the deposits are due to the same cause. Hence the variety in the foundations in different parts of a valley far removed from the present course of the stream, which has not, perhaps, been allowed to shift for many centuries.

But in addition to ordinary alluvial bottoms resting on clay, limestone, or sandstone, as the case may be, and consisting of the usual admixture of sands, clays, and river gravels, are the instances in which the river valley has been ploughed out by the action of the ice, and has received large deposits of boulders, boulder clay, and the usual accompaniments of fine and coarse sand and gravel. Gravels are frequently found at levels very much above the bottom of the valley, and they not unfrequently even cap the hills through which the river is cut. The same kinds of gravel often occupy the valleys themselves.

Excellent as gravel is as a foundation when in sufficient quantity and uniform in texture, it can hardly be trusted unless its history be known. The gravels called diluvial are often comparatively free from loose sands and clays, and are then excellent for every purpose required by the architect or engineer. They are sound, well drained, healthy, and generally yield water at a small depth. But it is not so with the gravels occasionally found with boulder clay, nor with ordinary river gravels, and thus, as I have already pointed out, the history of gravel is an important inquiry when it is proposed to construct buildings upon it.

Natural drainage is very important in all large buildings. Without this, even if the foundations are sound, moisture will rise up by capillary action through almost every variety of stone and brick, and will in time deface the building and increase the action of weather on the surface. Certain rocks drain naturally, and are safe. Others may be drained with little difficulty, and may be made safe. Others, again, will tax the ingenuity and experience of the most accomplished architect, and will, after all, be only partially cured. There cannot be a doubt that in this latter, and also in the second case, the constructor would be greatly assisted by knowing the nature of the enemy he has to deal with, and this can only be done by a knowledge of rocks generally and of the local geology.

Very important questions arise in reference to the relative influence of certain rocks, on the sanitary condition of the buildings erected upon them. Thus, in a general sense, it may be considered as proved by experience that clay soils and other impermeable material near the surface are less healthy than well-drained sites, and more liable to attacks of fever, and that permeable soils and gravel are dry and healthy. There are, however, important modifications of this view dependent on the subsoil and underlying rock which are often out of sight and below even deep foundations, and here a knowledge of geology becomes necessary to the architect. It is well shown by Professor Pettenkofer, of Munich, that in certain cases where bands of clay intervene in gravel, the presence or absence of fever in the population corresponds exactly with the existence or otherwise of these impermeable deposits. In other words, even where the general subsoil enjoys a certain amount of natural drainage, the healthiness of the site depends strictly on the condition of the rocks at a considerable depth, and that stagnant subsoil water, even when its presence cannot be detected by ordinary observation, makes itself felt in a very serious manner.

In speaking of the applications of geology, I have avoided the mention of particular rocks as much as possible, because it is not so much the rock as its condition that affects the practical man. I have known granites porous and absorbent, limestones compact and non-absorbent, sandstones offering every possible variety in every respect, and even clays very different in different places. What is wanted is such a general acquaintance with the principles of stratification and the nature of rocks as shall enable the architect or builder to make the best use of the conditions he has to deal with. I cannot lay down rules that can be made use of without further trouble; I can only point out the key which will unlock the difficulty in each individual case, if it is applied properly and intelligently.

Water supply from springs either at or moderately near the surface is a very essential matter in the case of buildings intended as habitations removed to some distance from pure running water. But it is now well known that however pleasant clear spring water may be to the taste, it is capable of containing, and does in certain cases contain, injurious ingredients sufficient to render it a fatal poison. There can be no doubt that certain superficial deposits and certain rocks are liable to induce this state in the water,

while others are not. It is evident that the causes of events of this kind should be known to the architect, and it is highly desirable that he should be acquainted with the theory of springs, at least of such as are likely to affect buildings. Absorbent gravels resting on non-absorbent rocks may be expected to introduce poison into water when the ground is liable to be covered with decomposing animal or vegetable matter, or with sewage, for the rain entering them cannot fail to carry in water loaded with as much of such impurities as it can contain. Such of them as are soluble in water will certainly therefore mix with it, and render unwholesome all the water pumped from the bottom of such a deposit.

On the other hand, where water has a free exit from rocks, it is almost impossible that such injury can take place to any great extent. Land springs and Artesian springs from basins are dangerous. Springs from hill sides, or Artesian springs reaching water tapped in its progress to an outlet, are generally safe. How it is to be known what is the nature of the springs without some reference to the science of geology, and some knowledge of the laws of superposition of rocks?

The whole subject of the weathering of rocks deserves the careful study of all who have to deal with stone and brick. All material, without exception, is affected by exposure; but while some will remain almost unchanged, and even hardens when left to the action of the air, other kinds will at once decompose and rot. It is not kinds in general that is the best. This is always the hardest that is the best. This is especially the case with flags or stones splitting with parallel faces. Many very good flagstones are formed by the exposure of quarried and squared blocks during one winter, and then in the following spring splitting the mass by wedges in the cracks indicated. If left longer, they can no longer be split with advantage; and after a time it becomes impossible to split them at all. Something of this kind happens with all stones. After being quarried, stones are for some time in the state called green, and after exposure to a certain extent they are said to be seasoned. In the latter state they are regarded as fit for use; but after all it is doubtful, without experience, whether they will be permanently sound. It is evident that if the architect and builder knew more of the history of stones he would be able to use them to better advantage.

The study of stones in the quarry, and a careful examination of the effects of weathering and disintegration by the action of rain and frost of the same stone in the immediate neighbourhood, whether naturally exposed or placed in buildings of any kind, combined with a knowledge of the chemical composition, the peculiarities of aggregation, and the natural history of the stone itself and the beds with which it is associated, will very often suggest to the intelligent observer its probable weak points for the special service for which it is designed. There are accumulated stores of information of this kind that should be familiar to all who have to decide on the selection of stone, and it should be remembered that stone is in the nature of things an altered form of a very miscellaneous deposit, and that without especial care in selection and placing it is next to impossible to secure a large quantity of perfectly even quality.

You will observe that I have included a great variety of details as included within the very important subject of building sites, but I trust you will not think that I have done so without sufficient reason. I am well aware that in modern constructions beds of concrete play an important part in forming artificial foundations, and are much trusted to in keeping out damp and preventing unhealthy miasma. I wish to point out that however useful such an avoidance of the difficulty may be, it should not be trusted to implicitly, and I think it would be easy to show that there are cases where the danger and mischief would only be postponed for a time by such contrivance, and would reappear and not with full force when by irregular pressure on a cracked and crushed long before the time has come when the building would begin to fail by reason of age and general wear.

I assume as entirely beyond discussion that in the exercise of his profession the architect desires only to do justice on the one hand to his own inventive genius, skill, and reputation, on the other to the highest interests of his client. I have endeavoured to show that in order to do this he must inform himself concerning and be to some extent familiar with the principles and

applications of the science of geology as now understood. He must from time to time call in the aid of this science to decide matters of vital importance, and he cannot do so properly without making them a subject of serious and special study. I have not entered into details, as they could hardly be fully discussed in this place, but I have endeavored to illustrate and explain the principles to which I think your attention as architects should be directed.

Since this memoir was in type, my attention has been directed by my friend, Dr. Letheby, to a pamphlet by Dr. Pettenkofer, in which attention is drawn to the great influence of sub-soil and rock on certain diseases, especially cholera and typhus. Dr. Pettenkofer points out that in the case of Gibraltar and Malta it was proved by British statistical returns that at a time when cholera was raging over a large area, there were certain small localities that escaped. On investigation it was found that, whereas the subsoil to a great depth, and, in the case of Malta, the rock, was eminently porous and permeable, the spots that escaped were situated on impermeable clays.

There can, indeed, be no doubt that the health of a town is greatly influenced by the condition of the rock and soil on which it is built, and that generally a moderately porous soil, admitting of the removal of moisture by drainage, is conducive to health, especially in a damp and comparatively cold climate, like that of England; and also that with us gravel and limestone as subsoil and rock are healthy as well as pleasant. But it is equally certain that where the underlying rock is deep and permeable, admitting of a considerable alteration of level of that surface of permanent wetness which is sure to exist at some depth or other under such circumstances, but which varies with the season, the result may be different, and it may require both knowledge and judgment to decide as to the relative value of sites, even with regard to water only. It is also true that wherever there is a great collection of human beings living over a permeable soil and rock, the effect of the accumulation of refuse and sewage cannot but be felt in the course of time. The water percolating from the surface will carry down organic matter, and this in time will make itself felt by generating unhealthy vapours occasionally reaching the surface.

But there is another question to be considered, which in warm and dry climates rises into great importance, and with regard to which the observations of Dr. Pettenkofer are very suggestive. All rocks are capable of absorbing, and therefore usually contain a certain quantity of atmospheric air, either in its normal state or replaced by other gases. No doubt a certain change in the constitution of the gases absorbed may take place, in consequence of an action well known to take place in porous and spongy solids when mixed gases pass through them. The quantity of air or gases contained in all rocks must vary, and must be affected by changes of weather. Daring dry and hot weather large quantities are given off, and during colder weather re-absorbed. In rocks then that contain much air, either in consequence of their great absorbent power or their mass when there has been received into the body of the rock by percolation from above any quantity of organic matter, and this organic matter has become putrid, the gases given off during hot summer days are liable to become dangerous miasms, and when cholera and fever are prevalent are especially liable to communicate infection. I cannot but attribute to this cause the extremely bad sanitary state of some districts in the Mediterranean—healthy enough so long as there is rain, but poisonous in the dry autumn; and in these cases I can easily understand that the intervention of even a small and thin band of clay may be a source of safety, and the more so the nearer it is to the surface.

I need offer no apology for pointing out these facts and inferences in a memoir on the subject of building sites, and of which the application of geology to architecture is the professed subject. Sanitary considerations connected with, and arising out of, topographical and geological positions, can never be dissociated from the practice of architecture, and I am sure you will agree with me that all knowledge that can help to a conclusion in such matters is not only desirable, but ought to be considered indispensable to the architect.

The Late Mr. Lewis Villiamy, Architect.—The death of this gentleman, at Clapham-common, on the 4th inst., has been announced.

THE LATE MR. HARDWICK, R.A., ARCHITECT.

PHILIP HARDWICK was born on the 15th of June, 1792, and at an early age began to study architecture under his father, Thomas Hardwick, who had been a pupil of Sir William Chambers.

After assisting his father for some years, Mr. Hardwick went abroad and studied for a short time in Italy. He was at Paris in 1815, when the allied armies occupied the city, and he often spoke of his visit to the Louvre, which contained the spoils of Europe, then about to be restored to the countries from which the first Napoleon had taken them. Mr. Hardwick returned to England in the autumn of 1818, and then began to practise his profession independently of his father, and soon after married the daughter of Mr. John Shaw, an architect of some reputation, best known by his hall at Christ's Hospital. The first work of importance sufficient to give Mr. Hardwick an opportunity of distinguishing himself was the Dock House and the warehouses for the St. Katherine's Dock Company, then a new undertaking,—a work requiring considerable skill in construction, from the difficult nature of the site. These docks were opened in 1825. Soon afterwards he was appointed architect to the Goldsmiths' Company, and erected their new hall, which was opened in the year 1836. We believe that few modern English architects have left a better monument of their skill than this building. The distribution of the rooms is at once magnificent and picturesque, and there are a breadth and simplicity in the exterior, which to those who knew him, are striking characteristics of the man as they are architectural qualities appropriate to the use and position of the building. His next work of public importance was the entrance portion of the Euston Station of the London and North-Western Railway, then called the London and Birmingham Railway. This was the first station of any architectural pretensions erected in London; it was finished in the year 1838, and was the last building he designed without the assistance of his son. He was elected a member of the Royal Academy in 1839, and was appointed to succeed Sir Robert Smirke as treasurer in the year 1850, an office to which he devoted himself with untiring attention, taking great interest in all that concerned the Institution, and we believe the members of the Academy have always acknowledged their obligations to the energy and patience with which he managed the duties belonging to his office.

The erection of a new hall and library for the Society of Lincoln's Inn was placed in his hands in the year 1842, but he became seriously ill in that year, and was obliged to leave the work in the hands of his son, Mr. F. C. Hardwick. Up to this time he had been engaged in the erection of many buildings both in London and the country, and had that large and general practice for which his clearness of intellect and judgment eminently fitted him. About this period of his career, though only in his fifty-third year, his health failed so completely that he was compelled to confine himself to such practice as could be followed in his own room; but he was still enabled, though with much pain, and in constant bodily suffering, to attend committees; and at none was he so regular as at the meetings of the Royal Academy, to whose affairs, as we have said, he gave all the powers of an active mind, still unimpaired by disease. He was, however, compelled, by increasing infirmities, to resign the treasurer-ship in the year 1861, and to withdraw from all participation in the practice of his profession, as well as from the society of his friends, which was a great privation to one of his hospitable nature. He was a Fellow of the Royal Society, and served for some time on the council. He took also much interest in the labours of the Geological, Antiquarian, and other societies, though his state of almost uninterrupted physical suffering prevented him using his leisure to contribute to their proceedings. He was one of the earliest members of the Institution of Civil Engineers, and one of the founders of the Royal Institute of British Architects. He received the Queen's gold medal in 1854. Mr. Hardwick was architect to the Duke of Wellington, Greenwich Hospital Commissioners, St. Bartholomew's Hospital, and other bodies. Besides the works already mentioned may be named the large hall at Euston Station, the hotels adjoining, and the Globe Insurance Office.

After upwards of twenty years of bodily suffering from a complaint in the spine, and

weakness resulting from an extensive disease of the heart, he went to reside at Wimbledon, where he lived for the last five years, sinking gradually into a condition more and more feeble, and bearing his sufferings with ever-increasing patience and resignation. At last he became helpless in body and infirm in mind; and having been long conscious of his approaching death, he passed away in perfect calm, on the morning of the 28th of December. His funeral, which was quite private, at his own urgent request, took place on the 3rd of January, at Kensal-green.

Mr. Hardwick was much beloved and respected, not only by the members of his own profession, but by all who came in contact with him; and the wide influence he exerted may, we believe, be attributed as much to his good heart and unswerving probity as to his architectural skill and professional success.

WORKING MEN'S COLLEGE, LONDON.

THE Christmas *conversazione* was held in the new rooms, Great Ormond-street, on the 3rd inst. Mr. Thomas Hughes, M.P., received the visitors, and a selection of music was agreeably performed by the College choir. A number of works of art, the production of the students under Mr. Cave Thomas and Mr. Brewer, were exhibited.

We have already spoken of the new rooms. They are built on the lower portion of the ground in the rear of the college, each room measuring in the clear 30 ft. by 23 ft., including a corridor so arranged as to be a portion of the room. The height is 12 ft., and they are lighted by a 12 ft. span skylight. The estimated cost of the whole when finished is about 2,400*l.*, of which 1,800*l.* have already been received. A further sum of 600*l.* is required to finish the museum. The College is, we believe, self-supporting; but to meet this extra expenditure the committee seek the aid of those who think, as we do, that the institution is doing good work.

THE WORKS AT ROTHERHAM WORKHOUSE.

SOME additions have been made to the workhouse, under the direction of Mr. Blackmoor, architect, by Mr. Harper. At the end of last year one of the builders, Mr. C. Morris, who had tendered, wrote a letter to the Board of Guardians, asserting that the specification had not been carried out in all respects, and that this might explain his own want of success in tendering. At the last meeting of the guardians, another letter was received from Mr. Morris, stating that proceedings at law had been commenced against him by Messrs. Blackmoor and Harper, in consequence of these statements and asking leave to inspect at the workhouse, in company with the architect, the plans, sections, and specifications submitted to him on his tendering for the building. The Board agreed to the request.

The imputation is a serious one, and the architect will do right in refuting it.

ROYAL ALBERT HALL.

ON Saturday last week a large number of persons were present, by invitation, to hear some music by the band of the 1st Life Guards and a little singing, in the Albert Hall. Very satisfactory opinions were expressed, but as the mass of scaffolding in the centre and the boarding under the glass ceiling still remain up, it is impossible yet to say with certainty what the effect of music will be when the hall is brought into its normal condition. Many of the visitors on this occasion saw the hall for the first time, and were much struck with its vast size and accommodations. Some points were canvassed as open to criticism, the proportions of the arcade around the upper part, the square skylights seen within the arched openings, the comparatively large size of the cross-shaped spaces left in the curve for mosaics, as well as others. We will leave all this, however, for the present, confining ourselves to one remark, in the hope it may not be too late to prevent a blot. The large central light, or rather ceiling, is being glazed, and we were distressed to notice, in a part exposed to view, that the cross-rails and borders between the main beams that radiate to the centre are straight instead of circular: they should, as a matter of course, follow the line of the circular opening. If completed as begun, we fear this will prove a perpetual eye-sore and cause for regret. Is it too late to change the arrangement?

KENSINGTON-ROAD AND THE ALBERT HALL.

THIS road, extending from Regent's-circus to Kensington, bordered by the Green Park on the left, and by Hyde Park on the right, may be dominated London's Western Boulevard. The importance of buildings in its course, the new Royal Academy, and especially the stupendous Hall of Arts, bestow upon it an increased importance; and since the sinuosities in the Royal town of Kensington have been opened and improved, the remaining straits on the line become more obvious.

The thoroughfare is of sufficient width save at two points: the first constriction being between Albert Gate and Charles-street, where its traverse is but 46 ft. This strait extends for 150 ft., where a row of seven inferior shops ought to be withdrawn some distance from the pavement, in order to give it greater width.

The other restriction of the way is at the Knightsbridge Barracks, which obtrudes upon the main thoroughfare fully half its width, presenting a stable and barrack-wall with windows, where first-class mansions ought to stand. These barracks have been long condemned as unsited to troops, and destructive of the choicest position in London for a residential quarter. No doubt but in time they will be removed; but now, and before the opening of the 1871 Exhibition, together with Albert Hall, some rectification of the road ought to be made, so as to give effect to this grand approach to the finest quarter of the metropolis.

From Kensington to the Queen's Gate the thoroughfare is of ample width; but here the park railing is projected 15 ft. from the gateway, and advances on the road, in a corollinear direction, bowing outwards as far as Prince's-gate, the lodge whereof stands about 40 ft. within the *enceinte*.

Now along the whole course of this railing, and within 5 ft. of it, there is a range of nearly full-grown forest trees as far as Knightsbridge Barracks, and another range of trees within 20 ft., forming a glade, which would make a charming public walk if the Park fence were withdrawn only 20 ft. (inclosing the inner range of trees), and the present Park side footway (which is, on an average, 16 ft.) thrown into the driftway; then this route would be worthy of its position, and would release from a great defect the Hall of Arts which is to be inaugurated on the 29th of March.

At present the way is not only restricted, but this Colosseum is approached diagonally, the road on the east of its frontage recedes, with a footway only 6 ft. to 8 ft. wide, bordered by five mean houses, without areas, and with doors and windows like those of an ancient City lane—the gardener's lodge, and store-sheds of Eden Lodge completing the line to the Exhibition-road.

If, as suggested, the increase of 20 ft. from the Park were devoted to the formation of a sylvan footway under the fine shady trees—not one branch whereof should be lopped,—there could be no expropriation in the dedication to public use of that narrow strip; although the railing were so far withdrawn, the ornature would be still the same; and instead of diminution, it would rather lend apparent extension to the inclosure.

So far as Albert Hall is concerned, the concession of the user of this narrow strip (from Queen's-gate to the Knightsbridge Barracks) would complete the rectification of the roadway. As to any farther extension, or the appropriation of the site of Knightsbridge Barracks, that might await the consideration of authorities, who would discover that the ground-rent of *one half the space* of its foundation would fully repay the outlay requisite for the creation of healthful, convenient, and suitable quarters for the household troops, now placed so ineaply for both public interest as well as their own comfort.

On and after the 1st of May every avenue leading to the Exhibition will be crowded, and the Park drive will prove a valuable easement to the main road, so far as the permission goes for private carriages, other vehicles being restricted. The new road across the Park from Victoria-gate, Bayswater, to Prince's-gate, Kensington, will afford an immense relief to general traffic, and has indeed already been a most serviceable concession to the western suburbs north and south of Hyde Park. This short cut has, however, one very palpable default. After passing the Serpentine Bridge, on the north end, it curves round the Powder Magazine, de-

scending by a fall of 10 ft., and ascending again by a rise of 12 ft., thus increasing the distance by 150 yards; whereas the road might be continued in a *direct line* by the west side of the Magazine, where, by an easy gradient, it would cross the Ha-ha, and join the new road without any divergence and without disturbing any trees save two unsightly pollard chestnuts,—in fact, the range of vigorous chestnut plantation which stands 10 ft. from the garden broad walk, would seem to have been planted in line for the purpose of adorning such an avenue; and at the same time no change need be made in the Magazine fence-wall (extending only about 120 ft.) unless it should hereafter appear advisable to remove so dangerous a repository to a safe distance from an important and densely-populated suburb. In case of accident, its central position in the Park could give little immunity to the range of mansions around its borders (the Hall of Arts in especial), while its removal to Woolwich or Wormwood Scrubs would not much incommode the service of the commissariat; and the planting off and throwing open the space of its foundation and *chevaux de frise* would be a restitution of woodland and a boon to the community.

As the Commissioners are now having the boundary-railings fixed, and the flag-end of the Park unified with the Gardens, and tastefully and effectively adorned, the present is the occasion for a masterly completion of our incomparable Park and Gardens.

A PLEA FOR PLEASURE.

PARIS AND ATHENS.

THERE can be few more interesting or instructive subjects in the history of fine art and architecture than that of the origin and actuating motive which created the art of the great cities in past times. Sometimes it has been said to have been wars, and sometimes it has all been referred to the imaginative faculty. Let us adduce Athens, and ask what it was that made the city of Athens the head-quarters of art, and enabled it to produce, and no one doubts that it did produce, the finest art that the world has ever yet seen, both in sculpture and architecture, and perhaps in painting. The Athenians, we are assured, were a fickle and pleasure-loving people, fond of shows and games and theatrical representations, and were averse to the serious business of life, as that term is now understood. Indeed, the good people of Athens seem to have led a thoughtless and joyous existence, and to have had the faculty of making the very most out of everything; but of all things, they would seem to have revelled in *games and shows*, and out of these pastimes to have really created the serious business of life; for out of these shows and theatrical representations they brought into existence their great and superlative art. Most of the great sculpture of Greece was, there can be but little doubt, inspired by these representations, adding a certain amount of religious feeling; so that old Athens may be said to have created that which the world so envies and tries to imitate out of its mere pleasures and amusements. It was the modern world reversed. It would be difficult to single out a subject more instructive, at the present moment, than this; for the unfortunate city of Paris, now so closely hemmed in, is not a little like old Athens: its chief characteristic is, or was, "pleasure-loving" and "amusement."

Putting aside the fatal love of military glory, which has made France a menace and a nuisance to the rest of the world, what, as in Athens, is the chief aim of Paris? or what is there, or was there, or will there yet be, in it which so rouses the interest and even wrath of the good world elsewhere? What is there to be seen in Paris and not elsewhere? And what is the great principle at work always which has made it a byword for pleasure, as it is called? And how have the people of Paris managed to bring it about? In short, how is it that what is here in London, and there at Berlin, an accident, is in Paris a *principle* and a system? Pleasure systematised! Is it, indeed, an evil or a good this effort to systematise pleasure after the example of artistic Athens? One of the great problems of the future, says the *Times*, is to rebuild and to render beautiful this great City of London, and the sooner it is begun the better; and one of the main objects of the to be universal system of education is to lead the

mass of the people, so we are told, to "healthier pleasures," as well as to make them "better fitted for business" and the serious duties of life; so that if it could be shown that poor beleaguered Paris has already more than commenced the rebuilding of its so-called hideous old streets, and begun even to make of "pleasure" a science, and publicly to recognise it as a something, may we not fairly say that it has taught the world something, and is to be excused for some of its less creditable doings?

But is there not a deeper meaning still to be found in this great and central idea of "amusement?" If we had to define art by the shortest possible word, we might say, *Art is pleasure*, and the avoidance of pain, or nothingness. There is no attempt ever made either in Paris, or London, or anywhere else, to create pleasure or amusement *without* art, fine art, entering into it in some form or other, either good or bad. It may be good art, or very bad art, but still art in some form or other is the ultimate end of it. No one ever starts a place of amusement or pleasure without the attempt, at least, of rendering it as artistic as possible, from the travelling wax-work show to the Italian Opera. Art is the constant and steady aim of those who offer them to the pleasure-loving public. We once heard a very learned and distinguished man in Westminster Abbey declare that the chief sin he saw in modern and renovated Paris was "its new grand opera-house," and which he declared was the largest and costliest building he had ever seen; and he went on to condemn it, not on account of its art and size and cost, but because it was to be devoted to pleasure, to music, dancing, plays, and pastimes, all of them demanding almost unlimited artistic resources,—nay, genius itself, and that of the highest order. What a singular thing it is that artistic talent should have the misfortune to bring on itself such heavy charges, and that one of the greatest of gifts, and one which no mere education can bestow, should be the means of bringing condemnation on the place it was meant to ornament and make pleasant to eyesight and to human sense. But so it is. How much we have to learn of art and its uses, and resources, and ultimate ends. Paris is mentally devoted by not a few to destruction simply from the fact of its giving birth to those who make it their serious business to invent and manage such things as these, mere pleasures, or ways of passing time pleasantly and not painfully, or as though nothing existed.

Again, may we not ask in justice to artistic Paris, for which it is impossible not to feel sympathy, what it is that constitutes the main difference between the business and pleasure of it, and of the business and pleasure of more sedate and artistically quiet places? What is the main difference between Paris and London? Why, perhaps, mainly this, that here business is business, and nothing else, while in Paris business itself would seem to be a pleasure, and we had almost said it,—a fine art. Keeping shop in Paris is a positive pleasure and delight, and the "serious duties" of life are made artistic, and not a little interesting and pleasurable. But not only has France sought to make the common business of life artistic,—it has more than all tried to systematise its amusements, or, in other words, like Athens, to render its amusements artistic and expressive of the wants and feelings of the time. Whether or how it has succeeded, or whether it has not neglected more important matters, are other questions. In Greece the shows and pleasures created the fine art; without the trifling shows, and theatres, and circus games, and "olympiads," the art of Greece, the envy and despair of us moderns, could have had no existence. Old Athens, like new Paris, was a city of amusements, and the great and unrivalled fine art of it, and in it, and which made it what it was, was mainly the growth out of its pleasures and pastimes, and, if the reader will, its showy and earth-born religion. What are our poor and miserable attempts at art to the art of Greece? Simply nothing! Not worth a word; for our art, at its very best, is nothing more than a series of attempts at the *copying* the art of those who have preceded us. We try to copy, and to see through the copy the pleasures and shows of Athens, or other antique cities, given over in their day to pleasures and trifles. At any West-end club you will see into the ways of some city of the past in this way. We would therefore ask those who condemn so entirely the pleasures and amusements of Paris, to consider

whether or not she is wholly wrong in the attempt to follow out the famous examples of the great art-producing cities of the old world. Its future may be nothing short of this,—the beginning and creation of the art of the future, by the preliminary step of the systematising of its present pleasures and shows, growing as they do, there as everywhere, out of its business. There has been as yet no time for the idea to work, and the misery of this bad war will be for the present generation, that it has hindered its progress. Assuredly the very best wish of all must be that in the future France will put from her "military glory," and create for herself at least a fine art of the future through the acting and living art always to be found in her actual and every-day life, and to do that by infusing into that life a high artistic element.

THE BISHOP'S PALACE, WELLS.

THE Bishop's Palace at Wells has lately undergone several works of restoration. The interesting thirteenth-century undercroft, which in former times had been coated all over with whitewash and used as a cellar and lumber-room, has been thoroughly cleansed from its grime, and substantially repaired. The undercroft is in two aisles, each containing five bays, and is groined with bold chamfered ribs in quadripartite compartments, the filling-in being probably of rough ragstone, which is plastered over. This, no doubt, is the original plastering, and it has only been found needful to stop and repair it in the defective parts with cement. This ceiling was evidently originally painted with the "masonry" pattern, and studded with little rosettes. Curiously enough, the only trace of this decoration has actually been preserved by an act of former vandalism, i.e., a brick wall put up transversely across the undercroft. Its builders seem to have carefully removed the ornamentation everywhere else, but possibly did not think it worth while to destroy the pattern here, as the wall would conceal it. This encroachment has, of course, been pulled down during the recent works, and hence the interesting discovery above mentioned. It is proposed at some future time to carry out the original design of ornamenting the vaulting with the addition of other new simple mural decoration. As this undercroft is to be used as the regular dining-hall for the Bishop and his family something of this kind seems desirable to relieve the cold appearance of the plain rough stonework and ashlar. The latter, which had previously been quite invisible, is now exposed to view, and the walls are re-plastered with rough stonework. It has been found necessary in many parts to replace the defective masonry, which had been much knocked about. This was more particularly the case with the blue lias caps and bases in the central arcade of the undercroft, which have been pieced and slightly polished. On the east side of this apartment are five narrow lancet windows; these have been filled with ornamental lead quarry glazing, and the heads of the lights decorated with coloured coats of arms, &c. A new two-light window has been inserted into the open archway (on the south side), which led into a conservatory put up some thirty years since. This has been filled with painted glass, in which, however, there is a considerable admixture of white glass; so as not to diminish sensibly the amount of light. All the glazing has been executed by Mr. Charles Hudson, of London.

The rough irregular concrete floor has been covered with a thin coat of Portland cement. As only portions of the undercroft will be carpeted, it is proposed at a future time to insert ornamental bands of tiles, or some other material, dividing the different bays. On the west side a large and deep hooded chimney-piece has been added, constructed of Doulton and blue lias stone. There are also two new wainscot doors, with ornamental moulded panels. Beyond the north end of the undercroft are two vaulted chambers, one of which was used for a beer-cellar, the other for wine. The former has been repaired, cleaned, and converted into a vestibule, or serving-room; and the wall, which formerly cut up into its vaulting, has been removed. Messrs. Haden & Son, of Trowbridge have been employed for a combined hot-air and hot-water apparatus. In conclusion, it may be stated that notwithstanding the small size of the windows, the undercroft is by no means gloomy,

but, on the contrary, is a cheerful apartment, which may be accounted for by the general light tint of the room, and the broad splay to the windows. All these works have been carried out under the superintendence of Mr. Forrey, F.S.A., by Mr. G. F. White, of Vauxhall-bridge-road (the contractor for the restorations of the west front of the cathedral). It is due to the present bishop, Lord Arthur Hervey, to state that the idea of converting this undercroft into a dining-hall was that of his lordship; and thus one of the most interesting features of the palace has been preserved from further injury, and brought into prominent use.

ARCHITECTURE A LIVING ART.*

THERE is an opinion pretty widespread, though I trust not universal, that the career of architecture as an original and real art is over; that architecture is a thing of the past, without existence in the present or hope of a future one; and that all we can now do is to reproduce faithfully the works of the past—that is to say, become copyists and plagiarists, which some schools of architects are content to do, and reduce themselves to archaeologists. This I consider an entirely erroneous view of the subject. If anything has become defunct it is the architectural genius, or rather the common sense of the present race of architects, and not architecture, which can never be defunct, no more than poetry or any other form of art, while nature and the heart of man endure; and nothing can necessitate plagiarism or copying but ignorance or stupidity. Therefore, if you see an architect, when employed to design a church, copying one already existing instead, some old one generally, do not conclude that the art is effete, worn out, or obsolete, but that the architect's want of knowledge, imagination, or invention alone is to blame.

My belief is that the art would go on for ever as it has gone, if we treated it as in other times it was treated; in other words, that the same architectural languages or styles would lend themselves to all new purposes, to the production of truly original works; and that, in order to be original, we do not need to begin again from nothing, as some writers suggest—a proceeding for which there is no precedent in the entire history of architecture.

It is true the career of our art has not been one of uniform progress, and that she reached in early Greece an exquisite beauty and perfection of form which she has reached nowhere else, and that in these attributes we can never go beyond the Greeks; for this especial reason can be assigned in the nature of their social and political institutions. In Greece the general art culture of the people rendered every man a patron or judge of their architecture, which, under such fostering care, reached what must be deemed perfection in that particular direction it took.

But it is evident that this was but one phase of the art, for she has shone out in different periods of history and different parts of the world with brilliancy and beauty in totally different forms; in Rome among the Saracens and Moors in Spain, Egypt, Persia, Syria; in the Middle Ages in Europe; and in Italy at the Revival, in innumerable works with that genuine stamp upon them which is a joy for ever. Nay, it had shone out before in Egypt and Assyria, and India, and exhibited in the porticoes and halls of columns of the temples, and palace temples, and the winged bulls and sphinxes and elephants, some of the noblest qualities which architecture has ever exhibited, yet totally different in kind and character from the Greek.

Cast your eye over the chart of architectural history, and how varied are the streams it encounters! What a variety of aspects and characters the art has already assumed in different countries, and at different times in the same country. The German Romanesque, for example, now distinct from the Norman and Lombard; the Italian, Gothic, and the Spanish, from each other, and both from the Gothics of Germany, France, and England. How different all from the Byzantine styles of Constantinople and Asia. How varied the styles of the Saracens, though inspired by the self-same religion, in different countries—Spain, Persia, Egypt, Syria, India. The architecture of the south of France,

how diverse from that of the north. What a host of beautiful sub-styles in Spain, Sicily, and south of Italy!—all different and all beautiful. While the varieties of the renaissance and revived classic in Italy—the Roman, Florentine, Venetian—all different from each other and from the renaissance of France, Germany, and England, and, like the rest, bearing the impress of the ruling thought of their creators—cannot fail to charm the most unobservant.

Of this great and varied system of architecture the Greeks, it is evident, only produced the first formed beautiful alphabet or language,—a limited one,—which was speedily augmented by the Romans, by their application of the arch and dome, introduction of super-colonnation, and development of the Corinthian column, to which they gave immense variety of character, and formed the whole into a vast storehouse, vast and varied as the Roman empire itself, and which has furnished the leading elements of all the styles of the world. From it the Romanesque of Italy, France, and Spain, the Lombard, Frankish, Burgundian, Norman, the styles of the south of France, and the various pointed Gothics of Europe, were derived, by a succession of changes and modifications, and admixture of Northern elements, just as the Romance languages, the Provençal or Langue d'Oc, the Langue d'Oïl, with the present French, Spanish, and Italian languages, from the Latin, mixed in various degrees with the Teutonic dialects.

The Greek, it is true, possessed qualities, beautiful subtlety of curve, and refinements which did not enter into any subsequent style; but this was because it was not understood as it has since become understood by us. All the refinements of Greek architecture could have been embodied in the great Roman works, and in the domed compositions of Western Europe. Had they been, these buildings would, in being nobler compositions than the Greek temples, have been an immense advance upon those structures. How superior would have been St. Paul's Cathedral to the Parthenon,—superior in composition and variety,—if Wren had known Greek architecture, and given it all the refinements of that building! The advance may yet be made. It is a very possible one, and here, therefore, is a wide and glorious field open to the architect,—a way of advance and progress.

What does all this show more clearly than the truth that, like the Hebe mother, Nature, who is always equal to herself, and from whom all art flows, architecture is ever young, and possessed of an unlimited field for originality and variety? I believe she still has the power to gather into herself all that is beautiful and sublime in nature, and reproduce it, elevated and idealised, for our gratification. Beauty is her object,—to present it in new forms to us as her work, and of this task she is as capable at this hour as in the palmiest days of old.

I believe no phase of art can become effete; for the objects of art, beauty, truth, and virtue, are immortal, and spring for ever in nature and the human breast; they cannot fail, for they are luminous shadows cast to us from the Eternal and Unfailing, the Infinite and the Fair.

WHITE LEAD AND ZINC WHITE.

IN the course of the Cantor Lectures, at the Society of Arts, "On Artists' Colours and Pigments," the lecturer, Mr. Barff, made some observations on white-lead which may usefully find a place in our pages:—

White-lead has been made for years past according to what is called the Dutch method. Lead is cast into plates, and these plates, in some factories, are rolled into coils. These coils, then, are immersed in earthen pots; the pots are placed in a row, and a small quantity of vinegar is put into each pot. On the top of one row of pots a board is placed, and then other pots above, and so a stack is made. Between the interstices of the pots is put spent tan, or some other substance which by oxidation will evolve heat and also carbonic acid gas. Now, the heat which is evolved in oxidation of the spent tan is useful in volatilising the acid from the vinegar, and in the presence of this acetate the oxygen of the air oxidises the lead. The oxide of lead is dissolved by the acid, and the normal acetate of lead is formed. More oxide is produced, and this is dissolved by the normal acetate, and then you have basic acetate. When substances containing carbon are oxidised carbonic acid is the reproduct of the oxidation, when the oxygen is

* From a paper by Mr. S. Huggins, read at a meeting of the Liverpool Architectural Society.

in excess, as in this particular case. Carbonic acid is then formed by the oxidation of the spent tan. We formed it here by acting on the carbonate by an acid which was sufficiently strong to turn the carbonic acid out. The carbonic acid then unites with the oxide of lead which was dissolved in the normal acetate, and a thin film of lead carbonate is formed. These thin films go on forming in succession, until at last nearly the whole of the lead is converted into carbonate, which retains the shape of the original lead. In some cases gratings of lead are used. When the lead is in this state it is ground in water and reduced to a fine powder, and is then made up into the sort of pigments required, either with water or with oil. This, or rather was, an operation attended with considerable danger to the workmen, who were subjected to what is termed lead-poisoning, to which, unfortunately, many painters, from want of cleanly habits, are subject now. There have been introduced, however, improvements in the grinding of white lead, which have to a considerable extent freed the workmen from the liability to this kind of poisoning.

I have now briefly described the method in which white-lead is prepared. Other pigments containing lead have been used in lieu of white lead, but none of them are found to possess the same body. There is a process known as Pattinson's process, of making oxy-chloride of lead; but it is not necessary to take up time in describing the process, because I dare say no person uses any pigment made of this substance, for it has not the body which white-lead has. Probably the fact that white-lead possesses the body it has is the reason why it has been so largely used, and why so many of our paintings which have been painted with it have come to a most untimely end. I know of no pigment so liable to change of colour as white-lead. In saying this, I know that there are many who will not agree with me. They know that white-lead works well and easily, and they like it because it covers down well; but when I have pointed out to you some of the great defects under which it labours, I hope I shall convert at least some of you to my opinion. If you take some oil, and if to that you add lime-water, you know that the oil will mix with the lime-water, and form a kind of emulsion. Again, if you boil oil or fat with soda, you know that a kind of soap is formed, and the process of manufacturing soap is termed the process of saponification. Now if, instead of boiling fat with soda or alkali we boil it with plumbic oxide or oxide of lead, we shall form a soap, and that soap goes by the name amongst medical men, of *emplastrum plumbi*, or lead plaster. Here is a roll of this. This is a substance made by the saponification of oil with the oxide of lead. Because this oxide and carbonate of lead have the power of saponifying oils, you get in white lead that peculiarly smooth, easy working which you do not get with any other white pigment; and it is on this account, for one reason, that it is liked by artists and painters. Here I have a piece of paper, coated with some of this lead-plaster; and if we throw a light upon it, you will see that the substance is semi-transparent. Mr. Newton was kind enough to give me a few valuable hints for my lecture; and amongst other things, he spoke to me of this peculiarity of lead, that it will saponify and form this sort of transparent substance. He told me an anecdote of the famous landscape-painter, Mr. Wilson, who made an addition to a room in his house. The old part of the room had been painted a dark colour; the new part, of course, when it left the workmen's hands, was perfectly white, and therefore the painters painted down the dark colour with white-lead, until the whole room displayed one uniform tint. After a while, however, it was found that the part which was originally painted dark became dark again; the dark paint, in fact, showed through the white-lead. Sometimes, possibly, when an artist wishes to put in figures upon a dark background that he has painted, he uses white-lead, and the figures will stand out well and brilliantly at first, but after a time the dark colour upon which they are painted strikes through the lead, and the figures of course recede. Now, this striking through is owing to a slight process of saponification, no doubt owing to an interchange between the carbonic acid of the lead-carbonate and the stearic and oleic acids of the oil with which the lead is mixed; so that, in time, the white-lead, which has a body which makes it so great a favourite with artists, loses that body, and becomes a transparent or semi-transparent sub-

stance, something like this lead plaster. Here is a reason why white-lead should not be used unless the ground has previously been brought to a light colour; and I have been informed by Mr. Newton, also, that it was the custom of Mr. Stanfield, the celebrated marine painter, whenever he had to paint a rope in over other painting, he always cut away his painting from behind it, being well aware that otherwise the colour of that painting would strike through the white-lead.

There is another objection to the use of white-lead, and really a very valid one it is. It often strikes me with wonder how persons can go on year after year laying out sums of money for having their houses painted with white-lead when other pigments which will keep their colour might well be employed. A house painted with white-lead after some time darkens in tint considerably; the colour is changed by some influence that is acting upon it through the air, and that influence is sulphuretted hydrogen gas. If you paint doors placed near a drain from which this gas escapes with white-lead, those doors will become browned and blackened, as we all know.

Whilst this experiment is going on, I will show you how to test the purity of white-lead; for, if we do use this pigment, we should certainly like to employ it in as pure a state as possible. Now, white-lead is very often, particularly that which you procure at ordinary shops, adulterated with a substance called sulphate of baryta, or commonly, barytes. This is much more transparent when ground with oil than white-lead itself, and you will perceive that it will materially impair that property for which white-lead is valued, viz., that of covering down well and solidly. White-lead adulterated with baryta has, generally speaking, a bluish sort of look; it is semi-transparent. It has not that opacity that pure white-lead has. I will take a small piece of this white-lead and put it into a test-tube, and add to it a little of the substance commonly known by the name of nitric acid, or aquafortis, and some water. If the lead is pure, the whole of it will dissolve in this liquid, and we shall have a clear solution. If it does not dissolve, there is a white precipitate, which you will see after the lecture: it will fall down to the bottom of the tube, and that precipitate is sulphate of baryta. Sulphate of baryta is insoluble in aquafortis, but carbonate of lead, and most lead salts, are soluble in it. There is another very excellent test for the purity of white-lead, which is this. If you take a small portion, and grind it up with a little carbonate of soda into a small pellet about the size of a pea, and then put it upon a piece of charcoal, and hold it in the middle flame of a blow-pipe for some short time, the sulphate of baryta becomes decomposed, and you get sulphide of sodium formed. If this sulphide of sodium be acted upon by an acid liquid, sulphuretted hydrogen is given off, which could not be formed from carbonate of lead, for in it there is no sulphur at all; and inasmuch as sulphate of baryta is the impurity for which we have to look, the presence of sulphide after this treatment indicates that it was with the white-lead which was examined.

As I have given you reasons, extremely cogent why white-lead should not be used as a pigment, you will no doubt ask me, what is to take its place? I cannot tell you, not if the requirements of all artists are to be met. I cannot suggest a subject that will paint as easily as white-lead. I am, however, going to select one which has advantages so infinitely superior to white-lead, in giving permanency to your pictures, that I am sure the little mechanical difference that will arise in its employment will not be considered, when you know that it is a substance which is absolutely indestructible as to its tint, if submitted to those influences which destroy the purity of the colour of white-lead. The substance I allude to is zinc-white. Here is a solution of zinc sulphate. I will put a small quantity of it into this beaker-glass, and will then add to it a solution of caustic soda. You see we shall get a white precipitate. I add the caustic soda cautiously and slowly, because the white precipitate formed is soluble in an excess of caustic soda; as you see, by adding more of the soda, it is gradually disappearing. The substance precipitated is called zinc hydrate,—that is to say, zinc oxide united with the elements, which forms what is termed by chemists a molecule of water. The presence of the water in this compound destroys its body entirely, so that in this form it cannot be used as a pigment. If the substance precipitated—the zinc hydrate—be submitted to the action of

heat, this water of hydration can be driven off, and we shall get a white powder. There is some in this bottle, which is zinc oxide, containing zinc and oxygen only, made in this way. The zinc white has more body, of course, than it has in the hydrated form, but it has not sufficient body for a pigment. This specimen of zinc white is made by Messrs. Winsor & Newton, on a large scale, by another process. Zinc is kept at a high temperature, and a current of air is gradually admitted to it. The zinc burns in the oxygen of air, and the product is zinc white, much more dense than that which can be produced by any method of precipitation.

Now, the question is, is zinc-white liable to the same destructive influence as white-lead? I will show you an experiment to prove that it is not. This is a solution of zinc sulphate, to which I added some caustic soda. I will now put water to it and pass in sulphuretted hydrogen gas, when you will see that the precipitate formed will be white, and not black. We will put some zinc-white into the bell jar, for the very obvious reason that sulphuretted hydrogen gas has a most unpleasant smell. Here is a specimen of zinc-white. If we were to submit this to the same test to which we submitted the white-lead just now, we should find no change take place whatever in its colour, for sulphuretted hydrogen has no effect upon zinc as to its colour, because zinc sulphide is white.

MRS. BOWES'S MANSION AND GALLERIES AT BARNARD CASTLE, DURHAM.

We illustrate in our present Number a remarkable building. The foundation stone of it was laid on the 27th of November, 1869, by Joséphine Bénétte, Countess of Montabo, wife of Mr. John Bowes, of Streatham Castle, since which time the work has been progressing rapidly. It is designed as much for a museum and picture galleries as for a mansion, as it is the intention of Mrs. Bowes to place there a large and valuable collection of ancient and modern paintings, and objects of art and curiosity, which she has been collecting with care for many years.

The plan of the arrangement, with the exception of that portion for the sculptor, museum, and picture galleries, is not yet definitely fixed, further than the main walls, as it is not yet decided which portion may be set apart for the above-named objects of arts and curiosities.

The basement story is intended for the servants' apartments, kitchens, &c.; these are entered from each end of the building, behind which are the cellars, built entirely of dressed stone.

On the ground-floor, in the centre pavilion, is the entrance-hall, 48 ft. 6 in. by 40 ft., and 30 ft. in height, and adjoining is the principal staircase, 37 ft. by 32 ft. Within, these are being built of polished ashlar work, having pillars and pilasters, with marble panels, carved caps, mouldings, and spandrels. The stairs and galleries will be of polished stone, about 10 ft. in width. On each side of the entrance-hall are suites of large rooms; and behind are the museum, and painting and sculpture galleries, 200 ft. in length, by 45 ft. in width.

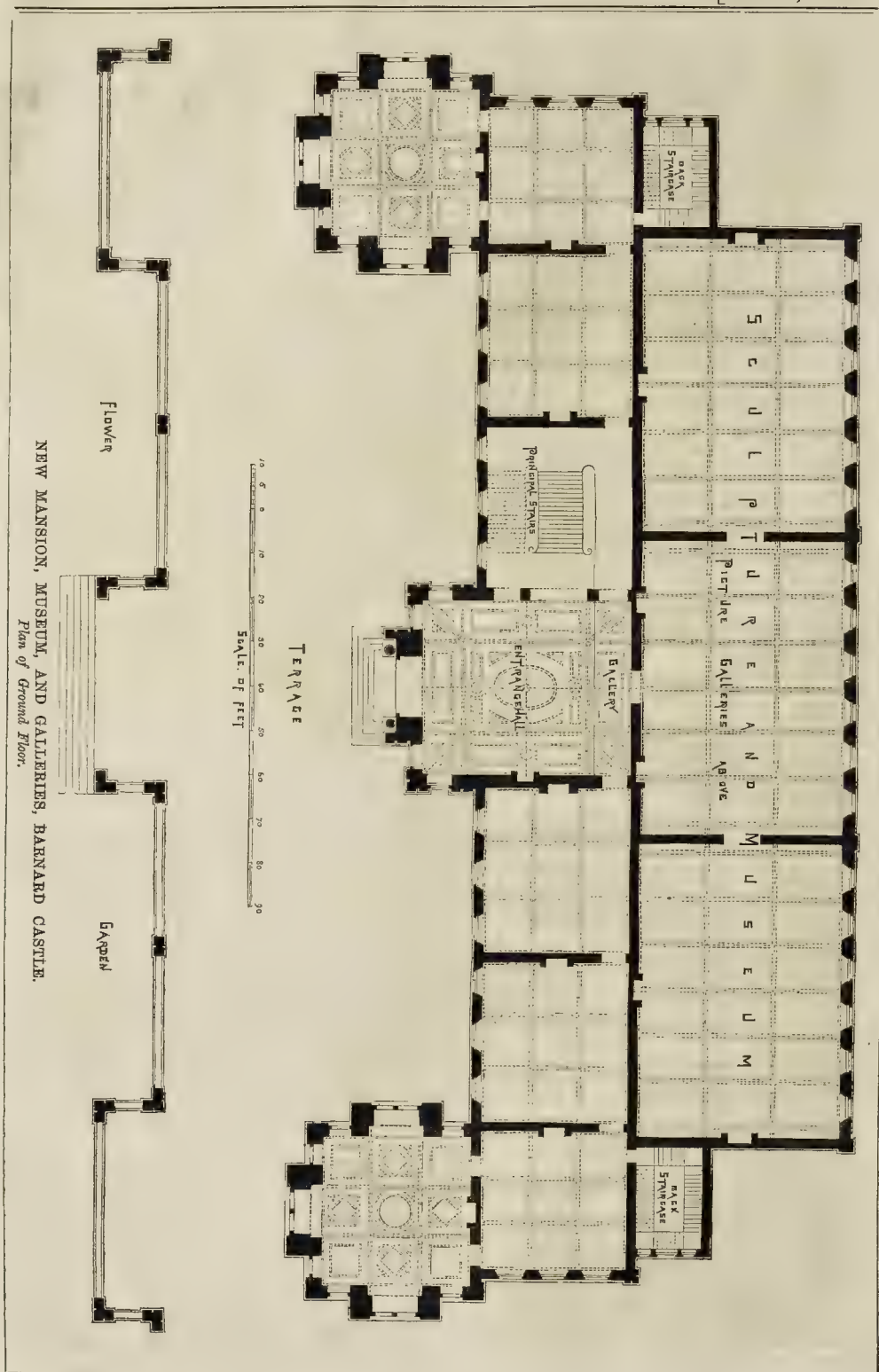
The first-floor is arranged the same as the ground-floor, with the exception of the addition of a grand reception-room above the entrance-hall, from which a fine view of the beautiful surrounding country is obtained. The picture gallery is on this floor, and is 200 ft. in length, by 45 ft. in width; it is lighted from the roof, and made entirely fire-proof.

The second floor contains the bed and dressing rooms, and the attics in the roof include the servants' bedrooms.

The exterior of the building is of polished masonry, of a superior quality of stone from Dun House Quarries, on Mr. Bowes's estate. The ornamental terrace in front is approached by a wide carriage-drive; the steps in the centre lead to the flower-gardens.

The entrance gateway will be placed on the main road leading to Greta Bridge, and will be ornamental. The grounds are intended to be laid out with walks, terraces, lakes, gardens, and an orangery and other buildings necessary for the purposes will be erected.

The mansion is being built from the designs and under the superintendence of Mr. J. E. Watson, architect, of Newcastle-on-Tyne, by Mr. Joseph Kyle, contractor, also of Newcastle, who is intrusted with the execution of the whole of the works.



MRS. BOWES'S MANSION AND MUSEUM, BARNARD CASTLE, DURHAM.—MR. J. E. WATSON, ARCHITECT.



SOME THINGS I DON'T WANT IN THE BUILDING TRADES.

I don't want my house put in repair, or rather out of repair, by a master who employs "Jacks of all Trades."

I don't want bricklayers' labourers, or hodmen, to turn builders; because they usually know about as much of an architect's plans and specifications as a cow does of an eclipse.

I don't want fresh-water sand to be supplied to me from the neighbourhood of Ramsgate or Margate or other equally pleasant sea-side place.

I don't want my foreman to tell me too much at one time about the faults of the workmen under him, as I may forget asking him about himself.

I don't want a builder or carpenter to give cost of paint to any joinery work he may be doing for me until I have examined first the material and workmanship.

I don't want any jobbing carpenter or joiner whom I may employ to bring a lump of putty in his tool-basket. I prefer leaving the use of putty to the painters.

I don't want jobbing plumbers to spend three days upon the roof soldering up a crack in the gutter, and when done, leaving fresher cracks behind them. The practice is something akin to "cut and come again."

I don't want scaffolding to be lashed together with rotten ropes, and the whole stage to have an unmistakable incline to the street instead of a "lean-to" inwards.

I don't want boys put to learn any of the building trades until they have received a tolerable elementary and technical education.

I don't want builders in general to be putting in estimates with hundreds and even thousands of pounds difference in the one job. The public can only think, like me, that they are dishonestly inclined or that they do not know their business. This charitable view of the matter covers a multitude of sins.

I don't want a contractor to undertake a job at a price that he knows will not pay, and then throw the fault of his bankruptcy on "that blackguard building."

I don't want 1½ in. sashes of white deal to be put into a building, instead of 2½ in. of red deal, as contracted for.

I don't want any more hodmen to be carrying up the weight of themselves in their hod as well as their bricks; I would much prefer seeing the poor human machines tempering the mortar or wheeling the barrow, while the donkey engine, the hydraulic lift, or the old grey horse, worked the pulley.

I don't want builders' carts to be screeching in the city like a locomotive whistle. A little grease might ease the wheel and the labour of the horse at the same time, and give me and others the opportunity of hearing what is spoken as well as seeing what is done.

I don't want house-doors to be made badly, hung badly, or composed of green and unseasoned timber.

I don't want locks, keys, door, window, and window-blind furniture and fastenings, that are manufactured in Birmingham to "sell," to be used in any of my houses. I was "sold" once. A burnt child dreads the fire.

I don't want any of my workmen to "kick" a gentleman or lady, or even the architect, should he happen to come into a new building to see how it progresses. "Kicks" of any kind, whether in the shin, or for beer, are simply unbearable. All spirited workmen ought to be above the mean practice of a kick, or they deserve one.

I don't want common plasterers to imagine that they are modellers or workers of Scagliola.

I don't want stone-masons or stone-cutters, or mural masons to off the role of sculptors, or to think that the hideous effigies they cut on corbels and friezes have any relation to art.

I don't want houses built first and designed afterwards, or rather wedged into shape, and braided into form.

I don't want surveyors in general to dub themselves civil engineers, or civil engineers to think that they know as much about architecture as legitimate professionals whom they bark at but are unable to bite.

I don't want to be compelled to pay any workman a fair day's wages for a half-day's work.

I don't want an employer to act towards his workmen as if he thought their sinews and thews were of iron, instead of flesh and blood.

I don't want any kind of old rubbish of brick

and stone to be bundled into walls and partitions, and then plastered over "hurry skurry." Trade infamy, like murder, "will out" sooner or later.

I don't want men to wear flesh and bone, and waste sweat and blood, in forms of labour to which machinery can be applied, and by which valuable human life and labour can be better and more profitably utilised.

I don't want to say much more at present about trade in general or trade in particular, for fear I may be accused of "spoiling trade," and "rattened" accordingly, both by master and man.

Lastly, I don't want to know whether I have offended any of the readers of the *Builder*. If the cap fits any of them, let them wear it, without my apology, as I object to the rude practice of first putting on a man's head, and then giving him a plaster.

ONE WHO KNOWS.

VENTILATION OF HOSPITALS FOR THE SICK BY OPEN FIREPLACES.

SIR,—A correspondent of the *Edinburgh Daily Review* suggests that "a supply of fresh air should be led on to each patient's bed by means of a ½-in. pipe; and also that the foul air charged with the dreaded germs of disease should be extracted from the wards by pipes led into one, by which the impure air would be passed through the fire in connexion with the steam-engine, and thence be expelled by the chimney-stalk."

The admission of pure air as above suggested recalls to mind the Spanish proverb, which says,—

"If the wind reach you through a hole,
Go, say your prayers and mend your soul."

And as to the mode of extracting foul air, experience has shown that the vitiated air from the different wards will, by a difference of temperature in any wall, as readily rush in to pollute it as that the foul air will pass along the extracting shaft or flue common to all the wards. Why not try to expel the smoke of different room fires by leading the vents into one common chimney? The smoke will not go as we wish, neither will the air. Suppose we have an apartment with only one opening for inlet and outlet, then let us humble our boasted skill and science to the instinct of the humble bee, and say in admiration, "How doth the little busy bee ventilate a colony of 30,000 in one hive?" It is not long ago since we heard of an ill-ventilated free church with several openings for admission and exit, but no fresh air: so the result was that 600 drowsy perishing sinners fell asleep, as related by Dr. Guthrie.

There has as yet been no satisfactory solution of the ventilation problem to suit the artificial habits of the period. In our ordinary dwelling-houses no steps whatever are taken to regulate either the supply of pure air or the exit of vitiated air, but it is probable that our large fireplaces regulate this matter tolerably well. In crowded rooms, however, and hospital wards, where the amount of vitiated air bears a much larger ratio to the cubical contents, the fireplaces might be constructed after the wise sanitary principles of our forefathers, as may be seen in the old baronial halls, where in olden time the wide, lofty fireplaces, lined with bright Dutch tiles, radiated the genial heat around, while the capacious chimney-flue carried away the vitiated air, the supply of external air being admitted from roof and casement. The height of the fireplace gave always a pure stratum of air to breathe, whereas now our modern grates are made so low that even when we sit or lie in bed the lintel of the grate is lower than our heads! By introducing again Mediæval fireplaces, our retrogressive notions may be utilised and improved upon for hospital wards, as surely the science and skill of the period may construct a fireplace to warm and ventilate a ward, say 40 ft. by 20 ft., and 15 ft. high.

The fireplace for such an apartment should have the real character as well as semblance of the old style: say that it be made 6 ft. wide in opening of jambs, and the lintel set 5 ft. high; there should be two or three vents of 1 ft. diameter each, or more if practicable, for smoke and ventilation; the inlets of fresh air to be at ceiling or top sashes of windows. The grate for such a fireplace may be made about 3 ft. high, and its fire-oracle in the form of *W* made 4 ft. wide, the grate to stand clear from the back and sides of the fireplace, which should be lined round with bright tiles to radiate the heat and cheerful glow of the fire.

The object of the grate having two divisions as in *W*, is a device for consuming the smoke which will be so far accomplished by either side being supplied with coal alternately,—the bright side burning the smoke of the other. The heat from such a fireplace may be more thoroughly radiated through the room by means of a large tin screen kept bright to reflect or shade the heat as required. This idea of a bright metallic side for fire-screens will draw out the heat of our open fires.

In a room heated by warm air all the air must be hotter than is required for breathing: the solid objects in the room, being colder, are constantly absorbing the vital heat from the bodies of the occupants, while they are breathing the warm debilitating air. It is this condition of things that gives that uncomfortable feeling so universally complained of in all rooms warmed by hot air.

On the other hand, it is the powerful direct radiation that comes from the glowing flames of an open fire that makes it so nearly correspond with the radiation from the sun, and enables it to produce an artificial warmth unequalled for comfort and healthfulness.

Seeing that we must accept an inferior arrangement to maintain a uniform temperature over a large room or ward, I can scarcely see how we can avoid coming directly to the conclusion that we should warm the floor and exterior walls to a temperature equal to that of our bodies, and so prevent the absorption of radiant heat from our bodies by the cold plaster walls. We could thus afford to have cold air for breathing.

The hypocaust of the Romans, which is also well known to the Chinese, for warming floors, and their mode of heating walls, may give some idea how the cold stratum of air that is always found rushing in at every chink could be warmed in the space behind laths and plaster, and under the floor. If this plaster were hung upon iron laths and standards, we should have fire-proof walls, the open space forming a caldron for heat from the open fire-place to distant parts of the room; and also all extracting flues should be formed in such spaces for carrying away the vitiated air and fumes of burned gas, &c. The admissions and diffusions of fresh may be over hot-water pipes, as required at windows.

JAMES KERR.

OPENING OF AN OIL-CAKE MILL AT BOSTON.

THE opening of new premises of such large proportions as the mill and warehouses just completed for Mr. John C. Simonds, cake manufacturer, of Boston, is an event which is of rare occurrence in this part of the country.

The building has been erected under the superintendence of Mr. W. H. Wheeler, C.E., of Boston. The contractor was Mr. Haddleton, of Lincoln. Mr. Owen Broughton, of Boston officiated as clerk of the works. The mill is situated in Skirbeck Quarter, a few yards from the Black Sluice. It is thus well placed for transporting products either by railway, sea, or canal.

The building is 200 ft. long, 47 ft. wide, and 60 ft. high, and contains a press-room for four treble sets of oil-presses, cake stores, oil-room, engine and boiler house, and granary-room for 14,000 quarters of seed. The foundations of all the main walls were excavated to the depth of 15 ft., and 6 ft. wide below that level. Memel timber piles were driven by a steam pile-driver to a further depth of 15 ft. On the top of the piles was fixed a Memel timber sill, 12 in. square, and covered with two thicknesses of 9 in. by 3 in. deals, on the top of which was put about 1,400 cubic yards of blue lias lime concrete. The quantity of timber used in the foundations was upwards of 8,000 ft. The total weight of bricks, lime, concrete, and sand used in the erection of the building exceed 3,000 tons, upwards of 10,000 ft. of timber in joists and roof, 80 tons of slabs, 380 squares of floor and roof boarding, 4,000 cubic feet of stone, 600 yards of concrete for engine bed, beds of presses, pumps, &c., 40 tons of Yorkshire tooled flags, and about 50 tons of wrought and cast iron (exclusive of columns for carrying the floor). The chimney is 110 ft. high. Inclusive of two residences for the foreman and engineer, about a million bricks have been used in the construction of the buildings. The floors of the mill are supported on balks of timber resting on iron columns. The cost of the building and its fittings will be a large amount.

HOW DO YOU PROVE YOUR PLUMB-RULE?

A TECHNICAL LESSON.

THE following particulars are authentic, and I remember all the parties. I shall condense from memory. The matter in dispute was a brick wall which fell shortly after its erection, the downfall of which, I believe, was accelerated by a downpour of rain. When the builder put in his bill for payment, his client refused to acknowledge any claim. The wall was certainly built, and the wall was certainly down. The client contended that it was badly constructed, and that it was put up in an unworkmanlike manner; the builder, on the other side, was ready to swear and prove that it was erected by competent workmen, and that it was executed in a creditable and workmanlike manner.

The case had to be settled in the law-courts, the builder being the plaintiff. The defendant secured the services of a clever, well-known counsel, who was known to have a knowledge of architecture. When the builder had given his evidence, he was submitted to a severe cross examination, in which his practical knowledge cut a very sorry figure. The particular point of the question turned upon the plumbing of the wall, whether it was truly perpendicular, and whether the plumb-rule was correct. The builder said he was ready to take his oath that the wall was plumb, and that the plumb-rule was quite correct.

"Listen for a moment, gentlemen of the jury," cried the defendant's counsel, "while I put this master-builder to the test. You will be able to judge of his practical acquaintance with his profession from the answer he gives. Well, Mr. Builder, you are ready to swear upon your oath that the wall was plumb, and the plumb-rule correct?" "Yes," "You are?" "Yes."

"Will you be so good, Mr. Builder, as to turn round and tell those twelve intelligent jurymen in that box how you know that your plumb-rule was correct?" The builder hesitated for a moment, and then replied, "I know it was correct, for my workmen are always careful and particular with their work." "I am not disputing the character you give your workmen," replied the counsel; "I merely ask you to tell the jury how you know that the plumb-rule they worked with was correct." "I know it was correct," repeated the builder, "because it was made the same as all plumb-rules are made, and used by men in the habit of using them."

"I must again ask you, Mr. Builder, to be so kind as to tell the jury or me how you are certain that the plumb-rule was true; or, in other words, let us know how you prove your plumb-rule?" This was a poser.

"Now, Mr. Builder," continued the defendant's counsel, "you have come into court to make a claim against my client: you swear that the wall was built properly plumb, and that it did not tumble down from bad workmanship. I now ask you, as a respectable builder, to just explain to the jury the method of practically constructing and proving a plumb-rule. You are no doubt aware that if a plumb-rule is not correct, the work that it is applied to will not be correct. I am ready to prove that it was not correct, that the wall overhung. Geometrically speaking, it was out of perpendicular: consequently, the work was badly executed, and I deny that you have any claim for payment."

A silence for some minutes reigned, and then the plaintiff made one or two ineffectual attempts at explanation, but got so confused that he completely broke down.

"It is needless, you see, your lordship, and gentlemen of the jury, for me to carry this case much further. I will simply conclude by saying, here is an instance of the deplorable consequences attending rash assertions and wrongful claims. Men are found to come forward to make a claim for what they have no right, or have forfeited, and are ready to fortify their unfair demands by swearing that they know practically what they do not know. Well, gentlemen of the jury, as the master-builder, when in the box, was unable to prove his plumb-rule, perhaps he will not take it amiss from a lawyer to tell him how to practically construct and prove at the same time a plumb-rule, which may be depended upon, for plumbing a straight wall, or any other description of perpendicular work."

Take a piece of board a little more than the proper length, breadth, and thickness which you require. With a pair of compasses strike a

circle on its face within a few inches of either end. Plane straight on the edge until the sides of the circles are touched,—repeat on opposite edge. When this is done your piece of board will be of a parallel breadth. Then a line drawn through the centre, with a slit for the cord and an opening for the play of the "bob," will complete your plumb-rule. I am not an architect, gentlemen of the jury, but I believe any practical architect, builder, or workman will say I have not given a practical method for proving a plumb-rule. One word more, gentlemen; I think when a master-builder comes into court and takes it upon himself to swear that his work was properly executed, he ought to be able to give us proof when asked of the workmanlike manner of its accomplishment. I now ask a verdict for my client."

The jury unanimously declared in favour of the defendant, the foreman saying that he himself and his fellow jurors were of opinion that the wall was badly constructed and out of plumb, and that that was the reason of its fall.

It may be asked here, was the counsel for the defendant technically correct in his method of proving a plumb-rule of any length? And it may be further asked, how many master builders, and workmen too, are there at the present hour, who, if called upon suddenly, could practically demonstrate, in proper language, the geometrical construction of a simple plumb-rule or straight-edge. However astounding it may seem, I have come across many workmen who could not, without some thinking and groping, properly set out the egg oval opening, or "bob" hole, in their plumb-rule. Archimedes is reported to have said that if a prop, or position, and a lever, were given to him, he would move the world. Technical knowledge is the prop, the position, and the lever; and, without the ambition of the great Greek mathematician, it will enable a man, at some time or other, to lift himself in the world, and morally and socially speaking, lift up the world at the same time.

ORCHARD HOUSES.

The best form of a villa orchard-house is that of a span roof, having the ends placed due north and south, so that an equal amount of light may be received on the one side as on the other. A span-roofed house receives more light than a lean-to, or any other form, and they are consequently the best adapted for fruits, which can never receive too much of that. As regards dimensions, that is greatly optional. Narrow houses are liable to heat rapidly, and to cool down as suddenly, whilst large houses, having a greater body of air, keep to a greater uniformity, and in this way large houses would seem to be the most preferable. Where no artificial means of heating are at command, whilst plants in small narrow houses are often injured by frosts, those in the wider and larger escape. Large wide houses, however, have this disadvantage, that the air is more stagnant. A fairly proportionate house, and suitable, is one about 15 ft. or 20 ft. wide, having for the lesser sized one a single pathway down the centre, and, for the larger, a 6-ft. bed in the centre, then a 3-ft. path all round, and a border 4 ft. wide on each side. The height of the house need not exceed 10 ft. or 12 ft. in the ridge, with the sides about 5 ft. high. The cheapest style of structure is that adopted by Mr. Rivers, the inventor, being simply some stout oak poles fixed into the ground, 5 ft. high, for the top plate to rest on. These are placed about 10 ft. apart, and the space between boarded up, the top half being hung as a ventilator, sometimes a transparent and sometimes a dark shutter. The roof is formed of strong sash-bars, 1½ in. by 4½ in. deep, placed about 15 in. or 18 in. apart, in which the glass is fixed,—no rafters or sashes being used. Ventilation is provided by an opening just under the top of the ridge at either end, and at the sides; and the *Farmer*, which so describes it, says it is wonderful to see the results. Houses such as these can be erected very cheaply, for at least 20s. per ft.—that is, a house 60 ft. long would cost 60l. One, however, something a trifle better than this is recommended. First, let the house have a good brick or stone foundation, say 18 in. out of the ground, on which fix the batten or wall plate; then sashes, 3½ ft. by 5 ft., hung on central pivots for ventilation, the top plate being thus 5 ft. from the ground. At every 10 ft., strong rafters, 2 in. by 6 in., should be fixed to a centre ridge plate, and connected together in their middle by

a strong bar, about 12 in. from the ridge on either side; another cross-bar, the same depth as the rafters, should be placed on which to fix the sash-bars, the space between this and the ridge to be for ventilation, by covering it with the common flap-board fixed to the ridge; the sash-bars, about 1 in. by 1½ in., should be fixed to receive the glass, 12 in. or 14 in. wide. The glazing would thus be continuous throughout, and very light and strong. The ventilation being from the side sashes and the top flap at the ridge, all of these could be opened by simultaneous movement. A house of this sort may be as much ornamented as fancy pleases, by mouldings on the ridge ends, &c., by painting the rafters and other parts of a lively blue, and the sash-bars white, &c., and the cost of such a house, 50 ft. long, would not exceed 100l. The enjoyment to be derived is regarded as worth double the money.

PROPOSED MASONIC HALL FOR LINCOLN.

MASONIC halls are springing up throughout the country. The design for the proposed new Masonic Hall for Lincoln, to be erected on the site recently purchased on the north side of Newland, has been decided on. The building will be commenced in the spring, and, in addition to the rooms to be used for Masonic purposes, will comprise a large assembly-room, or concert-hall, and other rooms and offices. The designs have been prepared by Brother W. Watkins, architect, of that city. The ground-floor plan contains two entrances, each 9 ft. wide. Between them is a room 24 ft. square, to be used for sales or small meetings. Immediately behind this room, and approached from the right-hand entrance, is the large open staircase leading to the Masonic departments, which occupy the whole of the front or the first story. Immediately behind the staircase, and approached from the left-hand entrance (which will be the chief entrance to the public assembly-room), are cloak-rooms. Behind these are staircases leading to the galleries, which extend round three sides of the large assembly-room. This hall, which is 78 ft. long, 32 ft. wide, and 25 ft. high, has an orchestra at the extreme end, 16 ft. wide, and 13 ft. deep, to right and left of which are two green-rooms. Exclusive of the orchestra, the hall will seat 700 persons. The principal staircase, approached from the right-hand entrance, leads to the Masonic lodge, which consists of a reception-room, 24 ft. by 18 ft.; a porchway leading to the lodge-room, which latter is 36 ft. by 24 ft., and 22 ft. high in the centre; and a preparation-room, together with stores for lodge furniture, &c. The building is designed in the Geometric style of Gothic architecture, and is intended (on certain conditions) to be a memorial of the late Doctor Oliver; and, with that view, provision is made in the centre of the front for a life-size statue of him, which will be placed upon a pedestal supported by coupled polished granite columns, and surmounted by an ornamental traceried canopy. The front will be 45 ft. wide, and 50 ft. high from the pavement to the apex of the centre gable, which will be surmounted with the life-size figure of St. John. It is to be regretted that the design is for merely a front.

FROM IRELAND.

Dromore.—The Cathedral Church of Christ the Redeemer, at Dromore, has been re-opened, after extensive additions and alterations. About 2,000l. have been expended upon it, the design having been given by Mr. Thomas Drew, architect; the contractor being Mr. Walter Doolin, of Dublin. The church at Dromore stands upon a very ancient site, but it possesses no merits in an architectural point of view. In the additions which have been now made and are in contemplation in the future, a difficult task has been experienced, viz.—to re-model an unsatisfactory building, hampered where extension was wanted by interments, without, at the same time, destroying historical associations which the several portions of the structure bore. This has been effected by taking down the eastern end of the old church, and terminating it with a semi-circular apse, lighted by seven pointed windows, and which is intended as a memorial to Bishop Jeremy Taylor, and will be known as the "Taylor apse." In the angle, formed by this portion of the church and the transept alluded to, has been made the principal addition, in the form of

an aisle, 25 ft. wide, which embraces within it the transept, and will consequently be known as the "Percy aisle." On the east and north of this again are narrow aisles, opening into it with pointed arches, and it is intended that this aisle, with its north aisle, should be ultimately extended towards the west, so forming an addition of considerably greater area than that of the old church, and opening into it along its entire length, with an arcade of arches springing from carved columns. Although quite impracticable to transform the building into one of a cathedral aspect, it has not been lost sight of that it still, at least nominally, possesses a chapter and dean, and that at some future date it might possibly be the pro-cathedral of a separate bishopric. The eastern end of the church, for two bays in length, has been treated distinctively as a choir, terminating westward in a square pier, the intermediate pier being of coupled columns with sculptured capitals. The roof of the choir is treated distinctively, being cusped in section, and sheeted with stained timber. The new roofs of both the new and old building are high in pitch, open-timbered, and plastered between the rafters, having tie-beams and king-posts moulded after the manner of columns. The former stalls of the caputular body are now arranged on each side of the choir, and terminated with a low stone wall or curb to the raised floor. The building is still encumbered, from sheer necessity, with unsightly and inconvenient galleries in the "Percy aisle" and nave, the removal of which is urgently demanded. This done, and the whole contemplated additions carried out, Dromore Church or "Cathedral" will be a building of considerable area. The memorial-chapel rails are by Messrs. J. Redman, of Coventry; the floor is laid throughout with encaustic tiles by Messrs. Shaw, through their agent, Mrs. Riddell & Co., of Belfast. A lantern, by the Messrs. Skidman, the gift of the rector, is placed below the steps leading into the choir. Two windows of grisaille work, by Messrs. Wailles, of Newcastle, have been placed in the north aisle to the memory of various members of the family of Mr. T. Scott, now of Ballymoney, but formerly of Dromore; while a nook near the eastern porch contains four memorial windows, by Messrs. Heaton, Butler, & Bayne, of Coventry, representing Faith, Hope, Charity, and Justice. Other windows have been promised.

INUNDATION OF ROME.

THE Tiber entered Rome just before the King, and has done enormous damage. A correspondent on the spot writes to us:—

Rome at this moment is in a state of intense excitement. The Tiber has risen against it, and now occupies a good half of the city; the Corso itself and Piazza del Popolo being several feet deep in the water; the Via Condotti up to the Albergo d'Alemagna, the Via Ripetta and quarters of Trastevere, and more especially the Ghetto, both quarters densely populated by the poorer classes, are in the worst case of all. The country around is flooded from the breaking down of dykes and other disasters, and indeed it is impossible at present to ascertain the extent of the disaster and the loss of property, as it is a far higher flood than the celebrated one of 1846. The whole place is in a state of uproar, both yesterday and to-day. There is such a dearth of boats of any kind, and the water is so deep that carriages cannot venture far into the flooded streets, and the difficulty is to convey food and assistance to the imprisoned inhabitants. The Government is sending about high wagons, guarded by soldiers, and laden with bread. The King sent a return telegram, on hearing of the disaster, to place 20,000*l.* from him in assisting the sufferers; but now also some accident has happened on the railways, and there has been no mail in from the north of Italy or Civita Vecchia for five days; so we are almost in a state of siege. From the terraces of the Pincian Hill the sight is extraordinary. You can see down the Condotti, looking like a street in Venice, and would that they could have the gondolas also; the Piazza del Popolo looks, from its shape, obelisk, and fountains, as if it had been intended to be filled with water, as it now is a basin; and beyond, in the Campagna, extends a large tract of water, like a lake, dotted with the roofs of houses, the highest floors above visible, and tops of trees. The water is, they say, receding now a little; and if a strong *transmontane* wind would blow, instead of this *sciocco*, they say the water

would subside; but I saw little difference again this afternoon. All houses are now lighting up their windows, in the inundated parts, and we are going out to see the effect. It will be some time before accurate accounts of the disaster can be obtained; but it is certain that they can scarcely, as yet, be exaggerated. The King has since left 200,000*l.*, in addition to his first gift. He has been received with the greatest excitement and delight. "Come back soon, Emmanuel!" was the cry when he left. Those who superstitiously would connect the doings of the King and the Inundation are met by the fact that the lightning which heralded it struck the Pope's chapel in the Vatican.

THE INTERNATIONAL EXHIBITION, 1871.

It is surprising to find how little is known out of doors concerning the approaching Exhibition. Nearly every week we receive letters of inquiry, and yet, as we are reminded, the rules have been announced and advertised since August, 1869, and many thousand notices have been sent direct to exhibitors at former Exhibitions. Let us repeat to two inquirers whose letters are now before us that all applications should be addressed to Col. Scott, Kensington Gore, and that exhibited articles will be protected by the Act of 1870.

Objection is made, so far as models of inventions and delicate machinery are concerned, to the requirement that works must be sent in by February, though the public will not be admitted till May; but the authorities say it is necessary. The judges for Fine Arts have been announced, and the list of judges in other departments is now, we believe, settled.

One of our correspondents urges that the Commissioners should light up the Exhibition, so that it might be open on certain evenings for the advantage of those who are engaged during the day. We do not know any valid reason why they should not do so.

FAIRFORD CHURCH: FAIRFORD WINDOWS.

"THE TAMES OF FAIRFORD."

At a meeting of the British Archaeological Association on the 11th, Mr. H. F. Holt read a paper on this subject. First giving a brief notice of the claims of Saxon Fairford in an archaeological, historical, and artistic sense combined, the object of the paper was declared to be, to prove:—1st. That John Tame did not acquire the painted glass in 1492, or at any other time, by conquest, piracy, or purchase; 2nd. That he did not found Fairford Church, or dedicate it to the Virgin Mary; 3rd. That he did not even rebuild the church, or any part of it; 4th. That he did not purchase the manor of Fairford from Henry VII.; 5th. That he never had anything whatever to do with the painted windows, and never even contemplated their erection; and, lastly, that the windows were not ordered until after Midsummer, 1500, and were erected not later than 1505. These propositions were supported by direct reference to original documents, which seem to have never been previously noticed, consisting among others of the original wills of John Tame; Sir Edmund Tame, knight; his son, Sir Edmund; and other members of the family. In other words, the old tale of John Tame having seized the glass in 1492, built Fairford Church to receive it, and dedicating it to the Virgin Mary, was disproved.

The effect of the paper being to prove the date of the glass to be later than hitherto imagined, it will be regarded as important by those who attribute it to Albert Dürer.

The history of the Tame family was related, and John Tame's first connexion with Fairford was declared to be 1480 (20 Edward IV.). The romantic history of the Manor of Fairford was given from 1480 to 1489, the lordship thereof having, during that period, been successively held by Richard, 5th Earl of Warwick, in right of his wife, the Lady Anne Beauchamp; the Duke of Clarence, supposed to have ended his days in a butt of Malmsey; Richard, Duke of Gloucester, afterwards Richard III.; and, on his decease, the widowed and childless Countess of Warwick. An account of the circumstances under which the Manor was vested in the Countess, and afterwards conveyed by her to Henry VII. in 1489, was also given. A statement then followed to show that Fairford Church was rebuilt on an enlarged scale by the eccle-

siastical communities of Worcester and of Tewkesbury, between the years 1490 and 1495, and that John Tame had nothing whatever to do with this rebuilding; that John Tame's connexion with the church was distinctly pointed out and defined by his will, dated the 28th of January, 1495, and confirmed on the 3rd of May, 1500, five days before his decease, from which it appeared that instead of founding the church, and dedicating it to the Virgin Mary, he founded a chantry in the north chapel of the church, dedicated to the Virgin. Details of his will were given in support of Mr. Holt's views, who then proceeded to show that the painted glass windows were erected at the sole expense of Edward Tame, the son of John, and fortified his views by reference to the donor's will, and other collateral circumstances.

Here, so far as the church and windows were concerned, the observations of Mr. Holt concluded; he having, as he submitted, made good the truth of each of his before-mentioned propositions, which, if admitted, would be found to have an important bearing in considering the much-disputed question as to the artist who painted the windows, and the school of art to which they belong.

Mr. Holt continued his paper by giving a statement of the salient points in Tame's history, showing the date and circumstances of his knighthood, and the hitherto overlooked fact that on the 26th of August, 1520, King Henry VIII. and his Court arrived at Fairford, and remained there a week, as the guests of Sir Edmund Tame; as well as that, during the royal stay, his Majesty conferred upon Sir Edmund a signal and unprecedented mark of his royal favour, by bestowing upon him a shield of arms, "composed of the supporters of the Royal Arms of England, the crowned lion and griffin."

BUILT TO SELL.

A GLASGOW case of this kind has just occurred. Messrs. D. & R. Law were building premises at Belmont Crescent, and had reached the fourth story, when the whole affair collapsed into rubbish, killing six persons, and seriously injuring five others. Messrs. Law were not themselves builders, but their father, a shipowner, had once been a builder, and they had confidence in their foreman. They fenced the ground from a Glasgow banking company, to whom it belonged, and who knew well that it was made ground, raised on a slope, with 33 ft. in depth of forced earth at one corner; and the bank advanced money to Messrs. Law as they went on, an agent, in whom the bank had confidence, "coming and going," and certifying to the doing of the work (and the public) from story to story, week by week, as it rose, like a mushroom. No architect had anything to do with the matter, with which, in truth, no builder either seems to have had to do. The third story had been "certified" and the fourth was in progress, when the card structure collapsed; and for the event Messrs. David Law, sen., and David Law, jun., were tried before a jury, who have decided that Mr. David Law, sen., is "not guilty," and that the charge against Mr. David Law, jun., is "not proven."

BROKEN IRON PIPES.

SIR,—The only sure cure for the nuisance referred to in your last, is to put new pipes.
D. M.

THE INSTITUTE AND THE SURVEYORSHIP OF BRIDEWELL AND BETHLEHEM HOSPITALS.

SIR,—I desire, with your permission, to put a question to the Council of the Institute, through your pages, upon a subject of considerable importance to the profession. I take this course of addressing you publicly in preference to asking the question privately of the Council, or at an ordinary meeting of the Institute, in consequence of the importance and public nature of the subject, which, I think, deserves wider recognition than could be possibly obtained were I to introduce the matter at the very scantily-attended meetings which are held in Conduit-street.

The Council of the Institute issued some time since a paper of rules on professional charges, in which the various payments for different kinds of services are defined with great accuracy. In this document it is stated that the minimum

commission payable for preparing drawings and specification, and superintendence is 5 per cent. upon the net cost of the work. In the case of alterations to old buildings, or the designing and superintendence of furniture, fittings, sculpture, stained glass, or other works of a similar kind, a higher commission may be charged; but it was clearly the intention of the framers of these rules that 5 per cent. should be the minimum charge for an architect's services for designing and superintendence. Now, the question I wish to ask the Council is this.—Are these rules, which were, I suppose, drawn up by the governing body of the Institute, and are presumably intended to regulate the general practice to promote the welfare and define the position of the profession, obligatory upon the Fellows of the Institute, or are they not?

My reason for asking the question is that I observe that more than one Fellow of the Institute is a candidate for the appointment of surveyor to Bridewell and Bethlehem Hospitals, and that in a memorandum of the duties of the surveyor issued by the governors for the information of candidates, it is stipulated that, should any buildings be erected under the superintendence of the surveyor exceeding 2,000*l.* in value, he shall be paid a commission of 2½ per cent. upon the cost. If the rules of the Institute are binding upon its members, it would appear that a Fellow—I will not say an Associate, because an Associate has no share in the government of the Institute, and his obligations to the Institute are less rigorously defined,—but a Fellow certainly cannot consistently seek an appointment in which the rules of the Institute are set at naught. Into the merits of the question of payment by per-centage I am not disposed to enter; nor is it, I think, at all necessary that I should do so: there is much to be said both for and against the system, but as long as the Institute countenances it, and makes rules for its members based upon that system, it seems only common sense and common honesty that the members of the Institute should endeavour to carry out those rules in their own practice, and not, while seeking to impose them upon others, to throw them aside whenever their observance becomes inconvenient.

There was an old custom, which existed until very recently, and took place at an inn at Highgate, where the neophyte swore upon a ram's horn to observe a variety of conditions, and to abjure many things, in a long and absurd jurat, which ended with the remarkable provision,—"unless you choose otherwise." It would seem, from the conduct of some Fellows of the Institute, that they qualify the obligations they contract towards that body with some such addendum as that which formerly attended the ceremony of being sworn at Highgate.

CIVIS.

THE CONSISTENCY OF THE INSTITUTE.

SIR,—Professor Donaldson seems to take needless offence at the letter of "F. R. I. B. A." in your of 31st ult. He says, "I know not whether the writer considers it consistent with the loyal allegiance which every one owes to a public body of which he is a member, to cast discredit upon its regulations." I certainly think such conduct, if indulged in, most inconsistent, and, moreover deserving of prompt and rigorous action on the part of the council. But in the present instance, is not the learned Professor himself more amenable to the charge than "F. R. I. B. A."? The latter has said a word against the Institute rules, whereas the Professor has recently pronounced one of them to be "incapable of proof, illegal, and unreasonable." It was well to observe that he was in a minority at the time, but his opinion carries more weight than that of most men, and was calculated to do much mischief.

Surely if the rules were drawn up in the careful and conscientious manner, he says, the more reason why an important one of them should not be denounced on such slight grounds as the recent decision of the Court of Exchequer, which dealt with a very peculiar case. As the Professor very properly says, "previous decisions as to law are overruled every term." It is quite possible, then, that this apparently adverse decision may yet be reversed or superseded; and in the meantime would it not be more becoming in such an influential member and office-bearer of the Institute to stand by its published views (in which it has been unanimously confirmed by the provincial societies), than to join with the *Times*, Mr. Ayrton, and

Mr. Baron Bramwell, in condemning them? It is well known that the 5 per cent. charge, and, indeed, the whole system of payment by per-centage, was at one time denounced as illegal in the courts; but it has continued, nevertheless, and is now seldom, if ever questioned.

If one rule on examination turns out to be "illegal and unreasonable," all may be so, and under such circumstances it is manifestly absurd to quote any as authoritative. One-half of the rule referring to property in the drawings being set aside, why should the other, which binds the architect to supply two copies for one fee, remain in force? It is especially unfair that those which relate to architects' duties should be rigidly enforced, while those that have regard to his rights are weakly surrendered. There are many good reasons to be adduced in favour of the architect furnishing quantities at a fair rate, the Institute rule notwithstanding, and the practice is very general in the north of England. Architects are expected to understand "the measurement and valuation of artificers' work" and if so, why should they be debarred from practising it? Indeed, it might be worth while to ask Mr. Overy, or some higher authority, whether this rule be not illegal also, coming under the category of "contracts in restraint of trade."

I yield to none in honest loyalty to the Institute, and in anxiety to see it take its proper place as the chief governing and representative body of the profession. This will never be the case so long as its members are not ashamed publicly to contravene its rules, and such a line of conduct is not deemed worthy of notice by the Council. I am very far from being singular in these views, many members having expressed the same, and numerous other active and respectable architects declining to join the Institute on the ground of its inefficiency. I hope, however, some day to see more useful practical measures adopted to secure "uniformity and respectability of practice," but in this hope many think I am over-sanguine.

WM. FOGGERTY.

OVERHANGING ROOFS AND CORNICES.

SIR,—I crave your permission to suggest that overhanging roofs or cornices should not be allowed in crowded thoroughfares. It seems to me that the district surveyor should have power to stop all such merely ornamental, but useless, encroachments. They fall now and then, and drip continuously, rendering the footway unpleasant, and even dangerous to passengers.

A. H.

THE LONDON BUILDERS AND THE LAW COURTS.

A DEPUTATION of London builders, consisting of Messrs. H. Lee, Plucknett, Hannen, Johnson, Trollope, and T. Lucas, waited by appointment on Mr. Ayrton, at the Office of Works, on Saturday, the 7th, in reference to the proposed conditions of contract, which had been objected to. These were generally modified, but on the principal supposed points of difference it appeared that the Commissioner and the builders were already quite agreed in substance, and the only question was whether the wording of the conditions carried out the intentions of the Commissioner and the builders. The legal adviser of the builders and the legal adviser of the Commissioner appeared not to coincide on the legal phraseology necessary, and it was left to these gentlemen to confer further together. The deputation expressed their thanks to the Commissioner for his patience and courtesy, and withdrew.

We have before us the particulars of the changes that were made, but their publication now might prejudice the question.

THE ARCHITECTURAL ALLIANCE.

A COPY of the following letter has been sent to the honorary secretaries of the several societies forming the "Alliance":—

"In issuing the report of the proceedings at the meeting of the Alliance held in June last, I beg to call your attention to two or three points in reference thereto.

Although the recent legal decision may be considered almost, if not quite, to set at rest the question as to the delivery of the plans by the architect when the works are not carried out, the proprietorship of the drawings when the works are executed is still an open question. It would be of great value if you can obtain from your members any decision upon this subject that may have occurred in the course of their practice.

You will perceive that the question of architectural

examinations occupied considerable attention at the meeting, and resulted in two resolutions being adopted. The subject is an important one, especially to the younger members of the profession, and the establishment of provincial examinations would no doubt stimulate many who would otherwise be deterred by their absence in London were needed. It would strengthen the application to the Institute if you could ascertain approximately the number of your members who would be likely to offer themselves for examination, or are, at any rate, favourable to the scheme. I shall be happy to procure any information you may need, so far as lies in my power. The establishment of classes for the preparation or assistance of students would be a great incentive. Such classes have been established by the London Architectural Association, and with much success.

It is intended that an Exhibition of Architectural Drawings shall be held in the International Exhibition, to open on the 1st May, 1871. As the Architectural Exhibition Society is now dissolved, this will be the only means of exhibiting architectural drawings; and as it is believed the architecture of other countries will be well represented, it is hoped that England may maintain its own in this respect. All drawings intended for exhibition must be sent to the Exhibition Building, South Kensington, W., not later than 22nd February next, but applications should at once be made to the secretary.

In his opening address for the present session, the President of the Royal Institute of British Architects suggested the desirability of the amalgamation of the Alliance and the other architectural societies with the Institute. As far as the connexion of the delegates and members of the societies with the Institute is concerned, the suggestion is a very reasonable one, and it is to be hoped the Institute the recognised body of British architects; but as the Alliance is a representative body, and it can hardly be proposed to abolish the country societies, it has great advantages in ascertaining the views of the several societies comprised in it, and through them of architects generally, which could not be so easily obtained from individual members. It is therefore suggested that the Alliance should have the opportunity of adding the Institute (as, for example, in the establishment of local examinations) and of exerting an outside pressure that will be of value to that body. It is suggested that the Alliance should have some members of the Council to be present at the next meeting of the Alliance will be accepted; and that the two societies should continue to work separately in their own sphere, but for the common good of the profession.

To make the Alliance answer its full purpose, it is most necessary that it should be in a position to obtain directly the experience of the whole, or the greater part, of the architects practising in the United Kingdom, but as many of these live at a distance from the provincial architectural societies, they are not represented. As, however, there are archæological societies in almost every county or diocese, and most of these include the principal local architects, I purpose ascertaining their names, and suggesting the formation of a Professional Architectural Committee or Section, for practising architects and students only; I shall be obliged if you will forward me the names of any such societies in your neighbourhood. I should be also thankful for any suggestions towards the accomplishment of the object. There can be no doubt that the Alliance has been found of value, and it must be some time before the scheme having been fairly organised, it would be a great pity to allow it to drop for want of proper support from the allied societies.

The annual meeting will most probably be held in June next year, at which we shall have to receive your delegates; due notice will, however, be sent. I shall feel obliged by any communications or suggestions for submission to the meeting being sent to me, not later than the middle of May.

J. DOUGLASS MATTHEWS, Hon. Sec'.

ARBITRATION v. FIST IN THE WORKSHOP.

SIR,—Men who denounce fratricidal war are invariably ready for a fight, on a slight offence or an affrontive word; yet working men have to learn it does not decide right. I have seen shopmates batter each other; invariably the victor is the stronger. We stop these scenes. The instant a man was struck by a shopmate he was to inform the oldest man, who called us together. We had only one case to try; a fine of 10*s.* was inflicted, with an intimation of its being doubled if repeated. Nothing of this kind has occurred since among the men. The boys have an occasional *far up*; but foreman is umpire for them, and sometimes thrashes both.

R. T.

UXBRIDGE UNION: NEW INFIRMARY.

CONSIDERABLE alterations and additions have been in progress at the above during the last few months, under the superintendence of Mr. C. J. Shoppee, architect. The accommodation hitherto provided having been for some time past felt to be insufficient, the guardians decided on erecting a new infirmary for males, in addition to altering the old infirmary (which formerly served for both sexes) for females. Mr. G. E. Kearley was the contractor for this portion of the works, and for the new boundary walls.

A new ward for able-bodied men has also been erected, for which Mr. F. Taylor was the contractor. The stoves and heating apparatus have been provided by Messrs. May. Moul's earth-closet system has been adopted throughout. Mr. Collett was clerk of the works.

Thames Piers.—It is understood that a new pier is to be formed near Lambeth Palace, in the place of the old one which was moored near Lambeth Bridge, and recently removed.

THE SURVEYORSHIP OF BETHLEHEM HOSPITAL.

THE governors of Bridewell and Bethlehem hospitals are about to appoint a surveyor. They offer a salary of 250*l.* a year for the discharge of multifarious duties, and in addition a commission of 2½ per cent. upon the cost of new buildings erected under his superintendence, provided the cost of the building so erected be 500*l.* and upwards. Much dissatisfaction is of course expressed by architects with respect to these terms, but the governors nevertheless, we are say, have plenty of candidates to choose from, so singular is the condition of the profession. The tendency of such proceedings on the part of public bodies is necessarily to damage itself further.

VARIORUM.

THE (American) *Manufacturer and Builder* (Samson Low & Co) is publishing in its monthly issues "The History of Art and Architecture," translated from the French of M. Viollet le Duc by Mr. P. B. Wight, architect.—The current number of the *Art-Journal* contains an engraving of "America" by Mr. John Bell, a group now set up as part of the Albert Memorial in Hyde Park. It is to be hoped that the various sculptors who are executing groups for the memorial are working in subordination and under one general direction. If it be not so, we may have to regret incongruities and want of balance. Mr. Bell's group is evidently the result of much thought. We trust, however, the figure of Canada in reality is better proportioned than the engraving. Haddon Hall is the subject treated of and illustrated in the series headed lately *Homes of England*. The writer is too true a brother of the angle to omit reference to the pleasantest little inn in England, "The Peacock" at Rowsley. Oh, for summer weather, and a week at that quiet haven!—The half-timber houses of Herefordshire are thus spoken of in "Annals of a Border County" in the January number of *Fraser's Magazine*. Picturesqueness must rather be sought in the numerous timbered houses, conspicuous in black and white, which form one of the specialties of the county. Weobley and Pembridge are collections of these quaint dwellings, whose projecting gables, heavy back-boards, and plastered wattling carry us back to a time when oak was plentiful and labour cheap. The durability of the materials employed is marvellous. There are extant houses built in the early part of the fifteenth century, and still, so far as their timber is concerned, evincing no signs of decay. The axe glints from the surface of their massive beams as from a close-grained rock, and even fire itself can make little impression upon wood seasoned by the lapse of centuries. Dineley's sketches, reproduced in *fac-simile* in the very curious volumes lately published by the Camden Society, show us what the county has lost through the spirit of improvement since that time. But we still have in China or Cheney Court an almost perfect example of the domestic architecture of the Tudor era; and in Brinsop Court, the moated grange of the Dansey family, are specimens of native oak such as this degenerate age could not produce. Attached to each house is a dismantled chapel, and the first-named has a series of panel paintings, representing the Sibyls, of considerable interest. But the local style was not confined to dwelling-houses. It had its fullest development in the Market-hall or Butter Cross of each little town, a building which in most instances has suffered largely from the Philistinism of its custodians.—The January part of the *People's Magazine* (Society for Promoting Christian Knowledge) includes, with much interesting reading, an illustrated account of the Fells Railway over Mont Cenis, a remarkable undertaking.

Miscellaneous.

Busts of Deceased Statesmen for Guildhall, London.—A bust of the late Lord Derby has just been unveiled in Guildhall. It is the work of Mr. Noble. It is placed in a corridor near the Aldermen's Chamber, immediately beneath the portrait of General Sir W. F. Williams, of Kars, and close to the bust of the late Earl's great rival, Lord Palmerston, and of Lord Canning, the first Viceroy of India. It has cost the Corporation about 250*l.*, and was ordered about a year since. A bust of Lord Brougham will likewise be unveiled in a short time.

The Condition of "Wapping Island."—The *Standard*, commenting on the account we gave of a visit to this place, last week, says,— "What is to be done with 'Wapping Island?' Rowland Hill once preached to 'Wapping sinners,' and the species would seem to be far from extinct. The misery, we fear, has increased. Since this visit was paid from which we have derived our description, the local authorities have been at work. Nine houses in one court have been declared unfit for human habitation, the whole of the families in them have been turned out, and the doors and lower windows boarded up. The ejected families, 'fevered and plague-stricken as they are,' have betaken themselves to an adjacent court, where disease is also rampant, and where the dead and the dying of the poor Irish 'are waked together.' Outside the confines of this island, we are told, there are other lanes and alleys quite as bad as those previously referred to. English or Irish, good or bad, it is neither fit nor safe that human beings should thus herd and fester together. Well may it be said that places like these 'require instant parochial and Government inspection.' Local mortuary houses are 'an actual necessity,' in order to stop the progress of contagion. Sanitary inspection must not merely be frequent, it must be 'daily.' 'Sisters of Mercy' and 'Puseyites' are going about on angels' errands among these suffering creatures, but the tide of misery bears down all the agency yet employed. This dreadful picture is repeated in other parts of London, in varying degrees of light and shade."

The Romford Surveyorship: Shabby Treatment.—At a recent meeting of the Local Board of Health, a resolution was passed reducing the surveyor's salary to 120*l.* per annum, and time was given for him to consider whether or not he would accept that remuneration. The Surveyor now stated that he accepted the salary, but did so under compulsion; as, when he took the office, it was upon the understanding that he would receive 160*l.* per annum; and therefore he considered the action of the board was a breach of faith. He also wished to inform the board that now the salary was reduced he should expect to be paid regularly; at the present time the board owing him three quarters' salary, and he being obliged to frequently trespass upon his private means to pay accounts of the board. Mr. Bird thought the board were not justified in calling upon the surveyor to expend money for their purposes: he ought to be supplied with money so that he would not have occasion to trespass upon his own resources. Mr. Idle expressed a similar opinion.

The Nine Hours' Movement.—At a recent meeting of the house carpenters and joiners of Newcastle and Gateshead, the following resolution was adopted:—

"That we should have a reduction in the hours of labour from fifty-five and a half to fifty hours per week; to work nine hours for the first five days, and five hours on Saturday."

The following alterations are also proposed in the working code of rules:—

"Rule 4, clause 2, all men paid 6*d.* per hour shall be paid 5*d.*, or, working by the day, 28*s.* per week; rule 5 to alter the hours of work; rule 7, to be paid overtime,—first four hours, 8*d.* per hour; and from 5 p.m. to 8 a.m., 9*d.* per hour."

We understand that the masters have received official intimation of these intended alterations, the term of notice, in accordance with the rules of the trade, extending to the 1st of April next.

Gallery of Illustration.—Mr. and Mrs. German Reed's new entertainment, to be produced on Monday, the 23rd inst., is called "A Sensation Novel," and in it the characters and combination of incidents in this class of literature are satirised. Mr. W. S. Gilbert is the author. The "Musical Notes" are by Mr. German Reed; the "Vignettes" by Mr. and Mrs. Reed, Miss Fanny Holland, Mr. Corney Grain, and Mr. Arthur Cecil; and the "Frontispiece" is by Mr. John O'Connor.

Working Men's Universities.—While the project of founding at Liverpool a college of science, at a cost of 50,000*l.*, is still talked of, a scarcely less important undertaking, on a lower scale, has got into successful operation. This consists in a number of classes opened in different parts of Liverpool for the practical instruction of operatives in building, naval architecture, &c., and all mechanical arts, as well as in the science of chemistry.

Bradford Waterworks: Bursting of the Low-Level Conduit.—The supply of water to Bradford by the low-level service is at present interrupted, owing to the bursting, a few days ago, of the main conduit at Morton Banks. The course of the conduit here is along the face of the hill, parallel to the Leeds and Liverpool canal, but at a considerably greater elevation. At the place where the accident happened the water is carried across a small valley by an aqueduct of stonework about 80 yards in length, pierced by an arch to allow of the passage of a rail which runs at the bottom of the hollow. The dimensions of the conduit internally are about 4 ft. by 3 ft. 6 in. It appears from an examination which has since been made, that there was a leak in the masonry on the south-west or low side, and the action of the frost had caused it to give way. The stone work has gone down for a space of about 40 yards, and the force which has been brought to bear on the side of the conduit may be judged from the fact that at least 10 ft. of the solid wall about the centre of the aqueduct has been pushed out as a door might be thrown back on its hinges. The work of restoration is now, we believe, complete.

A Fatal Kitchen-Boller Explosion in the North.—A distressing accident has occurred at Middlesbrough, attended with fatal results. The kitchen boiler in the house of Mr. Wilson, Cromwell-terrace, Newport-road, exploded with dreadful effect. A servant girl was in the collar kitchen when the boiler, which was fixed behind the fireplace, exploded. The thigh of the poor girl was broken, her face, hands, arms, and shoulders frightfully scalded, burned, and mutilated; the back of the boiler was driven through the wall into the kitchen of an adjoining house, where it lay upon the floor, torn up and twisted like a piece of paper; the bricks upon each side and under the fireplace were riven from their places, the ceiling shaken down, the windows smashed, and the doors displaced. The poor girl was conveyed to the infirmary, and there expired, in great agony, three hours afterwards. The inquest jury returned a verdict of "Accidental death," and recommended that in all similar boilers safety-valves should be fixed.

Winchester New Town-hall.—The designs, which are forty-six in number, have been arranged, for the inspection of the committee and to facilitate their decision, in the large room at the Corn Exchange. It is a difficult task the committee have before them; for though some few of the competing architects have evidently mistaken the wants of the city, and have subordinated what should have been leading features, the great majority of the designs display careful thought and effective treatment. The collective labour must have been immense. Gothic is the prevailing style adopted by the competitors.

The late Herr Aismüller.—The death of this artist at Munich is announced. He has long been honourably connected with the stained glass works there, and designed, amongst many others, windows in Glasgow Cathedral and St. Paul's, London. We have an agreeable recollection of an examination of the works in Mr. Aismüller's company a few years ago. He was about sixty-four years of age when he died; and was held in much esteem as an artist.

Society for the Encouragement of the Fine Arts.—The first conversations of the season will be held on Thursday, the 19th inst. at the Suffolk-street Gallery; and on the 26th there will be a lecture by Dr. Zoriff on "Pre-historic Art." The committee has issued a capital programme, giving promise of many interesting evenings, and have abolished the entrance fee. The society's own rooms are at No. 9, Conduit-street.

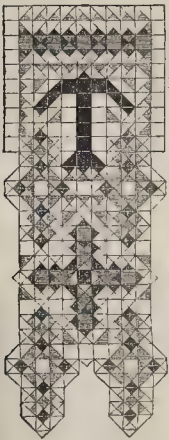
Mr. Munro, Sculptor.—The death is announced of Mr. Alexander Munro, the sculptor. He had been in such bad health for some time that his recovery was generally regarded as hopeless. He died at Cannes on the 1st inst., aged 45.

Hope for Herne Bay.—The designs for the new promenade pier are now on view at the Dolphin Hotel. The structure is to be composed entirely of iron. We hear that the estimated cost is 18,000*l.*

St. Olave's, Hart-street.—This interesting old church is about to be restored. It is now cleared out of all the old pewing, and is well worth a visit.

The Builder.

VOL. XXIX.—No. 1459.



*Rivers :
their Functions and
their Treatment.*

THE universal diffusion of water is necessary to existence; and perhaps no process in the great economy of nature subserves more important and useful ends. The moisture evaporated from the ocean is carried inland, and the clouds, descending in rain, "drop fatness" upon the soil. This duty done, the configuration of the surface collects the drainage water in rivulets, the primary supply for the support of animal life; and the

union of the latter in the lowest valleys produces the mighty stream, which, completing the rotation, returns the water to its parent sea.

It is no uncommon figure of speech to impute to great rivers the parentage of the dwellers on their banks; and our own familiar "Father Thames" readily occurs to the mind as an instance. Nor is the epithet undeserved; for in all times the great seats of population, industry, and wealth have been placed, for the most part, on the banks of a navigable stream. To the river, the city owed its existence, its protection from danger, its supply of the first necessities of life, its communication, and its trade. The fairest and most stately buildings adorned its banks, and the highest and noblest denizens displayed their pomp upon its waters. The parent stream was held in affection, approaching personal regard; and in ancient times the feeling of veneration thus created has even led to its deification:—

"O Tiber, Father Tiber,
To whom the Romans pray."

The great streams, as already stated, are formed by the union of many rivulets, and thus represent the result of the *drainage* of the entire district or watershed to which they appertain. The first function, therefore, of a river is the drainage of the land; and it is needless to dilate on the universality and importance of this duty. When, from either natural or artificial causes, it is inefficiently performed, the surface becomes moist or swampy, the atmosphere miasmatic and insalubrious, and the country more or less unfit for the habitation of man.

It has also been stated previously, that the great seats of population and trade have been usually placed upon navigable streams, to which, in fact, they owe their origin; and which form, also the earliest, and in no few instances the most important highway of a country. It follows, therefore, that the second great function of a river is to supply the means of internal navigation.

In considering, therefore, the treatment of rivers, with a view to their artificial improvement, these two functions, viz., drainage and navigation, have evidently to be kept in view; and almost all the works of river engineering

have been directed to one or other, and not unfrequently to both together, of these objects.

It is proposed, accordingly, to discuss briefly in this paper the usual conditions found existing in large streams, from their point of discharge to their source; to describe the causes of impediment to the proper discharge of their functions; and the best available means whereby such difficulties may be diminished or removed.

A frequent source of impediment to the navigation of rivers arises from the formation of bars at their mouths. This most usually occurs from the circumstance that the bed of the river is composed of soft material, which the running water removes and carries down with it in suspension to the sea. Then the flow of the stream being arrested, and its silt-bearing waters brought to a stand-still, in consequence of their impingement on the sea, the material in suspension subsides or settles down at that point, and forms a bar across the entrance of the river. As the greater or less velocity of the current will determine the distance to which it is carried out to sea before its flow or motion is sufficiently checked to allow the silt to deposit, so will the distance of the bar to seaward from the mouth of the river be regulated.

The first effect of this process is naturally to shoal the water or form a bar at the entrance of a navigable river, to an extent generally limited by the circumstance that the river water must at all times force its passage over or through the bar into the sea. Nor are the impediments to navigation always confined to such shoaling alone. When the mouth of the river is in an exposed situation, the bar is liable to become, as it were, an artificial foreshore, over which breakers are formed and roll with violence; and the depth of water on the bar is then further diminished by the extent to which the trough of the wave descends below the level of the smooth water. The surface of the water will, in such a case, frequently pass with great rapidity from a state of quiescence to one of agitation, and remain so for a lengthened period; detaining vessels, in many instances, for weeks together, from the impossibility of their crossing the bar with safety. In fact, many frightful shipwrecks have occurred in attempting such a passage with an insufficient depth of water to keep the vessel afloat at the lowest level; the ship being alternately lifted on the crest of the waves and lowered in their trough till her bottom strikes on the bar, when the pounding motion thus produced on the heavy mass of her hull almost instantly breaks her to pieces.

It has been stated that the diminution of the depth of water over a bar is generally limited by the circumstance that the river-current must at all times force its passage either *over* or *through* the bar into the sea. The former of these conditions usually occurs and continues whilst the river waters are at their average volume and normal state; when the tendency of the bar is to shoal to the utmost limit, at the same time increasing its width or transverse section from the continual accumulation of deposit. The latter condition, on the other hand, takes place at the period of heavy floods, when the increased velocity and volume of the current tends to sweep away the previous accumulation and to remove the material of the bar further out into the deep sea water. The force of floods, therefore, when thus available, is the most potent agent for keeping open the navigation; and the usual object of engineering works in such a case is to confine the force of the flood within artificial boundaries or limits, and to direct or discharge it fully upon the bar; when from the expansion of the river-current or otherwise, that effect did not previously take place.

When the object of works of this nature is to remove an existing bar, they usually consist of two embankments or walls in continuation of the natural banks of the river, carried out sea-

ward to such a distance as to prevent the diffusion of the flood water, and the consequent diminution of its force, before it impinges upon the bar. Perhaps one of the most interesting examples of works of this nature, which have been recently constructed, is that from the designs of Sir Charles Hartley, for maintaining a navigable depth through the bar of the Sulina mouth of the Danube, the particulars of which it is now proposed briefly to describe.

The shore of the Black Sea, at the point where the Sulina mouth of the Danube discharges into it, lies nearly north and south, and a littoral current of about a knot an hour, flows from north to south along the coast. There are no tides in the Black Sea, but the level of the water along the shore is considerably influenced by the action of the wind, varying from 18 in. below the mean sea level when the wind is from the west, or off the land, to 2 ft. above that level when the wind is from the east, or off the sea. The Sulina branch of the Danube discharges at right angles into the sea, its navigable width being about 300 ft., and it discharges a quantity of water, varying from $4\frac{1}{2}$ million cubic feet per minute during times of greatest flood, to a little over half a million cubic feet per minute during the dry season. The amount of deposit held in suspension by the river water during these times (from which deposits the bar is formed) varies from about 1 in. in the foot, or 1-12th during the floods, to about one-fortieth during the dry season, of the cubic quantity of water in the river.

The phenomena of the formation of the bars are sufficiently curious. In ordinary seasons, the matter held in suspension by the river waters is precipitated near the shore, at a short distance seaward from the mouth of the river; and this effect, frequently continuing for months together, forms a regularly increasing bar across the entrance. At the time of high floods, however, the river waters having a greatly increased volume and velocity, force their way through the bar further out into the sea, removing it either wholly or partially into deeper water, and leaving the river entrance comparatively free from obstruction. But the flood waters themselves, which carry a greater quantity of matter in suspension, form bars in their turn farther from the shore, as well as of considerably greater magnitude. Also, if the flood be accompanied by a westerly wind coinciding in direction with it, and lowering the sea-level as already described, this bar will be formed still further out to sea, owing to the greater penetration of the river waters; while, on the other hand, if the wind be eastward, or contrary to the flow of the river, the level of the sea is raised as above mentioned, the velocity of the flood waters is more effectually checked, and the deposit of the matter in suspension takes place more rapidly, resulting in the formation of a bar nearer to the shore, and of greater magnitude than in the former case. On the subsidence of the flood, these deep-water bars are gradually lessened, or partially removed, by the littoral current, and the formation of bars near the shore from the ordinary river waters proceeds as before, until another flood again sweeps them out to sea.

It will be readily understood from this description, however, that the whole mass of the deposited material at the river mouth is continually on the increase, even though a navigable passage through it may be maintained either by natural or artificial means. The result is, in fact, a constant encroachment of the land upon the sea; and the delta of the River Danube, which discharges through no less than eleven mouths into the sea, has attained the dimensions of about forty miles from east to west, and about fifty miles from north to south; and covers an area of considerably more than a thousand square miles.

The system of improvement of the Sulina

entrance recently adopted by the European Commission of the Danube is described by the engineer as being that of guiding "the river waters across the bar, by means of piers projected from the most advanced dry angles of the mouth; or, in other words, that of concentrating the strength of the river current on the bottom of the proposed seaward channel, by an artificial prolongation of the river banks into deep water." For this purpose, two piers were built out into the sea in continuation of the river banks, the northern pier being 4,631 ft. in length, and the southern pier 3,000 ft.; the formation of the shore allowing the south pier to be commenced at a considerable distance seaward of the shore end of the north pier, and the latter also projecting out somewhat further. These works had naturally the effect of concentrating the river current, and directing its whole force on the existing bar; and they have been carried out to such good purpose, that the navigable depth has been increased from 9 ft. to 17 ft., to the immense improvement of the navigation, and consequently of the trade of the locality.

It may be understood that in works of the above nature the effect is but temporary, as the deposit of silt ever continues, and that in a period of time varying according to the circumstances of the case, a further prolongation of the piers will become necessary; and this applies to all rivers carrying matter in suspension to the sea.

The above effects are considerably modified where a river discharges into a tidal sea. In this case, the river waters, instead of descending with a regular flow, are penned back, and rendered stationary, by the rising or flood tide, and are therefore liable during its continuance to deposit the matters held by them in suspension in the upper reaches of the river, instead of at its mouth. In general, however, the entrance of such a river is kept comparatively open by the tidal scour, especially when the ebb tide, uniting with the fresh waters, creates a strong downward current. Such a current is also less liable to be brought to a standstill by impinging on the sea; as, instead of being arrested by the salt water, it continues its flow in conjunction with the retreating tide, to which its waters are united.

The above, however, though the most common, are not the only cause of the formation of bars. It also frequently happens that deposits are formed at the mouths of rivers by tidal silt-bearing waters which are checked in their regular flow at that point. The Thames is a notable example of this effect. The flowing tide runs along our eastern coast in a southerly direction from the north of Scotland to Essex, and the flowing tide through the English Channel runs at the same time in an easterly direction to beyond Dover, and, turning northward from this point, it meets the northern flow above mentioned.

These opposing currents arrest each other's velocity opposite the mouth of the Thames, and enormous deposits in consequence take place in the estuary into which the river discharges, though, fortunately for the navigation, the scour created by the tidal waters passing into and out of the Thames itself is sufficient to keep open several navigable channels at its mouth, where sufficient depth of water for the largest vessels is constantly maintained.

Again, in the Dornock Frith, which is the most northern estuary on the east coast of Scotland, there is a remarkable example of the formation of a bar by tidal waters. The mouth or outlet of the frith forms a semicircular bay of considerable extent, the diameter of which is open to the sea; but at the upper end or head of the semicircle, the prolongation of the frith is contracted abruptly to about one-fourth of that diameter, and it continues its course inland with that diminished width. The consequence is that the flowing tide from the open sea is guided along either shore of the semicircular bay till it gradually forms two littoral currents, which meet each other in opposite directions at the head of the bay, opposite the point where the frith is suddenly narrowed, as above explained. These littoral currents, thus meeting from opposite directions, bring each other to a comparative standstill opposite the point where the upper or narrow portion of the frith discharges into the bay, where they deposit the silt which they carry in suspension. Thus the curious effect is produced of the formation of a bar opposite the mouth of the upper portion of the frith, but which is formed from the deposit of silt by the

external waters of the sea instead of by the internal waters of the river.

This effect, of course, ceases on the commencement of the ebb tide, when the current is turned in the opposite direction. The tendency of the ebb is to remove the newly-formed bar; but as there is only the water contained in the upper or narrow part of the estuary available for this purpose, which is considerably less in quantity than the flood setting in through the bay, the bar permanently continues. It is found, moreover, that the depth of water over the bar is greatest after the occurrence of heavy land-floods acting in conjunction with the ebb-tide.

A bar is also formed in the same locality, but from a different cause, at the sea entrance to Cromarty Frith, immediately south of the Frith of Dornoch, just referred to. This entrance consists of a narrow chasm between two lofty headlands, of about a mile and a half in length. On the landward side of the entrance the frith suddenly expands into a bay of several miles in extent. The tidal waters, in consequence, rush through the narrow passage with great velocity, and deposit their silt on either side of it when their velocity is checked. The flood-tide deposits its silt in the inner bay, and especially around its shores, where the velocity of the current is the least; and the ebb-tide deposits its silt at a short distance to seaward of the mouth of the narrow passage, forming a bar in a manner precisely similar to that of a silt-bearing river. In the latter case, the fact is observed, that the greatest amount of bar, and consequently the least depth of water over the bar, is found in the direction which is taken by the main current of the ebb-tide; the quantity of silt carried by the ebb being, of course, the greatest in that direction.

The effect of the tidal waters in maintaining a navigable channel, either over a bar or through the deposits in the lower reaches of a river or estuary, is, in the majority of instances, of far greater importance than the effect of the river waters themselves. Any engineering works, therefore, in such a locality, whereby the tidal scour may be effected, usually require the most careful consideration; and in the case of projected works in this country are made the subject of minute investigation by the public authorities.

Such works have generally one of the following objects in view, namely, to improve the navigation, to form lines of wharfs or quays, or to reclaim for cultivation the lands lying on the foreshore of the river or estuary, which were previously submerged at high water.

For maintaining the navigation, it is usually advisable to admit the greatest possible quantity of tidal water into the river. The reason of this is manifest. As the river approaches the sea, its inclination diminishes, until it becomes nearly or entirely horizontal, and the velocity of the upland waters is diminished in proportion. This causes them to deposit their sediment, and to diminish the depth for navigation. But the tidal waters, by creating what may be termed an artificial current, correct this tendency and keep the channel clear, and the larger the body of tidal water admitted into the river, the more effectually this duty is performed.

Though, however, it may be assumed as a rule that the larger the quantity of tidal water the better, yet this rule may admit of some exceptions. For instance, if any portion of a river subject to tidal influence be expanded to a considerable width, so as to form a sort of lake at that part, the tide during its flow will be partially occupied in filling this expanse, and proportionately prevented from rising or flowing into the portion of the river immediately above, which is thus deprived of the full advantage of the tidal scour. In such cases it may be more advisable to contract artificially the channel of the river to its normal dimensions, even though the capacity for receiving tidal water should be somewhat diminished. In short, the benefit of the tidal influence is measured, in one sense, by the cubical quantity of tidal water which the river receives; and, in another, by the height or distance up the river to which the tide ascends, and the balance of greatest advantage is arrived at when due regard is paid to both considerations, either of which may predominate according to local circumstances and requirements.

We will treat further on this subject in our next.

Royal Academy. — Mr. Edward William Frost has at last been elected R.A.

ART-WORKMEN'S EXHIBITIONS AND NATIONAL ART.

If there be one thing more than another which would appear to be characteristic of the present age, it is the earnest, nay, passionate desire which seems to pervade all civilised nations to gather themselves together into single, great, and distinctive groups, bound together by the sole tie almost of language. Thus America, North and South, after a tremendous struggle and cost, have become one, under one head or centre of rule; and Germany is now about to consolidate itself into an empire, also under one head and centre of general regulation. Indeed, it would seem to be a kind of modern civilised mania thus to centralise and bind together those speaking the same language, as German, or Italian, or English. It is certainly a grand and captivating idea, and it is no wonder that the public mind of the world takes to it, and sacrifices a good deal to practically realise it; but, like every other good thing, it has its disadvantages as well as its advantages. Without dwelling for a moment on the grandeur and good to be got out of such a state of things, and on such a division and distribution of the civilised world, we may be allowed, perhaps, to say a word on one or two of the disadvantages inherent, as it would seem, in such a state, and more particularly as regards the working portion of the community.

Again, and it is a subject which has hardly received the attention which it so well deserves, what a curious thing it is that nations should have what we may term "artistic periods," or eras, times in which they seem to put forth all their artistic strength and power, and to concentrate into a few years the whole art power which is in them, as in the time of Michelangelo, Raffaele, and Leonardo. There never was before nor since such a time for painting; it all seemed to concentrate itself into a few years of fleeting existence, and then to die out without possibility of renewal. Why is this? and why should art flourish at one time and not at another? What was there in the times of those giants of painting more than at this hour, that should have made them what they were, and that there should be absolutely nothing now to succeed them? Can any one offer any theory of explanation? Art power never entirely dies out; there is always a natural supply of it, always ready for its special work, provided only circumstances are favourable to its real and healthy action, and opportunities offer for its profitable production. We think we can see a cause for this, at least a partial one, but for the present we put the fact before the reader to help him to look into our present subject with more clearness. There is yet one other subject perhaps more to the purpose than either of the two we have named, important and vital as they are; and it is this, — the feeling there is, or rather *mania* we might call it, to teach other nations *our own way* and modes of work; or, in other words, to "civilise" them, as it is called. Vast sums of money are annually collected for the purpose of almost compelling other countries, such as India, the vast peninsula, almost a continent, of Hindostan, to accept our institutions, and literature, and art manufactures, and, as far as can be, language itself. We seem to feel a sort of morbid pity for the poor Hindoo, and to fancy that all he wants is to be made as English as possible, and as unlike his own natural self as can be. There are those who, had they but their own way, would destroy all his architecture, his temples, his cities, his modes of work, manufactures, and everything else, language included, and make a genuine Englishman of him. Happily this is impossible; but if it were possible, would it be wise to do it? There can be no little doubt that in the original thought and constitution of the world, it was intended, not that progress or "civilisation," as it is called, should assume one uniform type and likeness, but that there should be in the very nature of things a vast number of such types, varying in each time and country, and each one capable in itself, if left alone, of expanding into new and untried forms, peculiar to itself, and unlike anything else. Is it well, therefore, artistically considered, to civilise or fill with our art-manufactures the whole wide extent of India? Surely it cannot be. The effect of it must be in the end, and if perfectly successful, to fairly blot out one of the great inventive ideas of nature herself. Nothing can be more original, whatever its art worth, than the art and architecture of the Hindoo, and we are told on

all hands that his language, the Sanscrit, is the first and greatest in the world, far surpassing even the Greek itself. We have been led to these thoughts from some profound cogitations on the late exhibition of working men's productions at the Agricultural Hall. This exhibition was, without doubt, a remarkable one, and full of the deepest interest, and in it there was concentrated as much of the spirit of modernism as there well could be. It was not confined to things produced in this country, but contained something from nearly all others; indeed, it epitomised the working world as far as it went, and as it now exists. I professed to be, as all know, an exhibition of the productions, but of the master tradesmen of the world, but of their workmen, the artist-workmen of the time. What it all proved it would be impossible in our few words to indicate, but one thing at least it visibly showed, viz. this,—that other countries seem to be at present in the same state of transition as respects art as we ourselves are. Did any one observe it, that there was no one genuine specimen of indigenous art in the whole building; nothing was purely and solely "national" in its origin; nothing seemed to come solely from the place it belonged to, but to be compounded of different elements, got together no one can tell how, with but the original stock existing only as a kind of foundation or block on which to work? Let us name one or two things only by way of example,—truly melancholy things to look at, and to think over. Spain is at present going through a most curious phase of national existence; she is following the poor and truly pitiful instinct of the passing hour, and is getting together a foreign element of progress. Some workman from Spain,—from Saragossa, we think it was,—spent three years and a half, so the card on it said, in putting together, and carving in the most elaborate way, a small pianoforte, copied, as it would appear, from some cheap instrument by some inferior maker here. This piece of mechanism was carved, as we have said, in the most profuse and elaborate way, on every part of it; there was no space left uncarved, and it was all carefully and almost painfully done, and took the man who carved it years to accomplish. But what was it that this painstaking man covered his pianoforte with? Simply, a copy of arched and wall-surface decoration from the Palace of the Alhambra, as far as he could make it out. Most people know what the Alhambra is, and how it is decorated, both from the well-known book of Mr. Owen Jones, and from his reproduction of a part of it at the Crystal Palace. It was from this that all the ornament and carving was taken, but, of course, reduced down to the scale of a bit of furniture. It was a truly pitiable waste of painstaking labour, and what struck us more particularly in it was the fact of its being all copied work, and nothing else, the workman evidently not knowing what it was that he was copying or reproducing, or what it all meant. How it would have surprised him to see a genuine piece of furniture out of the old Alhambra Palace in the days of its prime, when it was a living reality, and peopled with the human beings who built it. Some little idea may be got of this from Mr. Lane's book on the "Modern Egyptians," and from one or two specimens of Arab furniture at South Kensington. A table, or a fountain, or a stool, in the days of the Alhambra, was as unlike the room in which they were to be placed, as those things are unlike each other nowadays; and we mention this production to show how completely continental Europe is at sea in such matters, as well as ourselves. This ingenious man would never have thought of doing what he did but from the startling fact of his not knowing what else to do. He had no idea how to decorate a piece of furniture otherwise than from forms got from the walls of a palace; and no modern Spanish palace wall affording him anything to go by, he must needs go back in time, and away from his country almost, and fly to the Arab, once his master, for an idea; and then having got one, was utterly blind to the right use to be made of it! Let us repeat it,—it took three whole years and a half of this good man's life to work out this poor notion. We have mentioned this Spanish production more especially from the fact of the comparative insular position of Spain, and from a sort of hope we always had that something original might come out of Spain consequent on her insular state, and from the fact of her being, as we are told, "behind the world" a little. To be behind the world in these days

means that of not being thoroughly, or not at all, in the active production of art-manufacture and art-producing machinery, but the being compelled, through the absence of those, to adhere to the old-fashioned system of *hand work*; or, in other words, of real art-production. May there not yet be in the interior parts of Spain some genuine art? And if there be, by head and hand, such work, what is it like, and what style is it in? What sort of work is the rough cottage furniture, and what the pattern or ornament, or the rough clothing worn by the common people in the wild mountain hollows of Spain, and in the out-of-the-way small towns where the people are too poor to buy foreign goods, and are obliged to manufacture by hand their own? Is the style of it Gothic, Renaissance, or Moorish, or more primitive than either?

We have no intention of going all through the late Exhibition, but only to draw out one or two thoughts from it; so shall but mention one other section of it,—the "Indian," as it was termed. This was more dismal of the two than the Spanish; for one always expects some genuine and characteristic work from entirely out-of-the-way and foreign sources like Delhi, or Agra, or Bijnore, or from villages on the banks of the Ganges. The place is too large, and the interior parts too difficult to come at, to be as yet entirely flooded with English or French manufactured goods, and cheap furniture from Bethnal-green. The objects produced must be, to a certain extent, real and genuine, and from the people themselves, without help from external sources. Men work traditionally in Hindostan, and the same trade keeps in the same family from age to age in a way that is truly wonderful and beyond our powers of conception; so that whatever the disadvantages of, such a system of doing things may be, there is, at least, one advantage,—the power of doing the work in a genuine and *bona fide* way. What the father does, and the grandfather has done before him, the son is now doing. The old idea which the family inherited so many ages ago has come down to the youngest child; so that time is almost annihilated, and the far distant part lives in the present. Of course, it need hardly be said that the few poor specimens of "Indian" work shown in a glass-case were from well-known localities,—Anglo-Indian productions, wherein there is always to be found an effort to copy some object or other of English manufacture taken over for English use, and made "Indian" by the simple process of carving Hindoo ornamental forms on it. It is a truly unfortunate and heartrending business; for it is neither one thing nor the other. An English scroll-ended-and-not-to-be-sat-down-on show sofa, covered all over with elaborate ornament from some Hindoo temple, dedicated to Siva, with all the emblematic figures left out, and nothing but little scrolls and unmeaning knobs of ornament sticking all over it, is not particularly interesting; and we can only in all charity sincerely hope that no "Indian" had anything to do with such an abortion and foolish waste of time, material, and money, beyond simply carving it as per order! What a pity it is that we cannot see some genuine work from the interior towns, uninfluenced by foreign work of any kind or from anywhere,—the unaided thoughts and design and work of the people themselves, made by themselves and for themselves, and for their own uses, and to supply their own wants. Let us hope that in the coming Exhibition we may see some few things from the India of the past and present; not from English Calcutta, but from some town or village of which no one here at present knows anything but the name. Working-men's exhibitions without individuality of both men and country, must be viewed as failures.

A NOTE IN GLOUCESTER.

ARCHITECTURAL interest in Gloucester centres almost entirely round the cathedral, the continued restoration of which appears to be the only work that can be called at all extensive, which has been carried on there for some time past. The nave and south porch, as our readers are aware, were restored some little time since under the hands of the great consulting physician in these cases, Mr. Scott: the restoration of the nave consisting chiefly in removing whitewash, and blinding with circular iron ties some of the ponderous but probably not overwell-founded columns; that of the south porch involving considerable reconstruction of tracery, &c. Operations have

for some time past been vigorously progressing in the north transept, now all but completed; and a commencement has been made in the south transept by filling in with new stone a decayed portion of the north front. In this part of the work a good deal has been done in the way of trimming and reinstating decayed portions of the stonework, and the removal of the inevitable whitewash from the stone and the Purbeck shafts, which it had deposited of their fair show; and the cutting and reinstating seem to have been as moderate in amount as were consistent with the endeavour to convey the appearance of newness and freshness which is expected of an architect who has a restoration put into his hands. The stone employed for the interior work is chiefly that from Falmouth, a tolerably hard and very white stone. After the work in the transepts and choir is completed, it is understood that, if funds are forthcoming, the process of restoration will be extended to the presbytery and Lady Chapel. A great deal of whitewash there is here to be scraped off, certainly; and the mullions of some of the windows are much injured by time and weather, and require reinstating; but with regard to the interior, with its elaborate and multifarious tracery and fan-groining and screen-work, let us hope that this will be tenderly dealt with. There is no such dilapidation here as seems to call for the "sweet restorer," and a simple scarfification to get rid of the offensive covering seems all that is necessary for some time to come, without any such further cutting and carving as would despoil the old masonry of the characteristic appearance and expression which no new work can absolutely imitate. The decoration of the choir roof, in colours in which blue and gilding predominate, though far less crude and strong than many examples of modern coloured decoration, yet is not otherwise than a confirmation of the opinions recently expressed by a well-known writer, through the medium of these columns, against the over-colouring of stone-work; and there was reason in the remark made by a local mason at work on the job, that "the roof looked a great deal higher, sir, before it was painted." There seems no reason either that we should see a mass of colour on the vault over white stone walls: on the contrary, such a treatment rather deprives the building of the monumental unity of expression given to it by a roof evidently and palpably of one material with the walling, and forming, in fact, an integral part of it. "Late" as the work is at this end of the building, one cannot but look with delight at this exuberance of delicate ornament in almost endless variety; nor are there many interior effects in English architecture more piquant and charming, in a way, than that produced here by the aspect, first, of the great screen of coloured glass forming the eastern termination to the choir, and appearing from some points inside as the final boundary of the composition, till a change of position reveals the further perspective of the Lady Chapel beyond, with its repetition of fret-work and coloured glass; and perhaps few things could bring more vividly home to us the singular rapidity of growth in the Gothic style than the contrast afforded between the severe and massive grandeur of the Norman work in the nave, and the display of lacework in stone in the Lady Chapel, and the extraordinary meeting the vault pendant across the transept arches. Strike out the intermediate links of the chain, and who would suppose the two styles to be so closely connected, hereditarily and chronologically? Of the stained glass in the nave we do not speak with much admiration: the central west window is a very unfavourable specimen of the art (or manufacture); the best is that at the west end of the south aisle, by Messrs. Clayton & Bell. We regretted to learn that the organ at the cathedral is not only an inferior one in some ways, but very much out of order. Considering that the Gloucester folk have in Dr. Wesley the most distinguished living church musician as their organist, and that their cathedral is the scene of a triennial music festival, they ought certainly to carry out without delay the intention which we heard has been mooted, of providing an instrument more adequate to the situation.

As we have hinted, the architectural visitor in Gloucester will find little to interest him beyond the precincts of the cathedral: considering the long history the city has behind it, its four main streets, named (as in some other towns of Mediaeval origin), Eastgate, Westgate, Northgate, and Southgate, are remarkably

devoid of any monuments of the earlier days of the place; nor do we know that a search into out-of-the-way nooks and alleys would afford anything to repay the trouble. St. Michael's, a very late Gothic Church at the central crossing of the main streets, is worth notice, as displaying a solidity of design unusual at the period, especially in the treatment of the buttresses at the angles of the tower, the lowest stage of the tower being brought out by a deep set-off to the face of the buttresses, and thus forming a massive base to the whole tower. In Westgate-street, St. Nicholas church shows what would have been a fair late tower and spire, but the latter is only half finished; one of the aisle windows, which are of a very late debased design, with round-arch heads, has recently been fitted in anew with a species of plate tracery, in a style we are unworthy to describe. The commerce of Gloucester being mainly in grain, has led to the formation of a commodious dock, surrounded by warehouses, for the lading and unlading of ships; the dock being approached by a canal cut from the Severn, at Sharpness Point, about 18 miles down the river, and which allows of a safe navigation for larger vessels than could well approach previously by the less safe route of the natural stream, with its various bends and shallows. Those who are interested in church decoration will find it worth while to take a walk or drive of two or three miles out to the pretty village of Highnam, and inspect the church there, which has been decorated with frescoes, as our readers know, by Mr. Gambier Parry, whose residence is not far from Highnam. So far as the decorations (which are still progressing) are completed, they consist, firstly, of a kind of diaper, of chocolate and green, in geometrical patterns, carried right round the nave as a dado; in the north aisle a conventional "drapery" design, in red and green, painted above this (the whole effect being here rather too dark); and on the south aisle wall a series of ornamental crosses, with texts, one between each window. The effect of this is brighter and pleasanter than on the north side. The chancel walls are painted in diaper of a similar style, but in brighter colours,—the dado in red and green, the upper part with crosses and flour-de-lis, in gilding, on a light ground. The more important items in the decoration consist of a large painting of Christ (enclosed by a vesica) and the Apostles, on the wall over the chancel arch, the spandrels being filled up by angels with trumpets, skilfully grouped, so as to fill in the space without any straining of the composition or attitudes. The upper portion of the painting is too much in an archaic and stiff style to interest us much as a specimen of figure-painting; but the eastern compartment of the nave, which has been more recently finished, is a great improvement in this way. On the south side we are shown the "Expulsion of Adam and Eve from Paradise" (we can scarcely congratulate Mr. Parry on his treatment of the female figure, as regards the refinements of drawing), and an angel flying over the group—a very elegant and happily-conceived figure—seems to direct their attention to the representation on the opposite side, where is painted the Annunciation. Under these two groups some heads of Scripture characters in medallions are painted, that of St. Peter showing considerable character and originality of expression. But by far the best bit of the work, regarded artistically, is the painting (on a smaller scale) occupying the position of a kind of "frieze" (if we may borrow a term from Classic architecture) over the windows of the north aisle. The portion finished, representing the entry into Jerusalem, comprises figures and faces of great beauty and refinement of expression; and we can only hope that the whole will be continued in the same simple and natural style, so far more pleasing to us unprejudiced eyes than the more conventional figures, with gold nimbi, which are too often considered a *sine qua non* in church decoration. If the painting of the nave roof, however, is to be continued in the same strong and violently contrasted colours in which it has been commenced, it will soon kill the best of the frescoes below, by the help also of the heavily-toned stained glass which mostly fills the windows, and is of no very superior design. We very much question whether the union of stained glass with fresco-painting is possible with entirely good effect, the transmitted light being always so much warmer and more powerful than the reflected light. The chancel arch itself, we should observe, has been painted in such strong and variegated colours as completely to destroy

the effect of the mouldings; the light tinting of the eastern arches of the nave is far better in appearance. In architecture we may seek powerful effect either from surface light and shadow or from colour, but not from both together; they are antagonistic, and the strong colour of the painter nullifies the effect of the rolls and hollows of the mason. Externally the church (by Mr. Woodyer, we believe) is a good specimen of modern Gothic work, the tower and spire especially being decidedly above mediocrity; and a very picturesque cottage for the sacristan, near the church, is a further specimen of the ability of the same architect. On the whole, we may return from Highnam with the feeling that there is architectural activity around Gloucester, although there is but little of it displayed within the boundary of the city.

TREATMENT ADAPTED TO MATERIAL.

AMONG the many varieties of skill which are necessary to the excellence of each work of art there is one which, as it seems to me, lies in danger of being overlooked, or, at least, of being treated with something like oversight,—I mean that particular skill that must emanate partly from the designer, but far more from the workman, by which the special qualities of the material to be dealt with are recognised, valued, and expressed.

At the first glance we should be apt to say that a beautiful form will be beautiful, whatever the material in which it is shaped; but this is now so generally admitted to be a false doctrine, that it is not necessary for me to pursue the argument against it. My present object is to show that, given the *design suited* to stone, or wood, or metal, there yet remains to the workman an excellent field for the exercise of his perception and the display of that particular skill by which every excellence of his material is made the most of.

Without going the length of saying that every variety of every material calls for a special style of execution, I do say that the subject demands much closer attention than it receives, and that it is well to bring forward some of the more notable instances, and to point out how or where we may look for the peculiarities of texture or substance which should influence the use of our tools.

Let us, then, begin by considering the *solid* materials which may be moulded or carved. The first, and most important to architects, are those materials which may be classed generally as "stone." Under this head are included materials of very varied qualities and characteristics, so varied, indeed, that one almost may say that each variety requires its own treatment in sculpture.

We may, however, group them together broadly under a few heads; and then, looking back historically, we shall see that the whole style of art was, in early ages, affected by the peculiarity of treatment rendered necessary or possible by the characteristics of the materials used, bearing in mind that the most esteemed materials being used for the most noble monuments, and those monuments having the strongest hold upon the mind and the most powerful influence in art, so the working of those materials gave the key-note to the art-work of that age or country.

Granite.—Thus, as we find the earliest and grandest sculpture of Egypt worked in granite, the beautiful and durable stone of Assouan (Syene), so we find all Egyptian sculpture partaking, to some extent, of the characteristics of execution most suitable to that material. Broad, even surfaces, crudely-rounded contours, and obtuse or rectangular sections prevail. A thin "arris" or acute angle is almost unknown. The value of the material also is much enhanced by a high polish, which is only compatible with broad surfaces and bold roundings. Where greater detail is required, it is either cut deeply, at right angles to the surface, or slightly, through the polish, and left dull in contrast with the polished. And as the forms must be of the simplest and most conventional, so the detail must be very limited and very expressive.

Marble.—In the beautiful white marble of Greece we have a material the admirable qualities of which may almost be said to have had a large share in perfecting Greek art. The workman must have taken delight in its exquisitely even grain and pure colour, admitting, as they do, of the most delicate expression of form, and of the highest mechanical finish. Indeed, it is impos-

sible to compare the progress of Greek sculpture, from the archaic to its more perfect development, without feeling conscious that the artists were gradually recognising the wonderful capabilities of their material, and were led on to fresh efforts and more careful study, in consequence.

In addition to its beauty, the ease with which it is worked, and its durability, encourage the use of fine sections in mouldings, sharp arrises, and delicate detail. The even, crystalline granulation of surface is admirably calculated to express the roundings and the most subtle gradations of shade. Consequently he who, overlooking these special qualities, executes his work as if in a coarser stone, throws away much of the excellence within his reach. The semi-transparency of marble gives a peculiar value to thin sections under some conditions; and occasional acute angles, in section, may almost be said to be necessary to the full exposition of the nature of the material.

It must not be supposed that, even among the ancients, an equal amount of intuitive skill was possessed by all the workmen employed on one building. Let any one who has the opportunity examine the several blocks which formed part of the frieze and cornice of the *Brechtheim*, now lying in the British Museum. On looking closely he will find an immense difference in the method of finish in one block and another (compare those numbered 127-129). Even at this lapse of time one can almost say that the worker of one block was thinking of *his work*; the other of *his wages*.

The student of "material" will also do well to examine very carefully the sections of the draperies and other portions of the best Greek sculptures. He will find nothing overlooked there. Every surface, every edge or angle is so worked as to use to best purpose the light which falls on it. If, too, he observes in these works the treatment of the human face and figure, he will learn how the *breadth* of light must be preserved; and how, when emphasis is needed, the shadow must be cut so deeply as to overcome the luminous white of the marble.

Figured Marbles.—What I have been saying applies to white marble only. "Veined" or "figured" marbles admit only of the boldest moulded forms, and not at all of carved detail, which only quarrels with the "figure" which is the material's natural beauty.

Stone.—In the commoner varieties of building stone we have materials of a grit variously coarse, more friable, both in working and in wear.

These qualities necessitate coarser "arrises" and "fillets," and, therefore, heavier contours in the mouldings. It is well to bear in mind that the *apparent finish* or *delicacy of mouldings* is, to a great extent, determined by the delicacy or otherwise of the narrow fillets.

The colour of the common stones is again less even than that of marble. The treatment of the detail has therefore to be vigorous enough to overcome its inequality. In comparing the buildings of Greece with those of Rome, we see that this difference of treatment is very observable.

The detail, in stone, requires stronger definition, which is obtained by greater relief and depth of cutting. So that often where low reliefs would suffice in marble, high relief or bolder forms are requisite in stone. I am, of course, supposing the conditions of light, or position, to be equal. Climate or other special circumstances may largely affect the treatment; nor am I now considering special design so much as special workmanship.

It will be readily understood that according to the coarseness, or fineness, or friability of the stone, the treatment may be modified upon the same general rules. It may, however, be as well to enumerate a few leading points.

In carved details, stone allows considerable freedom. Deep undercutting is admissible and useful when not carried to such excess as to expose the subject to risk. Projecting masses must always be corbelled, so to speak, in such a way as not to have a tendency to break themselves off. Thin edges are incompatible with so friable a material, but lightness may always be given by bevelling back to the ground.

Where strength is expected, a rectangular section is agreeable to stone: indeed, a square edge seems constantly demanded; and an edge presenting an angle of less than about 60° or 75° is too weak for the material. To sum up, the ordinary building stones require a firm, vigorous, substantial treatment, with sufficient breadth and depth of cutting to overcome the more or

less irregular colour, according to the distance at which the work is intended to be seen.

Of *Stucco or Plaster*—the treatment may be classed under two heads; that moulded by hand, and that cast in moulds. The two methods may also be blended.

In working plaster relief ornament by hand, a great freedom of touch and variety of form are attainable and desirable. At the same time, thin edges or deep undercutting are rendered undesirable by the friability of the material. The degree of finish must depend rather on the conditions of application, since its texture may be rendered as fine as that of ivory; and a pure and even tone of colour may be obtained, either in the material, or by subsequent tinting.

Almost any degree of vigour may be given by bold modelling, keeping the lights broad, and not too much softening away the tool marks. Excellent examples of plaster treatment may be seen in the ceilings of many old London houses of the period of the Georges, and the elegant and spirited stuccoes of both ancient and mediæval Italy afford valuable teaching. Where the ornament is intended to be painted or coloured, care should be taken to avoid narrow quirks, which may become stopped, or thin edges to be broken; and if the relief be very low an incidental outline is useful.

For the treatment of plaster ornament cast from moulds, we cannot do better than observe Arabic or Moorish work. Except where a reproduction is attempted (with which we have nothing to do now), ornament produced in this way should be clear, well defined, not undercut, and arranged so as to draw readily from the mould, and require little subsequent finish. It is applicable, of course, chiefly for repeated or diaper ornament, &c. In Moorish work beautiful soft gradations of shade are obtained, not by rounding or moulding the face or edge of the ornament, but by introducing two or three distinct "strata" of ornament, interlacing with each other, each on its own level,—a plan in every way adapted for work cast in moulds. In combining the cast and hand-worked methods, the simpler and more rigid parts may be cast, leaving the lighter detail to show the workman's hand.

Many of the above remarks apply equally to *terra cotta*, in which, however, partly on account of the coarser material, and partly because its use is most often external, greater boldness of execution is demanded. A certain rough plastic touch, with rather hard edges and strong surface lines, tells best. (See the details of Certosa at Pavia; and for the higher forms of art, the Florentine portrait busts of the fifteenth century, such as Nos. 7,621, '61, and St. Jerome, 8,383, '63, in Kensington Museum.)

Undercutting, fine arisies, and fillets should be avoided.

From "terra cotta" we easily pass to the glazed material, as "della Robbia" ware, and to pottery. Here angular sections are to be avoided, the surfaces all rounded; and it must be borne in mind that, as a number of small high lights only perplex, it is desirable to maintain great simplicity and breadth in the moulded surfaces; and distinctness in the outline of the forms to be expressed.

Where the design is set off by a coloured or tinted ground, *without glaze*, a careful outline and sharply-executed detail are required; for examples we have but to look at the productions of Wedgwood, many of which are, in their way, perfect.

Under a *glaze*, however fine, low relief requires a more delicate and softened treatment, with an avoidance of hard outline or sudden protuberances. Of this class of work is the "Celadon" ware, of which a splendid sample is the Cobden vase, on view at Kensington. The conditions of this material are,—on an opaque tinted ground, a semi-transparent white relief, with a high glaze over the whole,—conditions favourable to extremely subdued relief and softened outline.

Allude to these finer descriptions of pottery, because, in the form of medallions, &c., they are occasionally used to decorate either the building or its accessories.

Wood Carving.—The grain and texture of wood vary so considerably, that comprehensive rules of general application cannot be laid down. It is not difficult, however, to show in what respects general rules may be observed, and at what points they must diverge according to the material to be dealt with.

Some woods are of so fine a grain, and so close a texture, that they are capable of almost

unlimited delicacy of finish; and of these the harder sorts will take a soft hand polish, which places them almost on a par with ivory. I need only refer to that wonderful specimen of wood-carving—the cabinet, by Foudrinio, of Paris, from the Paris Exhibition of 1867, now at Kensington. Work of this description is, however, so exceptional as not to demand so much notice as the carving of the various woods in ordinary use.

In such woods as oak, walnut, or mahogany, we have materials with a more or less pronounced grain or texture, in colour not quite even, readily cut with a sharp edge, and of a tenacity altogether different from the brittle nature of stone, enabling it to bear considerable undercutting or perforation without risk. These are all qualities admitting of or requiring special treatment.

To commence with the first-named condition—the visible grain or texture. It is obvious that the workman will select for his carving that wood which is most even in texture, grain, and colour, since all strongly marked grain or figure tends to confuse and destroy the effect of his work. Still, even when he has done this, he has in oak a very apparent grain, and here or there some amount of "figure."

Oak.—The carver in oak, therefore, must seek carefully to execute his work in such a way as to overcome the opposition which these qualities present. His lights must be preserved broad and clear, and in high relief; the leading intention of all foliage distinctly marked, the finer lines or stems preserving a sharp outline. The shadows must be bold enough to explain the forms, intensity being given by bold undercutting. Much assistance to the expression may be given by the actual tool marks. Nothing is so fatal to the spirit of wood-carving as glass-paper. Yet, bold though the execution of the work be, it need not appear coarse; the strength and tenacity of the material allow of thin edges, and considerable freedom as to detached or perforated work. But above all things let the wood-carver avoid a thick, square edge; an edge at right angles with the face of the work. This at once gives his work a stony character, which no mere finish will obviate.

I know no examples better illustrating the exact capacities of oak than the exquisite stalls of Amiens (1528), and the beautiful panelled door enclosure, by Paul von Scheldens, in the town-hall of Oudenarde. There is an excellent model of the latter in the Crystal Palace.

In *walnut-wood* we have a material extremely suitable for the carver's art. There are many varieties, differing greatly from each other; some abounding in strongly marked and often beautiful figure; others presenting a mellow, even grain (with but a slight "streakiness"), and an agreeable grey-brown tone of colour. When this latter class of wood is used (and its fine pores are, upon the completion of the work, filled up by a judicious wax rubbing), results may be obtained as satisfactory in the way of wood as those from bronze are in the way of metal.

To those who would learn the style of finish and execution adapted to walnut-wood, I would point out the numerous works of the Siennese carvers, the stalls of St. Pietro at Perugia, and of St. Maria Maggiore at Bergamo, both by Stefano da Bergamo. There are also some admirable benches and a desk in the little Sala di Cambio at Perugia; and the numerous grand doors in the Vatican, which likewise present excellent specimens.

In the Museum at Kensington there are a few good works of this class. Modern Siennese work they are, but the artist has well caught the style and method of the old carvers. I do not call to mind any prominent good example of *ancient* carving in walnut wood in that collection.

The numerous coffers in the Cartoon Gallery have no special merit of execution.

It will be observed in the examples I have quoted that a certain *precision* of touch is common to all of them. The lights are crisp and well preserved, always with a view to carrying the eye along the *motives* of the ornament. If it be a scroll with a fine stem connecting foliage or husks, observe that the eye is always made to travel along the *centre line* of the curve. The section of foliage or stem is such as to take the light in the proper direction; the fine stem is so sharply cut (though sometimes a mere thread) as never to fall of expression, either by means of its fine high light or sharp little shadow. In this way even the finest lines are not allowed to be lost in the dark colour of the wood. It will be found also that excellent use is made of the tool marks, which greatly assist the expression of the work.

I must not be understood to proscribe the use of the "*figured*" class of walnut-wood. On the contrary, this, beautiful in itself, should be used for such plain, flat surfaces as will exhibit and derive embellishment from its beauty.

Ivory.—Holding a place superior, but closely allied to the finer woods is ivory. This beautiful material has been very highly prized for the purposes of art from the earliest times. Its close, homogeneous texture peculiarly fits it for the finer kinds of carving; and the beautiful surface of which it is capable, together with its soft, even tone of colour, have frequently induced artists to adopt it for works of a size considerably beyond what we need consider now. The form and size of its natural growth may, in a general way, be taken to limit the size of its use, which is therefore ordinarily confined to a surface of a few inches. There is hardly any limit to the finish and elaboration of detail which may be given to a few inches of ivory. High relief or low relief appear to equal advantage, and the conditions attached to it appear most simple: the work must never be rough or coarse, and must always exhibit the exquisitely delicate texture of surface which is natural to it. Its strength admits of its being undercut to almost any extent, and of being worked to almost any degree of tenacity; whilst the remarkably soft gloss of its surface exhibits to advantage either the boldest or most delicate roundings.

The several metals in use for ornamental purposes present conditions different altogether from those distinguishing the materials which we have been considering. If we except cast iron, the condition of friability is wanting, and we are therefore at once admitted to the use of the thinnest sections and the most acute angles. Their different degrees of ductility also represent a special quality to be expressed. Their capability of being bent and twisted without losing their strength is a valuable quality to be recognised. In treating each separately we shall have to be guided partly by the different degrees in which they possess these qualities, partly by their colour, and partly by the greater or less extent to which they exhibit bright high lights, or are capable of receiving a burnished surface.*

THE CHURCHES OF LINDISFARNE.†

LEST our readers should be in doubt as to the exact geographical position of the Archdeaconry of Lindisfarne, we will premise a notice we are about to give of an architectural survey of it, by stating that it comprises the north-east coast line of Northumberland from Newbiggon to Berwick-upon-Tweed, and runs inland up to the base of the range of the Cheviot Hills. It also includes, as may be inferred, the seat of the Columbite Seminary, Lindisfarne, or Holy Island, the semiland lying about two miles off the coast line, to the north of Bamburgh, the old Saxon metropolis. Within its confines are seventy-six fabrics in which the service of the Church of England is performed, besides many ancient ecclesiastical buildings now in decay, and numerous modern edifices belonging to Nonconforming bodies. The district, until the year 1843, formed part of the archdeaconry of Northumberland,—one of the two archdeaconries into which the bishopric of Durham was divided; but at that date it was constituted a third division of the episcopal territory; and in remembrance of the early Celtic and Saxon see which preceded that of Durham, the title of Lindisfarne was conferred upon it.

We are not dependent, altogether, upon the architectural fortunes of the locality for the history of the churches, for there are various literary sources extant, belonging to successive centuries, from which conjectural outlines of some of them might be made out. The charges of the late and present archdeacons give many facts relating to recent alterations. Hodgson, in his voluminous "History of Northumberland," makes mention—too brief and unappreciating, sometimes—of the religious edifices of each parish. Raine, in his "History of North Durham," made scant, though not undisingering, mention of those that are situated in that tract of country that until recently, politically, formed

* By Mr. J. D. Craze. Read at meeting of the Architectural Association. The remainder in our next.

† An Architectural Survey of the Churches in the Archdeaconry of Lindisfarne, Northumberland: containing Plans and Views of seventy-nine Fabrics, and Sketches of the principal Antiquities in them." By Frederick Richard Wilson, architect. Photo-lithographed by Mr. E. M. W. Lambert, Newcastle-upon-Tyne. 1870.

part of the county of Durham. Hutchinson, Mackenzie, and Wallis traversed part of the ground, and wrote of some of the fabrics according to their lights. In the seventeenth century we have Dr. Basire's account of the dilapidated state of most of the churches. Camden shows us the chief and choicest. Two years after the battle of Bannockburn, the "Taxatio Ecclesiastica" informs us, every church in Alnwick rural deanery was laid waste. This was in the fourteenth century. The thirteenth-century rolls of expenditure preserved by the Dean and Chapter of Durham incidentally hand down word of the building and repairs of some of the structures. And then we have the writings of Symeon and Reginald, the Durham monks.

Nevertheless, we turn with considerable expectations of advices, if we may say so, of interesting architectural and archaeological features in a field so favoured, to a recent survey of the churches in this archdeaconry by Mr. F. R. Wilson. Among the seventy-nine fabrics he has measured and delineated there are twenty that mark the distinctive character of this border territory, in the possession of strong, sturdy, massy towers, capable of staunch defence. Edlingham Church, which stands, Mr. Wilson tells us, in the green leap of a valley between Alnwick and Rothbury Moors, is a case in point; and may be looked at as a fair representative of its courages—

"We may say that the Norman builders reared a nave and chancel here, and that the entrance into their church was at the south side, for sufficient of the Norman wall-stone still stand on the south side, at the east end, and at the point of junction of nave and chancel on the north side, to prove this; and the south side of the wall still intact, though it has been shrouded by a porch built in modern times. Before the bright, newly-quarried sandstone had time to tone down to the sad grey tint it now presents; before, too, the day of the Early English style had dawned, a north aisle was built, with an arcade of round-headed arches, such as were turned about the same time by the clever masons at Breckburn Priory. The tops of the columns of this arcade are scalloped, each indentation being enriched with bead ornament; and a strong pele tower was built at this time, adjoining the west end, for the protection of the inhabitants of the district, and for their gallant defence when the Scots came swooping down from the hills and sweepers off all before them. This tower is still standing, unscathed and hale, built in regular courses of different heights, with very long quoins, to suit the moor stones; with no entrance save from the church, no window-openings less than man-height from the ground, and these of serious, precautionary dimensions. The north wall of the aisle of this period, with the exception of a pointed doorway, now blocked up, with which it was subsequently pierced, has, however, disappeared, and has been replaced by modern walling, enclosing at its western extremity a vestry. The north wall of the chancel, some of the recent window-openings of both chancel and nave, the flat tiled roof, the low-hipped slate roof to the tower, and the porch, appear to be portions of the more modern repairs. At St. Hild's well, the porch building refused to demolish the Norman bullet ornamented doorway, but contented themselves with enclosing it in their ample, sombre, and stern-looked porch.

My attention has been called to a curious fact about the stone old tower by the vicar, the Rev. M. H. G. Buckle. There is a receptacle for a bar to the door on the outside of the doorway, which circumstance shows, that when fastened, it was barred on the outside from the church, and not from within. This indicates that it was probably used as a place of detention for prisoners of border warfare."

The incessant hostilities from the other side of the Tweed are also shown in the absence of ancient woodwork, all of which appears to have been destroyed; if, indeed, the acute Northumbrians were so incantious of their neighbours as to have furnished them with such a ready means of conflagration. With these exceptions, the churches in this district do not appear to be essentially different from others where good building stone is equally abundant. There are but seven spires in the archdeaconry, of which only two are ancient; there is but one crypt, which is at Bamborough; there are but few ancient bells; and ancient fonts are not numerous. But there are several fine Early English chancels; some curiosities, such as enigmatical openings of the nature, but not identity, of hagstones; nearly twenty recombent effigies; and, rarer riches still, seven instances of Saxon remains incorporated in existing buildings, besides one instance of Saxon foundations uncovered within the boundaries of a Norman church, now extending over the same site. Another distinctive feature in some of these Northumbrian churches is the appropriation of an aisle, or a transept, as the burying-place of the lord of the manor. Since the rising in favour of the young Pretender, and we know not for how long before, the crypt of Bamborough Vault has been only known as the Forster vault. As the pages and plans in Mr. Wilson's volume flutter over in our hand, we note that Sir Horace St. Paul thus owns considerable part of Doddington Church; that an aisle in Mitford Church belongs to the Mitford family; an aisle

in Embleton Church to the Crasters; another in Holy Island Church to the Haggerstones; that great part of Alnwick Church is thus divided between the families of Selby and Clennell; that the Burrelle occupy a transept, as a mortuary place, in Kirkcubright Church; the Ogles, another in Eglington Church. In these still, shadowy aisles lie the remains of the restless energetic beings who, in old times, organised the "Great Risings in the North," rumours of which ever filled the South with deep commotion. In the parish registers, too, is to be found word of some of these martial worthies; though the earlier generations, of course, belonged to the days when the only registration of their burial, beyond their heraldic devices upon their monumens, consisted of an entry of their mortuary gift to the account rolls of the neighbouring abbey or priory. One item in the survey, we must explain, consists of a copy of the first entries of baptisms, burials, and marriages in each church where the register is of sufficient antiquity to give them interest. The oldest register is that of the parish church on Holy Island, which dates from the reign of Queen Elizabeth.

Mr. Wilson's remarks upon the different modes of work practised by masons in the successive centuries, however, apply equally well, as we have indicated, to stonework in other localities. Of Saxon masonry, he takes the tower of Whittingham Church, with its "long and short" work at the angles, for an example.

For a specimen of Norman masonry, he takes Rook Church, in this archdeaconry. Here the stones are from 10 in. to 12 in. in height, even not larger than a man could lift, and they are laid in regular courses. Eight centuries have rounded their edges at the interstices, and toned the amber sandstone down to a sad dove colour; but that is all, for the work of the Norman masons has stood well, and flinches not, albeit the walls are filled in with rubble only. The north wall of this church was removed under the author's own care, northwards, to admit of an aisle, when this rough filling-in was noticed. There is more Norman stonework to be seen at Bewick, Ancroft, Norham, Shilbottle, and it is always the same. The Transition Norman masonry is better than this. A beautiful example of it exists in Breckburn Priory Church.

In this building, where round and pointed arches are interwoven in one fascinating design, the stonework is excellent, firm, and compact. Seven centuries of Northumbrian weather have failed to leave any mark upon it, save that of beauty of colour. The stones are rather larger than those of the Norman masons, but like them they are laid in even regular courses. Intelligence and devotion are to be read in every line of it. Whereas, we feel as we examine Norman masonry, that Saxon labourers carried the stones to and fro with protest and sighs, and perhaps with stripes from the Norman *ingénieur*, their taskmaster; this work impresses us with its silent appearance of ready compliance. There is an aspect of calmness and acquiescence in it, altogether captivating. We feel sure those who reared it believed they were doing so to the glory of the Most High. The Early English masonry is also excellent and regular, but on a vast scale, and massive. The narrow lancet lights left wide intervals of ashlar work, where all effect depended upon the finish of its execution. There is an air of austerity about it, but there is no short-coming; nothing less, in fine, than a rigorous stonework perfection. The chancels at Bamborough, Mitford, Holy Island, and Rothbury, the towers at Eglington and Ingram, and the west end of Ford Church, are examples of it. Of the stonework of the succeeding centuries, he adds:—

"But in the Decorated period, when cultivated taste began to lurinate in exquisite combinations of geometrical figures for ornamentation, the workmanship of the masonry was less considered. In the length of a course, here, and there we find a stone too unwieldy, or too small. When it is too large it projects into the course above it, and the level of the next one is obtained by the expedient of placing a smaller stone than the average upon the top of it; and when it is too short, its full height is made up with another smaller one. By these patches a general appearance of regularity is maintained; and that appears to have been the extent of the aim. Where there was a surpassing window to come, full of gracious and deft lines of beauty—a song of praise, indeed,—the Edwardian masons knew that the plain groundwork in which it was set would be but of little account.

And so with Perpendicular work. In proportion as ornamentation increased in esteem, the perfection of the ashlar work was disregarded. The stones of this time are about twice as long as they are wide; they filled the space that was to be filled quickly, and all taste and intensity of feeling were lavished upon the beautiful windows, the sumptuous doorways, the laughing, leering, grotesque gargles; the dainty crockets; the proud finials,

the label terminations, the doughty corbels,—the coigns of vantage, in a word, of the carver's art. The tower and the south aisle of St. Michael's, Alnwick, and the south aisle and porch of St. Lawrence's, Warkworth, are examples of the period.

When we come to more modern work, we may say that the marble temple of Greece and Rome were in men's minds. Smoothness; wide surfaces of the smoothest finish were in vogue. This led to coating rough stonework over with plaster, cement, stucco; various inventions to obtain a resemblance of the effect of marble, at a small cost."

From these extracts it will be perceived that the author has not considered bare measurements, or even perspective views, to be sufficient to give a fair presentation of the architectural wealth of the district. Without going into minute details, he has strung together, in three chapters, particulars respecting the history of the see of Lindisfarne, of the priory established on the site of the Saxon cathedral in Norman times, and of the locality from the Reformation to the present day, with which it is necessary to be acquainted to properly appreciate much of the work in it handed down to the present age, before he commences his individual survey of each fabric. Perhaps his account of the building of the Priory Church, after the Saxon cathedral had been deserted by the Saxon monks, who fled before the Danes with St. Cuthbert's remains, is as good a specimen of his manner of treating his subject as the volume contains; but it is long; and curtailment would divest it of its speciality.

Remote as Northumberland may appear to counties lying south of the Humber, it is curiously associated with London merchants, and with London guilds and companies, as in the instance of Woodhorn Church. Furthermore, some of the longest, straightest, brown-brick London streets are the property of Northumbrian noblemen and gentlemen, whose forefathers have lived in Border castles and peles, and been buried in their own mortuary aisles, in the grey parish churches among the hills and heather, or on the bleak sea-coast, since the Conquest. Twelve hundred years ago the Northumbrian metropolis was in the vicinity of Lindisfarne. Mr. Wilson's notes and sketches help us to contrast the one with the other, as well as to see much of the intervening centuries, very agreeably.

ORNAMENTAL ART IN BRITAIN.

At the annual meeting of the Halifax School of Art for the distribution of prizes, held last week, Mr. E. R. Holmes, Librarian to her Majesty, Windsor Castle, delivered an interesting address on "The History of Ornamental Art in the British Isles." Mr. Holmes said that when a nation learnt art, its progress was very gradual, but when learnt by individuals, assisted by such excellent models and masters as those whom he addressed had, it was comparatively at a rapid rate; but the method of progress was essentially the same. Pure art had its natural home in Greece, and thence it was developed in the Roman Empire, until it became known as Byzantine art, with which we in this country generally commenced. In Ireland they had to invent a comparatively new art for themselves. That was in the sixth century, and in which Ireland had always been supreme. Art was the fellow-labourer of Christianity, and it was introduced into England by St. Columba, whence it was afterwards transplanted into other countries, particularly France and neighbouring nations. The speaker then gave a sketch of the progress of art throughout the centuries down to the present age, and gave specimens on a black-board of the various styles of ornamental art in the successive stages of its progress. It was remarkable that every change in art was coincident with the change in a century. In the thirteenth century in England ornamental art was in the bud, in the fourteenth the leaf, and in the fifteenth the flower. Up to the fourteenth century England led the van of art from the early ages. After the fourteenth century France added to power of expression by the English, that of colour. When art declined in the extreme East, the new art arose in the extreme West. Ireland began with the mastery of pencil, and England reproduced invention in form. To the power of drawing and beauty of imagination, France added the splendour of colour. The first thing that students should attend to was that of getting the mastery of their pencils, then to educate their thought, and reproduce the thought by the mastery of the pencil, after which came colour.

ZINC WHITE AND STIPPLING.

CONTINUING to speak on this subject,* Mr. Barff, in his Third Cantor Lecture at the Society of Arts, said,—In describing the manufacture of zinc-white on a large scale, such as is practised by Messrs. Winsor & Newton, I made one mistake. Mr. Newton, who was present, corrected me after the lecture, and I feel it my duty to mention this mistake, in order to correct it, as it is liable to lead some into error as to the process which is used by that firm; and from the way in which they make their zinc-white, you will see, I think, that it must have a greater body and a greater density than that which is made in the way I described. I told you that after the zinc had been burnt, not in a current of oxygen gas, but in a current of atmospheric air, the zinc-white, together with particles of metallic zinc which passed along with it, was treated with water and levigated, and that, by subsidence, it was separated from the small particles of metallic zinc. Now, that is a method which has been employed largely, but it is not the method which is employed by these gentlemen. They pass the oxide of zinc in such a manner, over a bridge from the place where the furnace is, that it is perfectly free from particles of metallic zinc; the oxide passes into a chamber beyond—a chamber of wood,—and, you will judge, therefore, that it has got pretty cool before it has arrived there. It is collected in this room, and when the room is about half-full, so full that when a man walks in the oxide of zinc is almost up to his waist, it is collected in pieces of sacking, and these pieces of sacking are drawn together and squeezed up tightly, so that the oxide of zinc, when newly prepared, is pressed into hard, dense masses. It is found that by this process the substance, as a pigment, has a greater body than when prepared in the other way; and inasmuch as the want of body in zinc-white is one of the objections to its employment by artists and by decorative painters, this remedy does, to some extent, rectify that defect. But I cannot say that, by any process whatsoever, zinc-white can be made to have the body of white-lead. I think it cannot; but still I think it is the duty of those who are engaged in art to weigh in the balance the disadvantages of both substances. I think I showed you that white-lead is a substance which loses its colour, and, in time, loses that for which we most prize it, viz., its body. Now, zinc-white does not do that; and if there is a difficulty in employing it in the first instance, still it is better to employ it than to use a substance which is liable to such destructive influences as white-lead. Do not let it be understood for one moment that I am attempting to make a crusade against white-lead. I have no object in speaking against it, but my desire is that the works of artists, whether those engaged in high art or decorative art, or whether they be simply house-painters, should be performed with materials which will effect as perfectly as possible the object which they wish to attain. If a wall is painted with white-lead, it can be finished with zinc-white. I shall be met with this objection, perhaps, by practical painters, that the zinc-white will not cover well upon the lead. That is true, if the flattening is done in the ordinary way, but if you will simply allow a man to follow the person flattening with a large stippling-brush and stipple, then you will get your covering sufficiently solid for all purposes, and it will have a better effect upon the eye than if it were absolutely solid, for the small interstices that are left between its particles show the ground well, and give transparency to the effect of the mass upon the eye. We know well how beautifully stippled work looks. We know also that when we paint with a mixture of colours, intending to produce a certain tint, the tint produced is not as satisfactory as if we paint with these colours separately, one upon another. Why is it that artists glaze? It is simply that the ground colour underneath may have its value through the superimposed tint. From what I said about the effect of colour upon our visual organs the other night, viz., that waves of light are passing to a certain substance that absorbs all but one, or nearly all but one, and sends back that to our eyes, it follows that if we get wave motions of two distinct colours acting upon the retina, the sensation is much more satisfactory to us than if we got them so mixed that the wave motions act upon one another, and neutralise one another to produce that effect.

* See p. 26, ante.

If we desire to paint a wall with a sort of sage green, or Quaker green, as it is sometimes called, we know that by mixing a certain green pigment with a certain amount of red colour and yellow, we shall produce such an effect; but if we paint the wall first with red, and then stipple the green pigment over it, we shall have small spots of red sending back their reflected rays to our eyes, and the effect of such a treatment is far more agreeable, and the colour far more beautiful, and the tint far more pure, than if we were to mix all the pigments together which produce that colour, and lay them on all at once.

The subjects in nature which we paint are none of them flat-coloured. The green leaves we see, and depict in our pictures, are not really all green; for if you examine them under the microscope, you will find that they derive their colour from a number of small particles of green floating in an almost colourless menstruum, so to speak. Again, the human face represents to us a certain colour, but there is no large surface of that face which is of the colour which we see. There is a colourless skin over a skin which gives colour to the human physiognomy; and therefore the light, before it is reflected back to our eyes, has to undergo refraction. Then, again, when we look at the skin beneath, and examine it, we find that the colour is not evenly distributed over its surface; that here and there are spots, more or less near one another, of red, and others yellow, the red derived from the blood-vessels, and the yellow derived from fatty matters, and so forth; so that what we see is not a flat colour; and the way in which we represent that, I humbly suggest, should not be according to a simple flat treatment of combined colours, but the effect should be obtained from a judicious admixture of those colours by a process somewhat akin to stippling.

ODD DOINGS IN ACTON, MIDDLESEX.

SOME serious charges have been made against the Acton Local Board, at first anonymously, through the local Press, and more recently by the writer in his own name, Ewen Robertson. Although described as a "common carpenter, out of employ," he is evidently a man of some education, with a clear head; and, when before the Board, prepared to justify what he had said, showed that he was not to be easily put down. He may or may not be right,—some of his assertions are obviously overstrained; still, the Board, if wise, will reply to his charges. We will not now go through them, although it may become necessary to do so; but will mention two or three of them. If correct, they certainly serve to show that change is necessary in Acton. By-law 99, as quoted by the writer, says:—

"The walls of every new building shall be constructed of such thickness as shall be approved by the Local Board, and the foundations shall rest on solid ground, or upon concrete, or upon other solid substance."

Now when gentlemen make ridiculous laws to rule a large community, they must forgive the said community if they form some very ridiculous ideas. Should they say that the said law was the invention of a partially-diseased brain, every sensible man in England would believe them. The law belongs to the feudal ages, and not to the nineteenth century. By this law you rule supreme above Acts of Parliament. You can allow one builder to build a wall 4½ in. in thickness to whatever height and purpose he may think proper, if he does not intrude upon By-law 98; while another builder you can compel to build his garden-walls 18 in. thick. You, gentlemen, but you only, can drive through this by-law with five elephants abreast. In my letter of the third December, I stated that you gentlemen were a mystery. Now, I maintain that you are a mischievous mystery; which the following facts will substantiate.—How is it that you have compelled Mr. —, builder, in accordance with By-law 101, to carry his party-wall through his roof; whilst at the same time you allowed Mr. —, builder, to build three houses in Grove-place without the said walls?

Again, he says:—

"In your By-law 99, the following words are used:—

"And the foundations shall rest on solid ground, or upon concrete, or upon other solid substance."

Now, if you have compelled other builders throughout Acton to build according to this by-law, I find you have not compelled Mr. —, builder, to fulfil his share of local stability. I find that he has built his houses there upon the top of the ground that was turned over (four months before he commenced to build) 10 in. deep, and sowed and planted with peas and cabbage; the builder did not even take one inch of footings out, or use one ounce of concrete in some of his houses. The gentleman who used the ground was Mr. Jeffries, of Gansersbury-place, who will give you further information, if required. To build houses upon the top of such loose soil is inferior to Highland cott or Irish cabins. Yet if it is to be a rule, let all builders do the same."

Whether Mr. Robertson has exaggerated or not, one thing is quite certain, that the general Building Act which applies to the metropolis should be made to apply also to Acton and other suburbs, so that it may no longer rest

with the local Board or its officers to settle whether a wall shall be 4 in. or 1½ in. thick. With such uncertainty prevailing, we are not surprised to hear that land in Acton is less rapidly covered than is desired.

METROPOLITAN BOARD OF WORKS.

At the usual weekly meeting of this Board, the chairman opened fifteen

Tenders,

for the works of deepening and reconstructing the sewer in Queen-street, Hammersmith. The highest tender, that of Mr. William Crockett, was for the sum of 4,737l., and the lowest, Mr. George Young, for 2,837l. The last tender was accepted.

Damaging St. Stephen's.

The Works and General Purposes Committee brought up a report, recommending—

"That the Commissioners of Her Majesty's Works, &c., be informed, in reply to their letter relative to settlements in the buildings of the Speaker's stables in Millbank, and also in the pavement, gates, and railings of New Palace-yard, to the effect that the Board will, at the proper time, cause the injury done at New Palace-yard by their works to be made good; but that, with regard to the settlement in the Speaker's stables, the contractors assert that it was in existence before the commencement of those works."

The report was unanimously agreed to.

The Auction Business of the Board.

Mr. E. Dresser Rogers moved the following proposition:—

"That it be an instruction to the Works and General Purposes Committee not to carry out the resolution come to by them at their last meeting, viz., to allow Mr. Goddard, assistant valuer in the architect's department, to take out a license as an auctioneer, to sell the old materials of property purchased by the Board for public improvements."

The motion was carried by a majority of 24 to 6.

Tramway Schemes for the Metropolis.

The Parliamentary Committee presented a printed report with regard to the numerous tramway schemes it is proposed to carry into effect in the metropolis. The committee considered, that in the last two sessions Parliament had affirmed the principle that tramways were suited to large towns, and a benefit to the population; therefore they had confined themselves to a consideration as to the best modes of carrying out, and they made various recommendations as to lines to be laid down. These recommendations included lines in many of the chief metropolitan thoroughfares, such as Oxford-street and Holborn, Piccadilly, Tottenham-court-road, New-road, City-road, Caledonian-road, &c., and all the recommendations were adopted,—with one exception, as to Uxbridge-road.

THE SANITARY CONDITION OF NEWLYN.

SINCE the date of our article, much has been done in the way of compilation, by the three, or rather four authorities, which govern this place. We left Newlyn sick and dirty; it is so still, yet the Madron Highway Board has done something, the Paul Local Board has done something, the Penzance Board of Guardians has done something, and the Penzance bench of county magistrates has done something: the grand result is,—nothing.

It would be tiresome, to the point of pain, to say what they have done, but they are now trying all they know to make a scapegoat of the county surveyor (much to the discredit of those concerned).

Dr. Buchanan, from the Privy Council Office, has been down, and therefore we hope something will result for the benefit of the place; if not, the sooner England's sanitary laws are altered the better. We do not accuse the local authorities of want of earnestness; they are earnest enough, but we think there is sore need of a directing power. We would ask, supposing this county drain were clean enough to put *gambrobes* sufficient for 1,500 people, in the house (!) drain explain the fact of these being houses, containing twelve inhabitants, with no "convenience;" and yet we understand the county surveyor declared at the quarter sessions next subsequent to our paper, that such was the case. If a person owning houses and land in the place happens to be a county magistrate, is that a reason for fear of action?

If the district magistrates are positive of the

justice of their justice, why do they hesitate to levy the fine that they have imposed on the county surveyor of one pound a day until the alleged nuisance is abated? We recommend the formation of a committee (a small one), and, with an engineer to advise, at once beginning the work. Proper conveniences should be at once erected; and, for our own part, we believe that a practicable scheme for the utilisation of the sewage, and so turning it into money, would soon suggest itself.

One way would be by collecting the sewage at two or three points (not one point), according to levels, and so distributing it: the stream would afford lifting power if required. We cannot resist pointing to Newlyn and the authorities which govern it, as examples of the urgent need there is for a Central Controlling Board, both for highway districts and sanitary arrangements.

KEIGHLEY TRADE SCHOOL.

THIS school was to commence its operations on the 18th inst. It inaugurates a new era in the educational history of the neighbourhood. We gave a view of the building for the Keighley Mechanics' Institution and School of Science and Art when its erection was commenced, and at the opening of it we noticed it favourably. The several departments have got fairly to work, the opening of the Trade School being the last step taken. The club portion possesses a good supply of papers, periodicals, &c., and draughts and chessmen; whilst among other attractions, we are told, for the small charge of 2d. "hot tea and coffee may be had at any hour."

The evening elementary classes have been well developed since the building has been opened, and now there are voluntary teachers to over 300 boys and young men. A girls' class has also been formed. The superior accommodation for art purposes, at the disposal of Mr. Stevenson, is taken advantage of by a class of young ladies during three mornings a week, and at night by over 100 male students. Lectures on scientific subjects are being given in the Lecture Theatre during two or three evenings a week, and now the Trade School is to be added to the features of this important establishment. From an interesting paper on the subject of the Trade School, by Mr. Swire Smith, the Honorary Secretary, we learn that the rule and experience of the Bristol Trade School have been taken advantage of in the establishment of the Keighley School. Mr. Spencer is the English and science master.

THE LONDON BUILDERS AND THE LAW COURTS.

THE following, we have reason to believe, are the chief alterations that have been made in the form of contract.

The time for completion of the first contract is extended from seven months to twelve months. The penalty for delay is not to be enforced should unforeseen circumstances arise beyond the contractor's control. The contractor is not to be bound to execute anything unless it is obviously shown on the drawings or described in the specification, or unless he be paid for it as an extra. The contractor is not to be bound by the certificate of the architect if he shall consider himself unjustly dealt with. The certificate of the architect is not to be under all circumstances a condition precedent to the contractor having the power to obtain payment.

In the original form of contract the word *not* was omitted from the above-mentioned conditions.

CONCRETE AND DAMP FOUNDATIONS.

SIR,—Seeing in the *Builder* of the 24th of December, 1870, "Heat and Damp," with a question on each, and answers to them, I beg to take exception to the latter answer. "A bed of good concrete under floor will keep damp down." Now this I do not think correct, because when lime and sand are mixed with shingle (or beach, as we call it in Sussex), a porous substance is introduced, which substance, when in contact with a clay soil, will absorb the moisture, and bring it to the surface of the bed of concrete. Any of your readers may try an experiment for their own satisfaction in the following manner. Let them make a lump of concrete in the shape of a common brick; let it remain to dry; when

quite dry, put it into a vessel with an inch or two of water in the bottom. In a very short time it will be found that the water has impregnated the whole of the lump. At the same time let them put into a vessel some shingle quite clean, then let them fill the vessel up to within 2 in. of the surface of the shingle, and they will find the water will not reach the top of the shingle; that is, the shingle being non-absorbent, the top stones remain dry. In this part of the country (Halesham) we use shingle to pave on. We usually put on the clay about 4 in. of shingle, and thus pave on that, laying the brick in mortar. We then get a dry floor.

JASON THOMPSON, Bricklayer.

* * A bed of good concrete (over the whole site), that is, properly compounded of shingle, sand, and Portland cement, will be found, as we stated, to keep down damp likely to rise from clay soil.

Pro.

RAILWAY EXTENSIONS IN 1870.

ABOUT forty years since an event occurred in Lancashire that was considered of national, almost of world-wide importance, and it has proved to have been so, from the wonderful results to which it has led. It was the opening of about 30 miles of railroad. Many much more extended lines have been opened since that time, that have excited little more than a passing local interest, and in some instances scarcely even that. The ramifications of the railway system of the United Kingdom are now so extensive, that the additions from time to time of loops, junctions, extensions, even of new lines of considerable mileage, almost escape notice, and their magnitude, as an aggregate, can only be appreciated by bringing the additions together at certain seasons.

The last four or five years have been less than usually productive of either railway bills for new works, or of completed lines; and it is almost startling to find that in Great Britain, in the course of 1870, nearly forty extensions, junctions, and new lines were added to our railway system. These were various in extent, from the Dingwall and Skye, of 5½ miles, to numerous short junctions, of from a quarter of a mile to a mile in length. The most important additions to the railway system of the metropolis, referred to in a review of the year, in the *Builder*, was the opening of the Metropolitan District Railway from Westminster to Blackfriars Bridge. The remainder of the Metropolitan District line may be expected to be completed in autumn of the current year. Its terminus will be in Cannon-street, opposite the end of Queen Victoria-street; and there is now, after the legislation of last session, little probability that the "inner circuit," so much spoken of and looked forward to, in past years, will ever be completed. The Metropolitan line, which will furnish the other end of the horse-shoe, will probably terminate at Broad-street, in a working physical junction with the Great Eastern and East London lines, on a low level.

The remaining extensions of the metropolitan system opened during 1870 have been,—The Walthamstow Branch of the Great Eastern, of 2½ miles in length; about a mile of the East London, extending it to a junction with the South London line; a branch of the London and South-Western of 7½ miles, the Aldershot and Farnham; and a ½-mile junction at Hammer-smith; a London and Blackwall extension in the Isle of Dogs; and lastly, a junction of about a mile in length between the Midland and the Tottenham and Hampstead Junction lines at Kentish-town. All of these are more or less important; the last referred to will utilise the Tottenham and Hampstead, which has done very little service hitherto, and enable the Midland Company to carry their goods and mineral trains to the Victoria Docks.

Among the new lines opened in England have been several important extensions in connexion with the Midland system, including a line from Chesterfield to Sheffield of 13 miles; the Cudworth and Barnsley line of four miles, with several junctions; the North-Eastern, which has added to its system the York and Aikern line of 26 miles; and a very important junction at Newcastle—the Quayside line of 2½ miles, bringing its system into connexion with the quays on the Tyne. This line has been long in hands, the delay in its completion and opening having been mainly caused by the corporation. It is expected to prove of great value to the commercial community. The Darlington, Merrybent, and Barton line is also of great importance, from the mineral

traffic expected to be created by its connexion with limestone, ironstone, coal, and copper mining districts; it brings a supply of limestone, for fluxing the iron ore, above twenty miles nearer Cleveland. The line has a fine bridge over the Tees. It has still to be completed beyond Barton. The Silverdale and Market Drayton line, of 12½ miles, has five stations. It brings the agricultural districts of South Shropshire into connexion with the Potteries, and North Staffordshire into connexion with the Great Western at Market Drayton. The London and North-Western has added to its system a line from Saddleworth to Marsden, Yorkshire, and important connexions with the North Docks, Edge Hill, and Boodle, at Liverpool. The Northumberland Central Line has been opened to Rothbury,—about 13 miles; and the line of the Manchester, Sheffield, and Lincolnshire Company has also been opened between Rotherham and Mexborough, a length of 6 miles. The Lancashire and Yorkshire system has received additions of about 6½ miles at Rochdale and Horwich; the Cheddar and Wells line, of 8 miles, has been added to the Bristol and Exeter system; the Winsford branch of the Cheshire lines, of 6 miles; and the Garstang and Kust-end, in North Lancashire, have also been opened. Numerous other small junctions and extensions have been opened in England during the year, but the most interesting, and, as regards mileage, the most extensive additions, made to the railway system of Great Britain during the year, have been in Scotland. These include the complete opening throughout of the Solway Junction line, which crosses the tidal waters of the Solway Firth. The line has been opened for goods and mineral traffic for nearly twelve months, but Colonel Yolland, the Board of Trade inspector, has not been able, until quite recently, to certify the section from Bonness to Kirtlebridge for passenger traffic. This length, of about 8½ miles, includes a portion over elastic and rather treacherous moss, that has caused a good deal of trouble; the difficulties presented have been at length completely overcome. The Caledonian Company has opened the Dundee and Forfar line of 17½ miles, and the Carmyllie Branch of 5½ miles. The new line of the Glasgow and South-Western, between Ayr and Mauchline, reduces the railway distance between the two localities from 30 to 11 miles. The opening of the North British, Glasgow, and Coarbidge line, of 8½ miles, is hailed with great satisfaction in the localities affected, and is expected to prove of great advantage to the North British Company. The works of the Glasgow City Union line, now opened for 3 miles, are so substantial and elegant in character as to have been a source of pardonable pride to engineers, contractors, proprietors, and the inhabitants at large. Captain Tyler, R.E., the Government inspector, reported in the most favourable terms as to the excellence of the works throughout in design, materials, and execution. The line is one of the most substantially and tastefully constructed in the kingdom, and only less costly than "the Underground," the Charing-cross, and some other metropolitan extensions. The Glasgow and South-Western, it is stated, subscribed 440,000*l.*, and the North British Company 300,000*l.* towards the capital of the City Union. The union line has stations at Shields, Dunlop-street, Gallowgate, and Belgrove, all of which, notably that at Dunlop-street, are handsome and commodious, fitted throughout with the best modern appliances for the comfort of the passengers, and the proper conduct of the traffic.

It is almost "as smoke to the eyes and vinegar to the teeth," with the thermometer below freezing point, even to think of railway travelling amid the ice-bound locks and snow-covered mountains of the Highlands of Scotland; but even now the scenery opened up by the new railways has its grand, albeit wild, beauties, and in the vernal seasons the charming districts made accessible will doubtless be the resorts of multitudes of tourists. Among these Highland lines are the Dingwall and Skye, of 53½ miles, through some of the most widely grand scenery in the north of Scotland, the train passing, in many places, with perpendicular beetling crags on one hand, and a yawning abyss on the other. The cause of the delay in the opening of this line was one not often heard of,—that the fences were not sufficient to keep off the wild deer. The Dingwall and Skye line opens up the western Highlands by the best route from Edinburgh, Glasgow, London, and all parts of the south. Dingwall is reached by a run of 163 miles from Perth upon the Highland Railway. The "ballast" on

this line attracts the attention of southern visitors interested in such matters, being of granite, in rather large lumps; clay for burning, or gravel, being unknown in the district. The Duke of Sutherland's railway, now open, 16½ miles, is another interesting addition to the railways of the far north. His Grace, who is not unaccustomed to the foot-plate of the locomotive, drove his own engine, the "Dunrobin," in the first experimental trip over the line. The train consisted of an engine, a carriage, and a brake-van, and conveyed their Royal Highnesses Prince and Princess Christian, the Duchess of Sutherland, and a number of the aristocracy and gentry of *ultima thule*. The noble driver shut off steam, and applied his brakes, at Helmsboro', "exactly to time," and was received with tremendous cheers by the assembled Highlanders, many of whom probably had never before seen a locomotive or a railway carriage. Yet another new railway in the north well merits notice,—the section of the Callander and Oban line, from Callander to Killin, 17½ miles in length. The line starts from the Dunblane, Doune, and Callander branch of the Caledonian, and, proceeding in a north-westerly direction, skirts the base of Ben Ledi, and is carried through the picturesque pass of Leny. For nearly five miles the line is along the banks of Loch Lubnaig, or the winding lake, its title to the name indicated by the fact that the line is carried in its course over six arms of the loch. The scenery is of the most beautifully picturesque character. At nine miles from Callander, Strathgry, the first station, is reached. The next station serves "Balquhidder" and the "braes" of that ilk. In the graveyard surrounding the old kirk of Balquhidder, the remains of the famous cateran, Rob Roy, were interred; and were sometime since the object of a pilgrimage, or rather a visit, by Queen Victoria. Fine views of Loch Earn are obtained in this locality. Farther on, Glen Ogle, or the terrific glen, is entered, and the line passes in some places at a height of 400 ft. above the bottom of the ravine. There are numerous bridges in the glen, one of them of twelve arches, of 30 ft. span, and 35 ft. high. The line terminates at present at Killin, at the upper end of Glen Ogle. The works of the next section, from Killin to Tyndrum, are in progress.

NEW LODGING-HOUSES AND HOSPITAL ACCOMMODATION FOR GLASGOW.

EARLY last year we gave a brief yet somewhat comprehensive sketch of the social and sanitary condition of Glasgow. We also took occasion to point out where and how, and in what particular direction, these improvements were needed.

It is satisfactory to hear that our labours in many quarters have been productive of some good, and promise to be still more so. Our friends across the Borders seldom appear satisfied or in humour when one of their southern contemporaries happens to draw attention to their sanitary or social shortcomings, and his crime is none the less even though his facts are supported by stiff and undeniable figures. The Scot is not given to "befoul his own nest," although he may desert it for warmer latitudes. He loves his country, though, unlike Cousin Pat, he seldom cares to go back to it. The municipal authorities of Glasgow are seldom at fault, except now and then. The *North British Mail* recently did good service by its dark pictures of social life and living in Glasgow; and now the *Glasgow Herald* is furnishing some interesting particulars of the past and present of the city on both sides of the Clyde. Some of the ground we went over is now being trodden again with advantage. We spoke strongly of the want of proper dwelling-houses for the working classes and the very poor of Glasgow; and we also instanced the wretched places in existence and the localities in which they were situated. We are glad to see that in one of the quarters we mentioned as amongst the worst, a large building is being converted into lodging-tenements for the poor. This building is situated in Drygate: there are a number of mean, tumble-down looking structures at the head of this locality, and several wretched "registered" lodging-houses for many years have been allowed to exist here. The City Improvement Trustees began several months ago their operations in Drygate, and the city architect and his assistants have finished a building which, according to the description of the *Glasgow press*, "is four stories in height, and presents a frontage architecturally

plain but neat." On the basement story is a pay-office and a provision-shop; and at the side of the entrance passage is a dining-hall extending the whole length of the building or 50 ft. by 20 ft., by 13 ft. in height. The kitchen is in the rear. The superintendent is furnished with house spaces on the ground-floor; and all the sleeping accommodation for the lodgers, as may be supposed, is in the upper and inextinguishable flats. Every flat has four wards, and every ward is constructed to contain twelve sleepers, and twelve times twelve being one hundred and forty-four, there is consequently that number of beds. There are lavatories on each landing, and the proper ventilation of the building, we hear, has been attended to.

Let us say plainly at this point that this new lodging-house for the poor is not exactly a model one, but simply a sort of new and improved "casual ward." No matter how low the charge may be, we are doubtful of the success of the experiment in such a city as Glasgow. The working classes will not patronise such a structure, no matter how poor any of them may be; and the homeless and houseless poor of Glasgow who avail themselves of this lodging will have to submit, as far as we can see, to similar conditions as the pauper casual of the workhouse, who has to "clear out" at a stated hour in the morning, with the difference that when he pays for his bed and has to buy his supper or his breakfast, he will not, of course, be compelled to break stones or pick oakum in return.

Scotch habits of life and location differ in some particulars, and what might be found to answer tolerably well in London might be altogether unsuited to Glasgow or Edinburgh. As far as we can view the matter, we believe that all isolated attempts at meeting the requirements of the homeless or semi-houseless poor on such a plan as that now in course of adoption in Glasgow, will be unsatisfactory. The poor and indigent, to be properly helped, must be classified, for there are grades of poverty as well as wealth. Are we to admit in one indiscriminate batch the pick-pocket, the vagrant, the shoe-black, the match-seller, the blind, the lame, the deaf, the deserving mechanic on tramp, and that other large army of Arabs, Ishmaels, and Wandering Jews who periodically patronise all our poor-houses from Cornwall to Caithness. If the temporary homeless or houseless have to pay for their bed and board, be the price ever so small, they will not care to avail themselves of one liable to such queer neighbours. We would like to know if the outside poor can avail themselves of the same advantages as the lodgers in the purchase of eatables. A little benefit might accrue thereby.

There is also in course of construction a female lodging-house, on a precisely similar plan as the male. This is situated in East Russell-street. The accommodation for sleepers here will be for under 100. We cannot think that, with all their good intentions, the Glasgow City Improvement Trustees have yet hit upon the right plan. Still they are to be encouraged and commended for their exertions in so laudable a direction.

In the matter of hospital accommodation for the poor of Glasgow, there has been some activity to meet the supposed urgency of the case. About ten years ago the Royal Infirmary was the only hospital in Glasgow for the decent and respectable indigent or working classes, unless those who were within the poor-houses. Subsequently in Parliamentary-road an auxiliary temporary fever hospital was erected; and during the last two years this has been extended. The spread of relapsing fever renders it necessary now for the welfare of the Glasgow community to have increased accommodation for fever patients. In the eastern districts lands known as Belvidere, on the south side of London-road, have been purchased. The property consists of about 35 acres, and there is an old mansion in connexion. Here at present eight temporary sheds are being constructed, intended to accommodate 400 patients. It is to be hoped that out of this present hurried and temporary arrangements the nucleus of a permanent foundation will soon arise. The present mansion-house could shortly be converted into a standard fever hospital, and wings could be soon attached. With or without the present mansion, the lands are large enough, and favourably situated, for any treatment that might be determined upon. In the meantime, of course, the epidemic must be met, leaving in abeyance the question of future architectural design. The purchase-

money for the lands of Belvidere is said to be 17,000*l*. This would be a rather heavy sum, if the consideration did not exist that a portion of this property is well situated for building purposes, and that, after some time, the public outlay will return to the city. When the permanent hospital becomes a reality, we trust there will be sufficient open space left around it. The fever-stricken are always athirst, and pure air is as necessary for their recovery as kind treatment.

THE STATE OF WAPPING.

THE editor of an East-end newspaper attempts to throw discredit on the statements made in our recent notice of Wapping. He does not disprove any of the particulars, but falls back upon the very safe and handy plea of charging us with exaggeration. He would point out that not very distant from our own office, viz., Drury-lane, we could find as vile and foul spots for description as in Wapping. Our contemporary is young in London journalism, and untried, or he would know that the districts he alludes to have long since been exposed in these pages; and thus long before the daily papers gave attention to such subjects, the *Builder* was labouring earnestly to make known the condition of London. He would better show his fitness for the position he holds by furthering our endeavours than by the time-serving and injurious course he takes.

We print part of a letter from an independent witness, addressed to the editor of the *Standard*, who had reprinted some passages from our article, and sensibly commented on them:—

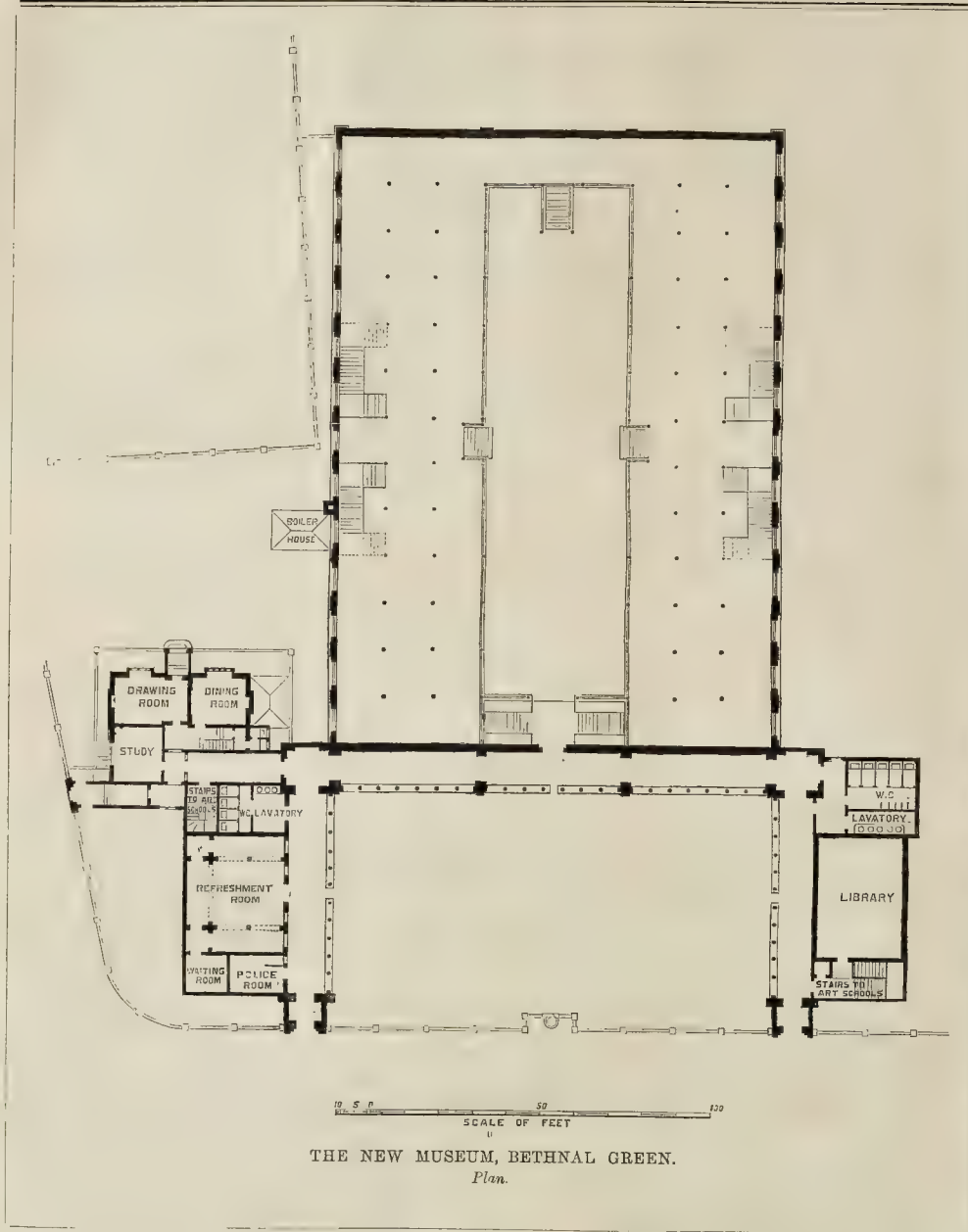
"Your article in yesterday's paper, on the state of disease and destitution amongst the poor in Wapping is attracting a great deal of notice; but in the case of every comment I have heard made, the good-natured, easy-going people say, as no doubt they wish—'It can't be quite true; it must be an exaggerated account.' I beg to state, as an independent witness, that it is within the truth. I could lead your reviewer to scenes exceeding any he has described."

I have been so struck with the awful state of poverty, ignorance, and vice, in this part of London, that for the past fourteen months I have spent all my spare time, usually four days a week, in works of charity amongst the poor of this very locality; returning from time to time amongst my friends. I have represented to them the necessities of the place, and they have been most liberal in supplying me with money and clothing to distribute amongst the poor—most liberal, as regards their power of giving; but, of course, the amount thus privately collected has not been sufficient for the giant wants of a huge population. Besides the benefits thus distributed, I have opened a free day-school for the poor little children. Thus during the past year has been very well attended, and at Christmas I was able to give to each child some article of clothing—mostly boots, for the poor little children are, as a rule, barefooted. I am glad to say that, owing to the care and gentle teaching of our very excellent master and mistress, these poor outcast children are being rapidly civilised and tamed. We also have a night-school for men and big lads; the average attendance is about 100 a night. . . . I have only to add, that I shall be most happy to act as steward of the bounty of any whose hearts have been touched by your article, and that cheques can be paid in to the account of the St. Agathe's Mission Fund, at Messrs. Hoare's, Fleet-street.

ROBERT LINKLATER, M.A.

Perhaps, after a perusal of the above, and a visit to some of the courts of Wapping Island, our East-end contemporary may feel regret for having penned his vulgar and vicious article.

An article in the *East London Observer* contrasts very favourably with that to which we have been referring. At the close the writer says,—"None, we imagine, will be bold enough to dispute the substantial correctness of the general picture of many of the homes of the poor,—not, alas! in Wapping Island only, but in all parts of the metropolis,—within a stone's throw of our principal streets and squares, and even of the seat of the Imperial legislature. And what can be done in the way of remedy? The St. George's vestry have never shown themselves indifferent to sanitary considerations, and it will not fail to be noted that some of the evils the *Builder* details are directly due to the action of the sanitary authorities. The vestry have, under a magistrate's order, obtained the closing of the houses in Plough-alley, as a measure of sanitary necessity; and what follows? The fever-stricken inhabitants crowd adjacent alleys. Is the remedy better than the disease, or worse? Let it be well noted, also, that the inhabitants of Wapping Island are perhaps exceptionally well off for labouring people. They are nearly all workers on the river, ballast-getters and ballast-heavers, coalheavers or coalwhippers, or porters at the waterside warehouses,—men whose toil is about the hardest, but whose pay is also about the best, of London labourers. It is precarious, and as it comes it goes; but there is more room for providence in Wapping Island than in most of our courts and alleys."



WILHELMSHÖHE.

CIRCUMSTANCES having given this place a notoriety, our readers may be glad to have a few particulars of it. The palace of Wilhelms-höhe is built on the classic model, and, in its treatment, greatly reminds us of the works of Inigo Jones. It is oblong in plan, with two semicircular ends, and has a long range of offices on the left. It is approached by an Ionic portico, the six columns of which are raised above the ground line on twenty-six steps. In the centre of the building is a broad, but low lead-covered dome. The palace is five stories high, and has a balustraded parapet. The Ionic capitals are after the style of those in the Coliseum at

Rome. The construction of the portico is less singular abroad than it would be thought here. The shafts of the columns, instead of being monoliths, or composed of two or three stones only, consist of a great number of separate pieces, corresponding with the stone courses of the body of the building. Over each of the six columns is a wedge-shaped block of stone, with an intermediate stone lintel. This course of stones forms the architrave. The frieze, instead of having the stones jointed at right angles, consists of a series of stones radiating from centres, one series over the space between each column. On the frieze is carved, in incised letters, the single word, "WILHELMSHÖHE." The cornice is of the usual Ionic character, with

dentils; but the plain tympanum is constructed in a very curious way. Immediately above the cornice (and in the tympanum) is another series of radiating stones, and above this are no less than three flush stone arches, which are perfectly useless, as there is nothing above to support. Several down-pipes unpleasantly obtrude themselves in very unfortunate places in the front,—one even follows the volute of one of the Ionic capitals of the antæ. The offices are joined on to the semicircular apse in an ugly manner, without any regard for the rest of the building.

Immediately in front of the palace are walks and flower-beds, and a beautiful and extensive lake, planted with firs, larches, and evergreen oaks, down to the water's edge.

THE EAST LONDON MUSEUM OF SCIENCE AND ART.



THE EAST LONDON MUSEUM OF
SCIENCE AND ART.

OUR readers will remember, that after a conference, in 1865, as to the appropriation of the original building at South Kensington, christened by us as the Brompton Boilers before the design was carried into execution (in the hope of inducing the authorities to set up something less ugly), the Government agreed, on certain conditions, to erect a part of it in the East of London. One of these conditions was a fresh site, and this, through the exertions of Sir Antonio Brady, the Rev. Septimus Hansard, and others (the Corporation of London and the Fishmongers' Company being amongst the subscribers), was obtained in Bethnal Green; the title-deeds being presented to the Government by a deputation in February, 1869. On this occasion the deputation repeated the views of the promoters as to the nature of the museum which they wished to secure for the East End of London; their leading idea rightly being that it should be educational, in the strictest and widest sense of the term. All the subscriptions had been asked for, and given with that understanding; and in making over the land to the Government, the subscribers pressed these views on the consideration of the Government. As regards the study of art, they felt this to be a matter deeply affecting the trade and commerce of the country, and urged it as one of imperial necessity. What they desired was that the museum should be made subservient to technical education generally, and prove not only a blessing to the million at the East End, but a model educational institution for all provincial cities and centres of manufactures to imitate. Earl de Grey and Ripon, as President of the Council, in accepting the deeds, made it understood,—and it is desirable that this should be repeated,—that the museum is not a local but a national institution; that it will form as it were an outwork of the South Kensington establishment, and will be dealt with upon the principles on which the Committee of Council act with respect to the South Kensington Museum.

The site is a good one, some 4½ acres in extent, in the midst of a dense population, and thereon the building is being erected. The main body of it, about 185 ft. long, and 130 ft. wide, is now approaching completion, and we give in our present number a plan of it and a view of the entrance front. It has been built by Messrs. Perry & Co., under the direction of Lieut.-Col. Scott; Mr. James Wild, architect, mainly assisting in the design. The building is wholly of brick, moulded where necessary, and the arrangement of the front marks the tripartite plan. Within there are galleries in the two side divisions and at the end, lighted from the top. The central portion will have a mosaic pavement, made by the convicts at Woking and elsewhere.

Our illustrations show the complete design as proposed, with library on one side, refreshment-room and house on the other, with corridors leading to the road; but we understand that the Treasury has just now determined not to erect these,—at any rate, at present; the amount granted, 20,000*l.*, being nearly expended: absolutely necessary accommodation for attendants and so forth, is therefore to be provided in the basement of the main building.

We hope soon to hear that arrangements have been made for the completion of the building, and the establishment of a school of design and free public library in connexion with it. The value of such institutions can scarcely be overrated, and it is quite time that the long-neglected East End should be provided with them.

DESIGNERS AND OUR ART-SCHOOLS.

SIR,—I fear that our Schools of Design are in effect very much of a delusion and a snare to our manufacturers, who have a right to expect that their *employés*, who have been educated in Government Schools of Design, should be what they need; that is to say, *designers*; whereas few of the very best of them have been grounded in the indispensable rudiments of design. Mere clever draughtsmen or modellers (made so without having been taught the very A B C of fine-art design) can never do anything towards helping their employers out of the middle of unconscious ignorance in which they are so generally "floundering about." Very many of the chief designers on the staffs

of important firms of furniture manufacturers are totally unconscious of the meaning of the technical term "Order" in architecture, as "a system or assemblage of parts subject to certain uniform established proportions which are regulated by the office each has to perform." Can there, sir, be any doubt that the knowledge of *constructive necessities* generally, and of orders and styles, as established by instances of universally acknowledged excellence, are what a real art-education should be built upon? Surely it is a misnomer to call a collection of bits of subordinate decoration a "Grammar." A thorough grounding in constructive proprieties and style-characteristics, is the only sure means of preserving art pupils from "decorative" anomalies and absurdities. J. H. M.

PUBLIC WORKS DEPARTMENT IN INDIA.
CASE OF THE CIVIL ENGINEERS.

SIR,—I wrote to you a short time ago, pointing out that the long-promised consolidation of pay and improvement of the position of the civil members of the Public Works Department had not yet taken place, although sanctioned by the Secretary of State. The measure in question has now been published, with effect from the 1st of September last, so that the Indian Government has virtually deprived every civil engineer in the Department of a year's increase of pay, or 60*l.* This is, however, not the only instance of the persistent determination of the Bengal Engineer officers who framed the new rules, to postpone, as long as they possibly can, justice to the civilians in the Department. I send you an extract from an article in the *Englishman*, the most influential Calcutta paper, with no particular bias in favour of civil engineers, which shows that our view of the matter is not a prejudiced one. The main features of the new rules are as follows:—

1. The pay of all civil engineers, up to Exec. engineer, first grade, is raised 60*l.* per annum. This is a boon certainly, but one not granted before it was necessary.
2. The above revised pay is made compulsorily applicable to all officers of the Indian army who entered the services after 1859 (Engineer officers always excepted). This will, I believe, cause a slight loss to only three officers now in the Department, and is so far unjust.

3. Older officers have the option of taking the new or the old rules. This is only just, as they entered the Department on different rates of pay, and could not now fairly be reduced.

4. All Royal Engineer officers, whether now in the Department, or who may hereafter enter it, or to be allowed the option of taking the old or the new rate of pay; if they elect for the latter, they are to receive their military pay in addition. The clause in italics is the one to which I take exception, and it is, I consider, a most unfair one, being conclusive evidence that the idea of justice to civilians was not present in the mind of the Indian Government, and that it was not their intention (as they professed in the circular I referred to in my former letter) to put civil engineers on the same footing as other members of the Department. It will, therefore, not be our fault if the ill-feeling so long fostered by the inequality of pay still continues to mar the *entente cordiale* of the two branches of the Department. As regards the clause granting engineer officers their military, in addition to their departmental pay, it is based on the old sophistical argument that it is a retaining fee paid them because they are liable to be called away on military duty. Now, sir (excluding the mutiny), about 5 per cent. of engineer officers in the Department have once in their term of service the chance of being called away from their civil duties for a year at the outside, during which time, I believe (although the rules on this point are purposely dark), they still receive their departmental pay; at any rate, no engineer officer has ever of late been a loser by his trip on military duty. The only fair rule would be to give engineer officers in the Public Works Department when on field service the civil consolidated pay, they being during their absence considered supernumeraries, just as officers on leave now are. This would be a great pecuniary gain to Government, and this course would have been adopted had it been the intention of the Indian Government and the Indian home council to do justice to our civilians.

Sir, I appeal through your columns to the council of the Institution of Civil Engineers; they have once already made the Indian Government eat their words, and if they will only take

up the cause of their junior and helpless brethren in India, they have it in their power to obtain justice and equality for us, and it is more imperative than ever that they should do so now that such a very great extension of railways and other works is in contemplation.

Allow me, in conclusion, to make a few remarks on the new Civil Engineering College. The Indian Government found out that by their treatment they could no longer obtain the services in the lower grades of the Department of Public Works of the pupils of the best firms, and have had to content themselves lately principally with men who had had merely a scholastic training and a smattering of out-door work. They then tried to obtain skilled men in higher grades, but this has been found expensive and (owing to their ignorance of India and the language) not to answer so well as was anticipated, the new men not being sufficiently submissive to their often less skilled superiors. It has therefore been found necessary to establish this college, and one can only hope that the Government may turn out men to their liking. In the selection of the Principal a wise discretion has been shown, and it is to be hoped that the *alumni* will be taught official reticence and official veracity. Allahabad. A CIVIL ENGINEER.

GAS-FLAME DENUDED OF ITS
IMPURITIES.

SIR,—Having for a great many years held strongly the opinion that there *must* be something in chemistry, even though at present unknown, which, by proper application, should be capable of denuding gas-flame of its impurities, I collected the best books on chemistry, and sought to discover the exact properties of gas-flame. I then studied further, and found that almost all the constituent parts of gas-flame had the strongest and most marked affinity for *pure water*. I looked further, and I found that no other known ingredient had, in itself, such effect on these constituents as this simple, natural element. I therefore sought to bring pure water, or the steam of pure water, to bear upon gas-flame the moment the latter issued in the burner, into life. I employed various mechanics to make the machines which I drew for them, and having at last discovered the most effective mode of doing so, I have had this exceedingly cheap apparatus fitted up in every part of this house, consisting of four sitting-rooms and twelve bedrooms.

Water, or the steam or exhalation of water, entirely divests the gas-flame of the noxious acids and gases of which it is composed, and enables it to come out into a heat which all scientific and other persons who have seen and felt it here, pronounce to be "pure and delightful to inhale."

I have taken out no patent for it, being not in want of such adventitious aid; but I now freely give it to the public, the first means thereto being a letter to the *Builder*. I have also tried the action of gas-heat on various metals, and will merely add that no one should ever cause gas-heat to be evolved through iron or other metals, but through fire-clay or porcelain tubes; and that we all should further do "justice to gas" as we do to coal, by giving it a vent of some sort. No one ever sat in comfort by a coal fire in a room without the natural vent which we call a chimney, and no one should seek to heat his rooms with the heat of gas, however sweet and delicious it may be, without giving it a vent of such kind as may naturally suggest itself. The quality of the heat here produced is, by test and ventilation, as pure as that evolved from coal, is without smell or effluvia, and is exceedingly agreeable to inhale. In the case of bedrooms, both those who are in health and those who are delicate sleep in perfect comfort. The price of obtaining this heat from gas, whether the gas itself or the apparatus, is, by experiment with coal, considerably lower. One of the first philosophical chemists in London, closely connected with the Royal Institution, wrote to me, after a description was given to him, as follows:—"I think you have certainly discovered the means for effecting this object, and on strictly scientific principles." Another equally distinguished person (both of whose names I will give) said, "The well-known principle you have taken for your guide has never yet been applied as you have applied it." To this I would parenthetically add that all works worthy of imitation are marked by Nature or by simplicity,—mine, by "pure water." I had rather

not be called on to make any drawings. It is always difficult to show forth practical mechanics by written representations; but I open my house, heated in every part by gas, to every scientific or other person who may wish to see and to feel the "heat from gas flame, denuded of its impurity," any day from two to four o'clock. I, perhaps, ought to say that, not being a chemist or a mechanic, or a tradesman of any kind, I can offer nothing more than what is perceptible to the eye, the nose, the skin, and the lungs. I have now done; I need hardly add that I have not the most remote interest or benefit in thus making the above facts known, excepting the inward gratification of giving to others and to the public the same knowledge for practical good which I have, after much labour and expense, worked out for myself.

E. WARD JACKSON, J.P.

Royal Park, Clifton.

THE CHURCH OF ST. JAMES, MARYLEBONE.

THIS church, which is one of those built during the past century, in the very worst style, but substantially, has during the past year been placed in the hands of Mr. J. West Huggall, of Oxford, with a view to a remodelling of its details, and he has formed a chancel within the eastern end of the parallelogram, fitting up the whole of it with oak fittings. A row of stone, decorated in colour and gilding, is added. Stone columns, with carved capitals, have replaced square boxes supporting the galleries. The fronts of the galleries are now an open arched instead of solid panelling. A stone arcade separates the vestry from the south aisle, instead of a wall, with folding doors, and all the high pews have been cut down, preparatory to the introduction of open benches of oak. Colour has been introduced, the object of the architect being to give a Byzantine character to the church. Further internal works are proposed, as well as an adaptation of the present "meeting-house character" of the west end, in Westmoreland-street.

Six memorial windows have been recently erected in this church. They contain single figures, nearly life-size, of St. John the Divine, St. James, Moses, Elias, St. Peter, and the Blessed Virgin. The gironing of the arches and other decorations are surrounded with borderings. These restorations and improvements have been presented by the Rev. Sir Lionel Darel, bart.; and the windows were designed and executed by Mr. G. Rogers, of Worcester.

THE PRICE OF EARTHENWARE PIPES.

SIR,—I think it would be well to direct attention to a matter that appears not to be generally known. The prices of glazed earthenware pipes were some years ago adjusted to a uniform scale by common consent of the manufacturers, the selling prices being in each case adjusted by a discount on what is called the "Lambeth price list."

So long as this list was maintained as the standard, the system was understood and worked well; but it appears that absolute uniformity is not now preserved in the lists of all the manufacturers, and as tenders for the supply of pipes are nearly always framed on the discount allowed, it is clear that if the standard is changed much inconvenience and some loss may be the result.

S. E.

A TRIP THROUGH SOME OF THE COTTON GROWING DISTRICTS OF INDIA.

INDIA is beginning to reap the benefits of irrigation. A considerable quantity of exotic cotton-seeds has been sown in many parts of these districts, and is found to yield an average of 68 lb. per acre of cleaned staple. The market value of the exotic cotton is greater than that of the indigenous, but, from the want of proper machinery to clean it, two-thirds of it are wasted. The cotton-gins, if not kept in working order, hack the cotton; and the owners are, consequently, unable to obtain the price they would had the cotton been cleaned by proper machinery. If mechanical workshops were built, and roads made, the cotton-growers could get their goods brought to market at a reduced price compared with what now prevails. Besides, the cost of unpressed cotton is one-third more than when pressed, equal to a tax of 26 rupees per ton;

therefore it only requires equation to prove that by a proper investment of capital in machinery very large profits would be realised.

The irrigation of southern India, where the people live near the equator, and, consequently, the physical exhaustion and the mortality are greater than in the north, should take precedence of that of the latter.

The best plan would be to hand over the irrigation to home contractors, who have a reputation to lose, and let them hammer away, instead of entrusting works which are a matter of life and death to the natives, to Messrs. Raumbhander & Bhownee Bappoo, and other enterprisers, who, like the Arabs, are not remarkable for finishing anything they begin.

There should be a staff of sturdy navvies kept at every station to prevent the works from being obliterated from the landscape, like the bottomless tanks of Madras. It cannot be expected that the young English sahib, who frizzes in a tub of what the Neapolitan boatman poetically calls "burning water" in some jungle choudi until the sun goes down, can be expected to devote the necessary time to the construction of works. Although by such a tumlah he may become a homoeopathist, to understand agricultural engineering, according to home notions, would require quite a different process.

When the "heads of departments" make periodical inspections, they are followed by a crowd of dancing-girls, to the stirring strains of "Pinks, Pinks, Pinks." One could, with a stretch of the imaginative faculty, fancy that a scene from the "Arabian Nights" was being enacted. How fatally ignorant their mighty highnesses must be of the true state of affairs.

As a climax to my observations, the great wants of India are useful public works, machinery, and pure water for domestic purposes, as no European can avoid thinking of the water he drinks without grief, whilst the poor fire-shipper stalks about muttering to himself, "Sahib, it is destiny." PIERRE ARTHUR.

HOLLOW-BRICK WALLS.

SIR,—Wishing to build a house for myself as cheaply as possible, and to combine strength and comfort in the greatest degree, I had intended to use concrete; but the gravel on the site not being very suitable, and bricks at the spot being cheap, I have been assured that hollow-brick walls will be economical. Can any of your correspondents give me their experience in building such walls with iron or slate ties, such as Rattle's patent or any other? I object to using brick ties, because the main value of the hollow-brick system, besides its economy, is, that it secures a perfectly dry inner wall. But to do so the inner and outer walls must not be connected by brick ties, which will convey the moisture in vertical lines just as if the wall was solid brick, which in fact it becomes at the tie. What I require to know is, whether it is found, by experience, that two half-brick walls 4 in. or 6 in. apart, and connected by ties, are sufficiently strong for the main walls of a two-story house (say 30 ft. high); or if the brick-on-edge wall, which is the one that is most used for the upper 10 ft., as the latter would use only half the number of bricks.

ALFRED R. WALLACE.

CEMENT AND MURIATIC ACID.

SIR,—I have lately erected a bath lined with ordinary white glazed tiles, for the electro-chemical process (the patient being submerged in water acidulated with muriatic acid, and having a continual galvanic current passed through him), and although the tiles have been set and reset several times, the bath, which is the ordinary small one, leaks,—owing, I suppose, to the chemical action of the acid on the cement. I should feel greatly obliged if one of your correspondents would advise me what to do in the matter, or what cement to use.

B. LOTT.

LIABILITY UPON CONTRACT.

THE case of Henry Stroh v. The Rev. Charles O'Neill Pratt has been decided at the Macclesfield County Court, to which it was brought from the Court of Queen's Bench. In opening the case, the counsel for plaintiff stated that in 1866 the defendant had obtained, or it was supposed he had obtained, a grant from Queen Anne's Bounty Commissioners towards the erection of a parsonage at Dale Hall, Burslem. The plaintiff called on Mr. Pratt with reference to the plastering work, and after the interview Mr. Pratt sent plaintiff an extract from the specifications, and he, in return, sent a list of prices, which the Rev. Mr. Pratt approved. Plaintiff thereupon sent his material to the place for the purpose of doing the work. However, Mr. Pratt said there must be but one contract for the whole of the work for submission to the Bounty Commissioners, and though there would be separate tenders for the plastering, building, carpentering, glazing, &c., they would all have to be included in one contract in the name of Mr. Burroughs, the builder. To carry out this arrangement, plaintiff was asked to send in a separate tender for the plastering work, which he sent in to Mr. Burroughs, who gave it to Mr. Pratt, and Mr. Pratt afterwards gave the plaintiff upon it, and told him he was very pleased with his tender, for it had saved him a sum of about £80. After that the work was done, and was completed about ten months ago. It amounted altogether to £84, under the contract, and to £115, for extras not under the contract. Of the former amount there had been paid £25, and the present action was to recover the balance. There was a

dispute as to who was liable, Mr. Pratt or Mr. Burroughs. His client had contracted with Mr. Pratt.

The plaintiff substantiated the counsel's statement. The defendant's case was this. Mr. Stephens was the architect of the house, and drew up the necessary documents. The work was separately tendered for, Mr. Burroughs, for the woodwork; Mr. Maydew, for the plumbing; and the plaintiff for the plastering. The Commissioners of Queen Anne's Bounty would not receive separate estimates for the work, but required that there should be one contract for the whole, and with the consent of all the parties, Mr. Stephens drew up the contract, produced, between Mr. Burroughs on the one part, and Mr. Pratt on the other part, in which Mr. Burroughs undertook the execution of the work tendered for, with the provision that extras should be paid as certified for by the architect. In confirmation of the contract several receipts were put in, showing payments to the plaintiff by Mr. Burroughs. The contention, in fact, was that the binding legal contract was only between Mr. Pratt and Mr. Burroughs, and not with each separate tradesman.

Mr. Stephens, the architect, Mr. Burroughs, the builder, and Mr. Maydew, the plumber, were called upon to prove Mr. Burroughs's responsibility under the agreement. The architect said, that under the agreement in question he held Mr. Burroughs responsible. Mr. Burroughs himself stated that he employed the other men, and was responsible to pay them as the money came in; and Mr. Maydew, the plumber, said that Mr. Burroughs was to be responsible, not only for the work, but for the materials. He stated, however, that he only considered himself responsible so far as concerned the payment proportionately of the money which came in. The money was to be raised by subscription and in different ways, and the plaintiff agreed to take his proportionate share. Pressed by plaintiff's counsel, to say whether, if no money had come, he would have considered himself liable to pay it upon his own pocket, witness said he supposed he might. He admitted, however, that when plaintiff first applied to him, in October, 1869, he instructed his attorneys to say "out of papers" (the real matter), and that he did not wish to do with Mr. Burroughs. We only took the joiners' work. We have your client's tender, which you can see."

The judge, after remarking upon the conflicting evidence, and after having heard the counsel for the plaintiff, added, that he never knew an instance of a clergyman or a minister who did not get himself into a hobble if he had anything to do with business; whereas none do it worse.

Mr. Mottram. Because they think they can do it better than men of business; whereas none do it worse.

WEDNESBURY TOWN-HALL TENDERS.

AT last meeting of the local Board of Health, the subject of the tenders for the erection of the proposed new Town-hall was considered.

The Chairman said it was only fair to the public to state that the tenders were opened in the absence of the reporters because it was thought impudent that the tenders should be exposed until the Board had decided upon one, and had signed and sealed, they having found, when the tenders for the erection of the Public Offices were sent in, that, in consequence of the figures appearing on the tenders, (the real matter), the Board had decided to send in the lowest tender refused to complete it, his figures being much below the next highest. The Board wished to avoid a like difficulty in this case, and, therefore, took the course to which reference had been made. On the tenders being opened, it was found that the figures were all above what was expected, and then a question arose as to the duty of the Board with reference to the competing architects. Their clerk informed them that they had power to deal with the plans without reference to the other competitors, and Messrs. Loxton and Architects, informed them that it was quite common for plans to be cut down to meet a previous estimate. Amended tenders were then obtained, and the lowest—that of Mr. D. Moore, of Bristol—was brought forward, and the Board thought they had a right to deal with it, 2,232. The cutting-down, which had been carried out to the extent of about 6 ft., had been effected without violating the integrity of the building in any way, without affecting its utility, and in such a way as scarcely to affect its appearance. Such an outlay he did not think any reasonable person would object to, particularly as all the repairs (and they were extensive) necessary in the present offices were included in the estimate. He then produced a letter from Mr. Nichols, one of the competing architects, objecting to the course which the Board had taken, and the letter was read. The chairman afterwards proposed "that Mr. Moore's tender be accepted." The proposition was seconded by Mr. Blakemore, supported by Mr. Brown, and unanimously agreed to. The contract was then signed.

"EXPLOSION OF KITCHEN BOILERS."

SIR,—Referring to your report of the coroner's inquiry into the death of Eliza Clark, caused by the bursting of a kitchen boiler, I, feeling sure that, with the apparatus properly arranged, and ordinary caution used, such accidents would not often occur, am led to make the following remarks:—In fitting up a force boiler, to supply hot water to the upper part of a house, it is usual to fix an iron tank to the roof under the eaves, the same being connected to the boiler by two iron pipes, with an escape-pipe from the top of the tank, when the apparatus is in working order, forms a safety-valve or escape for the steam, in case of any accident. If the pipes being stopped through the water freezing in them, when usually occurs in the upper part, on account of being most exposed, and this I suppose was the fact in the case referred to. What I wish to draw attention to is, that there should always be a draw-off pipe connected to the flow-pipe just above the top of the boiler, and connected to the tank, by a nut and screw, with a tap in the centre of the chimney-jamb; so that it would be impossible, by drawing water from the tap, to empty the boiler, which would remain full, unless boiled away. Should the pipes become stopped, the water would be drawn off the tap it would be discovered; and when the water ceases to run, by leaving the tap turned on, an escape is open from the boiler; the steam must then be let out, and the pipes cease to be clogged, and try to melt the ice by the heat of the fire, the circulation of water being stopped. There is not the same opportunity of fitting up a safety-valve on an account of the pressure of the pressure of water to contend against, although I consider

one formed in the following manner would answer the purpose.—A float being made of copper, and hollow, similar to a ball cut in half, the flat upwards, with a spindle through the centre fitted with an india-rubber washer, working upwards from the inside of the boiler against a brass collar screwed into the top of the boiler, and standing up about 3 in., with a guide for the spindle to work through, the spindle having a nut on the top, and long enough to allow it to fall 1 in.; the boiler being full, the float or ball would press tightly upwards, and close the valve. Should the boiler lose water before the water could boil away very much, the pressure of the water in the tank being taken off, the valve would open even with the motion of the surface of the water, and explosion be impossible. EDW. J. DUNMAN.

CAPTAIN HEATH, R.N., in a letter to the Times, respecting the bursting of kitchen boilers, suggests the following precautions:—1. The circulating cistern should be placed as nearly as possible over its heating boiler, so as to avoid angles and levels in the circulating pipes. 2. The circulating pipes (connecting the boiler with the hot water cistern) should not be allowed to touch an outside wall, and they should be wrapped round throughout their length with non-conducting felt. 3. The circulating cistern should be covered with felt, and cased in with plank over the felt. The adoption of these suggestions will ensure safety even in the longest nights and the severest frosts to which the English climate is liable. It is true that they cannot all be carried out where the apparatus has been already fitted; but there are few cases where the cistern cannot be covered in, and that is the most important of the three suggestions.

THE TRADES MOVEMENT IN MANCHESTER.

A GENERAL meeting of the operative house-painters of both societies has been held, to receive the report of their arbitration committee on the proposed alterations on the working rules of the trade. It appears that the mayor's decision, at the Town-hall, in last April, namely, "That 7d. per hour be the minimum standard rate of wages in the trade," had left many matters of detail unsettled, and considerable dissatisfaction in the minds of the employers. According to rule, an arbitration committee was summoned in October last, consisting of six masters and six men. The masters had prepared a number of additions and alterations. The men, under the direction of their societies, had also prepared amendments and additions to the working rules. Many meetings were held to consider the different points in dispute, but an umpire had to be called in, in accordance with the rules. The County Court Judge, Mr. J. A. Russell, Q.C., accepted the appointment without fee or reward. The result, ratified by the arbitration committee of six masters and six men, as the agreement binding in the trade until further notice, is that some of the employers' amendments are embodied in the rules, and others rejected. The first rule makes 7d. per hour the minimum rate, without any recognition of inferior men.

HOUSE-BUILDING IN LIVERPOOL.

The borough engineer, Mr. Newlands, has presented a report to the local health committee, in which he says:—The total number of dwelling-houses erected in 1870 was 1,241, thus classified:—Under 12l. annual rent, 15; from 12l. to 25l. annual rent, 1,102; from 25l. to 35l. annual rent, 87; from 35l. and upwards, 37. Of other buildings there were erected 89, thus classified:—Warehouses, 4; stables, smithies, and workshops, 46; public buildings, offices, manufactories, &c., 39. The number of alterations and additions to buildings was 334, of which there were of extensive character 59, and of inferior or trivial character 275. Of dangerous buildings, walls, chimneys, &c., taken down or secured, there were 212, thus classified:—Walls of buildings, 73; yard walls, 87; chimneys, 52. Number of houses built from 1841 to 1870 inclusive:—Houses under 12l. per annum, 6,473—per-centage, 14.03; above 12l. and under 25l., 32,123—per-centage, 69.67; above 25l. and under 35l., 4,855—per-centage, 10.53; at 35l. and upwards, 2,658—per-centage, 5.77.

Kington-on-Thames Surveyorship.—Mr. Clement Duncombe, M.A., C.E., late assistant engineer to Mr. Baldwin Latham, C.E., was elected, out of 109 candidates, to fill the above post, vacant by the resignation of Mr. Slagg, C.E.

STREET TRAMWAYS.

At the rooms of the Social Science Association, a paper has been read by Mr. John Noble, on "Street Tramways: ought they to be constructed by local governing bodies, or by private enterprise?" Dr. Brewer, M.P., occupied the chair. Mr. Noble urged the necessity of a royal commission being appointed to inquire into the subject, and determine whether it was better at once to authorise local bodies to undertake the construction of street tramways than conferring upon those bodies powers of purchase at the end of twenty-one years; and he further contended that the effect would be greatly to diminish the weight of the local burdens. A discussion ensued upon the paper, the chairman, who took part therein expressing a very decided opinion in opposition to a suggestion offered that the Government should, as they had done with the Post Office and the telegraphs, undertake the management and working of street tramways.—The Metropolitan Board of Works have adopted a long list of their committee's recommendations in favour of lines of tramway through the metropolitan thoroughfares to the city boundaries.—Mr. E. Allen, of Brompton, proposes to form tramway-rails of a Z shape, so as to be reversible.

CHURCH-BUILDING NEWS.

Smithfield, London.—An appeal in aid of the funds for the completion of the Smithfield Martyrs' Memorial Church, is made by the building committee. The foundation-stone of the building was laid by the Earl of Shaftesbury about twelve months since, in St. John-street, Clerkenwell, and the edifice is now completed, at a cost of about 8,000l., but in consequence of between 2,000l. and 3,000l. yet remaining unpaid, the consecration, which was fixed for the 30th ult., has been indefinitely postponed. The style is Early Gothic, and the church has been built from the designs of Mr. Blackburn, architect. Seventeen statues of the principal martyrs have been placed on the outside, together with five bas-reliefs of scenes of martyrdom, and medallions of Tyndal, Wycliffe, and others; and round the walls inside are ornamented scrolls, in which are recorded the names, accusations, dates of death, and dying words of the 66 persons who were burned at Smithfield. The new district to which the church is assigned has been taken from St. James's, Clerkenwell, and contains a population of about 8,000, many of whom are of the very poorest. The new church will afford sitting accommodation for 1,000 persons, half the seats to be free.

Blackfriars-road, London.—Christ Church, which has been closed since July last, in order to undergo a thorough restoration and enlargement, has been re-opened for public worship. The interior of the building has been remodelled. The high pews have been replaced by low-backed ones. The accommodation in the galleries has also been considerably enlarged, while a chancel has been erected. The entire expense of the restoration and the new erection has been some 2,300l., which had to be defrayed by voluntary contributions.

Howell (Grantham).—The parish church of St. Oswald, at Howell, has been re-opened for divine service. Howell is a small village, with a population of less than 100, distant about a mile and a half from Heckington. The church having fallen into a state requiring repair and reseating, efforts were made for its restoration. The sum of 500l. was raised, and under the direction of Mr. Kirk, of Skefild, new roofs have been placed on the nave and chancel, and the whole of the church has been renewed.

Amminster.—The church has been re-opened after a restoration. The work has been confined to the interior of the building, and consists, principally, of the re-arrangement of the seats—the old pews having been removed and open benches substituted; also the removal of the west gallery, whereby the west window is thrown open; the removing of the organ therefrom to a ground-floor position in the chancel, and the destruction of the pulpit. Some years ago, the taste of the time besmeared the piers and arches dividing the aisles from the nave with blue paint, which has been scraped away, and the stonework is thus left in its original form. The original capitals, too, which were superseded with wood, have been replaced by stone, and carved from a pattern of one of the original designs. The organ, one of the few remaining built by Green, is now

shortened from the "G" scale to the fashionable "C." The organ work has been done by Mr. Dieker, of Exeter. The windows have been re-glazed with lozenge panes. Two hagioscopes in the piers of the chancel arch, blocked, doubtless, since the Reformation, have been opened. The chancel has been paved with encaustic tiles supplied by Messrs. Maw & Co., of Brossley. The altar-table, made by Mr. Stone, of Arminster, is enclosed in an ornamental railing supported on iron standards. The vestment-room is now removed from the south end of the chancel to the opposite side. The entire gas fittings are new. The church is heated with an apparatus erected by Messrs. Brown, Brothers, of Lyme. The church will now accommodate about twenty more than formerly. The cost of the alterations will be about 1,100l. The contract was taken by Mr. Digby, of Ottery St. Mary, working from the plans of Mr. Ashworth, of Exeter, architect. The carving was executed by Mr. H. Hems, of Exeter, and the gas fittings were supplied by Mr. Worner, of London. The tiles within the altar were presented by Mrs. Matthias, and Mrs. Mallock intends filling up a window in the south aisle with stained glass. The old picture, "The Last Supper," is hung up in the south transept.

Great Doddington.—The parish church of Great Doddington, near Wellingborough, has been reopened for Divine worship after undergoing an extensive though not complete restoration. No professional architect has been employed, but the work has been carried out under the direct personal superintendence of the vicar of the parish, the Rev. Mase W. Gregory, whose aim has been, whilst restoring the ancient fabric, to preserve intact every architectural feature of the edifice. The repairs and "restorations," in the best sense of that misused word, have been made under the superintendence and by the direction of the vicar, and some interesting disclosures are the consequence. One traces very readily the original structure. It was a large Norman church, with a chancel full of small Norman windows with very deep splay. Some of these were wholly blocked up and lost until Mr. Gregory cleared away the accumulated whitewash and other obstructions; others were converted into Decorated windows. Rows of what looked like putlog-holes occur both in the lower and upper stages of the walls. But on examination they are seen to go completely through the wall, and to be finished masonry throughout. Their purpose is a puzzle. They give no light, and could scarcely be needed for ventilation, in such numbers especially. The chancel would have been a reasonably light one even in Norman times, when the east window was probably only the single small light, with a deep splay like those in the north and south walls. Against the chancel arch on the south-west side is a wall painting representing the Crucifixion, which Mr. Gregory, by whom it was discovered, has preserved. The design for the roof of the chancel was supplied by Messrs. Law & Sons, of Northampton, but it is only just to say that the design has not been carried out in its entirety. The whole of the work has been executed by Mr. Goodridge, builder, of Roade, under the supervision of the vicar. The cost of the chancel restoration has been about 400l., the whole being defrayed by the Marquis of Northampton. The cost of the restoration of the nave is about 600l., towards which his lordship gave a contribution, the rest being contributed by the vicar and farmers of the parish. A new roof is required for the north aisle, and some new seats for a portion of the church. For the further restoration some 200l. or 300l. will be required.

Gravesend.—All Saints' Church, Perry-street, has been consecrated by the Bishop of Rochester. The new church, which is in the centre of Northfleet, upon the side of a gentle slope, has been built on land presented by Col. Gladdish, and Mr. J. Edmeads, of the Hazels, Northfleet, who have also largely contributed towards the fabric of the church. The work was designed by Mr. James Brooks, of Lincoln's-inn, the architect of several churches lately erected in London. The edifice is built of Kentish rag, and the same material is displayed on the inside as well as the outside of the building. The style is that which prevailed in this country at the end of the thirteenth century. The church consists of nave, with north and south aisles; chancel with north and south aisles, and porch at the north-west angle of the building. A portion of the north chancel aisle is separated by a screen from the remainder to form a vestry, and has a separate entrance

from without. In addition to the porch doorway, there is an external doorway on the south side of the church. The bells are placed in a turret, above the chancel arch, and are arranged so that they may be rung from the steps at the entrance to the choir. The nave is separated from the aisles by an arcade, of four bays on each side; and an arch of wide span at the back of the choir-seats on north and south sides of the chancel, separates the latter from the chancel aisles. The windows are principally of plain lancet character, though we must except the wheel window in the west gable, and the east window of the chancel, which contains geometrical tracery and moulded jambs and arch-stones. The east window is filled with painted glass, executed by Messrs. Clayton & Bell, of London, and contributed by Mr. G. Jones, of Rosherville. "Our Lord in Majesty" forms the centre of the window, the lower part being filled with groups of saints and Old Testament characters. In the upper portion are two angels, and a representation of the "Agnus Dei." A painted window from the same atelier has also been placed in the south wall of the church; the subject is the raising of Lazarus. All the other windows are filled with glass of cathedral tint, in lead quarries. The doorways are treated in conformity with the style of the building, and that at the principal entrance is moulded. All are fitted with oak doors, with hinges of iron-work specially made for each. The roofs throughout have their timbers exposed to view, the ceilings being formed between the rafters, which are stained and varnished. The exterior is covered with tiles, principally of Staffordshire manufacture. The seats are throughout open, and of deal stained and varnished, and are free and unappropriated. In the wall over the chancel arch has been inserted a device containing the emblem of the cross, formed with Bath stone and inlays of tiles. The several gangways of the church have been formed with Staffordshire red and black paving-tiles laid in patterns. The chancel has, however, been paved with Minton's tiles. Arrangements are made for heating the building by means of an apparatus placed in a vault at the west end, and sunk slightly below the paving. Gratings placed in various parts of the church will deliver the warm air. The font is of marble and alabaster; it is designed in harmony with the rest of the church. It is placed at the west end of the central gangway of the nave, and is from the hands of Messrs. Burke & Co., of Regent-street. It was a special offering to the church. The pulpit is also composed of marble and alabaster; it is simple, and is the offering of the Brechney family, who have also contributed most liberally to the endowment and building fund. The extreme length of the edifice within the walls is 103 ft., the greatest width 42 ft., and the height from floor to ridge of nave roof 49 ft. All the works, excepting in some few particulars, have been executed by Mr. Thomas Blake, of Gravesend, builder, under the superintendence of the architect.

Horsell.—The church of Horsell has been reopened, after undergoing a restoration. The church is of ancient date, for the register dates back as far as 1656, and had become much dilapidated by time. The internal arrangements of the church, apart from the condition of the building, were not suited to the wants or comfort of the congregation; and some time since the Rev. Albert Mangles, the vicar, set about the restoration. He became his own architect, but received assistance from Mr. James Harris, of Woking Station, a church-builder, to whom the work was given to do. The old high pews on the north side of the nave have been removed and replaced with low stained deal seats to correspond with other seats of the church; the old-fashioned high seats in the chancel have been taken down, and stalls substituted for them, the whole being of stained deal. An altar-rail has been placed in front of the chancel. The chancel itself has been paved with tessellated tiles, black and red alternately. The communion-table is covered with green cloth, while on either side, on the wall, the commandments are illuminated. Above it are the words, similarly done, "This do in remembrance of Me." A new stone window has been placed in this, the east end of the chancel, filled with stained glass, and having in the centre a medallion of the Virgin and Child. It was manufactured by Messrs. Powell, of Whitefriars. The window is the gift of the Rev. Albert Mangles. A new window of stained glass has also been added to the north side of the chancel.

The passages of the nave and aisle are paved with black and red tiles in alternate arrangement. The walls have all been scraped, the unsightly plastering removed, and stucco substituted. The window dressings have all been cleaned, and the windows in the nave and aisle have been re-glazed with cathedral quarries. A new porch has been added to the south side of the chancel. The church is heated with a hot-water apparatus, erected by Mr. Smith, of Bramley. It is said to be intended in time to repair the tower when the funds will admit of it.

Books Received.

Preliminary Experiments on the Mechanical and other Properties of Steel; made or collected by a Committee of Civil Engineers. London: Adams, Brothers, Printers, Little Tower-street, E.C. 1868.

Experiments on the Mechanical and other Properties of Steel; made at her Majesty's Dockyard, Woolwich. By a Committee of Civil Engineers. London: Adams, Brothers, 1870. The results of these experiments, the first part of which is dated in 1868, are now in a printed form. They are chiefly tabular, and bound up in one volume.

The committee under whose superintendence the experiments have been carried out by Mr. Kirkaldy, and collected from other sources, consisted of Messrs. W. H. Barlow, George Berkeley, John Fowler, Douglas Galton, C.B., and J. Scott Russell. Mr. Berkeley acted as secretary, and Mr. W. Parsey as assistant secretary. The contributors to the fund wherewith the expenses were met were Messrs. Bessemer & Co., John Brown & Co., the Barron Hematite Steel Company, the Bolton Iron and Steel Company, Charles Cammell & Co., Krupp & Co., Lloyds, Fosters, & Co., the Monkbridge Iron and Steel Company, Naylor, Vickers, & Co., and T. Turtan & Sons. The arrangements were made to test the resistance of steel to tension, compression, transverse strain, and torsion. The second part relates to experiments on tension and compression carried out at Woolwich Dockyard, by permission of the Admiralty. The work contains experiments also on riveted joints, and a chemical analysis of certain bars, whose elasticity and ultimate strength are also given.

VARIORUM.

"A YEAR'S Voluntary Evangelising Work among the Costermongers in Golden Lane, under the superintendence of W. J. Orsman, 1870. London: Passmore & Alabaster, Finsbury-lane." The state of the Golden Lane district is not new to readers of the *Builder*, and it is satisfactory to us to find a humanising and improving work of any kind going on amongst its poverty-stricken denizens. The "mission" under Mr. Orsman's superintendence is presided over by the Earl of Shaftesbury, and carried on only "after office hours"; yet much good work seems to be done. Over and above the usual secular and religious education, weekly lectures are given, and the poor people are cheered up by the tonic sol-fa music, in which they seem to take special interest. They often get comfortable meals from the Mission, and are taught to sew their ragged clothing. On this last useful subject, Mr. Orsman says:—"As they unfortunately possess only a single suit, the meeting is, of necessity, strictly private." There are costermongers' tea-parties, too, the sick are visited, and much good is done in various ways.—"Second Annual Report of the Coventry Free Public Library." 1870. Coventry: Hickling, Earl-street, Printer. During the past year 31,076 volumes have been issued in 307 days from this library, giving a daily average of 198. 66 tickets have been granted, making the total number of borrowers, 4,088; of this number, about 1,000, it may be estimated, do not avail themselves of their right of borrowing books from the library.—"The Quarterly Journal of the Amateur Mechanical Society. Hon. Editor, Rev. J. Lukin. January, 1871. Trübner & Co." This is the first number of a new journal, of a new society. Lathe works form the chief subject of the present issue. There are also an introduction; papers on the "Rise and Progress of the Society"; on "Measurement and Enumeration of the Impalpable and Invisible," by the Editor; on "Breach-loading Fire-arms," by Others; and the journal is illustrated by engravings.—"The Australian Handbook and

Almanac for 1871. Second year of issue, Gordon & Gotch, Holborn." There is a good deal of information as to Australia in this Almanac, but a great want of more. We should like to see each succeeding issue a decided improvement on its predecessors; but we do not see much trace of that in the present instance. The printing is not very careful either. A map of Australia accompanies it, showing routes of explorers, &c.

Miscellaneous.

The Proposed New Engineering College.—A deputation from University College, London, consisting of Mr. George Grote, the president; the Hon. George Denman, M.P.; Mr. Julian Goldsmid, M.P.; and Dr. Storrar, members of the council: Professor Fuller, G.E.; Professor Williamson, F.R.S.; and Mr. J. Robson, the secretary; has waited upon the Duke of Argyll, at the India Office, to present a memorial from the council and the senate of the college, on the subject of the proposed institution of a new engineering college for the Indian service. The interview with his grace lasted upwards of an hour. The memorialists consider that the deficiency in the present system has arisen, not from any defect in the existing places of education, but from the injudicious system of examinations hitherto pursued, and from a want of sufficient inducements to well-qualified men to enter on the career proposed to them. The memorialists assume that the latter cause is recognised by the Government, for it is understood that it is in contemplation to augment considerably the salary upon which a civil engineer in the service of the Indian Government will hereafter commence his work. The memorialists believe the proposed college will be prejudicial to the public service by narrowing the field for the selection of candidates, and by limiting their means of obtaining the requisite instruction. They submit that the working of Government colleges has not been such as to recommend the creation of a new Government college, having practically the monopoly of appointments, and protected from competition. They suggest that such a step is at variance with the plan for throwing open to all her Majesty's subjects the opportunity of gaining Government appointments.

Railway Property Last Year and This. The *Railway News* thinks that nothing but some unforeseen turn in politics can prevent a general advance of the value of railway property during the present year. Trade is good, and promises to progress, whether we have peace or continued war. Money is cheap, traffics are expanding, and in most cases a very decided increase of dividend will be paid next month. Confidence in railway property is increased by the attention paid to railway accounts. A table of the weekly receipts of railways in the United Kingdom for the seven years ending December 31st last, is given in *Horsepath's Journal*. The increase in the total traffic of 1870 over that of 1869 was 2,100,000. For the past year the total weekly receipts amounted to 43,126,604.; for the year 1869, to 41,025,661, showing an increase of 2,100,944. In the past seven years the published weekly traffic receipts showed an aggregate increase of 12,172,600., or an average annual increase of 1,738,943. The inference drawn from these figures is that there never was so promising a period as the present for railway property. All the great trunk lines are made; the capital accounts of the companies are practically closed, excepting for additional rolling stock and other accommodation for the increasing traffic.

The Unseaworthiness of Ships.—Mr. Pimms, one of the members for Dorset, has twice addressed the public in the Free Trade Hall, Manchester, on the condition of our merchant seamen, with special reference to the practice of sending out unseaworthy ships; and, at a public meeting of the inhabitants since held in the Free Trade Hall, the subject was considered with reference to Mr. Pimms's two addresses, and also as to the propriety of petitioning Parliament, when it was resolved,—

"That this meeting deeply deplores the sad fact that, annually, about one thousand of our merchant seamen, the great proportion of them being married men, lose their lives in wrecks upon our coasts; and as it is found that fully half of that number is traceable to vessels which are unseaworthy and overladen, Parliament shall be asked to enact a law, in its next session, to prevent such vessels from going to sea."

Opening of a New Infirmary at Southport.—A new infirmary and local dispensary, recently erected in Virginia-street, Southport, has been formally opened for the reception of patients and the use of the public of that town. The building comprises, on the ground-floor, surgery, dispensary, consulting-room, surgeons' sitting-room, kitchen, scullery, pantry, &c.; also one male and one fever ward, each containing 7,280 cubical feet, and affording accommodation for six patients; there are also adjoining the above wards, nurses' scullery, nurses' bedroom, two lavatories, two water-closets, and other conveniences, all of which are one story in height, and effectually shut off from the main portion of the building by means of well-ventilated corridors, and are approached on the outside by a separate entrance. The upper floor contains surgeons' bedrooms, three nurses' and servants' bedrooms, two bath-rooms, two water-closets, nurses' scullery, one male and one female accident or non-infectious disease ward, the cubical capacity of each ward being 7,280 feet, and capable of accommodating six patients, the same being ventilated by means of six windows, 7 ft. by 3 ft. 6 in. from ceiling downwards, placed directly opposite each other, and containing pivoted apartments at the top to open with rope pulls, &c.

The Law and the State of House Property.—The Metropolitan Board of Works has had before it the question as to whether the owners of house property in London ought to be permitted "to do as they like with their own." At the instance of Mr. Lloyd, it was referred to the Parliamentary Committee to consider whether or not some legislation ought to be promoted with a view to enabling the Board to deal with property allowed by its owners to become an eyesore and an injury to the neighbourhood in which it is situated. Some dwellings in Stamford-street, Blackfriars, for example, have long remained in an unoccupied and uninhabitable state, without any attempt being made to let or improve them. Mr. Lloyd remarked that the roughs resident in and about the neighbourhood conceived they had as much right to inherit the unoccupied premises as rats and mice, and proceeded to take possession; but the authority of the law was invoked by the eccentric landlady to eject and punish the intruders; and Mr. Lloyd thinks that the law which protects owners should be invoked to secure the interests of neighbours. Stamford-street is not the only neighbourhood which suffers from a similar cause.

Doncaster Co-operative Solree.—The annual festival in connexion with the Doncaster Mutual and Improvement Society has been held at the Guildhall. About 500 of the members and friends sat down to tea, after which the secretary read the annual report, which stated that co-operation in Doncaster had made a strong impression upon the public. At the end of 1869 the share capital amounted to 260l. 19s. 9d., but at the end of 1870 it had increased to 772l. 17s. 7d. The amount received for goods in 1869 was 2,049l. 18s., and at the end of 1870, 8,042l. 0s. 4d. The disposable net profits in 1869 were 151l. 16s. 3d., and in 1870, 695l. 11s. 1d. Since the society had been established they had turned over thousands of pounds, and the secretary said he thought that if individuals could accumulate wealth from the profits of working men's outlays, it was high time that the working men themselves put their profits into their own pockets, and thus they might do by co-operating amongst themselves. Co-operation was destined and would ultimately overthrow individual interest, for the good of the great body of mankind.

Art Workmanship Competition, Society of Arts.—The works sent in competition for the handsome premiums offered by the Society of Arts are about to be exhibited to the members. Although the collection includes some productions of considerable merit, it is scarcely such a response as might have been expected. The judges invited by the Council,—viz., Sir Digby Wyatt, Mr. H. A. Bowler, Mr. R. Redgrave, E.A., and Mr. Godwin,—will meet next week to consider their award.

Institution of Engineers in Scotland.—The Transactions of the fourteenth session, 1870-71, of this Institution have been published, at their offices, in Renfield-street, Glasgow. The issue contains a report of the continuation of a discussion on a paper "On the Education of the Mining Engineer," by Professor John Young, M.D.

The Early Monument in Lough.—At the last meeting of the Newcastle Society of Antiquaries, Dr. Charlton read a paper on the interesting archaeological discovery made at Greenmount, on Lord Rathdonnell's estate in Gormanstown, in the county of Lough, Ireland, as already noticed in the *Builder*. There was an old tradition, he remarked, and it was not an unfrequent one in Ireland, that the mounds in that vicinity covered the remains of the Danish invaders of the country. The mound was found to consist of the materials of the ancient sea-beach. About 11 ft. from the top of the excavations, a small bronze plate, which had been attached to a sword-belt, was found. On one side the plate bore, in clear and well-defined Runic characters, in the Norse type, the inscription, "Domhnal Sealshead owns this sword." Domhnal being a well-known Irish equivalent to the Scottish name Donald, he thought that they might conclude that one Donald, surnamed Sealshead, wrote, or caused to be engraved, these words on the ornament to his sword-belt. In all probability, he thought, the Donald here referred to had been an ally or the friend of the Danish invaders.

Monumental.—The south aisle of the choir of York Minster has many mural monuments, and another has just been added. The monument is in memory of the officers and men belonging to the 33rd Regiment, who died when in India and in Abyssinia, and is erected by the officers of that regiment. Upon a large polished slab of dark grey marble, nearly black, is affixed a tablet of Parian marble, the summit of which is circular in shape, and has round it, in gilt letters, "The Duke of Wellington's Regiment," below which, also in gilt, are the figures 33 of large size, and encircled within a sculptured wreath of evergreens, with the motto of the regiment, "Virtutis Fortuna Comes." Below this a carved bordering runs across the tablet, and then are cut on the marble the names of officers and men. Above the tablet, on a ribbon, is inscribed, "1st York West Riding," and on each side of it are similar ribbons, having upon them the words Seringapatam, Waterloo, Alma, Inkerman, Sebastopol, and Abyssinia. The sculptor was Mr. Giffin, of London.

Co-operative Stores (Knightsbridge Branch).—At the last meeting of the Westminster District Board of Works, Mr. Z. D. Berry in the chair, a letter was read from the superintending architect of the Metropolitan Board stating that the application of Mr. Thomas Dudley for permission to erect an open covered way in front of 19, Albert-terrace, Knightsbridge (the office of the stores), had been refused. A further letter was read from the superintending architect (Mr. Vulliamy) setting out that notwithstanding this refusal, the works were being proceeded with, and calling on the District Board to enforce the removal of the projection. It appeared that Mr. Dudley received an intimation of the refusal three weeks ago. The Board now decided to inform him that if the work of demolition is not begun on or before the 23rd inst., the solicitor and the surveyor will be instructed to take the necessary steps to insure the removal of the projection.

The Oxford Surveyorship.—Mr. Thomas C. Clarke, the surveyor to the Local Board, having got a lucrative appointment in Peru, has resigned his office at Oxford. The Board have expressed their regret for the loss of his services, especially in the present position of the drainage question. One member said their proper course would be to advertise for a surveyor, in accordance with the terms of former advertisements; and if the Board should not be fortunate enough to secure the services of a gentleman equal to Mr. Clarke's abilities, they would then adopt a course to meet their requirements, so as to be able to carry out their drainage works. The question of an assistant was not, however, before them. The chairman then put the motion, and it was carried, the terms of the advertisement being agreed upon, the Oxford papers and the *Builder* being chosen in which the advertisement should appear.

Chromolithography.—Messrs. Nicholson & Son, of Bradford, have published an Allegorical Sheet Almanac for 1871, which is a remarkably good specimen of chromolithography. It is from a design by Mr. Edward Corbould. The drapery of the Angels censuring the new born year is particularly well reproduced. The sheet is the result of at least twenty printings.

Fall of a Warehouse in Liverpool.—Alarm and excitement have been created in Formby-street and its neighbourhood by the sudden falling of the west wall of the large iron warehouse of Messrs. Bailey & Co., extensive iron merchants. The warehouse is situated in close contiguity to the Waterloo Dock Station of the London and North-Western Railway Company, who are making an extension of the station in question. In the course of their operations, large excavations have to be made, and these are in progress. Following the course of the intended works, a portion of the required excavation had been brought within 5 ft. or 6 ft. of the warehouse wall, without any indication of immediate danger; but the foundation suddenly gave way, the wall falling into the cutting. The wall was about 30 ft. high, and the fallen portion leaves a gap for the whole of that height, and about 40 ft. in width. No one was hurt. The warehouse at one time contained about 200,000 tons of iron.

Value of Building Sites, Lincoln.—Last week, Mr. R. Hall offered for sale in the Corn Exchange, Lincoln, a number of building sites, in the parish of St. Swithin. The following is a list of the sales effected:—Lot 1, at 3s. 3d. per yard, Mr. J. Sivil; lots 3 and 4, containing respectively 436 and 406 yards of building land, 5s. per yard, Mr. Tweed; lots 5 and 6, building land fronting Montague-street; 5s. per yard, Mr. Sivil; lot 7, at 6s. 9d. per yard, Mr. Squire Whitworth; lot 8, 3s. 6d., Mr. Goulson; lot 9, 3s. 6d., Mr. H. Fotherby, and lot 10, 3s. 9d., to the same gentleman; Messrs. Martin & Sims bought lots 11 to 16 inclusive, at 4s. 3d.; lot 17 fell to Mr. Fotherby, at 3s. 6d.; Mr. Callen bought lot 18, at 3s. 7d.; Mr. Wistow bought lots 19 to 22 inclusive, at the same price; lot 23, at 3s. 7d., and lot 24, at 3s. 6d., fell to Mr. Tweed; Mr. H. Barnes bought lots 25 to 31 inclusive, at 3s. 6d.; lot 32, at 4s., went to Mr. J. Spencer, who also bought lot 33, at 4s. 6d.; Mr. Henry Goddard gave 4s. 3d. per yard for lots 34 to 40 inclusive.

Cement Testing Machine.—We have received particulars of a cement testing machine, said to possess many advantages over those ordinarily used. The general ideas of its construction originated with M. Michéle, but all the details were worked out by Mr. Carrington. By turning a hand-wheel a clip, holding the cement to be tested, is drawn down, and thus a tensile strain is exerted on the block or brick, which increases as the weights are raised, until a fracture takes place, when the weights fall, leaving the pointer indicating on the segment the exact maximum strain withstood. What is claimed for the invention is that it will apply a regularly increasing strain without any jerk, that it is of convenient size, and that it can be purchased at a moderate price. One has lately been obtained for their London tests by Messrs. Francis & Co., cement manufacturers, and it may be seen at work at their office, Vauxhall Bridge.

The Royal Historical and Archaeological Association of Ireland.—The annual general meeting of this Association (formerly the Kilkenny Archaeological Society) has been held at Butler House, Kilkenny. Mr. Eugene Shine in the chair. The report of the committee for the year 1870 stated that the number of new Fellows and members elected during the year, amounted to 75, and the entire roll, on December 31st, extended to 692 names, showing an increase of 10 in the year. Fifty-nine members were lost by death or resignation during the year, and six have been removed from the list. Sixteen new members and three Fellows were elected at the meeting.

Lead Poisoning.—The subject of lead poisoning by the domestic use of lead pipes for water is forcing itself on attention in America. The *Boston Journal of Chemistry* calls attention to the tin-lined pipes which have come into use there, and against which it emphatically warns its readers: 1st, because tin by itself is often more readily attached and dissolved by water than is lead; and 2nd, that when placed in association with lead, if any water contact is made between the tin and lead, both metals are dissolved with increased rapidity.

A Trades Insurance Company.—Suggestions have been circulated, and a meeting has been held, promotive of the establishment of a special company for the more equitable assessment of premiums for the insurance of manufacturing and business premises against loss or damage by fire.

Pictures on Hospital Walls.—The Royal Hospital for Incurables at Putney has, through the liberality of one of its warmest supporters, become what may not inappropriately be termed a "picture gallery." The *Art Journal* says,—A gentleman—one whose delight is to "do good by stealth," and would therefore not care to see his name publicly associated with an act of most thoughtful benevolence, though we may be allowed to speak of him as the "treasurer" of the hospital—has presented to it as many as 400 chromolithographs of the best kind, which he has had put into handsome frames, and hung round the walls of every apartment in the building where the afflicted patients lie helpless; or, if able to move about, where they are accustomed to assemble. It is not easy to imagine with what pleasure these beautiful transcripts of nature are viewed by the inmates, not a few of whom are incapable of seeing anything beyond the walls of the rooms in which, amid pain and suffering, they are, in all probability, destined to pass their wearisome lives.

Nottingham Free Library.—The third report of this institution states that it has attained to a fifth rank amongst the free libraries of the United Kingdom, in point of issues, though only one department is yet in active operation. A newsroom and a small reference library have been formed. The lending library contains 12,455 volumes. The issues were 135,272 volumes. The magnificent work on the textile fabrics of India, now in preparation by Government, has been subscribed for at a cost of 150*l.*, which is only the actual cost of production; the materials, as samples, being supplied by Government, at a cost to them of from one to four guineas a yard. The museum has been very greatly improved by the arrangement of several of its divisions. The committee urge the necessity of providing larger and more convenient premises, in which the library and museum could be embraced.

Chelsea Improvements.—At the Chelsea Vestry, on Tuesday, on letters being read from the superintending architect of the Metropolitan Board, stating that permission had been asked to form certain new roads on the Ashburnham estate (near Cremorne Gardens), and also to form three new streets, two continuations, and two mews, on Lord Cadogan's estate, lying between Flood-street and Smith-street, King's-road, Chelsea, the surveyor reported that it was proposed to put 218 buildings on the land, including ten stables, which would increase the rateable value very considerably. He recommended that the Metropolitan Board should be advised to grant the application. This was agreed to, on the motion of Mr. E. O. Symonds, seconded by Mr. Fisher.

New York Crystal Palace.—New York advices describe a project in course of introduction for a grand Crystal Palace in that city,— "a palace so inconceivably huge," according to the *Journal of Commerce*, "that, in the language of a prospectus, the crystal structure of 1851 was only a toy-house compared with it. It is to occupy about 23 acres, and the capital stock proposed to be created is 1,200,000*l.* A dollar per square foot is to be the charge for space to exhibitors, and the price for single admissions is to be half a dollar. The site chosen is stated to be at a disadvantageous point, 'far removed from the hotels and the populous parts of the city.'"

Holdenby House.—The remaining portion of this historical mansion is now being restored and adapted as a residence by the trustees of the late Viscount Clifden. It was one of the best works of the great Elizabethan architect John Thorpe, the builder of Burleigh, Audley End, Hatfield, Kirby, &c., and was erected for Sir Christopher Hatton about 1583. It had two great quadrangles, with its principal façade towards the south, in front of which was a terrace called King Charles's-walk, with a large bowling-green, flanked by terraces on each side, formed on the slope of the hill, and overlooking the valley and woods of Lord Spencer's park at Althorp.

The Sanitary State of Cambarne.—Dr. Buchanan has issued his report on the sanitary condition of Cambarne, which he considers will help the spread of any epidemic. The water-supply has been miserable; drainage is practically non-existent; nuisances abound; overcrowding prevails; the inhabitants are by no means concerned about all this, and the local authorities are in about the same state of feeling.

The Lead Trade.—Some large purchases of pig lead have been made by some of the principal houses within the last few days, and the smelters have also secured all the ore they could obtain. There are reasons to anticipate that this metal will bear a more remunerative price during 1871 than for the last year.

TENDERS.

For works in Water-lane, Backfairs, for Messrs. Spiers & Pond. Mr. E. Power, architect. Quantities supplied by Mr. A. Peebles:—

	No. 1 Contract.	No. 2 Contract.	Deductions from No. 2.
Garland	£1,646	£3,553	£213
Barnett & Whitchlow	1,520	2,550	85
Turner & Sons	1,406	2,988	174
Hill & Sons	1,380	3,118	141
Jackson & Shaw	1,312	2,537	88
Colts & Sons	1,278	2,678	130
Brass	1,265	2,703	108
Nightingale	1,263	2,754	177
Merritt & Ashby	1,259	2,663	138
Newman & Mann	1,255	2,829	215
Nelson	1,242	2,710	216
Henshaw	1,217	2,624	131
Perry, Brose	1,208	2,808	276
Brace & Son	1,200	2,890	153
Foster	1,199	2,803	165
Browne & Robinson	1,197	2,673	147
Sewell & Son	1,193	2,580	173
Atiss & Co.	1,174	2,625	165

For the restoration of Mallock Church, Derbyshire. Mr. Benjamin Wilson, architect. Exclusive of old materials.

Statham	£1,580	0	0
Brown & Sharp	1,668	0	0
Thompson	1,570	0	0
Bridge (accepted)	1,563	0	0

For sinking a well 80 yards deep, for the Alfreton Local Board of Health. Mr. Benjamin Wilson, architect. Per Yard Inval.

Farnsworth	£10	0	0
Nichols	7	0	0
Alderson	4	18	0
Haslam	4	5	0

For alterations and additions to Binn's Hotel, Harrogate. Mr. Benjamin Wilson, architect.

Winterburn	£1,354	0	0
Benson	1,345	0	0
Simpson (accepted)	1,350	0	0

For the erection of additional Infants' School to St. Paul's School, Derby. Mr. Benjamin Wilson, architect:—

Thompson (accepted)	£483	0	0
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Accepted for new school at Leek, Staffordshire. Mr. Benjamin Wilson, architect.

Mason's Work.			
Barlow	£160	0	0
Bricklayer's Work.			
Grace	260	0	0
Joiner's Work.			
Mackrell	181	10	0
Plumber's Work.			
Johnson	73	19	0

For the erection of a Pavilion, with conservatories, in the Public Gardens, at Buxton. Mr. R. Milner, architect:—

Hall & Son	£9,465	0	0
Vernon & Cooper	8,701	0	0
Clarke & Hope	7,800	0	0
Cumming & Edwards	7,700	0	0
Leigh & Co.	7,369	0	0
Handyside & Co.	7,347	1	9
At as Iron Works	6,952	0	0
Farrell	6,614	0	0
Step	6,140	0	0
Wade, Bros. (accepted)	5,836	0	0

For alteration of premises in Leadenhall-street, for Mr. J. Quobarth. Mr. Joseph Gibson, architect. Quantities supplied:—

Palmer	£797	0	0
Cole	789	0	0
Bennett	764	0	0
Young	745	0	0

For rebuilding the Black Bull public-house, Stoke Newington. Mr. James Harrison, architect. Quantities supplied by Mr. John Leaning:—

Little	£1,621	0	0
Roberts	1,685	0	0
Ashby & Sons	1,540	0	0
Terry & Co.	1,475	0	0
Browne & Robinson	1,467	0	0
Coleman	1,459	0	0
Ennor	1,421	0	0

For warehouse for Messrs. Farnham, City-road. Mr. William Medall, architect:—

Perry	£853	0	0
Axford & Whillier	798	0	0
Kiddle	780	0	0
Browne & Robinson	770	0	0
Baton & Chapman	694	0	0

For Wednesbury Town-hall, Messrs. Loxton, Bros., architects:—

		Reduced.	
Brewer	£3,780	0	0
James Wicks	3,730	0	0
Round & Bagnall	3,576	0	0
Stephenson	3,580	0	0
Brley	3,550	0	0
Whitmore	3,485	0	0
Pugh	3,379	0	0
Coapelle	3,300	0	0
Stockton & Son	3,213	0	0
Job Wilkes	3,149	0	0
Moore	2,903	0	0
Moore (further reduced and accepted)		2,925	0

For a vicarage-house and stabling, at Kinver, near Stourbridge. Mr. T. Smith, architect. Quantities not supplied:—

Everall	£1,785	0	0
Bennett	1,700	0	0
Thompson	1,580	0	0
Burnham & Son	1,485	0	0
Horton	1,478	0	0
Hughes	1,420	0	0

For roads at Morden:—

Bull	£3,450	0	0
Clark	2,279	6	10
Priest	2,254	10	0
Riley	2,116	0	0
Carter	2,100	0	0
Hulmes	2,068	15	0

TO CORRESPONDENTS.

W. A. D. (reply has been sent).—T. M. (it is not settled).—T. R. & Son (our list is official).—J. B. C. (makes the mistake of confounding "moulding" (casting) with moulding).—F. B. & S. & R. M. G. G. P. A. H. J. H. J. J. P. R. L. J. G. J. K. J. H. J. N. A. B. W. P. R. C. R. K. W. F. B. W. R. W. W.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication. None.—The responsibility of signed articles, and papers read at public meetings, rest, of course, with the authors.

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We gave with our last Number, as a supplement, an INDEX and Title-page to the Volume of last year. A COLOURED TITLE-PAGE can be had, gratis, on personal application.

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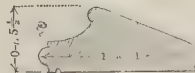
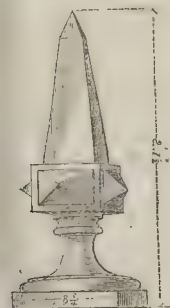
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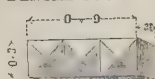
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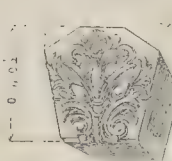
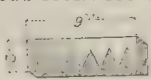
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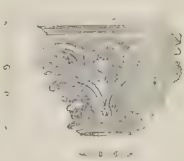
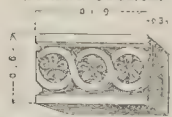
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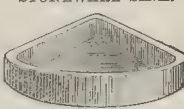
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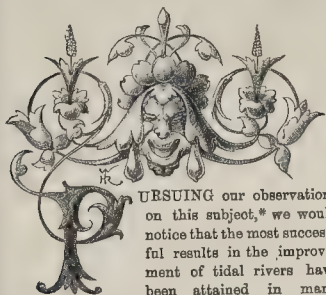
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VOL. XXIX.—No. 1460.

Rivers: their Functions and their Treatment.

PURSuing our observations on this subject,* we would notice that the most successful results in the improvement of tidal rivers have been attained in many cases by simultaneously regulating the width of the channel and deepening the bed of the stream. The latter process may be effected in soft soils, such as the alluvial plains of India, by means of the river current itself, which when properly regulated, will scour its own channel to the required extent. But it frequently happens that river shoals acquire, in the course of time, such hardness and consistency that no improvement of the channel will suffice for their removal. In such a case, the principle usually adopted by engineers is to remove the cause of the formation of shoals by measures tending to increase the velocity of the current, and then to remove the shoals themselves by dredging. The latter process has the further advantage of increasing the capacity of the tidal channel, and of allowing the tide to flow freely in both directions, which has the effect of increasing both its height and depth. Dredging has accordingly been very extensively practised in navigable streams; and in the Thames alone it is stated that about ten millions of cubic yards have been thus removed from the bed of the river.

The usual means of regulating the width of rivers is by the construction of longitudinal or training walls on either bank. They are built, according to circumstances, of masonry, concrete, or timber piling, or formed by earth embankments pitched with stone where exposed to the running water. Such embankments are also frequently formed of alternate layers of earth and fascines, or bundles of faggots, which makes a cheap and good construction for rivers of moderate velocity. Where the space or foreshore to be reclaimed is very large, and the filling at the back of the training walls would consequently be expensive, it is usual in the first instance to run out timber groynes from the bank at intervals, about half-tide high, across the space which it is proposed to reclaim. These constructions intercept and gradually collect between them a considerable portion of deposit from the river; and when this is done, the training walls are built. The most successful instance of a river improved in this manner is, perhaps, the Clyde at Glasgow, where the depth available for navigation at low water is stated to have been increased by the measures above described judiciously applied, and by dredging, to no less an extent than from 2 ft. to 20 ft. These works, and the importance of the port resulting from them, are, perhaps, the greatest triumph on record in this branch of engineering.

* See p. 37, ante.

In some cases, as in the Dee at Chester, groynes, as above described, have been applied without further constructions. But this treatment has been found to produce irregularities in the course of the stream, and, in fact, to be prejudicial to the improvement of navigable rivers rather than the contrary.

The above are the principal natural phenomena at and near the mouths of navigable rivers with which engineering skill and science have been required to deal. It is now proposed to proceed upwards, and review the causes of impediment to navigation and drainage which usually occur in the higher portions of streams.

It has been already stated that the lower reaches of rivers generally flow through a flat country, and consequently with a comparatively sluggish current; and this applies to the portion both within and immediately above the tidal influence. It is a curious natural fact that the tendency of a river under these circumstances is not to preserve a straight course, but to form for itself a winding or circuitous channel. The current, in the first instance, is probably deflected by some artificial obstruction, such as a partial hardness of the soil, from its straight and proper course, and cuts its channel in the direction of least resistance. The weight and force of the stream, instead of moving along the middle of the river, as they would do in a straight channel, are by this means directed sideways, so as to impinge on one or other of the banks, whence the stream is again deflected (like a billiard-ball striking obliquely upon its cushion), in an angle corresponding to the angle of incidence. This takes place in nature upon the largest scale; and the effect of these irregularities is, in many cases, surprisingly regular, forming a continuation of alternate or S bends, of equal curvature. Of this the Thames presents many notable examples, and the great rivers through the alluvial plains of India are often wonderfully regular in the form and extent of their sinuosities.

Where the river is of this nature, the outer or convex side of the curves or bends is naturally the deepest; and the inner side is liable to shoal. Between the bends the line of main current and of deepest water naturally sets across the river, from the outer curve on one side or bank, to the succeeding outer curve on the other.

It is evident from the above description, that the current will tend continually to abrade or bite upon the outer curve or bank at these bends, and to deposit and shoal the course of the water at the inner curve. The continued abrasion in the former case also tends to widen the bed of the river, to diffuse the stream over a larger space, and to weaken its force in proportion.

The effect of such sinuosities is also to increase the length of the channel to a large extent, and to diminish its rate of fall in proportion, thus aggravating the evil of insufficient velocity to which rivers in flat countries are liable. These remarks are even more applicable to the reaches above the tidal influence than to those below it, as the volume of the river water, and its consequent capacity for maintaining a clear channel, are usually very much smaller than that of the tidal stream.

The straightening of bends, so as to form a direct and uniform channel, is of course the most obvious remedy for this evil; and it occasionally happens, when a bend is very circuitous, that a very short artificial channel will save a comparatively great distance in length of river. These operations, however, involve the necessity of many precautions to insure their efficiency. The inclination of the channel in the new work of course becomes greater as its length is diminished, and the velocity of the stream is proportionately increased, involving the probability that the bed of the new channel may be scoured to a much greater extent than that of

the old, and that the material so removed may be deposited in the lower portion of the stream, where the current resumes its original rate of flow. Moreover, at the lower junction of the new and steeper with the old flat channel, the increased velocity of the stream receives a sudden check; and the current will expend its force, unless efficient measures be taken to prevent it, in ploughing or tearing up the bottom at the point where its velocity is so checked, and in throwing up the excavated material beyond in a bank or bar across the river.

The scouring power exercised by a river on various soils is, of course, measured by the velocity of the water at the bottom, which, owing to friction, is much less than the surface velocity.

It may therefore be interesting to state the comparative surface and bottom velocities of rivers, and the effect of those velocities in scouring various soils.

Surface and Bottom Velocities in Feet per Minute.

Surface.	Bottom.	Surface.	Bottom.
20	6	280	192
40	16½	280	210
60	30	300	228
80	45	320	245
100	60	340	263
120	75	360	280
140	92	380	300
160	108	400	315
180	125	420	333
200	142	440	351
220	158	460	369
240	176	480	387

Effect of different Velocities of Water in Scouring various Soils.

15 ft. per minute will scour fine clay.	
30 ft. do. do. fine sand.	
45 ft. do. do. coarse sand.	
60 ft. do. do. fine gravel.	
120 ft. do. do. round stone, 1 in. diameter.	
180 ft. do. do. angular stones as large as an egg.	
330 ft. do. do. conglomerate.	

One of the most important points in the treatment of rivers is to ascertain their liability to be affected by, and to provide measures against, the destructive results of heavy floods.

The effect of floods is very variable in different rivers, according to local circumstances. It is more destructive when, owing to a retentive soil, to steep slopes on the sides of the valley, or to both in combination, the waters of heavy rains are collected rapidly in the river, so as to swell its volume beyond the capacity of its channel. These effects are modified, on the other hand, by an absorbent soil, or by a flat and extended valley, which retains the water, and obliges it to pass slowly to its natural outfall, thus enabling the discharge to be gradually effected. In this way the flooding of rivers has been aptly described as a race against time; though in the case of long-continued and heavy rains, when the surface and soil become fully saturated, the rainfall begins to flow into the river with almost equal rapidity in the latter as in the former case. But the most rapid and destructive inundations are caused by the melting of snow, and almost all the great rivers of Europe owe their highest floods to this cause.

The absorbent strata in this country are chiefly sand and gravel, chalk, limestone, and sandstone. The extent to which floods, as well as other conditions of a river are modified by the prevalence of porous strata in its watershed, is well illustrated in the case of the Thames itself. The upper portion of this watershed consists, as is well known, of the chalk formation, which absorbs and stores the rainfall to a large extent, returning it to the river in dry weather by means of perennial springs. In consequence, the stream, excepting in long-continued rains, is uniform to a remarkable degree in the quantity of water it discharges; and its liability to flooding is caused much more by the artificial obstruction of weirs and mill-dams than by any natural condition attaching to the river.

As a rule, a flood commences when the strata, whatever they may be, are saturated with water so that their absorbent qualities are exhausted

and this is frequently exemplified by the circumstance, that a given amount of rain in summer is found to be disposed of by absorption and evaporation, and never reaches the river at all; while the same amount in winter, with a saturated atmosphere and soil, will pass into the river without diminution, and sometimes cause a flood.

The absorbent strata tend to moderate floods, not only in proportion to their porosity or capacity for containing water, but (especially in the case of limestones and sandstones) by the dip of their beds, which, particularly when of steep inclination, facilitate the subterranean escape of the rainfall.

Again, the effects of a flood are moderated on a large scale in nature by the existence of lakes, which afford an extensive area for the storing or retention of flood-waters, and enable their contents to be discharged gradually and quietly by the outlet rivers at their lower extremities. Many instances of this kind may be referred to. The two great lakes which supply the source of the Nile are said to furnish to the upper portion of that river a remarkably uniform amount of water; and although the river receives directly the flood waters of the districts below, which convey the well-known mud deposits of Egypt, yet the lakes referred to have the effect, on the whole, of moderating the flooding of the country to a material extent. On the continent of Europe also, the great lakes at the foot of the Alpine ranges, which receive the waters of the melting snows, serve the purpose of moderating the inundations, which, though still often destructive, would render the valleys below those lakes totally uninhabitable if their impetuous discharges were uncontrolled by this provision of nature.

The modification of floods by means of engineering works, is a matter of considerable difficulty. In some cases, as in the Po, dykes or artificial banks have been constructed for this purpose; but the tendency of the river to raise its bed by the deposit of the material carried down by the floods, has involved the necessity of constantly adding to the height of the dykes, until the river is raised above the level of the surrounding country, rendering any future escape of its torrent liable to be doubly destructive.

The French engineers have proposed, for moderating the floods of their great rivers, to form a system of artificial lakes at the mouths of the tributary streams, so that the mainstream should not be suddenly uncharged. But the usual and perhaps the most feasible course is to regulate, deepen, and improve the bed of the river itself, and to remove artificial or natural impediments from it, to the utmost practicable extent.

In very many rivers, of which the Thames and Shannon are notable examples, a constant antagonism exists between the interests connected with the navigation and those connected with the drainage of the adjoining country. The former can only be maintained by the construction of weirs or dams, which keep up the water to an artificial height so as to give it depth for navigation, at the same time affording water-power at the overfalls for mills. With the drainage, however, the matter is reversed, as the impediments thus created to the flow of the stream render it impossible to carry off the flood waters with sufficient rapidity from the low-lying lands adjacent to it. It becomes a question, therefore, of the comparative value of the drainage, or of the navigation, to the district. Until the present generation the interests of the navigation have been generally preferred, but the great extension of railways throughout Great Britain has much deteriorated the value, both in a commercial and national sense, of river navigation; and the modern tendency of public policy is to remove all obstructions to the discharge of rivers, as far as it can be reasonably effected with regard to the important private interests which the former policy has created.

It appears, in short, that in the early history of a country rivers play a most important part in providing the means of internal communication; and the Mississippi and other great streams of the American continent readily occur in illustration. As civilisation and wealth increase, however, the necessity for drainage is more felt, while superior and more rapid means of communication by railways become universal. The tendency in this case, therefore, is to confine the navigation to the lower portions, where seagoing vessels may be accommodated, and to devote the upper portions to their original purpose of the drainage of the country.

The line of longitudinal section of a river

generally forms a concave curve, which, of course, is flat at the lower end and steep in inclination at the source. In the upper portion the water supply is generally limited, owing to the contracted water-shed and steep inclination of the bed; but the storm-water for the same reason is delivered into the stream with great rapidity where the strata are composed of retentive soils. Such positions are especially favourable for the working of mills, and are generally so occupied to the utmost possible extent in this country.

It is pleasing to reflect that at no previous time in our history have the advantages afforded by our British rivers, whether in a commercial, agricultural, or sanitary point of view, been so highly appreciated as at present. The maintenance of their volume is jealously guarded; and the preservation of their purity from all pollution is being made the subject of the most minute scientific investigation and the most careful legislation. In these facts the lovers of nature and of progress may alike rejoice; for in no other natural objects than our flowing streams are the useful and beautiful more fully united.

THE WINCHESTER GUILDHALL COMPETITION.

OUT of the forty-six sets of drawings which, as we have already mentioned, have been sent in competition for the proposed new Guildhall and Public Offices at Winchester, the town-council have selected six which they recommend for special consideration; the others being, as we gather, already looked upon as "out of the running." We will say a word of these favorites first, bearing in mind that the cost of the building, including all fittings of a permanent kind, such as chimney-pieces, &c., was limited by the terms of the competition to 11,000*l*. The set with the motto "*Tria juncta in uno*" (numbered 1 in the order of hanging) is what we should call a rather fidgety design, proposed to be erected mainly in Beaulieu brick, with bands and alternating voussiors in Farnham red brick, and Bath stone dressings, with a good deal of notching and cutting of round dots by way of decoration; in short, an average specimen of a style of modern Gothic design rather too familiar to every one, and calling for no further remark. The plan (to which this set of drawings probably owes its position) is simply and conveniently arranged, especially with regard to the working of the business department, the surveyor's and town-clerk's offices and committee-room, easy communication between which was, of course, one demand in the conditions. Egress from the assembly-room, however, is far too scantily provided for, and concentrated too at a point close to the platform, just where early departures among the audience would most disturb whatever was going on. "*Cæsar Gwent*" (8) is a much better design architecturally. The assembly-room is here brought to the front, and its position and character marked by large windows, with geometrical tracery of a simple design, with gabled heads and finials carried up through the cornice and parapet; the general style being Early Geometric Gothic. An angle tower, flush with the faces of the building, forms the main feature; and a bay-window not unappropriately marks the position of the library and reading-room. The plan, while presenting no feature for special comment, appears satisfactory in the main. This design is also proposed to be built in brick and Bath stone, and would look less satisfactory when carried out in these varied materials than it does in the ink perspective drawing, which, of course, does not indicate the colour effect. The architect's estimate is 10,300*l*., which is probably under the mark; but the design comes nearer to being within the proposed cost than most of the others. In "*Utile dulci*" (25) the library and museum occupy the front of the principal floor, and the assembly-room is at the back; an arrangement adopted by most of the competitors, and which gets over a good deal of difficulty in planning, at the cost of some degree either of truthfulness or effect in architectural design. This is a modern Geometric Gothic design, in very bad taste. The centre tower, with its preposterously high gable-roof, and masses of roof clinging against the side walls, is a most inartistic feature; and there is nothing elsewhere to atone for this. The assembly-room, with low walls, and a high wooden painted ceiling in several parts, is shown in a large rough pen-and-ink drawing, with a good deal of faulty perspective;

the whole of the drawings are just of the kind to captivate a "committee;" but the cost would far outrun the estimate, and there is not much chance of its being executed. The next design to this, "*Manners maketh Man*" (26), is a great contrast; both drawing and design are evidently the work of a practised and artistic hand, and, considered purely as a piece of architectural composition, this is one of the best designs in the room. The architect has adopted the view that, as the proposed building will stand low and be opposed by several lofty structures, height is a *sine qua non*. The result is a building considerably cramped on plan and carried up higher in proportion than most of the others; the style is a modification of Early Gothic (a description applicable to a majority of the designs exhibited), plain even to severity, very solid-looking, the effect being principally obtained by opposition of line and surface rather than ornament; the windows admirably treated artistically, but far too small practically in many cases. The assembly-room is at the back, reached from a front entrance through a centre hall, which is carried up two stories, with a gallery round on the upper story, and marked in the external design by a tower finished with a simple but very picturesque wooden roof and lantern. The author draws attention to his planning of retiring-rooms, in connexion with the assembly-room; the ladies' cloak-room opening to the left out of a corner of the central hall, the gentlemen's room being on the other side, but on a higher level, and only reached by a special staircase not leading to any other department; an arrangement which his experience in planning public rooms has led him to think necessary. The objections to this design are, practically, that the business portions are too much separated, the committee-room apparently being only accessible from the town clerk's offices by going up a circular stair-turret (carried through all the stories, and forming a feature in the design), and then traversing the whole width of the building; and the rooms all appear small. Artistically, there is in the composition, with all its picturesque qualities, too much Medieval sternness of expression; the architect's mind has been running too much on the past of Winchester, too little on the present and future. The material is to be of brick, with ashlar facing; and with all its plainness, such a design would necessitate such very good and solid execution to do it justice, that it would perhaps run away with more money than some more showy buildings. The windows are proposed to be of plate glass below the transoms, and light stained glass in the heads. Were this design selected the Winchester people would have a Guildhall which would possibly be admired by every one except those who had to live and work in it. "*Concentration*" (27) is a very able and cleverly arranged plan, every bit of space being utilised. Perhaps the lines of communication are scarcely wide enough, nor the different departments sufficiently separated: the access to the museum and sessions-house, for instance, from the same corridor, and with the doors closely contiguous, might be found practically inconvenient. The library and museum occupy the front, and consequently have windows larger than necessary, to give dignity to the principal elevation;—an instance of falsity of architectural treatment which this arrangement may give rise to; for a library, so far as it is a storehouse for books, is a place where wall space is of more importance than large windows, and which, indeed, is best stained from above. The general design is not unlike in character to that of No. 25, but better, especially as to the central tower. No. 33, marked by a star, is one of the few Classic designs in the room, and is not calculated to assert the superiority of Classic over Gothic, being, in truth, a sadly commonplace affair, with a row of engaged columns in front, with cornice breaking round them and a statue over each. There is a little more originality of treatment in the upper part of the central tower; but it is flat and weak in manner, and the iron dome-shaped finial is not a happy feature. The assembly-room is on the ground-floor at the back, with a great array of retiring-rooms all round it, and very meagre kitchen accommodation, for a place where large dinners may occasionally be given. The front is all to be of a light-coloured freestone, with panels, &c., of red Mansfield stone; and the author states that the quantities have been approximately taken out, and that he "thinks it would obtain a tender" (for the sum limited) "from any respectable builder." We differ from him.

Among designs not honoured by special selection we must notice "Lufus" (16), which ought to have taken place before some of the selected ones. This is a very quiet but truly architectural design, shown in some very pleasing elevations clothed in ink in slight but artistic style; there is no perspective view so far as we could discover. The author describes his style as "a modification of Late Middle Pointed, with some introduction of the spirit of later domestic detail;" the front shows an elevation with two rows of multioned and foil-headed windows, under square labels, and a tower, very simple, but with a good deal of character about it, rising flush with the wall over what is called the "magistrates' entrance." The main entrance is under a picturesque carriage porch, projecting from the centre of the front; between the windows are chamfered buttresses terminating in a finial carrying a statue, half recessed into the wall between the upper row of windows; the statues not being included in the estimate. The assembly-room occupies the flank of the building, a lofty apartment with timber roof and external buttresses, shown only in section. These two fronts are to be of Ancaster or Donling stone, the rest of the building of Fareham white bricks; the principal staircase to be of oak, other woodwork of pitch pine, varnished. The plan is a little scattered, and there is rather a deficiency of staircase accommodation, but on the whole this is one of the best designs in the room for the purpose; indeed, it seems to us the only good design which looks as if it would really come within the sum stipulated. The author will, however, we suppose, have to content himself with the satisfaction of having competed honestly; but that this design should have been thrown out for such productions as No. 1, 25, or 38, is one more instance of the necessity of committees having some adequate professional guidance in making their selections in such cases. "Nisi Dominus frustra" (30) is another clever though peculiar design, totally different from the last-named, and probably an expensive one, but showing much boldness and originality of treatment in bold geometric Gothic, the centre feature (we can scarcely call it a tower) consisting of a square mass rising out of the front, and broken above into what may be described as a Greek cross on plan, with smaller diagonal arms in the angles; on each wing of the front a bay window, boldly corbelled out from a short wall shaft, forms a picturesque feature; the whole design, shown in a fine ink perspective drawing, is, though rather *outré*, very clever and suggestive. Of the two designs signed "Manus" (17 and 18), the first is so unhappy that it is difficult to believe they are by the same hand; 18 shows considerable merit and originality in the treatment of flowing tracery under circular-headed windows, and has a definite expression of its own, but there is too much roof, and it appears altogether an unpractical design. "Civis" has proposed to build a cathedral for his townsfolk, as "civis" in these kind of competitions generally do. His perspective drawing is a fine one, but the whole thing is totally impracticable. No. 3, signed with a white circle, is a most elaborate set of drawings, showing in two large perspectives alternative designs, in Gothic and a kind of Classic, the latter somewhat original in parts, but very heavy and uninviting. "Sans Dieu Rien" (6) is a very quiet little design, somewhat too domestic in expression, but, though rather weak, not without a certain picturesque originality in a kind of modification of Elizabethan Gothic. "Non modo sed quo modo" (41: we presume the author meant to say "Non quo sed quo modo") is a rather striking Gothic design, showing considerable breadth of treatment, with a massive square angle tower rising from the wall plane, and containing the main staircase. Judging from the plan, this must be the work of a young hand. The retiring-rooms are at the wrong end of the assembly-room, and only to be reached through the latter, so far as appears from the plan: and the circular turrets at each side of the centre gable have no meaning on the plan, and, indeed, spoil one of the ground-floor offices. "Well Considered" (36) is another Gothic design of somewhat similar character to the last-named, but with a central tower; the author has made a sad mistake in placing a projecting balcony on the face of the tower (which is flush with the main wall), just on a level with the cornice of the main building, so as to carry on the horizontal line, and break the vertical composition just where it should be emphasised. The roof of the tower, a square on plan set diagonally, would not

have a happy effect. "Fortuna sequatur" (33), one of the few Classic designs in the room, may be mentioned as showing a front elevation quiet and in good taste; the plan is a mere division of an area into squares, and is probably also the work of a young hand. There are no other designs which appear to us to call for any special commendation; we might specially abuse, "in good set terms," several of them, were we so minded: suffice it to say that this collection of drawings, while containing some very able designs, and showing an aggregate of much labour, appears to us to exhibit also rather more than the usual proportion of that peculiar kind of violent and sensational drawing and designing which competitions, more than anything else, afford opportunity and temptation for.

The council engage to employ the architect who may gain the first premium to carry out the work at the usual professional remuneration; but their dealing with the second premium is highly unfair: the fortunate gainer of this is to have the option of receiving his drawings back again without any premium, or receiving a 50l. premium and leaving his drawings in their hands. This is "premiating" with a vengeance: 50l. and the return of the drawings would probably not pay the architect for the mere time bestowed on them. We hope the council will reconsider this, and not act shabbily. They are to meet on the 2nd of February.

AN ACCOUNT OF ST. THOMAS'S HOSPITAL.*

In compliance with a request, I have much pleasure in laying before you a brief account of the new St. Thomas's Hospital, now approaching completion on the Albert Embankment, at Lambeth. The hospital at Southwark, which had existed in some shape since the year 1207, was incorporated and received its Charter from King Edward VI. in the year 1551, and a few preliminary remarks on the cause of its migration from that ancient site may not be uninteresting, particularly as such removal involved many important questions, not perhaps purely architectural, but such as are continually arising in our professional practice.

In 1859 a certain adventurous railway company, called the Charing Cross Railway, conceived the idea of taking a line from London Bridge to Charing Cross, and their great difficulty appeared to be to pass the Borough without trenching either upon St. Saviour's Church or St. Thomas's Hospital. They, however, respected the Church, not, perhaps, from any religious sentiment, and determined, as being most likely to succeed in their application to Parliament, on taking a small corner of the grounds of St. Thomas's Hospital, and they accordingly served a notice of such intention on the authorities. The Governors, feeling that a railway perched upon an iron viaduct within 10 ft. or 12 ft. of a most important portion of their hospital, irrespective of the damaging effect it would have on the whole institution, would be destructive of its usefulness, were reluctantly compelled to oppose the Bill in Parliament. After a long and arduous struggle, the Committee of both Houses came to the conclusion that there was a great public necessity for such a communication, and that the hospital must yield, and the Lords' Committee, after expressing a strong feeling on the injury which would accrue to the hospital, passed the preamble. Certain negotiations followed, but came to no result. In December, 1860, the railway company served a notice on the hospital to take the part they required. The Governors felt that a railway and a hospital could not co-exist in such close proximity; and, after full consideration, gave the company notice to take the whole under the 92nd clause of the Lands Clauses Consolidation Act. The company resisted such request; but on the matter being argued before the then Vice-Chancellor Wood, he, without hesitation, determined that the hospital view was the correct one, and that the company could not escape from the obligation of purchasing the whole hospital. Such being the result, one cannot but regret that the line was not taken directly across the hospital, passing through the centre of the London Bridge station, thus accommodating both the Brighton and the South Eastern lines, and crossing the High-street at a right angle, in-

stead of the tortuous and inconvenient plan which has been carried into execution at an enormous cost. Next came the question of how the compensation was to be assessed, whether by jury or by arbitration; and looking to the uncertainty which then attended the verdict of juries, it was determined to refer the matter to arbitration; and after considerable difficulty in finding a suitable umpire acceptable to both parties, Mr. John Stewart, of Liverpool, a gentleman of great eminence in such matters, was ultimately appointed in September, 1861. The reference commenced and lasted for seven days. There was necessarily a considerable discrepancy in the valuations made on behalf of the hospital and of the railway company, the highest, on behalf of the hospital, being 478,000l., and the lowest, on behalf of the company, 145,000l. Mr. Stewart's award amounted to 296,000l.

In 1862 the company took possession of the hospital premises, arrangements having been made by the governors for the use of the Surrey Gardens as a temporary hospital. A fire had recently occurred, burning out the whole of the interior of the music-hall, and by the introduction of new floors and roof, and sundry alterations to outbuildings, a temporary hospital was provided for about 200 beds in a very short time, and, I think, fairly answered its purpose during the interregnum. Next came the difficult question of the selection of a site for the new hospital. The governors had no compulsory powers of purchase, and to acquire eight or ten acres within reach of the population was a matter not easy of solution, and the question was further involved by the views expressed by certain persons as to the desirability of making it a suburban hospital. Several sites were suggested and valuations made, one being the removal of Bethlehem to the country and the occupation of that site for the purpose of St. Thomas's Hospital, and I prepared a design and estimate for a new Bethlehem Hospital to be erected at the cost of St. Thomas's. All this, however, dropped through, and ultimately the surplus land created by the Albert Embankment was fixed upon, and a contract made with the Metropolitan Board of Works for about eight acres and a half when embanked, at the sum of 90,000l., half of the eight acres and a half being land reclaimed from the river. Great objections were raised by some parties to the site: it has been called a mud-bank, and all sorts of uncomplimentary names, but it appears to me that a better site for a metropolitan hospital could not have been selected (always, of course, presuming the river to be cleared of the sewage). The great tidal flow of the river forms a powerful natural ventilator, changing the volume of air continually, and the quiet soothing influence of water, and absence from noise and dust, render it, in my opinion, a most desirable locality for the purpose of a metropolitan hospital. I do not mean to imply that some breezy down in the country would not be more conducive to health, but to place a metropolitan hospital in any such distant locality would render it practically useless.

Having sold the old site, and done the best we could for the patients by the conversion of the Hall at the Surrey Gardens, which has seen the strange vicissitudes of an abode for music, a tabernacle for Mr. Spurgeon, and a refuge for a hospital, and the question of a new site being settled, I was instructed to prepare the necessary design; and as the subject of competition is one of some interest, I may mention that on my appointment as architect and surveyor to the hospital, now some twenty-five years ago, the Governors reserved to themselves the right of submitting any great work which might arise to competition. They did not, however, avail themselves of this right; and although it is not for me to say anything as to the result, it is not for me to say anything as to the result of the course they took, yet I venture to think that they were relieved from some trouble, anxiety, and expense, and I take this opportunity of thanking them for the confidence they reposed in me. A Committee of Governors, accompanied by myself, visited several of the Continental hospitals, and the Committee of the several matters of detail. The design is arranged on the pavilion system, now generally admitted to be the best for hospital purposes, and specially suitable for the land on which the hospital was to be erected. The nature of the site did not admit of the pavilions being placed on both sides of a central court or corridor, as at the great French hospital at Lariboisière, the hospital at Brussels, or the Herbert hospital, but they all ranged on the river side of one continuous corridor, 900 ft. in

* By Mr. Henry Currey, architect. Read at the ordinary general meeting of the Royal Institute of British Architects, on Monday, 23rd inst.

length. This arrangement has the disadvantage of increasing the length of communication from the several departments, but at the same time it renders the ventilation more free by diminishing the length of the course. The prominent defect of the Lariboisière hospital, viz., the too close proximity of the blocks with reference to their height, has, I hope, been avoided. The pavilions are placed at a distance of 125 ft. from each other (the centre court being increased to 200 ft.), which distance, it was calculated, would admit of ample sunlight and air to every block, the axis of the wards being due east and west.

The general disposition of the building will be seen by reference to the plan of the one-pair story, on which the isolation of the blocks is more distinctly indicated, the intermediate spaces on the ground story being filled in with lower buildings, for purposes hereafter mentioned; and it was my endeavour to make the plan as simple as possible in its arrangements, for facility of inspection and working. Corridors run the whole length of the hospital on the ground and one-pair stories, and connect the several blocks of wards or pavilions. These corridors are lighted by large windows on both sides, and in the event of it being deemed necessary to isolate any particular block, it could be done by putting screens across the corridors, and removing the sashes from the adjacent windows. These corridors are not carried higher than the one-pair story, but the flat roof over forms a means of communication to the several blocks on the two-pair story. The pavilions are placed at right angles to the corridor, from which a passage leads direct to the wards, on one side of which is the staircase. The wards are designed to be 28 ft. in width by 120 ft. in length, and 15 ft. high, and will accommodate twenty-eight beds, giving a cubic capacity for each patient of 1,800 ft. The beds are placed at distances of 8 ft. from centre to centre, and the windows are arranged alternately with the beds, at a level to enable the patients to see out. A cheerful aspect is given to the wards by the end lights communicating with the external balconies towards the river, where patients may be placed on couches or chairs in fine weather. Small wards for two beds, contiguous to, but not communicating with, the general wards, are provided in each block for the reception of special cases, which it may be deemed desirable to separate from the other patients. Adjoining the passage are placed the sister's room, the ward kitchen and a room for the medical officers' consultation. The staircases are wide and easy of ascent, the treads being 12½ in., and the rise 5½ in. The well-holes are occupied by the large lifts and ventilating shafts hereafter referred to. The water-closets, lavatories, and bath-rooms attached to each ward are projected from the main building, and are out off from the ward by intercepting lobbies, with windows on both sides. The water-closets, lavatories, &c., have also windows on all four sides, to provide a thorough ventilation. In this department the foul linen and dust-shoots are arranged, communicating with a receiving-room in the basement for external removal. Dormitories are provided for the nurses and servants in the attic story, each having a separate sleeping compartment, care being taken to prevent the ascent of any ward atmosphere reaching thereto.

The main hospital may be said to commence on the first-floor, and consists of three tiers of wards, there being four smaller wards provided on the ground-floor for the reception of accidents, &c. The total amount of accommodation provided is about six hundred beds. The wards have flat ceilings throughout, and the windows are carried up to the ceiling, to ensure a thorough change of air in the upper part of the rooms. From the corridors on ground-floor patients will be quietly and conveniently conveyed by lifts to the various wards (these lifts will be referred to presently); the corridors will also afford a place of exercise for the patients in wet weather, and the covered colonnades adjoining the river will form an agreeable lounge for patients approaching convalescence.

The above description applies generally to all the pavilions, except the southernmost, which is designed for special diseases, inadmissible to the general wards. The wards in this pavilion are smaller, and are arranged for males and females, being separated by a central staircase. The wards on the ground story correspond in general arrangement, but in consequence of the main corridor on ground story being placed next the internal courts, the wards are shortened to

admit of the introduction of the necessary rooms in connexion therewith.

The general entrance to the hospital is placed in the centre, and will be approached from the Palace New-road. The entrance-hall is capacious, forming the sub-structure of the chapel, and its dimensions being large, will be found convenient for the reception of the patients' friends as the times appointed for visiting. The steward's or superintendent's offices are placed immediately in front of the entrance-hall, so that everything passing in and out of the hospital will be under his immediate supervision. From each side of the entrance-hall branch off main corridors of communication connecting all the different departments. The ground floor of the first pavilion to the left is appropriated to the kitchen department, as being as nearly central as possible. It comprises kitchen, scullery, and cooks' rooms, with larder, bread-room, &c., on the basement immediately under. A serving-place is provided, where the patients' food will be distributed; it will then pass along the corridor to the different pavilions, and be conveyed up a small lift to the different wards. The ground floor of the first pavilion to the right is appropriated to the matron's department, with a commodious room for linen stores. On the right of the entrance-hall is placed the principal staircase, which leads direct to the corridor on the one-pair story, and will be used by visitors to patients, or for the general purposes of the hospital. It communicates directly with the resident medical officer's apartments, which are placed in the central block, consisting of sixteen rooms and a common room. Two operating theatres are provided (communicating with the corridors), lighted from the northern slope of the roof, and of ample dimensions to admit of a large attendance of pupils. A private room is attached to each theatre for the operator, with a second room in which a patient may be temporarily placed after an operation. Conveyance to the mortuary will be provided from the basement by an underground passage, without exciting the patients or the public observation. The dispensary and surgery are placed conveniently for the service of the hospital in the main corridor, and of the out-patients (who are more particularly referred to hereafter), from the opposite side. The lavatory, drug and store rooms, are placed in the basement story, immediately under the dispensary.

All applicants for relief at the hospital will enter at the covered porch in Palace New-road, and will be received in one of the admission-rooms, according to sex; they will then be informed whether they are to be admitted into the hospital or to be treated as "casualty patients," or as "out-patients." If admitted, they will be passed through the hospital corridor to the wards. If "casualty," they will pass to the respective waiting-rooms for males or females, and thence into the male or female surgery. They will procure their appliances at a window immediately contiguous, and pass out at once. If the applicant is to be treated as an out-patient, he will be directed to the out-patient department, which is placed in the corresponding wing. The out-patients enter at a door towards the southern end of the hospital, and pass through a large waiting-room, 110 ft. by 37 ft., in which they will be arranged and classified. The physicians' and surgeons' rooms are ranged parallel with this room. Having been seen by the physician or surgeon, the patients pass into a second room, where they will wait for medicine or appliances from the dispensary and surgery windows, and after receiving them, pass out into the Palace New-road, without entering the hospital corridor. A staircase leads direct from the out-patients' waiting-room to the out-patients' baths, which are provided in the basement. Sufferers from accident arriving will be conveyed directly into the accident receiving-room, and thence, when the cases are serious, immediately through the hospital corridor to the wards, and cases of accident on or in the neighbourhood of the river may be brought to the hospital and received from the landing-stairs.

The administrative offices are placed next Westminster Bridge, and approached therefrom; they will comprise the governor's hall, committee-rooms, almoner's room, counting-house, receiver's room, strong-room, waiting-rooms, and offices for the clerk and surveyor of the hospital, the treasurer's residence, &c. A staircase will connect the treasurer's house with the main corridor of the hospital. The two lower stories of this block will contain residences

for porters. Four houses are provided for resident officers, containing eight rooms each, exclusive of domestic offices. They will be approached from the Palace New-road, and communicate in the rear with the main corridors of the hospital. For the last eight years, nurses selected by Miss Nightingale have been trained (the governors believe with great advantage to the public) in St. Thomas's Hospital; and in the design for the new hospital provision has been made for an increased number. The training institution adjoins the matron's residence, and will afford accommodation for forty probationers, who will be trained to the hospital wards for the council of the Nightingale Fund. Each probationer is provided with a separate sleeping apartment, ranged round a central gallery, with all necessary bath-rooms, &c., and a large day and dining room on the ground floor.

The chapel is placed in the centre of the building, communicating with the corridor, with convenient access for both sexes. The school buildings occupy the southern end of the site. They consist of a large museum, 85 ft. by 30 ft., and 34 ft. high, with two galleries, a museum for chemistry and materia medica, medical, anatomical, and chemical lecture theatres, library and microscope room, dissecting and *post-mortem* rooms, chemical and pathological laboratories, &c., affording the medical student opportunities rarely if ever equalled in completeness. The extreme point is occupied by gardeners, sheds, stables, &c.

The new wall enclosing Lambeth Palace grounds was built at the expense of the hospital in exchange for certain pieces of land surrendered by the late Archbishop of Canterbury to improve the boundary of the hospital site.*

TREATMENT ADAPTED TO MATERIAL.†

Iron.—Let us first take wrought iron, for the artistic treatment of iron must be guided by its finest capability; and that is to be found in its readiness, under certain conditions, to receive the direct impress of the worker's hand.

We have, then, a material of a dark colour, and which, under ordinary conditions, does not exhibit bright high-lights. A vigorous treatment and strong indentation are therefore demanded for detail. Its liability to corrode prevents any reliance on the effect of fine surfaces. It possesses, when being worked, considerable ductility, of which the workman must avail himself fully; also great elastic strength, which permits it to be bent or twisted extensively without frequent support. These qualities allow of very acute sections, sharp mouldings or narrow filets, all of which will be found expressive; but the finer the sections the more careful must be the finish. Excellent specimens of wrought-iron ornament are numerous enough among country inn sign-brackets and the balustrades and gates scattered about the country, all dating prior to the present century. The "Hampton Court" gates (not long since removed to the Kensington Museum) are splendid examples of what may be done with the smith's hammer. At the same time, I am disposed to doubt the desirability of working the ornament to such a paper-like thinness in a material which corrodes so readily as iron.

Cast iron may be considered, for art purposes, an abnormal material. Yet its extensive use obliges us to consider what rules should guide our treatment of it. We must regard its conditions as somewhat similar to those of bronze, without the latter's capacity for high finish. The coarse surface resulting from the casting is destructive of delicate detail, nor does it readily admit of subsequent finish. The character of the detail must therefore be regulated by the nature of the surface as it comes from the mould, and should be adapted to the requirements of casting. If these conditions are carefully studied, very satisfactory results may be obtained. It is only when cast iron affects to imitate wrought iron, or some other substance, that it fails, disagreeably, to take its right place as a valuable material.

Bronze may, perhaps, be considered as occupying the foremost place among metals for purposes of art. Its close texture admits of the highest finish, resulting in softened high lights, the most favourable for the display of surface form. It, therefore, lends itself admirably to either delicate or vigorous relief. The effect of the relief is often heightened by the brightness

* To be continued.

† See p. 40, ante.

of the metal where its prominences are subjected to abrasion.

Although, like cast-iron, it is turned out of a mould, it differs materially in more than one respect. It has not the hard brittle nature of cast-iron, but, on the contrary, is, to a certain limited extent, ductile and elastic,—qualities which enable its treatment to resemble more nearly that of wrought metal when such is deemed desirable. But beyond this it is admirably adapted for receiving finish at the hands of the *chaser*, who may expend upon it with advantage almost any labour or care that the size or nature of the object admits of.

Perhaps no material is so effective in work, both small and large. From the great gates of the Florence Baptistery to the minute medallions wrought by Japanese artists, bronze seems equally to lend itself to the object, and equally to satisfy the just requirements of art. In the latter instance it has received the highest conceivable finish; in the former, only so slight a finish as the large scale and exposed situation require. But in all cases, and whatever the size of the work, the plain surfaces should be carefully finished, so that the spectator may recognise the fine texture and beauty of the material. For the same reason, the contour of mouldings should be refined, and should be relieved by acute arisings or fine fillets. True, the dark colour makes requisite deep cutting and bold modelling where emphasis is necessary, or where the parts are in shadow; but even here coarseness must be carefully avoided, and the sharpest finish given to all edges. A dull, blurred edge is destructive of metallic effect: and herein lies one of the leading causes of failure among our London exponents of bronze statuary. One and all, they never get beyond the clay in which the model was designed.

Turn from these to such works as the equestrian statue of Colleone at Venice, or the great kneeling figures which stand round the tomb of Maximilian at Innsbruck (full-size copies of these are in the Crystal Palace). What a contrast! I defy the idea of plastic clay ever to enter one's head when regarding these examples. Apart from the magnificent vigour of their design, there is a metallic finish about them, bold though it be, from head to foot. Sharp edges are preserved both in outline and detail, giving an unmistakable sparkle and spirit to the whole, which would be entirely lost were these sharp lights rounded down or "smeared" away as we see them in Trafalgar-square examples.

Can anybody point to a single London statue (saying Charles I.) which might not just as well have been cast in iron as in the exquisite material of which they display such a profound unconsciousness on the part of the artists? Take our most recent and most valued acquisition, the "Nelson lions." Where do we find the spirit of bronze? Where are the crisp, bright lights and the sharp, deep cuttings, or the silky gleam of surface which all speak of metal? Not in the mane assuredly! Yet how valuable would have been the bright streaks of light in explaining the intended object. Look at the paws! How innocent of everything but the marks of the tool, not with which the bronze was finished, but with which the clay was moulded, all too faithfully reproduced in the casting. Had they been of terra-cotta, these modellers' toolings would have been well; but when we are working a valuable metal, the wretched sand or clay which we may happen to use in the process should be unknown to the spectator. It is not the ready, but "smeary," moulding tool that should be evident, to remind him that this is but a costly reproduction from a baser model; but it is the sharp file and the keen graver, the skilful handling of which he is to recognise. It is the ultimate work, the finished, hard, gleaming metal, which is to show the artist's hand. The clay, and all that belongs to it, have no more business to be seen than the painter's lay figure.

Herein lies the gist of all that I am trying to say; and, half against my will, I have selected this example, the noble design of which I thoroughly appreciate, precisely because its excellences are apt to lead the student to forget its defect—material ignored.

In such bronze objects as include the use of mouldings these should, as I have already said, present fine profiles. By this I do not mean that the actual size of the mouldings need be limited, but that the flow of the lines should be such as to present gradual and softened curves where broad lights are required, the edges being kept sharp, and the shadows dark and well defined. To this latter end we often find, in the best works, the moulding highly concave in its under side; by

which means the bright, sharp edge is brought sharply against dark shadow.

Examples of this are frequent among the elegant candelabra and other objects found at Hierculaneum and Pompeii. We may also observe in these works how the mouldings are, here and there, wrought to an extreme tenuity, thereby assisting the eye to recognise the tough strength of the metal. Occasionally, too, much delicacy is given by the occurrence of very fine fillets,—mere threads, upon the profile.

For examples of excellent treatment of ornamental work in bronze on a large scale we may take Alessandro Leopardi's grand standard sockets at Venice. In them we find the boldest treatment of contour or form combined with a masterly finish of the detail.

Modern French sculptors and artists have well studied the effects of bronze as a material; which, indeed, may be considered the one which, of late years, the French have most completely made their own. Simply because their artists and workmen are at the trouble of studying their material, and adapting the nature of the treatment to the due expression of its character. Before passing to the precious metals, we may pause for a moment to consider that exquisite works have been produced by François Briot and others in so common a metal as pewter. So ductile a material is, of course, very readily *repoussé*, and the subsequent chasing is much more easily executed than in the harder metals. Lead or pewter is used for the finished models from which the smaller kinds of ornamental details are cast in brass or bronze. These models are often far more beautifully finished than the greater part of the work cast from them, and there can be no question that these substances offer great facilities to the artist. The drawback is, that their softness renders them very liable to injury; so that it becomes a question whether a harder and more valuable material does not repay the additional labour demanded.

In silver we have a metal which, apart from its intrinsic value, possesses many qualities valuable to the artist. It is far more ductile than bronze, and at the same time has natural hardness sufficient to resist any ordinary risks of wear. This hardness may be increased by alloy. In addition, it is exceedingly durable, and admits of the highest finish. It is also open to two distinct methods of treatment, which may be used separately or in combination. If polished or burnished, its whiteness and strong high lights preclude delicate work in the detail. At the same time these qualities result in considerable splendour of effect when boldly treated; especially in objects which are made to depend upon form in such a way as to exhibit the burnished surface to advantage. Bold "bossed" work is very effective, and may be used with excellent result either alone, or in combination with engraving or *repoussé* relief. A matted ground is then valuable to the latter. Engraving, to tell well on bright silver, must be pretty boldly executed. The lines are otherwise lost in the overlapping, refracted rays of light shed from the surrounding surface.

For art purposes the most favourable form of silver is that known as "oxidised," in which the extreme whiteness and brilliancy of surface are subdued. It then possesses the finer qualifications of bronze in a higher degree, and the light grey colour which it presents, together with a fine surface, and softened lights, renders it the best of all materials for delicate and highly finished relief. In fact, the chasing may be as fine as the artist can bestow; nor need he fear that his labour will be lost.

Many valuable modern works have been executed in this country, though by foreign artists, and some excellent reproductions have been made in *fac-simile* by the electrotype process. The most beautiful modern specimens of *repoussé* silver, however, which I remember, were exhibited in 1867, by Fannière, of Paris, who, in a table service (said to have been designed by an amateur for his own use), combined excellence of form and design with most admirable treatment in execution. It is satisfactory to find that one of the English artisans, whose reports were published by the Society of Arts, appreciated the remarkable excellence of the works from this atelier. "Other exhibitors," he says, "show some good pieces; but in Fannière's case, I think it is impossible to discover one piece of inferior work, while many are real masterpieces."

Party gilding and "damascening" may both be used on dull silver, with good effect, the main point to care for being to avoid confusion.

Engraving may be used with both, and, if the surface is not polished, may be as fine or as elaborate as may be desired. A hatched or matted ground, judiciously used, often adds greatly to the effect, of low relief, or may sometimes be used to show a flat ornament with engraved outline.

Gold.—The most valuable and the handsomest of the natural products in general use, is, by reason of its powerful colour and strong lights, not very favourable to the display of delicate modulations of surface.

In large objects, highly bossed work, bold relief, or low relief set off by a matted ground, tells well; as also does engraving, whether fine or bold.

Whilst possessing great strength and tenacity, it is extremely ductile, and in its native state bends very readily. These qualities sufficiently account for the extent to which the ancient and Oriental goldsmiths used fine twisted wire in the ornamentation of their jewelry. Angular or very sharp sections are not desirable; the latter giving a hard, steel-like character to the subject, whilst thick, square edges have a "stony" effect. Slightly rounded edges, and tolerably bold profiles seem best to suit the characteristics of gold. Very thin, sharp edges seem to detract from the value, and look poor. Very fine relief, rising abruptly from its ground (as the wire ornament already mentioned), always tells very happily in gold, because, although ever so delicate, it provides itself a fine outline; and this is what gold always seems to demand. On this account *repoussé* work in plain gold must always rise more suddenly from its ground than would be necessary with bronze or dull silver; but, being once provided with this natural outline, the execution of the raised work should be rounded and soft, not abrupt and angular. Anything like abrupt contrast of light and shade will detract from the effect of work in gold. A certain *reposé* is essential to the solid beauty of the material, so long as we are depending on the solid gold alone. If, however, we are merely using the gold as a setting for some more precious object (such as jewels), the rule may be modified.

So far I have been speaking of gold having the fine dull surface natural to it in its native state. For almost all art purposes this is the most agreeable finish. At the same time, we must not ignore the burnisher, which, when used with judgment, may produce excellent effect by contrasting the bright and dull surfaces, and so giving special emphasis to certain parts of the design. Burnished gold alone has rarely so good an effect.

Gold has the peculiar property of *harmonising colours*. It does so to an extent that only those who have tried it can believe, and at the same time clears and purifies each colour that it surrounds. Precious stones are, therefore, always seen to advantage in a gold setting; and both they and coloured enamels may be used to give point to the design, even when they are only employed with that secondary intention.

Gilding.—From gold to gilding is an easy transition. Gilt metal may be considered as, in the main, subject to the same rules as gold; but the same delicacy of treatment and high finish are not demanded. The relief must always be strong enough to clear itself unless it be assisted by the burnisher, of which a more free use may be made.

Gilding on wood, or other similar material, may be made more or less effective, by judgment in execution, to a far greater extent than would at first sight appear. The judicious disposition of the burnish may make or mar the whole piece. Surfaces which are much cut up should never feel the burnisher, which should be confined to such parts as present an evenly-rounded or flat face. The burnished parts should always be so placed as to assist in expressing the design. Carved surfaces should be in dull gold; and care taken that the "preparation" does not smooth away all spirit from the work. When only a portion of the object is gilt, and the remainder shows wood as its material, I prefer that the gilt parts should also exhibit the texture of the wood.

The same rules which we have been applying to the treatment of ornament in the solid apply, in a different way, to the coloured treatment of various surfaces. Here, similarly, the eye must be judiciously led to forget the imperfections of the material where it is imperfect, or to value its excellence if it be excellent. A rough or irregular surface of wall must, in the first place, be absolutely without gloss, and its decoration must then be so carried out as to lead away from the consideration of surface. Continuous

straight lines, or fine curves, are to be shunned; nor is delicate finish desirable. A certain breadth of effect and execution must be maintained, and the forms of ornament selected must be such as not readily to betray the slight distortions caused by uneven surface, but to lead the eye to follow the intention of their own forms. On the other hand, where the wall presents a singularly fine and perfect surface, this may be done justice to and explained, firstly, by making the coloured grounds carefully even in tone and texture. It may even be thought desirable to maintain a slight gloss, but this must not be excessive. Fine detail and straight lines may be used to any extent required, and the finish need only be limited by the skill of the artist. In this, however, a distinction must be observed as to the execution of those parts which are mere ornament, and those which partake rather of pictorial art. The former are intended to add to the general effect of the room or building, and should, therefore, be executed in such a manner as to explain themselves, and answer their end when viewed as part of the whole. However finely executed, the lights must be sharply preserved, and not *toned off too gradually to the shades*. A certain crisp, solidity of touch, with a precision of intention, are indispensable, though they need never become obtrusive.

I cannot do better than point to the decorations of Pompeii for examples of the execution of decorative ornament,—on a fine surface.

When, however, pictorial art is introduced, I am far from desiring to limit the finish or to dictate the style or method of execution. The artist will of course comply with the condition that the general tone of colouring and force of effect be such as to harmonise with the rest, and assist the general result. Having done this, it remains with him alone to decide whether his work shall be most admired at a distance of one yard or five. It occupies the position of a gem in a fine setting, and invites admiration on its own account as well as by adding to the value of the whole. Yet, even with this freedom, the painter who has never painted for any surrounding but a gilt frame will find that he has much to learn before he can satisfactorily ally himself to the architect.

Stained Glass.—We have been considering how far the treatment of coloured ornament may be varied to meet the necessities of the surface to which it is applied: the variation being rendered necessary by the way in which the light, falling on those surfaces, affects the appearance of their ornamentation, and *vice versa*.

We have, however, in *stained glass windows*, coloured ornament applied under totally different conditions.

In wall treatment, we had to explain the surface; but here we have nothing to do with surface, of which the eye can take no knowledge, the light being transmitted. It can, however, take note of outline, form, and colour; therefore special care must be taken in respect to these elements of beauty. The *leading* forms must not only in themselves be pleasing, but must be so clearly defined as to be distinguished in spite of the flood of light which pours through, the rays of which spread and overlap each other.

But it is in dealing with the question of colour that the treatment of stained glass is really put to the proof. We have not only to arrange our colours harmoniously, but to make the most of our beautiful material. It is in the jewel-like brilliance and play of colour that the great charm of stained glass lies, and our study should be to enhance, as far as possible, this special beauty. If we observe carefully the best works of the old artists in stained glass, we shall find that one important means to their success lay in the skillful use which they made of the irregularity of their materials. *With colours obtained by transmitted light, those appear richest which vary most in depth*. This is an axiom which workers in translucent material (be it glass or enamel, or what not) should never forget. It is their first condition of success. Such homely illustrations as a decauer of claret, or a spoonful of currant jelly on a white plate, will explain my meaning as well as any.

If the wine were in a flat vessel of uniform depth, the colour would be there, but half its rich play and flashing glow would be gone; for it derives these from the varied diameter of the vessel. So with the jelly, the colour of which is displayed (as in enamel) by the light reflected from its ground, the plate. If spread in an even coating, the colour is still beautiful, but the rich palpitating effect is no longer there.

In large spaces of one colour, the mass should be made up of several pieces of varying depth. In small spaces the varied thickness of the glass itself must be depended on; and where, as in a border, the same colour is repeated to a considerable extent, so far from *matching* each piece to the other, the skillful artist will seek how to vary them with most effect. Many of our best glass artists are well aware of this; but until the workman himself appreciates and understands how thus to give value to his work by studying his material, advance will be slow. Still, in knowledge of their material, the English stained-glass workers of to-day surpass all their foreign rivals. Whatever excellence of pictorial design the much-vaunted "Munich" windows may possess, they betray absolute ignorance of the treatment of material. They are mere transparencies, and, but for their greater (almost unfortunate) permanency, might just as well be painted on oiled canvas as on glass, of which they exhibit not a single characteristic.

We have now glanced at several of those materials which are in most general use for the purposes of art, especially of such arts as are most closely allied to architecture. In thus rapidly surveying the leading peculiarities of each material, I have endeavoured to point out that, although much may be done in the design, much also remains in the power of the artist or workman under whose hands the crude, lifeless material is wrought into the living treasure. It lies with him, not only to do justice to the conception of his own or another's brain, but, in so doing, to seek for all the assistance and all the power of expression which he may derive from the substance which he has selected from the rich gifts of his mother earth. J. D. ORACE.

YEovil AWAKENED.

"'Tis the voice of the sluggard. I heard him complain: 'You have waked me too soon, I must slumber again.'"

AFTER five or six weeks' hibernation, the Yeovil Board of Guardians has hatched a report in answer to the facts stated in our article of December 17th. As may be seen from the report of the committee appointed to investigate our statements, these gentlemen confine themselves almost to a simple denial of our charges, and they appear to be in nowise interested in challenging us to the proof. Not at all: quite otherwise.

"The commissioners (*sic*) do not recommend the Board to take any further notice of the anonymous attacks upon it in the article contained in *The Builder*."

Before we make good our statement, let us give our readers the benefit of part of the report:—

"The committee appointed by the Board of Guardians, on the 28th of December, 1870, to investigate the charges contained in an article, which appeared in the *Builder*, on the 17th of December, headed, 'Yeovil, wake up! with power to examine any books and papers belonging to the union which they may think proper, and also to call before them any person or persons who, in their opinion, may be able to give information as to the truth or otherwise of the statements made in such article and the result of the report to the Board the result of their inquiries on this day fortnight, met on the 4th of January, 1871.

From the best investigation they can make, the committee have failed to discover a single case where able-bodied youths had been kept for several years in the house lazily squandering away their time from youth to manhood, and at last thrown out upon society, unable to follow any useful occupation; or when any treatment on the part of the guardians has tended in any way to promote the rearing up of such youths to criminality.

It is true that an accident occurred in the house about fourteen years ago, by which a child, aged three years, died from the effects of burns; the accident having occurred although a fire-guard was at the time of the accident placed before the fire in the room. Mr. Stone, the master, is prepared to prove that the whole of the paupers have had a change of linen regularly and systematically at the least once a week, and a pair of clean sheets fortnightly. The master has supplied, and Mary Elizabeth Ribberd, the nurse, will swear, if necessary, that the sick paupers have had, in wine, spirits, and beer, which had been put down to the workhouse expenses. Dr. Aldridge says he has no reason to suppose that the paupers for whom he ordered extras (i.e., wine, spirits, and beer), did not get the supply and that, so far as he has never had any complaint made to him by a pauper."

Will the Board of Guardians or the committee venture to deny that a youth, twenty-two years of age had been in the Yeovil Workhouse since he was two years old? Twenty years out of his twenty-two had been thus lazily squandered, but giving the juvenile a ten years' benefit for his tender years, what have the guardians to show for the surplus time?

Another boy of sixteen, who ought to have been apprenticed to some trade, or put to farm work, had spent six years in the Yeovil Union. No wonder that one of the guardians should remark last year, "that the Board, by their action, were squandering the ratepayers' money."

The two young hopefuls we have alluded to cost the union nearly three hundred pounds for their lengthened board, washing, and lodgment. Early last year there was such a large number of boys in the workhouse, that a correspondence was advised to be opened with the Admiralty with a view of sending them into the navy; a second party were for apprenticing them to trades; and a third were for putting them out to field labour. In the meantime little or nothing was done to teach those able-bodied boys how to earn a living. With the training they received in the Yeovil Union, they would be a curse either to the army or navy, until the terror of the "cat-o'-nine-tails" made them look alive. We have one quarter's account of the consumption of stimulants before us. This account relates to a period previous to the visit of the Poor-law inspector. Item, 1,039 ounces of brandy, 1,112 ounces of gin, and 737 pints of porter. This is the quantity returned as ordered by one of the medical officers of the union; but another medical gentleman in the environs of the town assured us that these quantities were never consumed by the pauper inmates.

It is of small consequence what the present master of the workhouse or one of the nurses may be prepared to swear: we are prepared to prove that the officers in the union have undergone a change; that the nurses and schoolmistress, as well as some of the paupers, have been refractory, and had to be remonstrated with for acts of insubordination, but that they continued despite, for a long time, to do as they pleased. The expenditure per head for food was under two shillings a head; some years ago it did not amount to one and sixpence. The late master having decamped, cannot be brought to book, and it is very handy now for the guardians to throw the late evil condition of the workhouse upon his shoulders. Now, what did a late visiting committee report to the Board?

"That the union was in a disgraceful condition, and that they were obliged to order new bed-clothing; and did not one poor old creature confess 'that she had not had a change of clothing for ten weeks'?" In the face of these gloomy facts, the reporting committee have the bravery to say that the paupers have had a change of clothing regularly. Have there not been between twenty and thirty pounds expended yearly for wine for children "between the ages of six months and two years?" Who were the wine-bibbers or tasters besides?—Mum.

Here is another fact, worth fifty assertions, showing the value of the training in such unions as Yeovil. Last autumn a member in a town-council not a hundred miles from Yeovil read a letter from a young man then in Bristol Gaol. The substance of the letter went to show that while the writer thanked the gentleman to whom he addressed his letter, and the union to which he formerly belonged, for treating him with kindness, and teaching him how to read and write, yet he declared that the union should have turned him out without teaching him any useful occupation or trade by which he could gain his living. To this cause the convict attributed his falling into bad company, and being tempted to rob.

Here was a lesson before the Yeovil guardians to profit by, if it did not immediately concern them,—but it did.

The authorities that keep pauper youth for years, half educate them, and finally turn them out upon society at an age when they should have nearly mastered some useful form of skilled labour, are guilty, to say the least, of very reprehensible conduct.

ART-WORKMANSHIP: SOCIETY OF ARTS.

THE specimens sent in response to the offer of medals and premiums made last year by the Society of Arts, and which are now exposed in the lower room of the Society's House in the Adelphi, are sixty-three in number, besides some twenty works submitted by Messrs. Cox & Son, with the names of the workmen who produced them, but which, for the convenience of the Society, are retained on the manufacturers' premises. Had other art manufacturers and artists,—such, for example, as Messrs. Jackson & Graham, Messrs. Hart & Co., Mr. Phillips, Mr. Collmann, Messrs. Clayton & Bell, and more that we could name,—acted similarly, they might, we have no doubt, have secured medals for themselves and money-rewards for their best men, besides facilitating the

admission of some of their works at the approaching International Exhibition, had they so desired. However, they have not done so, and, as it seems to us, have missed a chance. The Society generously laid themselves open to a very heavy pull on their finances, and were prepared to abide by what they had offered; whether they will repeat such liberal proposals remains to be seen.

As we shall probably think it right to print the names of all the rewarded competitors, we will confine ourselves at this moment to mentioning a few of the best works. No. 12, an Ambosya wood inlaid luo-table designed and executed by Thomas Jacob, assisted by Cornelius Rich (marquettier-outter), Charles Helfer (engraver), and others, is an unmistakably good work, and will doubtless obtain premiums for those concerned. No. 38, one of a pair of wrought-iron gates executed for the Union Bank of London by T. Winstanley, from the design of Mr. F. Porter, is an equally meritorious production in another department. G. Winstanley and F. Lanoeiler, his apprentices, helped, and should have some of the reward. Another remarkably good exhibit includes Nos. 22, 23, and 24, portions of friezes for rooms, designed and modelled by J. Daymond, jun., under the direction of Mr. A. Salvin. No. 10, a dead pheasant, from nature, shows much technical skill. No. 14, a cabinet, in mahogany and ebony, displays some carving creditable to W. M. Holmes and W. Maskell, but as a whole, both in design and execution, falls short of excellence. No. 20, figure of a child dropping off to sleep, by J. W. Gould, is remarkable—perhaps too remarkable—for its likeness to nature. The steel-bladed trowel damascened, by T. R. Rice, is technically excellent. Two hammered brackets in iron, by W. Morris and W. Robson, respectively, and some works in copper, *repoussé*, by E. Tow and W. Theserkauff, deserve commendation; and the same may be said of some specimens of glass-blowing executed by E. & T. C. Barnes. J. Ronca sends an elegantly cut cameo or two, but they are not equal to others that he has done.

The specimens submitted by Messrs. Cox, include some silversmith's work, part very good, a brass eagle lectern, a wrought-iron gas standard, a wrought-iron pulpit, and a font-cover of oak and brass, all deserving reward in one respect or another.

METROPOLITAN RAILWAYS, TRAMWAYS, AND MISCELLANEOUS IMPROVEMENTS FOR SESSION 1871.

THE basis of a map on which new railways, tramways, and other improvements within the metropolitan area are shown from year to year, need not necessarily be much changed from one year to another; but the coloured lines and patches, indicating the sites of proposed improvements, and the courses of proposed railways and tramways, necessitate numerous and elaborate alterations. Mr. Stanford, of Charing-cross, publishes annually a map, in anticipation of the Parliamentary session, in which the new schemes for which plans have been deposited at the Private Bill Office, are embodied. This map for the coming session is just published, and is as usual, upon an excellent map of London and its suburbs, extending north and south to beyond the five-mile radius from Charing-cross, and east and west to a considerably greater distance. It is necessary every year to have extra and entirely new work in one or more of the corners, to show the terminus of a new metropolitan railway or tramway, or the situation of some other work; as, for instance, this year corners have to be filled up to show the terminus of a tramway at Watford, of a railway at Edgware, and of sewage works at Beckenham.

In the new map railways and miscellaneous improvements are indicated in red colour, and tramways in blue; authorised lines, not yet opened, are dotted in the case of both railways and tramways, and new schemes by continuous lines in the respective colours. Among the new railway schemes the most decided novelty is Mr. Rammell's proposed pneumatic line, of 6 furlongs in length, between Cannon-street and Broad-street stations. A number of the stations in various parts of the metropolis, and a portion of the proposed coal-owners' line are shown, but the greater portion of the works of this scheme are far north of the metropolitan area. The Eastern Metropolitan line of two miles and a half is an underground project, revived from last session, concerning which little need here be

said. The East London is for deviations. The Euston, St. Pancras, and Charing-cross, has a main line and three branches, in all 2½ miles, and is probably the most important metropolitan scheme of the session. The Fulham, Hammer-smith, and City, of 2 miles, is another revived scheme. The Harrow, Edgware, and London, is a short branch, of a little over a mile in length, from the Midland line to Edgware. The important project for a grand terminal station on the Holborn Viaduct, has been noticed already in the *Builder*. The London and North-Western Company have a Bill for station works at Euston. The Brighton Company propose a short branch at the Commercial Docks for goods traffic. The Metropolitan and St. John's-wood Company proposes three short branches, of a little over a mile in all, one of them an extension to Kilburn, and another to Finchley Station. The Midland has an Additional Powers Bill; and, in conjunction with the Great Eastern, a branch line of 2 miles 5 furlongs to Alexandra Palace and Park. The North London has a Bill for a Station at Highbury. The South-Eastern Company has a Bill for a deviation in their authorised Greenwich and Woolwich line, which they ought to be exempted from making under the altered circumstances of the locality. These are, in brief, the whole of the railway schemes proposed in the metropolis.

The miscellaneous improvements embrace Powers Bills in connexion with Brixton Prison, the new Courts of Justice, the new Mint building, and the Record Office; also schemes for the enlargement of Billingsgate and Leaden-hall Markets, Knightsbridge Improvement, and improvements of Hampstead Heath, Leicestershire, and at Shoreditch. The other miscellaneous improvements are for sewage works at Beckenham, new works by the Hornsey Local Board, and by the Gas-light and Coke Company.

The tramway schemes, twenty-one in number, embrace 376 main lines, loops, branches, and extensions. It would be much easier to enumerate the thoroughfares and localities that are *not* proposed to be used than those that are. The total mileage of new tramways proposed for the metropolis is about 250 miles, in addition to the lines already at work, and about 100 miles already authorised, but not yet constructed or opened. The proposed extensions on the south of the Thames are inconsiderable in extent; but on the north side it may be said with truth, that there is no thoroughfare, north, south, east, or west, that the promoters do not propose to appropriate. One Bill, or rather the plans, embraces about 45 miles; another above 40 miles; and one company, the London Street, schedules about 60 miles of streets and roads. The plans of two sets of promoters, the Common Road Conveyance Company and the Southall, Ealing, and Shepherd's Bush Tramway, the one of 12½ miles, and the other of 7 miles, were not lodged at the Private Bill Office. Whether the promoters will receive a dispensation from standing orders remains to be seen.

The reference numbers on the map are not in all cases perfectly legible, and the legibility and clearness are further impaired by the novelty of duplicate numbers, which it was necessary to introduce, the plans, in five instances, having been lodged as connected with a private bill to be promoted in the ordinary way, and also as connected with a petition for a provisional order, in accordance with the Tramway Bill of last session. In some instances, also, there are competitors for the same line. It is more than probable that at the end of the session a map showing the tramways authorised in the session of 1871 will require the application of the sponge to three-fourths or four-fifths of the blue lines now shown. It is possible to have too much of even a good thing; and tramways are not good things in all positions.

THE METROPOLIS SEWAGE AND ESSEX RECLAMATION COMPANY.

At the last meeting of the Metropolitan Board of Works, the Works and General Purposes Committee presented a report relative to the intended application to Parliament by the Metropolitan Sewage and Essex Reclamation Company for a variation in their authorised works. The engineer had drawn up a report on the mechanical part of the scheme, which the committee recommended the Board to adopt and refer to the Parliamentary Committee. The engineer was of opinion that the work could not be carried out within the estimate. Apart, however, from

the mechanical portion of the scheme there are (said the committee) in the statement submitted to the Board by the company on the 18th November last, some points to which the committee think it desirable to direct the notice of the Board. Starting with the assumption that the scheme of 1865-6 for conveying the northern sewage from Barking to the Maplin Sands is, under present circumstances, financially and commercially impracticable, and at the same time that the only method by which large quantities of sewage can be effectively and profitably dealt with is by using it for the irrigation of land, the directors of the company proceed to state that, in reviewing their position, they have come to the conclusion that in the absence of sufficient practical evidence of the agricultural value of the sewage to induce land owners and occupiers to incur immediately the expense of preparing their lands for its application, and of any reliable criteria of its saleable value, it would be hopeless to attempt to carry out at present any project for dealing with so vast a quantity as 275,000 tons per day without direct financial assistance from the Board. With such assistance the directors consider that the modified works described in their letter, and now reported on by the Board's engineer, could be executed, and a profitable mode of disposing of the sewage carried into effect. The company's estimate of the cost of the scheme is 800,000*l.*, exclusive of the expenditure already incurred. The annual expenses are set down at 33,050*l.*, and the cost of purchasing Canney Island is estimated at 200,000*l.* In the Bill which they propose to introduce, the directors have embodied the views expressed in their letter on the question of the financial assistance which they desire should be given to the company by the Board; and it is this point to which the committee desire now to call special attention. By clauses 31 and 32 in their Bill, the company propose that the Board should contribute to the undertaking and guarantee the payment of interest or dividend upon any shares or stock (including debenture stock), and the principal of, and interest upon, any debentures or bonds to be issued or granted by the company, either absolutely or for any specific period, and hold shares or stock of the company, and lend and advance money to them upon such securities as may be agreed, and for that purpose create additional stock to the amount of 1,000,000*l.*, under the Board's Loans Act of 1869. The introduction of any such clauses as the foregoing would, the committee think, be highly prejudicial to the interests of the Board, and the committee feel sure that the Board would be strongly opposed to any application of the rates of the metropolis to the purposes of a public undertaking. After a most careful consideration of the whole subject, the committee recommended that the company be apprised that so long as they require the Board's guarantee, the Board will not be prepared to assent to the Bill promoted by the company.

Mr. Runtz proposed the adoption of the report.

The proposition was seconded, and after a brief discussion, carried *non con*.

Mr. W. Hope, observing that the Metropolitan Board of Works had dismissed with ridicule the proposition submitted to them by the Metropolitan Sewage Company, and being originally responsible for the creation of that company, has addressed a letter to the Board disclaiming responsibility for the present proceedings of the company. Mr. Hope says in this letter, "The statements of the company in the preamble of their Bill are altogether opposed to the real sober facts. The farmers of Essex are anxious to obtain the sewage; and the company, for reasons which are now obvious, has refused more than once to sell it to them."

I took them an offer in the autumn of 1869 from parties who were competent and willing to carry out the enterprise. These gentlemen were prepared to find all the money that was necessary, and to complete the works within eighteen months; and the estimate for such completion was 500,000*l.*, whereas the company now ask from the Board a payment of no less than 800,000*l.* for the same works."

The Victoria (Philosophical) Institute. The second meeting of the session will be held at 8, Adelphi-terrace, on Monday, the 30th inst., at eight o'clock, when the Rev. J. Titcomb will read a paper on "Arohaology and some of its Parallels and Contrasts," illustrated by diagrams.

THE STATE OF WAPPING ISLAND.

Our observations have, at any rate, awakened attention, and may, it is to be hoped, do good. At the last meeting of the Vestry, St. George's-in-the-East, a report from the health officer, on the recent article in the *Builder*, was read. Dr. Rygate observed:—

"That several of the matters referred to, such as tumult, wife-beating, oaths, &c., were not within the province of the Vestry to interfere with, though they, no doubt, led up to the 'sorrow, suffering, and sickness' complained of, and they all implied improvidence and recklessness of decent house-accommodation, and would lead to the other evils which come more directly within the province of the Vestry. It would be a source of satisfaction to the Vestry and Board of Guardians to know that not a single death occurred in either of the places complained of from synoptic disease during the whole of last year. Cases of the kind had, of course, occurred; but they had been as speedily as possible isolated. To the unusually good wages earned by many of the working classes in that part of the parish, and the food obtained therewith, he had no hesitation in attributing much of this immunity from disease and death. Dr. Rygate had in his possession figures obtained by the peculiar tact and sagacity of the sanitary officer (Mr. Fritchett), which showed that eight persons living in nine of the houses closed by order of the magistrate, had earned, in the eleven weeks from November to January 14th, an average of $\$11.12s.7d.$ each weekly. The damage done by this class of persons to their houses was grievous to witness. The houses were repeatedly under notice. The owner had been summoned, and an order for sanitary repairs obtained, before they were closed; and for weeks the agent had never been near them for rent. The ashes and night soil on the steps in front of the houses, as described by the writer in the *Builder*, would alone suffice to show the habits of the people, as the houses had capacious yards in the rear."

The worthy doctor's report is not altogether satisfactory. At the period of our visit, there were several persons lying in sickness, two deaths had occurred, another was hourly expected. In an upper room of one of the nine houses which were closed, one family were allowed to remain, in consequence, we believe, of a very bad case in the room, which it was thought dangerous to remove. The sentence, "Eight persons living in nine of the houses" may mislead if we do not state that the majority of the houses in the court contained from three to four and often more families in each.

A NEW THEATRE FOR DUBLIN.

DURING the last twenty years several attempts have been made to establish a new theatre in Dublin. The promoters in some instances had no money, but hoped to make it; and the promoters, in other instances, had already made money, and were willing to lose it. The lessees of the two existing theatres, viz., the Theatre Royal and the Queen's Royal Theatre, always gave a most determined opposition to every application made for a patent for a new house. Opposition, however, was conquered at last; and one of the successful promoters, who is in the music line, will also possess, we believe, the chief interest in the concern. The new structure, for which a patent has now been obtained, will be situated in Grafton-street. Tenders for its erection are advertised for. It is to be named the New Gaiety Theatre, and it is to be constructed to contain fully 2,500 persons. Dublin audiences are very exacting; they like good music and good singing, yet they do not give that continuous and hearty support to the drama that is desired. For many years Dublin has only half supported her two regular theatres, and the most fashionable one of the two (which, by the way, is situated at the entrance of a most unfashionable locality), is only open at certain seasons.

If the New Gaiety Theatre is intended to be a success, novelty will need to be combined with worth. The new theatre in Dublin cannot be looked upon in any other light than as a bold experiment, and though it may deserve success, it may fail for sundry reasons to command it. Ireland is not more difficult to govern than Dublin audiences are hard to please.

NEW TOWN-HALL, THURSO.

SOME time ago an esteemed citizen of Thurso, Mr. Alex. Henderson, left 1,000*l.* towards a new town-hall, having a room for the commissioner of police, and a library or museum. By good nursing this became 1,903*l.* Some other subscriptions raised the amount to 2,200*l.*, and now the building is finished and opened, the whole town on the occasion spending the afternoon *en fete*.

The building was erected under the superintendence of Mr. Russell Mackenzie, architect, Aberdeen. Mr. Robert Forsyth was clerk of works.

Internally, on the ground-floor, are the court-room, museum, and library, the retiring-room from court-room, and a committee-room. A stone staircase leads up to the first floor, where there is a large public hall, which measures 56 ft. 6 in. long, by 40 ft. broad and 30 ft. high. The roof is octagonal in form, and panelled in squares. The cost of the building amounts to about 2,500*l.*, and the contractors were,—for the mason work, Mr. Manson, Thurso; for the carpenter work, Messrs. Garvie & Sons, Aberdeen; for the plumber work, Mr. Johnston, Wick; for the plaster work, Mr. Smith, Thurso; for the slate work, Mr. Ross, Thurso; for the painter and glazier works, Messrs. J. & S. Fyfe, Aberdeen. The ironwork was supplied by Messrs. G. Smith & Co., of the San Foundry, Glasgow.

The elevation of this building, Gothic in style, is divided into five bays, by buttresses, which terminate above the parapet in carved pinnacles and finials, while the two centre ones rise to a greater height, and are enriched at the angles with carved crockets. Each compartment is finished with a pointed gable, pierced by a quatrefoil window. In the centre compartment is the entrance doorway, with pediment abutting on the buttresses, which project sufficiently to receive it; and over the pediment is a parapet, with sunk Gothic panelling. Over this doorway is the centre window of the public hall, and above it is a moulded Gothic window, filled with stained glass, representing St. Peter in the usual attitude, which is the arms of the town. In each of the other compartments is a plain two-light ground-floor window, with moulded string-course over; a two-light first-floor window, with label moulding, resting on curved blocks, stone mullion and astragal, and sunk and panelled breast for coats of arms, two of which are already carved, and are the arms of the Ulbster family and of Mr. Henderson, of Thurso. Over the first-floor windows is a cornice, with enriched blocks, representing fruit, flowers, and leaves, each block being of a different design. Above the cornice pointed gables terminate the various compartments.

We must express a hope that a rough engraving of the front in the *Northern Ensign* does not do justice to the design.

PROFESSOR TYNDALL ON THE WATER SUPPLY OF LONDON.

At the Royal Institution, on Friday evening, Professor Tyndall delivered a lecture upon the "Scattering of Light," which was, in point of fact, a discourse upon domestic water supply. Having established that the visibility of the track of a beam through water depended upon particles by which the light was reflected, the Professor next placed before the electric lamp a succession of nine bottles, containing samples of the water supplied to their customers by the various London water companies. The turbidity revealed was in every case sufficient to make the audience regard water as a very undesirable beverage. That of the Lambeth Company displayed pre-eminence of a bad kind; that of the Kent Company was by far the clearest; the West Middlesex Company stood second in order of merit; and among the rest there was little to choose. With a reticence more eloquent than words, the lecturer avoided expressing opinions about the dirt that he exhibited; and he also expressly mentioned that pellucidity was no proof of the absence of soluble impurities. He also showed, that to cleanse water from suspended dirt was a very difficult matter, and exhibited four specimens of distilled water, a specimen once filtered by Mr. Lipscombe, a specimen that had gone through a sintered carbon filter, and a specimen four times filtered through bibulous paper in the Royal Institution laboratory. These were clear when compared with the waters of the companies; but the track of the beam was plainly visible in all. A specimen of water from the Lake of Geneva was then exhibited in illustration of great natural purity, and here a faint blue line only could be seen. This brought Professor Tyndall to the practical conclusion at which he had been aiming,—namely, to an account of the water supply yielded by the English chalk formations. He characterised this as being of the greatest attainable purity, inexhaustible in quality, and easily accessible for the supply of the metropolis. He described its natural hardness as being such as to render it unfit for domestic use, but explained that by Clark's (lime) process this hardness could be entirely removed at the central works, and that

the water might be delivered in London at a uniform temperature, free from organic impurity or suspended particles, and so soft as to be perfectly adapted for all household purposes. He described Clark's process, and illustrated it before the audience, and finally showed actual results by producing a bottle of water from Canterbury, derived from the chalk, and softened in the manner described. By the side of this was a similar bottle containing the water supplied to the institution, and the two were illuminated together by way of contrast. The difference was like that between peascod and crystal. Professor Tyndall then read a portion of the report made some years ago by the late Professors Graham and Miller, and by Professor Hofmann, upon the admirable qualities of this chalk water when artificially softened, upon its fitness for the supply of the metropolis, and upon the improbability of allowing it to pass into private hands; and he concluded by saying that every word that he had read he desired fully and cordially to endorse.

As is usual when Professor Tyndall lectures, the theatre and gallery were densely crowded, and many distinguished personages (amongst others the Chancellor of the Exchequer) were among the audience.

FALL OF BUILDINGS.

Fall of Houses in Thames-street.—On Thursday in last week, at eight o'clock, p.m., an alarming accident took place in Upper Thames-street. It appears that for some time past men have been employed in pulling down some old houses at the rear of the buildings in Garlick-hill, and also behind those in Upper Thames-street, and the consequence was that the Bridge Coffee-house and other buildings were deprived of a portion of their support. At the time mentioned, the coffee-house and a house next to it came down with a run, after some premonitory symptoms which were sufficiently early to enable most of the inmates to escape. A woman was endeavouring to escape with her baby (having already helped her husband to remove her other children), when she was partly buried in the falling debris. A boy who was passing at the moment, was completely buried. The Fire Brigade and the London Salvage Corps at once hastened to the spot, and extricated the two children. One was cut over the forehead. The woman was also seriously injured. Both were removed to St. Bartholomew's Hospital. Several other injuries of a slighter character were sustained by children and adults. Reference has been made at a meeting of the City Commission of Sewers to the fall of these two houses. It was stated that they were built in the year following the Great Fire of London in 1666, and that the timber had become "as rotten as touchwood."

Fall of a Warehouse in Farringdon-street.—At the side of the Brigade Fire-engine Station, in Farringdon-street, runs a narrow thoroughfare called Bear-alley, and at the end of this place has lately been erected a brick and timber building, nearly 200 ft. long, three floors high, and of considerable depth. The warehouse was in the occupation of printers' brokers, &c. On Friday night, at eight o'clock, a terrific noise was heard, and on the firemen rushing up the alley it was found that about one-third of the warehouse had fallen into the court, bringing with it the massive window-frames, &c., and burying a quantity of the stock-in-trade. So far as could be ascertained no one was injured.

Fall of a Churchyard Wall at Brighton.—A large portion of the west wall of the Old Churchyard, almost opposite to Upper North-street, has fallen very suddenly, and without the slightest indication that any portion of it was insecure. No other damage was done.

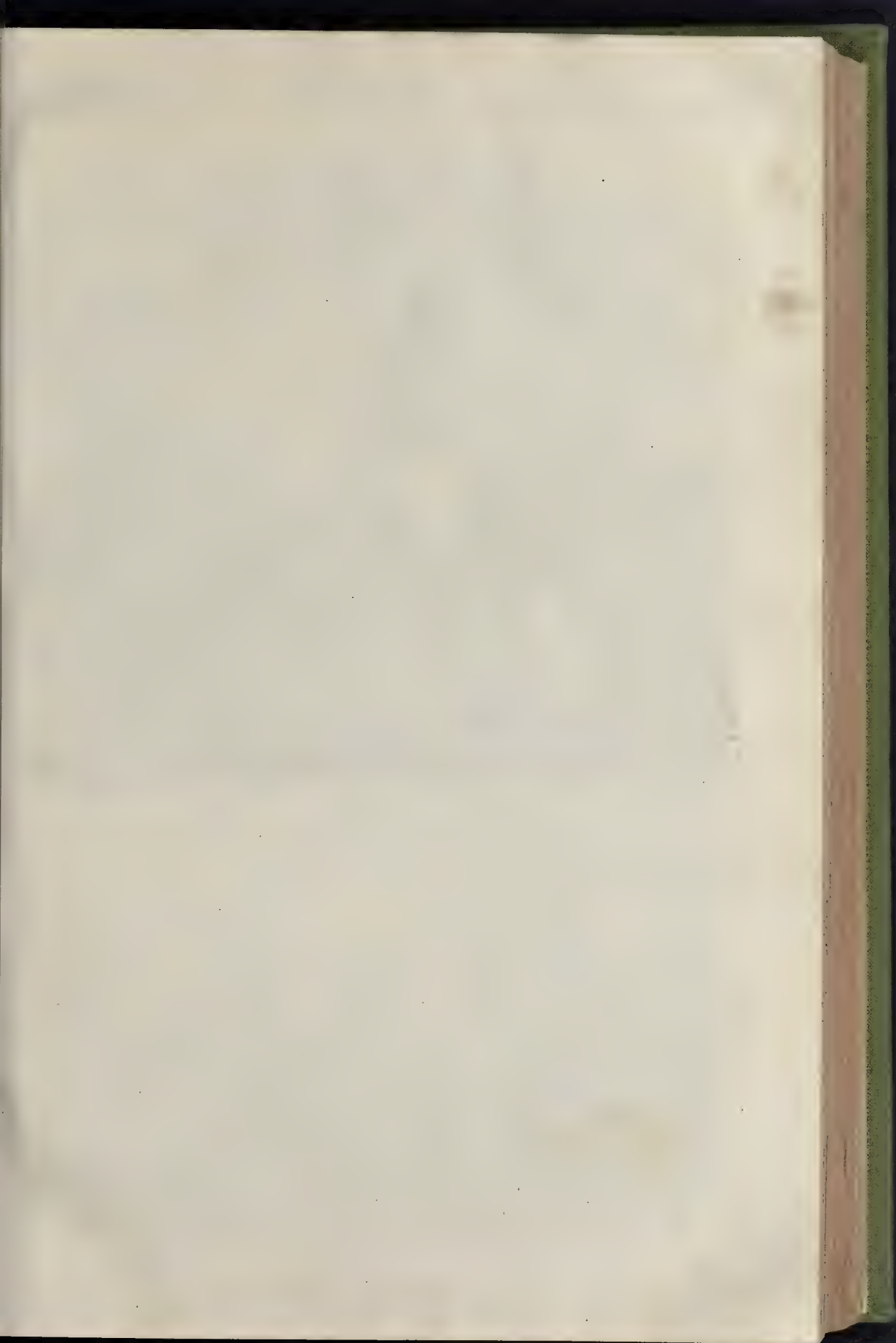
HOLLOW BRICK WALLS.

SIR,—Your correspondent, Alfred R. Wallace, may observe a block of two houses, called "The Close," at the south end of Park-lane, Croydon, which are said to be substantially built and free from damp, the walls of which are only 14 in. thick, and hollow.

The bond is two stretchers and a header, and the headers from inner and outer wall lap and coincide for three or four courses, when the bond is broken, that no line of headers may divide the hollow space into separate chambers.

All corners and angles of recesses are solid. The houses are four stories in height.

CHARLES E. AUSTIN.





THE CHURCH OF ST. SENANUS, FOYNES, LIMERICK.—MR. J. J. MCCARTHY, R.H.A., ARCHITECT.

THE CHURCH OF ST. SENANUS, FOYNES, IRELAND.

THE Church of St. Senanus, of which we give a view, is situated close to the railway station, on the south bank of the river Shannon, at Foynes, county Limerick. It serves as a supplemental church for the parish of Shanagolden, and also accommodates the sailors of the ship-of-war stationed at Foynes. Its erection is mainly due to the liberality and zeal of Mr. Stephen E. de Vere, the present high-sheriff of the county Limerick. The nave, south aisle, and north porch are already built, and are provisionally used for divine service till the entire design can be completed. The church is from the design of Mr. J. J. McCarthy, R.H.A., architect. Messrs. Ryan & Son, of Limerick, are the contractors. The walls are built of local limestone, of a dark colour, with dressings of white limestone, from the quarries near the city of Limerick. The shafts of the pillars, between the nave and aisle, are of red Cork marble, with Portland stone moulded bases, carved capitals, and moulded arches. The roofs are of open timber-work, stained and varnished, and are

covered with Killaloe and Bangor slates, in alternate bands.

The cross shown on the distant cliff is the memorial of the late Hon. Stephen Spring Rice, erected by the tenants of the Mount Trenchard and Foynes estates.

THE FRERE FOUNTAIN, BOMBAY.

THIS important work, which is the largest of its kind in India, has lately been erected by the municipality of Bombay as a testimonial of the esteem in which their late Governor, Sir Bartle Frere, is regarded by that presidency. The idea was originated by a native gentleman, Mr. Cursetjee Furdanjee, who gave a liberal donation towards its erection. The height of the fountain, measured from the water-line, is about 35 ft., and it stands in a large basin, 100 ft. in diameter, surrounded by an ornamental iron railing, having lamps at intervals. The material is Portland stone, excepting the columns at the base, which are red and grey granites. The four sitting figures are considerably over life-size, and are representations of four of the leading products of India, while that on the top is a repre-

sentation of Flora. In addition to these there is also a series of four dolphins, from which are discharged fan-like jets of water into shells; the waste water then escapes through the serrations of the shells into basins below, and is further utilised for the supply of jets lower down. In addition to the figures and ornamental sculpture, the fountain is further enriched by bronze heads of lions and panthers. From these heads are discharged jets of water, which fall into the large outer basin. All these jets, however, are subordinate to that in the centre; this wells up like a natural spring, the sound of which must be refreshing in a hot climate like that of Bombay. The execution of this fountain, which has cost about 4,000*l.* exclusive of foundations, large outer basin, waterworks, ornamental railing, lamps, freight, and fixing, was intrusted to Mr. Forsyth, of London, who was already known for his works in this department of art, and who, with the friendly co-operation of Mr. R. Norman Shaw, architect, has carried it out in a successful manner. The site chosen for its erection is the Esplanade, the most salient and central position of the European quarter of the city.



THE FRERE FOUNTAIN, BOMBAY, INDIA.—MR. FORSYTH, SCULPTOR.

HOMES IN THE EAST OF LONDON.

A FRESH VISIT TO BETHNAL-GREEN.

Pursuing our investigations, we select a well-known district, comprising a portion of two other parishes, and often reported on in our papers. As we glance upon the map, we find that the walk we had allotted to ourselves is too large to be taken during the time at our disposal. Reducing the outline, we adopt as our base of operations the broad thoroughfare of Shoreditch extending from the Great Eastern Railway to the foot of Hackney-road, facing eastward thence between the lines of the latter road and the line of railway stretching until both intersect Cambridge-road. Entering Boundary-street at the back of Shoreditch Church, we pass along with some delays until it opens into Bethnal-green-road. We traversed several alleys and courts, dirty and dismal, the denizens of which told their own tales in their pallid faces and tattered raiment. Here and about, the pavement of the streets, the flagging of the paths, the condition of the side channels, and the general state of the entries and back-yards are unendurably bad. Let us instance New and Old Nichols streets, the latter particularly as miserable and melancholy to behold. A showery day gives a vividness to the repulsive features observable. Rags, millboard, an old hat, or newspaper, will be found in this quarter doing duty for a pane of glass. We noticed several ashes here altogether free of panes, but we had no doubt about the ashes within. There are many houses in this quarter not in habitable condition, and the back-yards of several are full to overflowing with nastiness and filth. The lanes off Mount-street, formerly Rose-street, as an old captured tablet dating from 1725 informs us, are also in a filthy condition, and the channels are unable to discharge themselves, or the sinks to carry off the liquid matter, household slops, or rain-pour. At the end of this street, where it leads into Old Castle-street, and abuts against a blind street, the terrible conflagration which we noticed in the *Builder* last autumn occurred. It would appear that neither fire-warnings nor fore-warnings make much impression upon some people; and though they escape with difficulty once or twice, they are still ready for some petty advantage to risk their lives again. The houses that were here completely gutted of floors, windows, and roofs, are now being repaired, and are already occupied; and the large timber-yard, whose close proximity caused all this dreadful havoc, will be soon restocked.

The authorities of Shoreditch or Bethnal-green ought to see that the back wall of the timber-yard is built of sufficient height and thickness to prevent such another accident as the last. There will exist the same danger as before, and perhaps the next time there will be a greater loss of life, if timely precaution be not taken. To give the people at the back of this timber-yard a chance for their lives, a passage should be opened into Newcastle-street, and the street allowed to exist no longer as a blind street. A brick wall alone cuts off egress.

A few yards hence and we are in sight of Columbia Market,—a failure as a meat-market, and only a partial success as a fish-market. What a pity that such a large foundation, begun under such good auspices, and having its inception in such a fine benevolence, has not borne better fruits. Miss Burdett Coutts has, at all events, done her duty nobly; but the public and the poor, who form the largest part thereof, are not easily convinced. Fashion sways them, and prejudice leads them, and sharpens traffic on their credulity.

Opposite Columbia Market, on the Crabtree-road, there are streets, lanes, waste spots, and back-yards in a most wretched condition, dilapidated houses, whose shattered doors and windows bear all the appearance of having been once bombarded, and are now tumbling to unmistakable ruin. Passing through an old gateway here, where we had to pick our steps through 6 in. of heavy sludge, we found ourselves in a few moments among a number of old tenements, that no stranger could expect to find in such a place. We wind round an angle, and we find ourselves face to face with more old buildings, with patches of little gardens in front, but quite trodden upon and denuded at this season. Here we find poverty, dirt, and rags. No scraper or besom of Bethnal-green scavenger sweeps in here, nor are the denizens alive to the danger that surrounds them. Their homes are gloomy and bare, and the gravest concern of their lives is how they will be able to "make both ends meet," by Saturday

night. We move along, through a narrow passage, that cuts obliquely through the angle of a house, and while thinking what a villainous spot this would be on a dark night, find we are safely emerging into Virginia-row.

Turville and Tyssen streets are traversed, and the courts and lanes leading therefrom, but the picture is still unrelieved. While here and there we find these back and side streets barely passable and unsweped, the narrow alleys and entries, and back-yards, are in a most filthy condition. Club-row, off Bethnal-green-road, has breadth of pavement and footway, but ruin is in full swing in this short street. Here domiciles of five stories may be found propped, and no doubt prayed for, that they may not fall and kill any one. The state of Solater-street and the lanes and alleys branching therefrom is very bad. At the upper end of this, on a corner-house, a tablet has the following inscription,—“This is Solater-street, 17—18.” We need not stop to inquire who was Solater. All we need say now is, posterity knows Solater-street, and is shocked at its filthy condition, and that of its courts. Bacon-street has another stone tablet, with the date 1723.

Not long ago a new metropolitan police station was opened. In a crowd outside Bethnal-green Police Court, youth and old age, draggled and drunkard, shameless Amazon and skulking vagabond, will be found congregated. Such a sight we encountered as would beggar all description. Talk of the Whitechapel type of humanity and roughness, Bethnal-green has no necessity to play second fiddle, so far as the elements that compose her street rabble may be analysed. This street exhibition of infamy of all kinds acts as a dangerous example to villany in the bud. It is a living picture, on which the young mind glazes and hungers to see repeated. The neglected children in our streets thus grow up to manhood reflecting all, and more than all, of what they hear and see, and which, unfortunately, they are not slow to imitate.

Crossing Brick-lane—sacred to costers' barrows and street stalls—we wind along John-street by the Goods Station of the Great Eastern Railway, and thence, turning an angle, we reach Winchester-street. The house property about this quarter is in ruinous condition. The dwellings of the poor are low and mean, and the general character of the buildings as structures are of the “Jerry” type. If the rent can be squeezed out of the tenants around here, the landlord ought to be thankful. These wretched tenements have been doctored to death, and they are now bursting asunder in sheer rottenness. Southampton-street and London-street have roadways and footways of the very worst type, and on the day of our visit they were almost impassable swamps. The footways were nearly as bad as the streets. The drainage here is no doubt very bad, and in rainy weather inundation in the street is the consequence; but here as elsewhere in the district, as we will show, no attempt is made at keeping the thoroughfare in repair. In this quarter, the Great Eastern Railway Extension will curve off, and sweep round by the top of Hackney-road. At the head of Three Colts-lane, dilapidations are in full swing in the line of railway, and the tenements here and about are miserable structures. Poverty and sickness are rife, and foulness and filth abundant.

The streets on each side of Old Bethnal-green-road we found in an abominably dirty condition. Minerva-street,—sludge, heaps of filth and ashes unremoved; Hope-street, Treadery-street, Temple-street, Charles-street,—all miserable, and here wretched attempts at repairs had been a-making, with an odd barrow of stones flung into the rats. We went through some long passages or lanes leading off Old Bethnal-green-road, where rows of houses with little gardens before them may be seen. The roadway was deep with sludge, and the gardens in some instances but receptacles for all sorts of refuse. Perhaps the summer aspect might be different. The lanes parallel to this, and at right angles, are filthy, and heaps of unremoved dirt are in abundance.

Off Bethnal-green-road proper we found many streets and lanes in a similarly neglected condition. In the back and low places are choked drains, inundation, and heaps of unremoved refuse. In White-street and its offshoots, and Derbyshire-street, there was no end of sludge, and not a scavenger or sweeper to be seen anywhere. Round about this quarter a great many poor are located, eking out a subsistence in

making articles of household use for children, costermongers, wood-splitters, chair-carvers, pill-box makers, and several other shop and house articles for sundry uses, the profits from which enable them to keep body and soul together. Granby-street, Gosset-street, Thorold-square, Nelson-street, Essex-street, Gibraltar-walk, and the lanes, courts, and streets leading off these places, we found in an unclean and filthy condition. In all our walks about Bethnal-green, we did not meet more than half a dozen scavengers at work. Gibraltar-walk dips down into a hollow from Bethnal-green-road, and here and there are brokers, furniture-dealers, bird-fanciers, and cage-makers. If their health is good, they must have iron constitutions. The Bethnal-green vestry ought to take a walk round this quarter, and see whether its condition will have any effect on stirring them into action; but these last-named places are beauty itself compared with other unmentionable localities, where the “social evil” and the small-pox are killing bodies and damning souls together.

The epidemic is raging and increasing in virulence in many of the districts we passed through, hinging on one side to Hackney and on the other to Shoreditch, and we had great difficulty in obtaining information, from the reluctance of parties to allow any of their family to be sent to the hospital. In certain quarters we found the poor people entered into “a solemn league and covenant” to render no information to visiting officers, if they suspected them as such. They choose to nurse the small-pox at home, and in many instances they doggedly refuse to let their children be vaccinated. It is curious to hear their reasons and the foolish notions they entertain. In some instances, they have a show of reason upon their side; for we find that some few medical men have not taken particular care with the cases they have attended. The health and general constitution of the patient operated upon ought to be known. Fresh and healthy matter is a necessity, that the eruption may be perfect. If the poor are not properly vaccinated the rich will assuredly, through one channel or another, eventually suffer.

From the corner of Gibraltar-walk to Shoreditch the Bethnal-green-road requires to be widened several feet. The increasing traffic of this thoroughfare,—the ready and direct access to the new East London Museum, in course of completion,—necessitates it. The drainage of a large portion of the Bethnal-green district is very defective, and the back lanes and court-yard fountains exist in many places as a nuisance surrounded by nuisances. Many of them are most dismal spots.

Old weather-boarded houses on the front, and half-timbered ones, are numerous in the district, and they are sources of danger in case of fire. The many small furniture workshops and timber-yards on all sides of Bethnal-green and Shoreditch are another element of danger, and ought to lead to the perfectness of an efficient and ever-ready fire-brigade for the district.

To sum up the general condition of the portion of Bethnal-green district we passed over would be to simply say, Bethnal-green is in a most disgraceful and neglected condition, and has been so for years. Some of the predisposing causes of this state we have already shown, others are to be found in the long-protracted squabbles of its local boards. This charge also applies equally strongly to Shoreditch, and in a minor degree to Hackney. Some of the local organs are also to blame for fanning up and keeping alive factious quarrels between opposing parties. Instead of catering for the wants of the poor of the parish, and directing the whole of their energies to counteract the spread of a serious epidemic, we have the members of three local boards leaping at each others' throats, and acting more like savages than Christians. Need we wonder that fever stalks abroad, that people sicken and die, amidst streets and lanes full of filth; that prostitution and destitution, abomination and desolation, curse the earth. How can it be otherwise? Have we not seen honest men who have raised their voices and taken up their pen to strive against this fearful torrent of vice and filth denounced, held up to the fool's scorn, and the knave's laughter. Death, however, strikes indiscriminately, and the arm that is often stretched in relief, and the hand that is raised to strike down, are palsied together.

In dealing with the localities we have passed under review, we have been compelled to leave out minute details, and numerous sad recitals of

suffering and want which we encountered. From what we have seen, heard, and carefully examined we are justified in pronouncing judgment as we have done.

THE SEWAGE QUESTION.

Sewage Irrigation at Kidderminster.—On the recommendation of the Home Office, the town council resolved to purchase 130 acres of land from the Earl of Dudley, for the sewage irrigation, and steps were taken to ascertain at what price the land could be got. Mr. J. Mathews, of Edgbaston, the earl's agent and valuer, has asked from the council 150l. an acre (including compensation), and this, added to the cost of way-leaves to the land and construction of the sewer, would make the total expense of the Wilden scheme at least 25,000l., instead of the 19,000l. or 20,000l. at first estimated. The council have therefore instructed Mr. Fairbank, their engineer, to look out for other land, and he now recommends a tract of 100 acres, which may be obtained at 80l. an acre. This lot is situated about the same distance from the town as the Wilden Estate; but it will involve the erection of covered tanks somewhere near the Caldwell Mill, from whence the sewage would flow by gravitation through a sewer under the river and canal to a site near the Round-hill, where pumps would force it through a rising main pipe into a tank at such a height that it would fall by gravitation through the outfall sewer to be laid along the Stourport-road to the proposed irrigation works. The scheme involves no compensation to tenants, no way-leaves, as the sewer would be constructed on the high road. This scheme would cost 14,700l. as compared with 25,500l., and while the charge on the borough in the Wilden scheme would be 1,659l. a year, that on the Stourport-road scheme would be 956l.

WASTE AND WANT OF WARMTH.

Sir,—There seems no good reason why the present chance arrangement of our cherished open fire-places should exist, whilst health, pleasure, and economy are at stake. The boasted constructive and scientific skill of the period leaves the domestic hearths, around which our social system revolves, a troublesome, uncertain, smoky, and expensive source of enjoyment but one step in advance of the hearths in the humble Highland home, where

"The red peat gleams a fiery kernal,
Ere it is smothered by a cloud infernal."

Defoe wrote, 180 years ago—"We are the most lazy, diligent people in Europe, and the most prone to gratify the senses." Burns has pictured to us "the cozy ingle blinking bonniely," yet we are far from having comfortable fire-places in every dwelling, where warm pure air is of such great benefit during the cold, damp weather of this country.

A writer in the *Family Economist*, as far back as 1848, says—"I have known ingenious mechanics contrive in a simple manner to increase the warmth and pure air required in their houses by having an air-duct of iron or clay pipes long enough to reach from the outside of the house to the fireplace. This fresh-air duct is laid under the floor, and the inner end is brought into a hollow space or chamber made at the back of the fire. The chamber becomes hot, and consequently air rushes into it from the outside, and, after being heated, passes by another tube into the room at one side of the mantel-piece. Thus without any additional fire, a greater amount of warmth is obtained. To make this plan answer, the arrangements must be very carefully contrived." But several such improved fire-grates may now be got, as noticed in the *Builder* of 10th December last.

Tomlinson, in his "Treatise on Warming and Ventilation," describes the ancient Roman hypocaust, and says—"The hypocaustum is well known to the Chinese, and is in common use about Peking, where the winter weather is very severe. The houses of the better class are built with double walls, and with hollow flues extending beneath the floors; even the benches and sleeping-places are warmed in such a way that it is scarcely possible to improve upon these refinements of the Chinese."

We may, however, advantageously to health and comfort, make them applicable to our buildings, which are all, more or less, constructed with (what we may call) double walls, as the stone or brick outside wall has generally an inside lining (or wall) of laths and plaster, with

a hollow space of 1 in. or more between them, where heated air from hot-water pipes may usefully and easily be employed to heat this space, and so warm the thin interior wall, the cold, greedy plaster of which now absorbs the vital heat of our bodies, whilst a temperature of 60 degrees can only be obtained by over-heating the fresh air we require for wholesome breathing.

Much of the heat now wasted up the chimney of open fireplaces might be retained in chambers at back and sides of grates, and used to warm hollow walls, or at least to give action to ventilating-flues for expelling vitiated air.

The introduction of fireproof plaster walls is alluded to more than twenty years ago, in the *Builder* for 1849. "Fireproof ceilings of wire-work have been successfully applied in place of laths, with plaster or stucco as usual, at the Chester Lunatic Asylum. The wires are about 1 in. apart, and the plaster forms an adhesive and serviceable mass even on both sides. The wire is galvanised or japanned, to prevent corrosion. Not only ceilings, one would think, but thin partitions and walls in general, might be wired in place of lathed, and risk of fire greatly diminished; by a process neither patented nor costly;" and we could then have the heated air applied in space behind, and so warm the walls of rooms with safety and economy; and in buildings as now constructed, we may warm the floors and walls around the rooms by hot-water pipes placed in the void spaces below the floor and behind the laths and plaster of the walls, and so promote a healthy and economical system of heating and ventilating both public and private buildings, and tend also to equalise the temperature of the different apartments, preventing disagreeable currents of air, and dangerous chink-draughts. J. K.

PROGRESS OF GLOUCESTER.

Sir,—In your excellent article "A Note in Gloucester," in your issue of 21st inst., you observe, the commerce of Gloucester being mainly in grain, has led to the formation of a commodious dock surrounded by warehouses, for the lading and unlading of ships, &c. This is quite correct; but had you turned your attention to the bridge dividing the docks from the main line of ship canal, you would have seen another branch of commerce well deserving attention. Commencing at this bridge (Llanthony), for more than a mile on the east side of the canal is a continuous line of timber-yards of foreign import, with the Midland Railway line running through each; and intermingled with these are very extensive saw-mills, and manufacturing of joinery of all descriptions; also the extensive works of the Gloster Wagon Co., employing nearly 1,000 hands; extensive oil-mills, &c.; indicating a degree of progress, probably more marked than at any port in the Bristol Channel. N.

OLD HOUSES NEAR BIRMINGHAM.

At the last meeting of the Archaeological Section of the Birmingham and Midland Institute, Mr. A. E. Everitt read a paper on "Old Houses in the Neighbourhood." He began with Maxstoke Castle, which, he said, was rather a fortified manor-house, and, in many respects, a most perfect relic of the middle of the fourteenth century. Astley Castle was next described, and the once fine Collegiate Church of Astley. The stone moated house, New Hall, near Sutton Coldfield; Baddesley Clinton, Coughton Court, the Hall of the Knights Templars, at Temple Balsall; the Oak house, in the parish of West Bromwich; Berry Hall, near Solihull; Grimshaw Hall, near Knowle; the Old House, at Barnet Green; the Old Free School, at King's Norton; Parkwood, Pooley; the Moated Hall, at Perry; Hillfield Hall, near Solihull; the Old Manor House, at Grafton, near Bromsgrove; Sheldon Hall, Castle Bromwich Hall, and Aston Hall were included in the paper. The whole series was illustrated by a large collection of drawings, taken by Mr. Everitt.

Dr. Langford remarked that, during the reading of the paper it had occurred to him that, in addition to the admirable descriptions and illustrations of the "old houses in the neighbourhood," they had a history of their own, which every member of the section might assist in hunting up. Each of these houses had its particular history, and the section would remember when on an excursion to Maxstoke Castle, Mr. F. Dilke read a curious paper to them respecting

the history of that place. It would be exceedingly interesting to have collected together an account of the history of the old houses, and he thought it might be done very judiciously. If the members could also obtain access to the deeds relating to the old houses in the neighbourhood, they might obtain nearly their whole history. By this means some very valuable information could be procured.

EDUCATION FOR THE WORKMAN.

Sir,—Your correspondent of the 14th inst., in a letter headed "How do you prove your Plumb-rule?" referred to the want of technical education amongst mechanics.

I have myself been often greatly surprised at the ignorance of mechanics in this respect, and have met with many men, both in town and country shops, who could not set out or describe some of the simplest geometrical figures, such as an equilateral triangle, a hexagon, an octagon, &c. I have also met with men acting as foremen who could not set out the above figures when the length of one side only was given, or could not raise a perpendicular on the end of a given line without the aid of the square.

How many men calling themselves bricklayers can set out a gauged arch or find the centre for striking a segment arch (when the opening and rise only are given), except by the rule of thumb or guess-work?

I should like to see technical education more general among the working classes, as I think, with your correspondent "C," that it would raise them socially and morally.

FRANK CHERSELL.

A NEW ARTIFICIAL STONE.

A PATENT has been taken out by Mr. Frederick Ransome for a new material, composed of finely divided silica in a soluble state, a solution of silicate of soda or potash, or a mixture of the two, with lime-burnt chalk or other material. When mixed, caustic soda or potash is set free by the action of the lime and combined with the finely-divided silica. The lime may be either quick lime, or partially hydrated, or in other forms, such as Portland cement. The result is to produce an artificial stone of great specific gravity, capable of taking a fine polish; and, when other substances are introduced, as can easily be done, a kind of Scagliola is obtained, which, it is claimed, has the advantage of resisting the weather.

The specimen we saw was a large step, in imitation of red Peterhead granite, the colour being obtained by a metallic oxide, and the appearance of felspar by the intermixture of small broken crystals of natural carbonate of lime. Greys and other colours can be similarly produced.

The specification further includes some new combinations of the silicates to be used for lining vessels in use for acids and acid vapours, and also for the reception and transmission of heated air and gases.

DANGEROUS ROADS IN PADDINGTON.

Sir,—I know of no publication so suitable as the *Builder* to give publicity to the state of affairs adjoining the Great Western Hotel and the Metropolitan Railway; nor do I know of anything so likely to procure redress of a dangerous public grievance,—I might say a nuisance,—as some remarks from the editor of the *Builder* on the subject. The darkness and danger, and the perilous passages there existing, lead me to put the following questions:—

Can the railway company and the proprietors of the hotel be compelled to light their lamps? If not,—

Is the parish bound to supply others?

Several applications have been made to the police in vain. J. EDLIS.

THE PREVENTION OF KITCHEN BOILER EXPLOSIONS.

Sir,—Having contrived what I consider an effectual guard against kitchen-boiler explosions, I will, for the public benefit, and with your permission, describe it.

At the top of the boiler is inserted an iron pipe, which is then carried down outside, and below the top of the boiler 2 ft.; then bent, and carried up about 3 ft. This pipe will represent

an inverted syphon. It must be charged with mercury, to stand in each leg to the depth of about 16 in. The apparatus is now complete, and at all times and under all circumstances ready for action, which would be thus:—Say the boiler is full of water, and the water-pipes in connexion with it sealed up by frost or any other cause; a fire is lighted, the water expands, or steam forms; either of which taking place, pushes the mercury out of the iron pipe, leaving a free passage for escape. The length of the turned-up end of the pipe here named will suit where the cistern is 30 ft. above the boiler; other heights will require a proportionate turn up of the iron pipe.

To prevent explosions caused by want of water I would have a common lead plug inserted in any part of the boiler exposed to the immediate action of the fire. This, when the boiler is empty, would melt, and leave a hole for the escape of steam formed by the passage of water into the hot boiler. This is an old application to steam boilers.

THOMAS HOLT.

HOUSE-BUILDING ON VERBAL AND WRITTEN CONTRACT.

At the Ashby-de-la-Zouch County Court, on Thursday, January 12, before Mr. Serjeant Miller, Judge, the case of Widdowson & Adcock v. Thomas Chestle was tried; claim, 38l. 0s. 1d. A set-off for 105l. was pleaded.

The plaintiffs are joiners and builders at Ashby, and entered into a contract to build a house for defendant for 100l. The sum now claimed was alleged to be the balance due. From the evidence it appears that the contract was only a verbal one at first, but after the work had proceeded for about a month, then a written agreement was given, which stated that plaintiffs engaged to build the house for the sum specified, and to find all materials for the completion of the work. A man named Orion was employed by plaintiffs to do the brickwork, and he being indebted to them to a large amount, a portion of the sum due to him was to go towards the liquidation of the debt. The plaintiff gave defendant authority to pay money to Orion at various times, for which they gave receipts, but they now disputed a sum of 4l., which they alleged defendant had paid without their authority. Plaintiffs also denied their liability to pay for 17,000 bricks, and also for tiles and latbs which the defendant on the authority of plaintiffs had either ordered or obtained.

The Judge, on reviewing the evidence, said that it was clear to his own mind that the authority to pay Orion had not been withdrawn, and that the plaintiffs having signed a contract to find all the materials for the building of the house, they were clearly liable for the bricks and other materials used, and the verdict, he said, would be for defendant; but on an examination of the accounts it was found that 5s. 7d. had been allowed for discount when the account for tiles and latbs had been paid, and this had not been deducted.

Mr. Wilson therefore submitted that his clients were entitled to a verdict for this sum.—Verdict for plaintiffs for 6s. 7d., which just saved costs.

TENDERS FOR THE NEW LAW COURTS; FOUNDATIONS.

The following is a list of the tenders delivered on the 20th instant, for putting in the foundations for the Law Courts, in the Strand, under Mr. Street, architect:—

Gammam & Sons.....	£28,347 0 0
Holmes & Nichol.....	66,900 0 0
Lucas, Brothers.....	65,719 0 0
Myers & Sons.....	47,438 0 0
Lee & Sons.....	58,500 0 0
Taylor, Johnson, & Smith.....	54,240 0 0
Richwick & Thurgood.....	46,000 0 0
Holland & Haxton.....	48,300 0 0
Kirk.....	48,182 0 0
Webster.....	47,500 0 0
Culbitt & Co.....	46,555 0 0
Brass.....	46,240 0 0
Trollope & Sons.....	45,473 0 0
Perry.....	44,973 0 0
Browne & Robinson.....	44,280 0 0
Hill, Kiddell, & Waldram.....	42,750 0 0
Higgs.....	41,987 0 0
Henshaw (too late).....	38,350 0 0
Axford & Whillans.....	37,175 0 0
Dove, Brothers.....	36,755 0 0

The difference between the highest tender, 68,347l., and the lowest, 36,755l. (nearly 32,000l.), both being from known and established contractors, will increase the astonishment caused by statements in the same direction that we have recently made. The result would be interesting, if the two parties were to make an analysis and comparison of their several estimates.

IS A SCHOOL A GOODNESS?

The case, Harrison v. Good, tried in the ice-Chancellor's Court (before Vice-Chancellor Sir James Bacon), involved this question:—

It was a suit to prevent the erection of national parochial schools on a plot of ground in Abbey-place, St. John's-wood, as being a nuisance within the meaning of a certain covenant. The plot in question is part of the Byre estate, which was sold in building plots, in the year 1824, by Messrs. George Robins, and for the purpose of building suburban residences. The situation was then described in the particulars of sale as being very picto-

resque. Mr. John Thurlow was the purchaser of the lot in question, and, in accordance with the conditions of sale, entered into the following covenant:—
"That he said John Thurlow, his heirs, or assigns, shall not do or suffer to be done on any of the premises anything which shall or may be deemed a nuisance to Henry Samuel Byre, or to any of his tenants, or the occupiers or proprietors of the adjoining property, or the houses to be built thereon."

The plot of ground came into the possession of Mr. Good, architect, who offered it as a gift to the schools committee of the parish of St. Mark, of which committee he is a member, for the purpose of erecting schools thereon. This bill was filed by the owners of houses built on other parts of the Byre estate, on the objects above stated, the defendants being the school committee.

The Vice-Chancellor said, it was clear that the plaintiffs were persons entitled to the benefit of the covenant; but he could not extend the word "nuisance" beyond its strict legal meaning. He had no doubt the erection of the schools would cause annoyance to the plaintiffs, and depreciation of their property, but that formed no ground for the interference of the Court. Looking, however, to the facts disclosed by the evidence, that there was a proper site on which the schools might be built near the church, without annoying anybody, and that Mr. Dangerfield, one of the plaintiffs, had offered to buy the site and he objected to the price given by Mr. Good, he thought the conduct of the defendants such that they ought not to be allowed their costs.

We understand an endeavour will be made to reverse this decision as to costs on the ground of misstatements made by the plaintiff's counsel, and not contradicted from want of proper instructions by counsel on the other side.

A correspondent writes us that he understood that the school in Marlborough-place was not given up on account of the "frequent complaints" made against it, which was not the case, but solely and entirely in consequence of the very dilapidated and filthy condition of the buildings, and the insufficient and unsuitable arrangements for carrying on the school. Mr. Dangerfield never offered to give any site for the intended school-building; nor did he procure the means even of getting access to the church ground, alluded to in the report, from the Mews by Violet-hill. Mr. Good was appointed the architect to the new intended school in the year 1868, and in the beginning of 1867 had prepared the drawings, ready for contract. A meeting of the vestry was held, when it was determined to build on the church ground forthwith; but at the eleventh hour it was discovered that, without the consent of the trustees of the church site, they could not build. That consent was withheld then, and the building on the church site was abandoned. The consent now cannot be obtained for the same reasons as prevailed in 1867,—namely, that the trustees are nominees of Mr. Harrison, the plaintiff, who holds house property in the neighbourhood of the church, and the consent to build the schools on the church ground is withheld because they were and are supposed by Mr. Harrison to be a "nuisance." The district parish of St. Mark is very small, and does not exceed three-quarters of a mile in length by a quarter of a mile in breadth, and, with the exception of Lord's Orbits ground and the piece of freehold land which Mr. Good purchased, there is no plot whatever for any building. The consequence is, that in the event of the obstacles still remaining to build on the church ground, there is no spot whatever where the schools could be built within the district except on the site which the architect proposed presenting to the parish,—a site that cost him between 1,100l. and 1,200l. It is true that Mr. Dangerfield offered to give what had been paid for the land in question, but the offer was only made after the costs had been incurred. Of course, after having made the promise to present this site, Mr. Good could not do otherwise than decline to enter into any negotiation to sell it.

A CONTRAST: KAISER AND KING.

To wear the crown—to rule o'er noble men,—
To set th' Imperial circlet on the brow.

To win War's laurels in the wide world's ken,
Can human Pride more lofty moment know?

Yet is the laurel dyed with gresswome stain,
The pearl crown with misty tears is dim,
The lives of men a circuit dearly gain,
And leave upon the brow Death's shadows grim.

Ah! softly still shall rest the diadem
Which Rome bestows upon her chosen one,
And pure the lustre of its latest gem!
That gem—a nation's full heart nobly won,
When by kind word, and gift, and ready speed,
Kings aid the homeless—for the orphan plead.

M. Y. F.

QUANTITIES.

Sra.—A memorandum lately published by the Royal Institute of British Architects contains the following paragraph:—

"In cases where the quantities are provided, it is recommended that, unless a surveyor be mutually agreed upon by the architect and builder, two surveyors be employed to take off the quantities, one appointed by the architect and the other by the builder, at a meeting convened for the purpose."

The plan here recommended, however well it may work in most cases, appears to be sometimes open to the following objections:—

First. It frequently happens that clients, before inviting builders to tender, require their architect to inform them of what, within a small amount, will be the cost of the work to be carried out. This, plainly, cannot be properly done, unless the architect is furnished with quantities, a mode of proceeding which requires the aid of a surveyor not "mutually agreed upon."

Second. It admits of no change being made either in the names or number of the builders who are invited to tender.

Third. When it is necessary to begin the work at short notice, that time would be lost which would be occupied in the meeting and making of the arrangement recommended in the memorandum.

On this last account, I have lately had the quantities for a building, about to be erected in London, taken out by a surveyor appointed by myself alone; and, consequently, two builders amongst those asked to tender, acting on the memorandum, have declined to do so.

I have ventured to call your attention to this matter, thinking it one of interest both to architects and builders.

W.

THE INSTITUTION OF CIVIL ENGINEERS.

On January 10th, Mr. Joseph Cabitt, V.P., in the chair, the paper read was "An Account of Floating Docks, more especially those at Cartagena and at Ferrol," by Mr. George Banks Rennie.

After touching upon the various modes formerly adopted of cleaning and repairing the bottoms of ships, the author referred more particularly to the wooden floating docks introduced by Mr. Gilbert in the United States of America, and to that made by him, in 1858, at Venice, for the Austrian naval arsenal of Pola, in which the two largest ships that had been docked were the *Kaiser*, of 3,225 tons, and the *Ferdinand Man*, iron-clad, of 3,066 tons. The Messrs. Rennie having been called upon by the Spanish Government to make a proposition for furnishing a floating dock for Cartagena, capable of raising the class of iron-clad ships then about to be added to the Spanish navy, having a weight of from 5,000 tons to 6,000 tons, which represented the *Numancia* and the *Vittoria* types, they proposed a dock somewhat similar to that constructed at Venice, but of iron instead of wood, with certain important modifications. In the wooden structure, in order to sink the dock sufficiently, it was not only necessary to allow water to run into the lower chambers, but water had to be forced into the top compartments at the sides, to overcome the buoyancy of the material; while in the iron structure provision had to be made to prevent the dock sinking when the lower chambers were filled with water. To accomplish this, the upper part of the side walls was divided into compartments, forming permanent air-chambers, or floats, of a capacity sufficient to maintain the decks of the side walls from 6 ft. to 8 ft. above the water-level. The author laid stress on the importance of these for the safety of iron floating docks. As an instance of the success of the Cartagena Dock, he mentioned that the *Numancia*, of 5,600 tons weight, had been supported on it for a period of eighty days. A list was then given of wood and iron floating docks which had come under the author's notice, all of which were of rectangular-shaped sections, with the exception of the *Bermuda*, which was of a U section. The depth of the basement or lifting-chamber, of a floating dock, like that at Cartagena, mainly depended on the lifting power required. The thickness of the plates of the shell was $\frac{3}{4}$ in. and $1\frac{1}{2}$ in. in the centre part. For such a vessel as the *Numancia*, weighing 5,600 tons, the strain was estimated to be 1.32 ton per square inch, and for a vessel weighing 20 tons per lineal foot, 1.5 ton per square inch.

Of the different plans of conveying docks to their destination, it was remarked that that of Pola was built at and towed from Venice; that of Havannah, from New Orleans; that of Alexandria, from France; and the *Bermuda*, from the Thames; while those of Cartagena, Ferrol, &c., were sent out in pieces and erected at the respective ports.

The dock at Cartagena is 324 ft. in length, 105 ft. in breadth, and 48 ft. in height outside; these dimensions of the dock at Ferrol are 350 ft., 105 ft., and 50 ft. respectively.

WATER-TIGHT BASINS.

Sra.—Will any of your readers kindly inform me by what means I can effectually retain the water in the basin of a fountain? The reservoir is built of ashlar stone in courses, and was well puddled behind the stonework. The escape of water is in the joints betwixt the upper and lower stones. I have had the joints filled with Roman and Portland cement, but the weather or some other cause renders either of no use.

M.

SCHOOLS OF ART AND OF SCIENCE.

The Rochester and Chatham Art Schools.—The annual distribution of prizes to the successful competitors studying at St. Mary's and St. Mark's Art Schools has taken place in the National School-room, Military-road. Notwithstanding the inclement nature of the weather, there was a large attendance of the friends of the students. Previously to the proceedings commencing opportunity was given to inspect the drawings and water-colours executed by the students, which were hung round the walls of the room. The High Constable (Mr. H. P. Mann) presided, and briefly opened the proceedings by requesting Capt. W. C. Chamberlain, superintendent of Chatham dockyard, to present the prizes to the students.

TENDERS FOR KENNINGTON
WORKHOUSE.

At a meeting of the Lambeth guardians, on the 18th ult., Mr. Henshaw, who last week tendered to erect the new workhouse at a cost of 42,784*l.*, and whose tender, being the lowest, was accepted, waited upon the Board, and said he had made a mistake of 1,500*l.* in his tender, and asked that his contract might be altered. With the 1,500*l.* added, his contract would still be 100*l.* less than the next lowest. After some discussion, it was decided that Mr. Henshaw's request, in justice to the other contractors, could not be granted.*

DISSENTING CHURCH-BUILDING
NEWS.

Darlington.—The chief stone of a new Primitive Methodist Chapel has been laid at Albert-hill. Besides the chapel, it is also contemplated to build schools. The chapel and schools will be in Haughton-lane, and the architectural design is in the plain Early English style. The chapel alone will contain seats for 350 people, and the schools, which will be separated from the chapel by a movable partition, will provide accommodation for 200 children, so that in case of necessity sufficient room can be made for a congregation of 550. It is expected that the building will be completed by the beginning of March next. Mr. R. B. Dixon is the architect; and the contractors are Mr. R. Martin, bricklayer; Mr. Dobinson, joiner; Mr. Wandless, slater; Mr. Johnson, plumber; and Messrs. Davidson & Son, painters.

Liverpool.—The foundation-stone of a new chapel and schools in connexion with the United Methodist Free Church has been laid in Wellington-road, Toxteth-park. The chapel is to be in the Italian style of architecture, and will be built with patent red brick and Stourton stone dressings. It will be 61 ft. long by 41 ft. wide, and 28 ft. high, and will accommodate on ground and gallery floors 650 persons. The exterior elevation in Wellington-road will have a centre gable pierced with a three-light window, under which will be the entrance to the church through two doorways leading into a corridor to the ground floor and gallery stairs. A large school-room will be in the basement, the full size of the church; and the usual accommodation of class-rooms and vestries is to be provided. The contract for the building and boundary walls is 2,770*l.*; but the total cost, including ground, is to be 3,600*l.* The works are being carried out by Mr. Thomas Bridge, of Burroughs, from the plans and under the superintendence of Mr. W. J. Mason, architect.

SCHOOL-BUILDING NEWS.

Liverpool.—New national schools in Toxteth Park have been inaugurated, in connexion with St. Silas's Church. The schools occupy a site near High Park-street, immediately to the south of the churchyard, and of the same depth (152 ft.) from east to west, and with a width of 108 ft. from north to south. This site was purchased for the schools, at a cost of 912*l.*, from the Earl of Sefton, by the Liverpool Church and School Extension Society. The main building has the general form on plan of the letter L, the upper arm of the figure comprising, on two floors, the boys' and girls' schools, with the master's house at the northern extremity, and the lower arm forming the infant school and class-room. The building is very simple, Medieval in character, but making no pretensions to architectural display, any effect it possesses being derived from the arrangement of its parts, and from the grouping and treatment of the window and other openings. The materials consist of ordinary brick, with dressings of red sandstone in moderate quantity, while the timber, showing internally in the roofs, bearers, &c., is pitch pine, slightly stained and varnished. The accommodation is for 729 children, viz., 200 boys, 229 girls, and 300 infants. The boys' school, on the ground floor of the principal or west block of the building, is 67 ft. 6 in. by 20 ft., and 14 ft. 6 in. high. It is entered by a porch at its northern end, from the playground

at the back, and has two class-rooms attached, and a cloak-room and lavatory. It is lighted by windows on both sides, and has a fire-place at each end. The girls' school is in the upper story of the same block as the boys', and also 67 ft. 6 in. by 20 ft.; it is 11 ft. 6 in. high to the wall-plate, and 21 ft. to the ridge of the roof. It has also two class-rooms. The larger class-room can be thrown into the school by opening double folding wooden partitions, felted on their inner sides to deaden sound, the whole forming thus one room of large dimensions. This school is also furnished with a cloak-room, lavatory, and book-closet; it has likewise thorough light and two fireplaces, as the boys'. The staircase entrance is carried up to a third story, forming a bell-turret, oblong on plan, with a slated roof, finishing with ornamental iron cresting partly gilded. A separate stone stair leads from the upper landing of the entrance stair to the girls' playground. The infant school is entered from the north side, with cloak-room and lavatory, as in the other schools. It is 67 ft. by 24 ft., and 15 ft. 10 in. high to the wall-plate, and 24 ft. 6 in. to the apex of the roof. It is lighted by windows on both sides, and has two fireplaces on the south side; connected with it at its east end is a class-room capable of being thrown in with the main room by double wooden felted partitions, as in the girls' school; it has also a book-closet and separate entrance from the playground, which the infants share with the girls. The master's house at the northern extremity of the west block comprises, on the ground floor, parlour, kitchen, scullery, entrance, and staircase; on the first floor, three bedrooms, and two attic-rooms above them. A small boiler-house, opening from the girls' playground, is provided, affording means of supply on occasions of tea-parties, &c., and out-offices and water supply are connected with each school. The roofs of the girls' and infant schools are formed with a double pitch, the upper parts being less steep than the lower. Some of the galleries or graduated platforms are made movable, and capable also of being converted into flat platforms. These schools were the subject of a limited competition among local architects, and the plans worked out from the selected design (by Mr. H. P. Horner) were approved by the Committee of Privy Council on Education without suggestion for alteration. The buildings, general fittings, and furniture were contracted for by Messrs. Reeves & Whitby, of Peel-street, for the sum of 2,990*l.* The gas-fittings were the subject of a separate contract with Messrs. Peet.

Oxford.—A new Infant School for St. Ebbe's parish having been lately built in Paradise-square, mainly through the exertions of the rector, the Rev. E. P. Hathaway, the ceremony of opening the building has been celebrated by a tea party given in the schools. The new building will accommodate 100 infants, according to the Government regulations as to superficial area; while the cubic space in the principal building and class-room is equal to that which the Education Department requires for 150 children. The new school has been joined to the girls' school, large folding doors only separating the two, so that on the occasions of public meetings or tea parties one large room may be made of the whole by throwing open the folding doors. Mr. Basil Champneys, son of the Dean of Lichfield, who was formerly curate in charge of the parish, was the architect; and Mr. Symm, of Oxford, the builder.

Worthing.—A new school-room, 40 ft. by 20 ft., and 12 ft. high, has just been opened in this parish. It was built at the expense of the rector, who has thus anticipated the requirements of the Education Act for some years to come. The parish was in favour of a voluntary rate, and one of 3d. in the pound has been made. The opening of the new school was celebrated by a treat to all the mothers and children to whom the new Act applies.

New Basford.—The inscription-stone of the British schools at New Basford has been laid. The site is on the Nottingham-road, opposite Mr. Ashwell's bleach works. The plans were prepared by Mr. J. Gilbert. The proposed outlay is 1,920*l.* 18s. 1d. The schools when erected will be capable of accommodating 400 boys, girls, and infants, in three different rooms.

Hereford.—The new schools for the parish of All Saints have been opened. The school-house has been erected by Messrs. Welsh & Son, from the designs and under the superintendence of Mr. F. R. Kempton, of this city, architect, the cost, about 1,500*l.*, being defrayed by subscrip-

tions raised in the parish. The foundation-stone was laid by Lady Saye and Sele in July last. With the exception of certain of the school fittings, the work is now completed. The building is divided into six rooms, three (of considerable dimensions both as to height and length) being the schoolrooms proper,—one for boys, a second for girls, the third for infants,—and the remaining three are class-rooms. The accommodation afforded is for 450 children.

Old Woodstock, Oxon.—The new Infant Schools and teachers' residence was opened on the 9th. The buildings are situated in the northern extremity of the village, adjoining Blenheim Park. The walls have been built with random-coursed rubble-work of local stone, with Bath stone dressings, and the roofs have been covered with Staffordshire tiling. The works have been executed by Messrs. George Wyatt & Son, of Oxford, under the architect, Mr. John Birch.

FROM IRELAND.

Drumbeg.—The new church for the parish of Drumbeg has been consecrated by the Bishop of Down and Connor and Dromore. The new edifice, which is situated over the Drum Bridge, in the valley of the Lagan, is of simple architectural detail, such as prevailed in the thirteenth century. The ancient churches of this diocese and part of Ireland possessed a somewhat distinctive style of architecture, the churches built in the simple and convenient form of the letter T transepts being without intervening arches, and the cross intersecting with that of the nave. Beyond the top of the T the building is somewhat prolonged, and terminated with an apse, forming five sides of an octagon figure. This portion of the church opens into the nave with a lofty chancel arch. The nave internally measures 62 ft. by 23 ft. the transept 23 ft. by 19 ft. A little apart from the south-west angle stands the tower of the former church. The spire was built by the late Mr. John Charley, and is now applied as the principal entrance to the church, being connected with it by a short intervening passage; the old door has been removed, and a new porch with a double recessed pointed arch and gable, surmounted by a finial, brings this portion of the structure into harmony with the new church; a ceiling of moulded beams and timber, stained and varnished, serving as a floor for the bell-ringers, has been added. At the east side of the south transept stands the vestry, which has a separate porch, robing-room, &c.; underneath is placed an apparatus by which the whole building is heated with hot water. The chancel internally constitutes the principal feature of the church; it is of the same width as the nave, and some 9 ft. in depth, its area, however, being conveniently prolonged into the nave as a kind of platform surmounted by a stone kerb, which brings the pulpit and desks well out in front of the transepts. The floor is laid with encaustic tiles at the expense of a member of the congregation. Each side of the apse towards the east, south-east, and north-east is finished with a gable filled with a tracery window. Each of these windows has been filled with stained glass, executed by Messrs. Heaton, Butler, & Bayne, of London, the subjects in each being as follows:—North-east, the Sacrifice of Isaac and the Brazen Serpent; east, the Passover and the institution of the Lord's Supper; south-east, the Agony, and the Journey to Emmaus. The southern transept has two long lancet lights, also filled with stained glass by Messrs. Ward & Hughes, the subjects being the Covenant between David and Jonathan and the Death of Jonathan in battle. The western gable, which is the principal feature seen from the road, has in the lower portion an arcade of six lights. In the tympanum of the gable is a long lancet light, surmounted by a cross of Irish character. Internally the roofs are open timbered and stained, and in a combination of carved struts with the beams and string-poets moulded and rounded like columns; the seats are also open and stained. The chancel arch is of two orders, and springs from columns of red-tinted stone with sculptured capitals. The pulpit, which is of stone, is circular, and enriched with sculpture. The Bible-desk and prayer-desk are both of oak, and were executed by Mr. Digges, of Dublin, from Mr. Drew's design. The church has been erected at an expense of about 2,500*l.*, from the design of Mr. Thomas Drew. Messrs. Fitzpatrick, Bros., carried out the work.

* Mr. Crockett wishes it stated that his tender was 44,390*l.*, instead of 43,390*l.*, as printed; and Messrs. Rider say their tender was 44,918*l.*, not 45,918*l.*. The list came to us officially, and was printed correctly.

PROVINCIAL NEWS.

Pontefract.—During the ensuing year considerable improvements are contemplated to be made in Pontefract. Amongst the most important is the erection of a corn exchange, a building very much needed in a town which is the centre of a large agricultural district, and celebrated for its numerous malt-kilns. The street commissioners have under their consideration the formation of new waterworks, as the present works are inadequate for the wants of the town. It has been suggested that a sufficient supply can be obtained from the hill in the park, and with a view of ascertaining whether such is the fact, a committee has been formed to employ a competent person to examine the hill and report on the subject. The next most important is the widening of Finkle-street, the narrowest and busiest thoroughfare in the town, and the principal road to the railway station. After an agitation of several years' duration, the directors of the Lancashire and Yorkshire Railway have agreed to erect a passenger station at the Tansholf end of the town. A new militia depot, which has cost over 7,000*l.*, including the site, is just about completed, in the centre of the town. There are several other improvements of a minor nature which will also be shortly made.

Wigan.—The foundation-stone of a new infirmary has been laid at Wigan. The undertaking was virtually commenced by Mr. John Lancaster, M.P., who offered a subscription of 3,000*l.*, the Wigan Coal and Iron Company gave 3,000*l.* more, the late Earl Crawford promised 2,000*l.*, and his son, Lord Lindsay (the present baron), 1,000*l.*, while the Misses Gidlow contributed 2,000*l.* These, with smaller subscriptions, inclusive of the available funds of the existing Dispensary, make a total of over 28,000*l.*; so the committee have begun to erect the building. The architect is Mr. Worthington, of Manchester; the builder, Mr. J. Wilson, of Wigan; and the work has so far progressed that the corner-stone has been laid by the Earl of Crawford and Dalcarres. The site elected is the crest of the hill on the north side of the town.

Elsecar.—Earl Fitzwilliam has conferred a boon on the thriving village of Elsecar and its neighbourhood by erecting, at his sole expense, a large and commodious covered market-hall, which has been opened. The hall, designed by Mr. Dickie, of Wentworth, is built of stone, with glazed roof, supported by iron pillars.

Leek.—The Alsop Memorial Hospital has recently been opened to the public here. The chief feature is the two large wards, each 27 ft. by 14 ft., which are intended for four beds each; that for the males being on the ground floor, and the females immediately over it on the chamber. A corridor the whole length of the ward separates it on both floors from the men's and women's special wards (for two beds each), the operating-room, and the baths, lavatories, and water-closets; and all this portion of the building is divided by the hall and landing over it from the more domestic department, comprising the kitchen, scullery, pantry, and waiting-room for patients and visitors, and above these the three bedrooms for nurses and assistants, and the linen-closet, &c.; there is also another commodious bedroom and store-room, lighted by dormer lights in the roof. The mortuary is a detached building in the yard, on the north side; and the wash-house and other out-offices are also detached. The hospital is warmed throughout by the hot-air apparatus of Messrs. Haden & Son, of Trowbridge, which is placed in the basement story of the building. Open fireplaces have been retained in each room in addition to the warming apparatus. The building is of red brick, relieved by plain and moulded stone strings, and the jambs, mullions, and heads of the windows are also of stone. The windows have pointed arches in coloured brick and stone, with label mouldings, the spandrels being filled with pierced, traceried stone heads, or dark-coloured tiles. The woodwork in the interior is varnished without staining, the figure being preserved. The walls are coloured in tints of quiet tone; a skirting of porcelain-faced white bricks is built into those of the wards, instead of the ordinary woodwork, as being capable of more thorough cleaning in the necessarily frequent washing of the floors, &c. The fireplaces have mantel-pieces of moulded stone, the jambs of which are filled with pictorial tiles, and the hearths laid with glazed dark-coloured tiles. The architect was Mr. Sugden; and the work has been carried out

by Messrs. Nadin, Hudson, & Philips; the stone carving is by Messrs. Williams, of Manchester.

Malpas.—A committee appointed to get up a memorial to Mr. T. T. Drake, for a plot of land on which to build a new public room, has obtained the signatures of nearly every household in the township; and at a public meeting to further consider the subject, the Rev. Chancellor Thurlow was called upon to preside, and expressed his sympathy with the object, and promised to head the subscription with 50*l.*, and to write to Mr. T. T. Drake, and forward the memorial to him, and do all he could to carry out the desire of the inhabitants of the town. He thought, however, that a coffee-room would be a desirable addition to the building, if the reading-rooms were there and the clubs held their meetings there.

Bradford.—The new offices of the Third Equitable Building Society, New Market-street, are now occupied. The society numbers over 6,000 members, and last year the total receipts were 373,634*l.*, while the advances on mortgage during the same period amounted to 136,340*l.* The buildings in which the new offices are situated stand next the Mechanics' Institute, and form no inconsiderable portion of the range of premises which have been erected between Tyrryl-street and New Market-street. The whole pile covers an area of upwards of 900 square yards, has a frontage of 132 ft. to Market-street, 86 ft. to Tyrryl-street, and is 60 ft. high from street level to top of balustrade. The ground floor is divided into thirteen shops, the cellars under them being arranged so that they can either be let with the shops or separately. The whole of the first floor is intended to be occupied for the purposes of the Third Equitable Building Society, and the second and third floors are to form Mr. Holden's new dining-rooms. Three large staircases are arranged to give access to the different floors, and to communicate with each other. They are approached from the streets by three entrances, two being in Market-street and one in Tyrryl-street. In the centre of the building are two well-lights, lined with white glazed bricks, the reflected light from which makes the back rooms almost as light as those having windows to the streets. The floors are fireproof, being constructed on Messrs. Phillips's patent, with rolled Belgian iron and concrete. The style of architecture is Italian of ornate description. The eight shops of the Market-street front are divided by coupled and banded columns with carved capitals which support a decorated frieze and cornice. In this frieze and over the columns are carved bosses in circular panels, partly encircled with sprays of natural foliage varied in design and cut in flat relief. The lines of the shop columns are continued to the eaves of the building by two heights of pilasters which divide the front into eight bays. The upper series, the height of two stories, are panelled and carved on their faces, and have carved Corinthian capitals and entablatures. All the windows above the shops are deeply recessed, and are divided into two and three lights by detached column mullions, having moulded bases and carved capitals. An eaves cornice and a perforated balustrade, broken at the pillar lines by chimney-stacks, give a finish to the front. The five shops of Tyrryl-street front are divided by stone piers, the moulded and carved angles of which are continued along the shop frieze. Carved and festooned trusses at the top of these piers support the shop cornices and break the line of the frieze. The windows of the stories above the shops are divided by mullions into two and three lights. This front is finished with a block cornice at the eaves. Both fronts are built with cleaned stone from Mr. Neill's quarry, near Windhill. It is of a hard close-grained quality, similar to Cliff Wood Quarry, of which the Town-hall is to be built, but of a warmer tint. The whole of the labour in dressing the stone (except the moulded parts) has been done by machinery. The contractor for masons', joiners', plumbers', and slaters' work was Mr. Archibald Neill; and for the plasterers' work Mr. John Laycock. Messrs. Fielding & Dark, of Leeds, have done the carving of the Market-street front, and Mr. Staka, of Bradford, the Tyrryl-street front. Mr. T. C. Hope, of Bradford, was the architect.

Bath.—The purchase of the property required by the Midland Railway Company for widening the approach to their station from Queen-square, has been completed, and it is anticipated that the work will ere long be taken in hand. The direct route from the station in Seymour-street to the centre of the city will be through Charles-

street, crossing New King-street and Monmouth-street. Thus far the existing thoroughfare will serve, but on reaching Chapel-row the road will cut off a portion of the buildings on the left hand side of the street, while at the upper end it will traverse a portion of the site of the present Queen-square chapel, which, of course, will have to be taken down, the building having been already purchased by the company, and the claims of the incumbent settled. The church, which is to replace St. Mary's Chapel, will be built on what is now a stoneyard occupied by Mr. Reeves, mason, and the site of the old Elephant and Castle.

STAINED GLASS.

St. Andrew's, Sharrow.—A window has just been erected to the memory of the first vestry warden of this church, Mr. William Whitehead, of Sharrow Head. The window contains two subjects in the lower lights, viz., the Offering of the Princes to the Tabernacle, recorded in Numbers vii., which consist of silver and golden chargers and bowls, fine flour, young bullocks, rams, and kids of goats of the first year, and are received by Aaron and Moses at the Tabernacle, before the altar. The richly-wrought veil of scarlet, blue, and purple, with leaves of palm and cherubic adornment, is represented. In the background the wagons are indicated which contained the offerings for the use of the Tabernacle. The second subject represents the offering of the people for the repairs of the Temple during the reign of Josiah, and the priesthood of Hilkiah, recorded 2 Kings xxii., when they were delivered unto the "carpenters, masons, and builders, to buy timber and hew stone to repair the house." In the foreground the Jews are delivering their contributions to the treasurer; in the background a Levite is paying some to a builder; while a mason is engaged on the building, and blocks of stone and scaffolding indicate that repairs are going on. The subjects are set upon an ornamental base, beneath a canopy upon a grisaille ground enriched with lines of colour, and surrounded by coloured borders. In the tracery, Moses, with the Tables of the Law, forms its central feature, and in other parts Masonic signs are represented, indicative of the order to which the deceased belonged. The colouring is designed to convey a soft, warm light. Mr. T. W. Camm, of Smethwick, near Birmingham, was the artist.

Dorington Church.—A stained-glass window has been placed in the chancel of this church in memory of Mr. W. J. Hope Edwards, late captain of the 5th company of Shropshire Rifle Volunteers. The window consists of three openings, the centre one being subscribed for by the officers and men of the 5th company, the subjects chosen being the Crucifixion and the Ascension. The two outside openings were given by the Netley family. The subjects of these are the Nativity, the Baptism, the Agony in the Garden, the Last Supper, Bearing the Cross, and the Resurrection. The style of the window is Early English, the subjects being enclosed in panels, an enriched border running round each light. The design, colouring, and execution of the window were under the personal superintendence of Mr. Reginald Cholmondeley, Condover Hall. The window was supplied by Mr. John Robinson, of Shrewsbury and Dorington, decorator, and executed by Messrs. Done & Davies. Mr. Robinson has just supplied new windows of cathedral tinted glass to Kinnerley Church.

Laughton Church.—The old church of Laughton-en-le-Morthen has lately received a decoration, in the form of a memorial window, to the memory of the late Mr. James Barton, of Laughton, erected by his son, Mr. Edwin Barton. It is a large three-light window in the south side of the chancel, the work of Messrs. Meyer, of Munich. The subject is the Transfiguration. The tracery of the upper part of the window is filled with small figures of angels, &c.

Church of St. Peter in Eastgate and St. Margaret, Lincoln.—Some months ago a painted window to the memory of the Rev. G. Rigby, the late incumbent, was put up in this church. Another window has now been placed there by Mr. Frederick Barton, of this city, in memory of his daughter. It is the central window on the south side, and has two lights, containing four medallions. In the dexter light are represented the call of St. Peter and St. Andrew, and our Lord's Temptation; in the sinister the Sermon on the Mount and the Purification of the Temple.

The subjects selected form part of a series of Scriptural illustrations, which have been chosen for the whole church: each window, as yet unfilled with painted glass, has its subjects already designed, and all are intended to be the work of one firm, Messrs. Ward & Hughes, of Soho, so that a certain completeness and uniformity may be the result.

VIATORUM.

"MILITARY CHESS: the new Strategic Game, representing the Movements of Modern Warfare. By Charles Edward Conder, C.E. Mead & Co., Cheapside." A little book of rules, and a perspective view of the military chess-board, with its forts, river, and bridge; its cuirassiers, hussars, and fusiliers; its Moncrieff guns, heavy guns, and field guns; has been sent to us for a notice which we readily afford to the ingenious invention of an occasional contributor to our own columns. The game has evidently been very carefully considered, and bears the impress of much thought, as well as of mathematical knowledge and of acquaintance with much of the technical detail of modern warfare. It is obvious, from a consideration of the antiquity of the game of chess, that its moves and rules can only bear a very faint resemblance to the military action of the day. The obliquely-moving pieces, which are called (we hope not for this reason) bishops, represent archers, and are so portrayed in some of the Oriental sets of chessmen. The rooks seem to have been originally elephants, the straightforward trample of their enormous bulk bearing down all resistance. The queen, or mayor of the palace, is a perfect anomaly, according to modern notions. In Mr. Conder's game the standard replaces the king of the chess-board: it moves only over two squares at a time, and its capture decides the game. The Moncrieff gun, limited in its movement, has range unlimited on its field. It requires three fires to be concentrated on it to silence it, and it cannot be dismounted. We have heard the game well spoken of by the military men into whose hands it has already fallen, and we have pleasure in directing attention to Military Chess.—The *Academy* says, the study of the interesting class of lapidary inscriptions known as *Ogham* inscriptions, which are found in many localities in the South of Ireland, has latterly received a great impetus through the labours of Dr. Samuel Ferguson, deputy keeper of the Records of Ireland. He has already secured accurate paper moulds of about forty of these inscribed stones, from which metal casts can be taken. The moulds are at present arranged in the Royal Irish Academy, where Dr. Ferguson also intends to deposit a series of casts, which will, in fact, serve as the foundation of an *Ogham* museum, and place the study of this heretofore obscure class of inscriptions for the first time on a sound basis.

Miscellaneous.

Instruction in Science and Art for Women.—Professor Guthrie has resumed his advanced course of lectures on "Heat and Light" at the South Kensington Museum. Having in his previous lecture considered some of the circumstances which influence the direction of rays of light reflected from different metallic surfaces, and the formation of images in concave and convex mirrors, Professor Guthrie now proceeded to establish and illustrate additional facts bearing upon the same subject, but more particularly with reference to transparent surfaces. Professor Guthrie has since delivered another of his advanced course of lectures on "Heat and Light" at the Museum, commencing with some experiments to illustrate the different refractive powers or refractive indices of different kinds of liquids, such as paraffine and water. The lecture mainly related to the organisation of the eye and the relationship of light to that organism.

Asphalte in Pall-mall.—At the St. James's Westminster vestry, a letter has been read from the secretary of the Reform Club, requesting the appointment of an early day for a conference between the representatives of various clubs in Pall-mall and a vestry committee on the subject of the substitution of Val de Travers asphalte for the paved roadway in Pall-mall. The vestry fixed the 25th inst. for the conference, and appointed a committee of seven members.

Fever in the Turvey District, Bedford. A report has been made on the prevalence of fever in the Turvey sub-registration district, by Dr. B. Thorne Thorne. The reporter recommends that,—1, a thorough and effective system of disinfection should be carried out in Stevington, and the filthy accumulations with which the village abounds removed. Preparations should at once be made in Turvey and in Stagden to prevent, by disinfection, and as far as possible by isolation of cases, the spread of the disease into those villages. The necessity for this step is especially urgent in Turvey. 2, means should, with as little delay as possible, be adopted in order to prevent the excrement and refuse nuisances which in Stevington have been aptly termed, in Dr. Prior's report, as "a shame to civilisation," and which to some extent prevail also in Turvey and in Stagden. In acting upon this recommendation the local authorities will, in the absence of the water-closet system, which is hardly likely to be generally adopted, have the choice of (a) the dry-earth system, (b) the midden-stead system. In Stevington the privy accommodation is so scandalous, that nothing short of an entirely new system, from one end of the village to the other, can be considered as an effectual remedy. The abundance of clay, both in the village and in its neighbourhood, supplies the authority with a soil which, for the purposes of the dry-earth system, stands almost first in rank. A new and immediate public water-supply for Stevington is also recommended.

Science Teachers at South Kensington. Regulations have been issued by the Science and Art Department with regard to science teachers who wish to attend the special (six weeks') courses for training in teaching at South Kensington in June, July, and August, in accordance with the circular of September, 1870. These applications are so numerous that it is impossible for the Department to make the selection of teachers to attend, as was originally proposed. The Department has, therefore, decided to make the selection by competition at the next May examinations. The teachers who answer best, probably to the number of about forty-five in each group, will be allowed to come to London for the six weeks' course of training. They will receive their travelling expenses,—namely, second-class railway fare, and 30s. a week while in London. The results of the teachers' examination will not be published, but if a candidate wishes his success recorded, it will be done in the ordinary way. The biology course will commence on the 14th June, and the course on experimental physics on the 5th July.

Contractors' Quantities.—At the last meeting of the Metropolitan Board of Works, Mr. Runtz moved the adoption of a report from the Works and General Purposes Committee, stating, with reference to the question of quantities, &c., in connexion with the contracts for the works of the Board, that the committee do not consider it advisable that the Board should undertake any responsibility in respect of quantities upon which contractors tender for the Board's works, and recommending that the quantities necessary for the Board's estimates be taken out in the engineer's department, whilst contractors be left to accept the quantities of any person they may think proper, as the basis of their tenders. Mr. H. Lowman Taylor seconded the motion, which was agreed to.

Small-pox Hospital in Westminster.—The St. George's, Hanover-square, Union Board of Guardians have just adopted a report of the Petty France Workhouse (York-street) Visiting Committee, setting out that they are about to erect a temporary iron hospital for small-pox cases at St. Ermin's-hill, Broadway, Westminster. The building will be 130 ft. by 20 ft., and accommodate forty patients, giving to each 850 cubic feet, as required by the Poor-law Board. The cost will be 580*l.*, including brick foundations, cistern for water, drains, &c. The building will be ready in twenty-one working days.

A New Musical Instrument.—In Edinburgh, it seems, a new musical instrument is now being exhibited. It is described in the *English Mechanic* as a keyed instrument of six octaves, resembling an harmonium in general form, but very different in mechanism. The sounds are produced by the friction of wooden hammers against a revolving cylinder of wood, set in motion by the feet. The tones produced are said to be very sweet and wonderfully varied. "One can sometimes hardly believe they are not those of a wind instrument."

Fire in a Church Spire.—St. Saviour's Church, at Bamber Bridge, near Preston, at the higher end of the village, got on fire. Sparks were observed to be coming out of the top part of the spire, under which there is a flue, and continued to increase. The beams which cross each other, and are inserted for the purpose of strengthening the stonework, were all in flames. With much difficulty the flames were got under. All the higher beams in the spire were burnt away, and some of the lower ones were damaged. The fire is supposed to have originated through the over-heating of the flue which runs through a portion of the spire. Fears were entertained that the spire would fall, in consequence of the supporting-beams having been burnt out; but, so far, the masonry has kept up all right, and it was shortly to be made secure again.

Proposed Church at Hebburn.—A meeting of several of the influential inhabitants of the parish of Jarro-w-on-Tyee has been held to consider the best means for providing a church for that district. The Chairman said,—"Four years ago the late Colonel Ellison had promised to give a site and to build a church, but owing to his death the scheme was not carried out. He was glad to announce that Mr. Carr, the present owner of the property, had offered to give a site for the church, and to contribute liberally to the building fund. The church was to consist for the present of a nave to accommodate 300, hereafter to be enlarged by the addition of a chancel and transepts, to accommodate 600." Resolutions were passed thanking Mr. Carr for his liberal offer, forming a building committee, and appointing Mr. F. R. Wilson architect.

Restoration in Dover Castle Keep.—When Lord Granville, and subsequently his guest, Mr. Gladstone, paid a visit to this Norman donjon last summer, they were struck with the ruinous and even dangerous appearance presented by the south-eastern vestibule, commonly known as King John's Chapel, within a recess of the stone staircases landing-place. A sufficient sum of money, some 500*l.*, was placed in the hands of the proper authorities, and the work of restoring the tracery and mouldings of the lower and upper chambers was entrusted to the Royal Engineers stationed there, who have made rapid progress towards completing the plans of their commanding officers.

Novelty in Pumping.—There has been recently introduced at Halbeath Colliery, Fifeshire, Scotland, an improved system of driving pumping machinery for mines, which is likely, says the *Scottishman*, to attract attention, as it has proved very successful. The object is to provide efficiently for the great variation of strain in heavy pumping by bell cranks. This is attained by applying the patent Corliss system of steam engine, made by Mr. Douglas, of Dannikier Foundry. The specialty is that this engine supplies itself at every movement with the exact amount of steam required to overcome the resistance at the time, and casts off the supply of steam whenever the load or strain is surmounted, thus ensuring the greatest steadiness of movement and the most economical use of steam and fuel.

Society for the Encouragement of the Fine Arts.—The thirteenth session of this society has been inaugurated by a *conversazione* at the Suffolk-street Gallery, Pall-mall, which was lent for the occasion by the council of the Society of British artists. The *conversazione* was very numerously attended. In the course of the evening Dr. Heinemann, professor and lecturer at the Crystal Palace, delivered an address on the principles and objects of the society, and a programme of vocal and instrumental music was gone through, under the guidance of Mr. Alfred Gilbert, the hon. musical director of the society.

Soane Museum Trustees.—In consequence of the decease of the late Mr. Philip Hardwick, R.A., and the resignation of Sir Frederick Pollock, trustees of the Soane Museum, the remaining trustees have filled up the first vacancy by electing Professor Donaldson; and Mr. Frederick Cuvry, Honorary Solicitor of the Institute, succeeds to Sir Frederick Pollock.

Trade in Gloucester.—The contract for the construction of the new entrance and docks near Sharpness Point, the mouth of the Gloucester and Berkeley Canal, has been let to Mr. George Wythes, of Bickley Park, Kent.

The Influence of Heat and Cold on human Life.—In his annual report on the public health, for the *Birmingham Gazette*, Mr. James L. Plant, F.M.S., says:—"The year ended with a high death-rate, following the severe weather which prevailed in the last week of December, 1869. The mortality declined in the mild temperature in January, but was again when the cold weather succeeded at the end of that month. February entered with high temperature, which had the effect of reducing the death-rate of the ten large towns from 9 to 27.7 for the week ending February 12. But the severe frost in the second week of that month brought up the death-rate to 29.9 for the week ending February 26. This large and sudden increase was mostly in consequence of the fatality of the diseases of the respiratory organs. From this period to the second week in June, the public health slowly but gradually improved. The death-rate for the week ending the 11th was only 19.7. The superior summer temperature which prevailed in June, July, and August, brought on much fatal diarrhoea, and raised the death-rate of the ten towns to 32.5 for the week ending August 13th. The decline in temperature reduced the mortality from diarrhoea, and the death-rate went down to 23.1 for the week ending October 13th. The recurrence of the cold in the present winter, as he hints out, is again raising the death-rate.—The annual death-rate of the ten large towns for the week ending December 31st was no less than 32 per 1,000, which is an increase of 6.5 per 1,000 on the previous week. No one can wonder at this, seeing the intense cold which prevailed. The mean temperature of the eleven days ending January 1st was 22.5, being 1.5 degrees below the average, and the lowest ever known or registered for twelve consecutive years. Such terrible cold in this climate is incompatible with human endurance. The sufferings of the poor must be dreadful at this time. To alleviate the calamity by prompt measures of relief to the poor during this most inclement season will tax all the efforts of the authorities in every town throughout the kingdom."

The Thames Embankment.—A body of brickwork last week commenced the removal of the iron palings and brick wall at the bottom of Norfolk-street, in order to open that thoroughfare from the Strand to the Thames Embankment. Norfolk-street, the widest street on the north side of the Strand, has hitherto been *enclaustrée*, but will now be the main thoroughfare from the Strand to the Embankment. Arundel-street on the east and Surrey-street on the west being very narrow and incapable of receiving much traffic. From the ample gardens to Somerset-house there is a semicircular loop road, and this will be reached on Norfolk-street by means of arches, which will become necessary in consequence of the inequality of the ground. The thoroughfare thus opened will be directly opposite to the Temple station of the Metropolitan District Railway, to which it will form the main approach. There is a Bill before Parliament for the construction of a new street from the Temple Station to New Norfolk-street, and in the event of this being carried, a very large portion of Norfolk-street, Surrey-street, and Howard-street—all on the duke of Norfolk's estate—will be pulled down. This was the site which was proposed by the Chancellor of the Exchequer (Mr. Lowe) for the new Law Courts.

The late Mr. Brassey.—A correspondent writes:—"Perhaps the following anecdote of the late gentleman may be of interest. I have it from a gentleman who was one of Mr. Brassey's agents on the Romen and Havre Railway.—My land well remembers the fall of the Barentin caduet, which was owing, he thinks, not to any faults of design, but partly to the treacherous nature of the river bed, and partly to the force of the stream, swollen, as it was, by recent rains. In the midst of the confusion and despair which followed the downfall of the arches, mingled also with the rejoicings of the French engineers and contractors, who were exceedingly proud of the English, Mr. Brassey appeared on the scene. Without blaming or censuring any of his subordinates, he set them to work again on the foundations of the various piers, and offered 200*l.* to the man who should be the first to raise a good foundation above the level of the water. The line was afterwards opened within the time named in the agreement. With the French Government, failing which the most serious consequences would have followed.

Metropolitan Board of Works.—An approximate balance-sheet of the general accounts to the 1st of January, 1871, which has been presented to the Board, shows liabilities to the amount of 24,087*l.* 9*s.* 3*d.*, and assets 120,242*l.* 1*s.* 3*d.*, showing a balance of 96,154*l.* 12*s.*, made-up working expenses, reserve 60,000*l.*, and surplus, including 25,000*l.* from the Metropolitan Sewage and Essex Reclamation Company, 36,154*l.* 12*s.* In addition to this account, there is a sum receivable from the main drainage account, in respect of works at Abbey Mills pumping-station, probably 13,000*l.* An estimate of the sums required to be raised from parishes, districts, &c., for 1871 was presented, and the consideration of the subject was adjourned. The document showed a total charge for 1870 of 399,306*l.* 14*s.* 4*d.*, equivalent to a rate of 5*d.* 12*d.* in the pound on the total rental of the metropolis (18,719,237*l.*) for the year; and the total estimated charge for 1871 is 260,862*l.* 6*s.* 8*d.*, equal to a rate of 3*d.* 3*d.* in the pound on the present rental of 18,683,268*l.* The estimates for the present year are in nearly every respect lower than those of the past year. The general account for 1871 is estimated at 53,432*l.*, as against 55,105*l.* in 1870; the main drainage, 107,838*l.*, against 233,990*l.*; and the total expenses of the Board, 68,911*l.*, against 87,637*l.* in 1870.

Boiler Explosions.—At a conference on the subject of boiler explosions which has just been held in Manchester, resolutions were passed declaring that competent periodical inspections should be enforced by law. It was held, however, that the administration of the system should not be entrusted to Government officers, but to district boards, "constituted partly of gentlemen elected by the steam-users themselves, and partly of *ex-officio* members, to be chosen on behalf of the public, the boards having the power of making such laws, rules, and regulations, from time to time, as might be found necessary for the conduct of the service."

Royal Albert Hall.—A meeting of the Executive Committee of the Royal Albert Hall has been held at the Hall, to settle the preliminaries for the opening by the Queen on the 29th of March. Present—the Right Hon. H. A. Bruce in the chair, Sir Thomas Biddolph, Mr. Bowring, Mr. Cole, Mr. Thring, and Lieutenant-colonel Scott, secretary. It was resolved to give the proprietors of seats and season-ticket holders for the London International Exhibition special privileges in obtaining tickets of admission. Advertisements have since been issued.

The Tower Subway.—This subway is now to be used for foot traffic, without any machinery. Mr. Barlow, jun., the engineer to the company, states that this was one of the plans originally held in view as an alternative, although the first experiment was made with machinery. The foot traffic, it is believed, will be more beneficial to the public and more profitable to the company. On the 24th December the opening for foot traffic took place; and it has increased from 10,900 passengers in the first week to 20,000 for the last week preceding the 18th of January.

Sanitary State of Bridport.—In consequence of a series of delays connected with divers schemes for the sanitary improvement of Bridport, Mr. Arnold Taylor, on the part of the Government authorities at Whitehall, has written to the local Board of Health on the subject, and the Board has in consequence resolved, *nem. con.*, "That the council pledge themselves, as the sewage and local authority of the borough, to forthwith carry out a thorough and comprehensive system of main sewage and sewage outfall and disposal."

Microscopic Photography further Utilised.—A correspondent in Paris, writing on the 11th, says that a pigeon had just reached the city bringing despatches for the Government, which, when printed, filled three or four columns of a newspaper, besides 15,000 private despatches. All this news had been reduced to such microscopic size that it was conveyed in a small quill delicately attached to the bird's feathers!

The Builders' Benevolent Institution.—The annual ball of the Builders' Benevolent Institution will take place at Willis's Rooms, King-street, St. James's, on Thursday, the 2nd of February. It is to be hoped the charity will, as usual, be well supported by the trade and those interested in it.

Influence of Woods on Climate.—At the last meeting of the Scottish Meteorological Society, a letter was read from Sir Patrick Grant, G.C.B., Governor of Malta, intimating that in consequence of a paper published in the Society's *Journal* for April last, he had recommended a grant of 1,000*l.* a-year for ten years, to be appropriated to forming plantations of wood in Malta. The object of the paper in question was to show that plantations would increase the water supply of the island and ameliorate its climate.

The Ipswich Surveyorship.—Mr. W. P. Ribbans, the town surveyor of Ipswich, has died suddenly of apoplexy. The local board have passed a formal vote, expressive of their esteem and regret. They have also resolved to separate the offices of surveyor and inspector of nuisances for the future, and to appoint a surveyor not more than forty-five years of age. The salaries have also been under consideration.

Proposed Cottage Hospital.—A public meeting has been held to consider the propriety of establishing a Cottage Hospital for Swindon and its neighbourhood. Mr. A. L. Goddard presided. It was unanimously resolved,—"That it is advisable to establish a Cottage Hospital for Swindon and its neighbourhood," and a committee was formed to get all necessary information upon the subject.

Conciliation and Arbitration between Employers and Employed.—On Monday, the 30th inst., at eight o'clock, a paper will be read at a meeting of the Social Science Association, Adam-street, Adelphi, by Mr. Rupert Kettle, "On Boards of Conciliation and Arbitration between employers and employed, and what is required to give them further success."

Royal Architectural Museum.—A meeting of the council was held at the Museum, on the 23rd inst., when the report of the sub-committee on the financial position of the museum was considered, and a conference took place with members of the Architectural Association, to determine respecting the Architectural Exhibition proposed to be held in the Museum Building.

TENDERS.

For road and drainage works, at Gipsy-hill, for the United Land Company (Limited). Mr. John Ashdown, architect. Quantities supplied by Mr. J. S. Lee:—
Pearson £4,399 0 0
Wignore 3,999 10 0
Pizzey 3,680 0 0
Dickinson & Oliver 3,650 0 0
Haynes 3,228 0 0
May 3,000 0 0
Vickers & Crane (accepted) 2,900 0 0

For the erection of villa residence, at Camden-park, Kent, for Mr. G. H. Chubb. Messrs. John Tarring & Son, architects:—
Keyes & Head £1,410 0 9
Smythson 1,352 0 0
Snowdon 1,345 0 0
Colls & Son 1,294 0 0
Shepherd 1,290 0 0

For alterations and additions to Wykhamp Park House, Banbury, for Mr. Wm. Newburn. Messrs. John Tarring & Son, architects:—
Kumberley £1,489 15 0

For kitchen, offices, and fittings, at St. Luke's Workhouse, for the Guardians of the Poor of the Huddersfield Union. Mr. H. Saxon Snell, architect:—
Latley, Brothers £2,773 0 0
Bamford 2,650 0 0
Wright, Brothers, & Goodchild 2,415 0 0
Gibson, Brothers 2,397 0 0
Woodward 2,310 0 0
Wicks, Bangs, & Co. 2,253 0 0
Perry, Brothers 2,217 0 0
Howard 2,159 0 0
Manley & Rogers 2,137 0 0
Sabey 2,150 0 0
Rived 2,142 0 0
Sheffield 2,130 0 0
Crabbe & Vaughan 1,943 0 0

For erection of village hospital, at Sudbury, for Miss Copland. Messrs. E. Habershon & Brock, architects:—
Kiddell £495 0 0
Haynes 640 0 0

For road-making, at Gipsy-hill, for Lambeth Vestry:—
Fullett £424 0 0
Clark 410 0 0
Pearson 355 0 0
Green 330 0 0
Riley 277 10 0

For erection of house on the East Cliff, Bournemouth, for Mr. Charles H. Gatty. Messrs. E. Habershon & Brock, architects:—
Golton (accepted) £3,571 17 0

enclosing copies of testimonials, addressed to Mr. H. MIDDLETON, of
Hanwell Middlesex, W.

The Builder.

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Civil Engineering College for India.

AN apt illustration of our recent article on the "Education of the Civil Engineer in this Country," appeared a proposal for the establishment, or rather the modification, of a College for the education of Civil Engineers for the Service of the Indian Government, under the auspices of the India Office. It is perhaps but little known that for the last twelve years a college has been established at Cooper's Hill, Surrey, for this purpose. Admission has been gained by a competitive examination on technical subjects; the object of the course being to recruit the college from students already possessed of the

rudiments of mechanical knowledge. Notwithstanding the considerable inducements offered by the Indian Public Works Department to attract competent men to its service, this college has hitherto proved a failure. We cannot but think that this must, to some extent, be owing to the want of due publicity. Few persons, we are assured, can have been aware of the existence of an institution which opened a definite means of admission into a service that gave occupation, in the year 1869, to 896 officers, of whom 533 were civilians; and in which the salaries rise from 300*l.* per annum for third grade assistant engineers, to 3,000*l.* per annum for chief engineers of the first class. The head of the department is the Public Works Secretary of India, whose salary is 4,200*l.* per annum. The expenditure which it is estimated that this department will have to superintend in the year 1870-71 amounts to nearly 7½ millions sterling. Of this 1,230,000*l.* are devoted to State railways; 1,300,000*l.* to roads and miscellaneous public works; 2,400,000*l.* to irrigation works; and 700,000*l.* to civil buildings. Yet not only has there been no competition for the appointments to the college, but the number of students who have succeeded in passing a very low qualifying examination has been below the number of vacancies. In 1869, out of forty appointments offered for competition, no less than twenty-seven lapsed!

The conclusion being thus arrived at "that the present state of scientific education in the country does not afford the needful means of supplying direct to the Indian Government a sufficient number of qualified persons who are able to undergo an educational test of reasonable strictness," a new system has been decided upon. Admission is to be obtained by competitive examination, to which all British-born subjects, between seventeen and twenty-one years of age, who can produce satisfactory testimonials of good moral character, are eligible. The course will extend over three years, subject to diminution on proof of competent knowledge in the requisite subjects being already possessed. And

all the students who pass satisfactorily through the course will be appointed to the Indian Public Works Department as assistant engineers, second grade, with a salary of 420*l.* per annum, and provided with a free passage to India.

The full publication of these advantageous terms, conjoined with the belief that the management of the Public Works Department is to be improved, ought to produce abundance of competitors for the fifty scholarships. The payment to be made for each student is 150*l.* per annum, in instalments of 50*l.* for each of the three terms into which the year is divided. We conclude that the entire expense of the student, including his clothes, or at least a college uniform, will be defrayed by the college, in consideration of this payment; but this is not stated. It is intended that at least two out of the three terms shall be passed by the student under a civil or mechanical engineer, whose fees will be defrayed by the college. The pupil will receive an allowance of five shillings a day for lodging money and provisions, while thus absent from the college.

The subjects assigned for the entrance examination are mathematics, pure and mixed, natural and experimental science, and classics, each of which branches takes 2,000 marks; English composition, history, and literature, 1,000 marks; French and German, 750 marks each; mechanical and free-hand drawing, 500 marks each. For more minute details we refer to the prospectus issued by the India Office.

The appearance of the prospectus of the new college renders it important to take a comprehensive glance at the various establishments actually existing in this country in which it is proposed to give special education to young men destined for the profession of engineer, whether civil, mechanical, or marine. We have from time to time given accounts of what is doing in our Art and Science Schools. The organisation of industrial education, as a whole, is a subject which has never even been seriously contemplated in this country. In all that has hitherto been attempted in connexion with the establishment at South Kensington, applied art has been regarded as the ultimate object. Pure art, cultivated for its noblest aims, is beyond the scope of the Committee of Council on Education. Leaving out of question, then, this highest desideratum in the plan of any truly national culture, it is yet possible to design a general educational course, of which the teaching now given by the schools of art and science shall form a part, but which shall comprise the industrial training of the members of the principal handicrafts. The smith, for instance, to the practice of the forge and of the anvil, should add the knowledge of the elements of mechanics, of metallurgy, of chemistry, and of the principles of design, before he is in a condition rightly to avail himself of instruction as to ornamental hammer-work. In our recent exhibitions of modern smith-work the absence of some such guidance is painfully evident.

The distinct branches of our various skilled industries group around, and culminate in, the functions of the engineer, civil and mechanical. Metal work, from the forging of a nail or the shoeing of a horse, to the tempering of a watch-spring or the hammer work of a steel coffer or cabinet; woodwork, from the mitring of a frame to the carving of an altar-screen; stonework, from the quarry to the studio; textile work, from the spinning-wheel to the ribbon-loom; ceramic work, from the tile to the statuette,—all involve the practice of certain great constructive laws, which form the basis of the science and practice of the engineer. In the provision, then, which is made for the thorough education of this central workman we may find a measure of the probable outcome of our industrial skill in coming years.

As compared with the Continent, the provision

for this normal industrial training may almost be said to be nil. The Royal School of Mines, and the Royal School of Naval Architecture and Marine Engineering, at South Kensington, are the only English institutions distinctly designed for giving special education of this nature, apart from one military establishment.

In the former of these there were, during the session 1868-9, 17 students entering for one, two, or three years, with a view to become associates, and 93 occasional students entering for special subjects. In the Naval School there were in all 40 students. Such is the lamentable state of our special schools.

In the minor universities there has been an attempt to establish chairs, or faculties, of civil engineering. No provision appears to have been made for associating these lectureships with the Institution of Civil Engineers, or for obtaining the support and aid of the leaders of the profession. Each of the classes thus formed appears to be abandoned to the private guidance of the professor; and the various inaugural lectures and signed reports of some of those gentlemen display strange instances of aberration and crochets. One professor distinguishes himself by the advice "avoid Euclid as pestiferous," while, on the other hand, he "does not attach much importance" to the workshop as a means of education. Reliance on the most unpractical of all teaching, namely, lectures, is the characteristic of these classes. The Department of Applied Sciences at King's College, is intended for manufacturers as well as for engineers, and only desires to "form an appropriate introduction" to practical instruction. The Department of Civil and Mechanical Engineering at University College, London, is intended as an introduction to a regular pupillage. At the University of Edinburgh a course of a year less than in the two London colleges is supposed to qualify the attendant for a degree of Bachelor or Licentiate of Engineering, as to the conferring of which legal difficulties exist. In Glasgow University a "certificate of proficiency in engineering science" is granted at the close of two sessions. It is recommended that "if possible, the elementary parts of mathematics should form part of the preliminary education" of the student who is to attain, in so short a time, a certificated proficiency. The Royal College of Science, Dublin, affords a more serious course of three years' study, the third being specialised under the branches of mining, agriculture, engineering, and manufactures. Twenty-eight students only have availed themselves of this college in the past year. The education may be ranked with that given by the School of Mines and the School of Naval Architecture, before referred to, and the weakest part of the case is the small number of students. The three years' course of civil engineering in Queen's College, Cork, is also intended to be completed before the student enters an office. There is a three years' course of civil and mechanical engineering at Owen's College, Manchester, which is also intended as preliminary to articles of pupillage. Trinity College, Dublin professes, in a three years' course, to "furnish all the information, practical as well as theoretical," necessary to fit for practice.

It is evident that, whatever be the professed character of the two or three years' course which, in King's College, University College, Glasgow University, Queen's College, Cork, and Owen's College, Manchester, is intended to prepare for pupillage, and which, in Edinburgh and in Trinity College, is thought sufficient to render unnecessary any practical grounding in the profession, none of these establishments can be considered as ranking so high as the *École Polytechnique* in France, or the corresponding institutions in other parts of Europe. Moreover, while the *École Polytechnique* demands for its entrance a

rate of proficiency probably high enough to obtain the "diploma" of any of these newly established departments, the three years' course of that excellent establishment is only preparatory to a further term of three years spent in one of the more advanced and special schools of engineering, of which we have no counterparts in this country.

We fear that the attention at present given to our various industrial, scientific, and artistic schools will avail but little to place the English workman on the level now generally attained by his Continental rival, in the absence of any serious attempt to provide for a really superior course of education in industry, art, and science.

Apropos of the state of our technical and professional education, two illustrations have been brought before us, in consequence of our recent remarks on this important subject. One of these was an incident arising from that grievous national calamity, the loss of the *Captain*, a subject which has brought into evidence, in so striking a degree, the unacquaintance of our public writers with the simplest elements of mechanics. That this defect is not peculiar to members of the literary profession may be learned from this astounding fact, one so discreditable that we are only induced to give it publicity from the high official authority on which we received it. A civil engineer of eminence,—of course, names are better avoided,—wrote to a Government department on the subject of the disaster. He remarked that a good deal had been said as to the centre of gravity of the *Captain*, but that the fact was that NO HOLLOW BODIES COULD HAVE ANY CENTRE OF GRAVITY!

The second anecdote we give on the authority of a man well known to all familiar with engineering matters. Under the advice of this gentleman, a young man went to one of the colleges which we have above mentioned, and passed creditably through the three years' course. He then, under the same advice, was articled to a marine engineer, and served a five years' apprenticeship, during which he did his best to carry on his college education. At the expiration of his articles, still following the advice of our informant, he went to Zurich, with the intention of passing through the superior course of technical education there to be obtained. On making proper inquiries after his arrival, he found, as he wrote to inform our friend, that if he did his best for eight months with a private tutor, he thought that he should be able to get through the pass-examination into the college! Here we have, first, college course, and then practical study, leading short of the threshold of the Swiss college, and yet we find an Edinburgh professor proposing to turn out the article ready-made in three years by means of university lectures!

It seems to us that, especially considering that the acquisition of the Hindostanee language is to form an obligatory part of the college course, the term of three years proposed for the India College is inadequate to meet the requirements of the case. Nor do we think that the breaking up of the year into three terms is advisable. Considering the slackness which invariably characterises the beginning of a term, and the time consumed by examination at the close, we think that half-yearly terms are by far the most advantageous. The examination at the close of each term should be a real test of the pupil's ability and industry. The marks thus earned should be carried to his permanent credit, so that his final position should represent the merit and conduct of his entire collegiate life, and not depend, as at Oxford and Cambridge, on cram and a spurt at the last. The combination of a practical acquaintance with the duties of the office, the field, and the workshop, with an adequate college course, will be attended with the utmost benefit to the student. Here, indeed, as in the course itself, the time allowed is too short. It must be remembered that far more will be thrown on the civil engineer in India than is the case in this country, and that it is of far more importance that he should be fully prepared to discharge the important functions to which he may there be called than in circumstances where, in case of need, he may readily have recourse to adequate aid. A five years' course, including a year and a half of actual practice, seems to us the minimum which is worth the name of collegiate tuition. In this case, the last three terms, or the year and a half after returning to the college, might very advantageously be specialised. Mechanical construction, architectural construction, marine construction, forestry, mining, and metallurgy, are so many separate

branches of the duty of the engineer. To attain full and equal proficiency in each would require a longer time than we have indicated, unless the scale of attainment at entering the college were something much higher than we can at present hope to be the case. It would, therefore, be far better for the public service if the division of the engineering staff under these several heads were made early enough to allow of a special prosecution of the selected branch of study.

On one point, it is hardly necessary to add, the success or failure of the India College, will mainly depend. We mean the selection of the tutors. We shall not be accused of any want of professional *esprit de corps* when we say, do not let the tutors be merely engineers. Let them be men specially educated for tuition,—men like the examiners for Woolwich, and not engineers without practice, who therefore call themselves professors. The glance which we have given at existing institutions should be conclusive on this point. Those of our readers who are most familiar with the subject will remember, without more distinct citation on our part, reports and incidents of more than one recent Government Commission which tell the same tale. Important investigations, which ought to have borne valuable practical fruit, have come to a most ignominious close from the incapacity of what should have been the informing element of the entire machinery. Railway management in England and in Ireland, irrigation, sewage, river maintenance,—all these are subjects as to which there has been, within the last few years, more or less effort to settle the main principles; attempts as yet resulting in nothing worthy of the actual science of the day. That such will continue to be the case so long as political schemes have precedence given to them over scientific questions we fear we must expect. It is the more requisite that incompetent men should not be allowed to come to the fore as the representatives of a profession on the exercise of which, in its military and civil branches, the safety, wealth, and prosperity of the country so intimately depend.

We speak at once with the more earnestness and the more confidence from the fact that we suppose that we are regarding, not a private speculation, but a *bona fide* administrative effort to supply a great national want. Under this view of the case it is more than probable that the arrangements now proposed are the best for the moment, and that they may be regarded to a considerable extent as temporary. Thus, according to the prospectus, the fifty highest competitors in 1871 are assured of studentships, however low may be the positive qualification of the competitors. If hundreds of engineers are now urgently required, this may be all very well. Better fifty partially educated men for 1874 than none. But this must be, as soon as possible, amended. In the same way the length of the course and the specialisation of the pupils in the later terms, as above suggested, may be matter for subsequent amendment. The question of the choice of tutors is vital. We trust that, in any arrangement, the special qualifications of which the Royal Engineers have at present (most unfortunately) almost a monopoly, will not be lost sight of; and that some highly-educated member or members of this distinguished corps will be associated with the direction of the course of study. As to the practical part, we suggest that the Council of the Institution of Civil Engineers should be brought into official correspondence with the College; and that it will not be the men who offer the most tempting terms for the allocation of a pupil, but the most eminent and the busiest engineers, engineers, builders, and naval architects, into whose establishments the India College will obtain admission for their students. With these essential conditions fulfilled, we shall realise from this college an important benefit for our great Indian empire. We shall offer a distinct career to talent, industry, and merit, and we shall do for our Eastern dominions that which we ought to take shame and confusion to ourselves for not having hitherto even seriously attempted for our insular home, provided an adequate school for the civil engineers; and associated with the attainment of a proper education, and the formation of a reliable character, the certain entrance on professional duty.

We have seen with regret that some professors of two or three institutions, which include in their programme a course of introduction, in the lecture-room, to the practical instruction of the engineer, have not thought it derogatory

to their position to protest before the Government against the establishment of a thorough system of engineering education. Of the animus and good taste of such a proceeding the public will form their own opinion. We had hoped that we had survived the time when any persons should claim a vested right in maintaining the ignorance of others. For the conductors of an educational course, which bears about the same relation to the training which we ought to give, and which other countries do give, to the civil engineer, that a dame school bears to Eton or Rugby, to object to an effort to fill up a great gap in our public institutions, is not a matter which will much concern the Indian Government. What does concern them is that the education which they offer shall be so sound, extensive, and thorough, and that the inducements which they offer to the best men to devote themselves to the hardships of an Indian exile shall be so unmistakable, that in our Indian College, as at Woolwich, we may be able to submit without shame to a fair comparison with the great Continental schools.

RAILWAY DEVELOPMENT.—BOARD OF TRADE RETURNS.

The railway returns compiled in the statistical department of the Board of Trade, and published annually, were formerly moved for in the House of Commons, and a form was prescribed in which the particulars, in regard to traffic especially, were to be set forth. The formality of moving for the returns is no longer necessary, their compilation and production being now an ordinary official duty on the part of the railway department of the Board of Trade. For several years past there have been great complaints, not without cause, on account of the delay that has occurred in the publication of the returns, which frequently appeared so long after date as to be comparatively worthless. The returns for the year 1868, for instance, did not appear till the third quarter of 1870. The returns for 1869, now published, make way for those of 1870, which may be expected to appear in a few months. The returns, as now published, are altered in order, and modified in various particulars. The section relating to accidents is omitted, full particulars concerning these being given in another return and reports of the Board. The new form embraces, 1. Share and loan capital of each railway in the United Kingdom; 2. Traffic in passengers, goods, minerals, &c.; and 3. Return of working expenditure, rolling stock, &c. Live stock should not have been dropped, we think, from the traffic returns.

It may reasonably be expected that, with the statutory powers now available by the Board of Trade for the collection of the statistics of railways, particularly as regards share and loan capital, the next returns will be much more complete than those now issued. The blank schedules issued to the companies are suggestive, almost exhaustive; but the thought and care bestowed in the divisions of the schedule, and in the sub-divisions and headings are thrown away if the columns are to be published blank in the returns. The columns should be altered or reduced in number as occasion may require, so as to embrace the information that the companies are now under legal obligation to supply. A reliable return, complete as far as its range goes, would then be secured. The particulars hitherto asked for from the companies by the Board of Trade have been,—Authorised capital—by shares, loans, total. Stock and share capital received—ordinary, average rate per cent. of dividend, guaranteed, guaranteed rate of dividend, rate of dividend paid, preferential, preferential rate of dividend, rate of dividend paid, total stock and share capital received. Capital raised by loan and debenture stock—loans, rate of interest, debenture stock, rate of interest, total raised by loans and by debenture stock. Total stock and share capital received and capital raised by loans and debenture stock; and, subscriptions to other companies. A less diffuse form would probably be more satisfactory, and would avoid the wilderness of blank spaces now presented by the pages of the return.

The first part of the return enumerates 413 railway companies in England and Wales, including 93 which have leased their lines, 65 that have not sent any information or accounts, 5 whose powers have expired, and 4 that have applied to abandon. Forty-six Scottish companies are enumerated, including 27 whose lines

are leased, and 1 that has sent "no information." Ireland has 76 companies, including 19 whose lines are leased, 9 that have sent no information or accounts, and 8 that have applied to abandon. An enumeration of the 78 companies that have sent no information or accounts, of the 5 whose powers have expired, and of the 7 that have applied to abandon, would not be worth the space it would occupy. Of the 90 companies against whose names the columns are blank, there is only one belonging to Scotland, whose black sheep is the Caithness Company, which can have no information to give, as to traffic or working expenditure, not having broken ground, but must have a capital account, inasmuch as it is incorporated, and is applying, we notice, for another Bill this session.

The following is an abstract of the returns of capital at December 31st, 1869:—

	Capital Total.	Stock and Share Capital Received.	Capital raised by Loans and Debentures.	Total.	Subscriptions to other Companies.
England and Wales	£604,553,394	£317,212,652	£113,660,266	£1,035,426,312	£12,323,116
Scotland	17,886,041	44,889,072	16,442,781	81,218,900	1,714,092
Ireland	82,828,218	20,444,129	6,230,914	109,503,261	268,078
	£699,267,653	£382,545,753	£136,333,968	£1,218,147,384	£14,305,284

It is natural that any one interested in this return should revert, for purposes of comparison, to the returns of the preceding year. In doing so he will make a startling discovery that will induce further scrutiny and bring him to the conclusion that the official document from which the above figures are quoted contains so many errors and omissions as to render it almost entirely valueless. It matters little that care should be bestowed upon the divisions and subdivisions of the return if those whose business it is are incapable or indifferent as to the proper manipulation of the figures supplied to them. The return exhibits the extraordinary statement, —it does not disclose the fact,—that the authorised capital of the railways of the United Kingdom was more by 6,177,965*l.* at the end of 1868 than it was at the end of 1869! The returns show also that on Irish railways there was a decrease for 1869, as compared with 1868, of 263,960*l.* in the paid-up capital; of 469,934*l.* in stock, share, and loan capital subscribed; and of 126,724*l.* in subscriptions to other companies! An increase in the miles open is shown as concerning England and Wales, but Scotland curiously shows 42 miles less for 1869 than for 1868, and yet we have heard of no mountain floods or earthquakes that have swept away or buried any of the Scottish railways. But these errors of omission are bagatelles compared to those made in relation to goods traffic. The returns published three months since gave the goods and minerals carried by the railways of the United Kingdom as 126,621,006 tons; the returns now published give the quantity as 27,571,109 tons; a falling-off, if the figures had any value, of no less than 99,049,897 tons! It is shown, however, that for carrying about a fifth of the quantity the companies received 638,767*l.* more money! These returns would be interesting in themselves, if they could be relied upon, but much more so if given in comparison with former periods. The passenger traffic and miles run by trains appear to be stated with at least approximate accuracy, and a few comparative statements may be given in connexion with these.

Going back for two decades, we find the following to be among the facts:—In 1849 there were 6,032 miles open; passengers conveyed, exclusive of season-ticket holders, 68,841,539; in 1859 there were 10,002 miles open, and 149,757,294 passengers conveyed; in 1869 there were 15,145 miles open, and 305,668,071 passengers conveyed. The receipts for passenger traffic in the three years respectively were 6,277,892*l.*, 12,537,493*l.*, and 18,811,504*l.*; that is, the passengers carried have been more than quadrupled, and the receipts more than trebled, in the twenty years. The receipts from goods traffic at the same periods have been 5,528,606*l.* in 1849, 13,206,009*l.* in 1859, and 22,263,817*l.* in 1869. Receipts from all sources at the three periods respectively, 11,806,493*l.*, 25,743,502*l.*, and 42,695,927*l.*

Reverting, for comparative purposes, to a more recent year than 1859, say to 1862, we find the following to be the facts:—

Passenger Traffic, United Kingdom:—				
1st Class.	2nd Class.	3rd Class.	Total.	
1862	23,106,351	61,886,239	105,454,181	190,424,071
1869	26,916,307	65,655,089	176,000,245	268,574,240
Not classified				305,583,791

305,583,791

The proportions of first, second, and third class passengers, in England and Wales, and in Ireland, are in the proportions, speaking roughly, of one, two, and three, in the three classes. In Scotland the second-class passengers, instead of being more than double the number of the first class, as in England, or nearly double as in Ireland, are absolutely lowest in number of the three classes, the figures being, first-class 2,372,705, second-class 2,403,764, and third-class 18,187,303.

The receipts from season ticketholders constitute an important item in the passenger traffic. In 1862 the number of season and periodical tickets was put down at 13,359; in 1869, at 95,214. This return, however, is manifestly seriously defective, inasmuch as the numbers of season tickets issued by six or eight companies in England and Wales are not given, including

three companies that do very large season-ticket traffics. It is under the mark to add at least 20,000 to the season and periodical tickets, as will be seen presently, when some of the omissions are stated. Assuming that 20,000 should be added to the return for the omissions, it brings the season tickets up to 116,214 for the United Kingdom; and assuming that each season ticket is used 150 times, this would give 17,432,100 journeys to be added to the single ticket passengers, or 323,000,171 passengers carried in 1869 by railway, or more than ten trips in the year for every man, woman, and child in the United Kingdom. Lines having stations in the metropolis have, as may be supposed, the far greater part of this traffic. Nine out of ten of the periodical tickets are taken by business men, and some by women also, we can add from personal knowledge, who travel daily from their homes in the suburbs in the morning to their places of business in town, and back again in the evening. Many such tickets are used also for going home to dinner; and in the case of the South-Eastern Company are also available, and are freely used, for passing between Cannon-street and Charing-cross. The blanks in the following statement indicate some of the omissions of season and periodical tickets in the return to which reference has been made above:—

	No. of tickets issued in 1869.	Receipts from tickets issued in 1869.
South-Eastern .....	...	£73,018
Brighton .....	...	78,585
South-Western	6,951	71,096
North-Western	11,239	54,155
Great Eastern	4,899	41,735
Great Western	4,300	31,773
London, Chatham, & Dover	8,689	30,374
Great Northern	8,261	37,859
Midland .....	...	25,514

The three companies left blank for the numbers are not the only omissions.

The season-ticket business is not confined to the metropolis: some of the lines having stations in the large provincial cities and towns also cultivate residential traffic, as is apparent from the following:—

	No.	Receipts.
Lancashire and Yorkshire	8,487	£52,946
North Eastern	4,628	27,678
Manchester, Sheffield, and Lincolnshire	1,914	9,142
Bristol and Exeter	434	3,449
Gloucester and Swindon	386	761

For Scotland, the following are amongst the figures for season-tickets issued in 1869, and receipts therefrom:—

	No.	Receipts.
North British	6,918	£21,344
Caledonian	6,671	18,010
Glasgow and South Western	1,189	7,964
Great North of Scotland	4,332	4,200
Highland	1,143	2,286

For Ireland,—

Dublin, Wicklow, and Wexford	4,084	£13,831
Belfast, Holyhead, and Bangor	3,665	5,706
Cork, Blackrock, and Passage .....	...	1,041

As regards train miles run, the returns are as follows for the two years:—

	Passenger Miles.	Goods Miles.	Total Miles.
1862	57,642,831	58,318,966	105,961,797
1869	81,073,231	78,291,290	159,364,521

* Including 167,728 miles not classified.

The miles run by trains is a number too vast to be apprehended, and it can be but little help to the understanding to say that 167 millions of miles are more than 6,000 times the circumference of the globe!

The total receipts from all sources were,—29,128,558*l.* in 1862, on 11,551 miles, against total receipts of 42,695,927*l.* in 1869, upon 15,145 miles; the working expenditure was 49 per cent. of the gross receipts in both years.

As regards rolling stock, the increase has been very great in recent years. In 1849, the number of locomotives upon the lines of the United Kingdom was stated at 1,965; the following are the figures for the years 1862 and 1869:—

	Loco-motives.	Passenger Carriages.	Wagons.	Miscellaneous.	Total.
1862	5,140	12,581	133,580	9,161	150,474
1869	9,108	20,863	244,876	15,418	290,265

Like the mileage run by trains, the engines, carriages, and wagons that do the running, are more easily numbered than measured by the imagination. If they were buckled close up, the engines would give a noble vanguard to the monster train, that would extend over 60 miles; the grand army of passenger-carriages, wagons, and miscellaneous following would extend over more than 1,000 miles.

In 1848, the number of officers and employes of all kinds, employed upon the 4,253 miles of railway then open for traffic, was 52,687. In 1865, with 13,289 miles open, Mr. W. F. Mills gives the number then employed at 166,047. On a moderate estimate, the industrial brigade which manages and works our railway system may be put down as now numbering at least 190,000 men, whose essentially important and valuable services to the community are rarely appreciated,—never overrated.

ON THE PROTECTION OF DWELLING-HOUSES FROM SOLAR HEAT.

A TINY pamphlet has lately reached us from Italy, in which various simple methods of "Protecting Dwelling-houses and the Human Frame from the Effects of Solar Heat" are discussed by Professor F. Orioli, of Bologna. As the subject—the first portion of it especially—is much neglected by English residents in hot climates, a few extracts may, perhaps, be serviceable to builders and occupiers of dwellings thus situated.

"It is notorious," writes the Professor, "that with all the care and study which have been devoted to the question of providing artificially against the effects of cold, the application of similar measures to temper the effects of extreme heat has been altogether overlooked." He adds, that as he has no intricate machines nor costly devices to propose, he foresees that his remarks will not be regarded as of much weight; still the defect is so little creditable to the national knowledge of *sauro vivere*, that he desires to do his share towards remedying it.

After briefly noticing the palpable defects of Italian domestic architecture in the present day—dimmy, unshaded walls which absorb the heat from the adjacent soil, and transmit it to the interior of the building, despite the liberal application of whitening to their exterior, small confined rooms which have taken the place of the ample salons of a bygone age; numerous closely-set windows, which, in place of light, admit heat in summer and are a source of cold in winter; a confused medley of fanciful styles in glaring contrast with the noble Palladian models of the past,—he proceeds to consider the remedies readily available for some of these defects; and, first, as regards

Window Blinds.

Under this head the professor includes "the wooden gratings known as *jalousies*, believed to have been first introduced by the Saracens in Spain; inside-blinds of all kinds; wooden and other shutters applied to the inside of windows, and window-hangings, white and coloured, of all descriptions." In respect of the first, he observes that, when designed, as they usually are, for the exclusion of heat, the worst form which can be given them is with the "laths" ranged transversely, so as to admit of a view of the street or of the opposite houses, the reflected rays from the surfaces of which pass through the intervals to the interior of the apartment. With the best made *jalousies* this will occur to a certain extent. In some, the apertures are so

* "L'Arte di Preservare dai Calori Estivi le Abitazioni e le Persone." By Professor Orioli. Bologna. 1870.

wide as to defeat the object for which they are designed altogether. This defect may be remedied by movable laths; but, he adds, and the remark is applicable to a good many hot localities besides Italy, good workmanship cannot always be secured; and even where it can, the effects of the sun on the laths causes the blinds speedily to get out of working order. He recommends that the laths should be fixed upside down, with a sufficient overlap to preclude the possibility of any rays being reflected between them. One or more movable laths might be left in the middle, to prevent a total exclusion of the view. A movable blind, projecting verandah-fashion from the architrave in addition to the jalousies, would not only intercept rain and the direct rays of the sun from passing through the interstices of the former, but would also provide against the rays of heat reflected from the surface of passing clouds, which rays are frequently very troublesome. Inside blinds, although they cannot be regarded as absolutely useless, have little real effect upon the temperature of the room. If made of too thick a material they exclude light: if the former be too thin they are useless. The yellowish colour which is reputed to wear best, is by no means a good one in respect of coolness; blue and green are much less favourable to the transmission of heat.

When hangings are used, they should be ample, and so fitted that no apertures may exist at the top or sides through which light (and heat) may pass into the rooms. This arrangement, if it entail a loss of light, secures an increase of coolness in the apartments.

Shutters, fitting well, and made of wood, or green stuff stretched over close-fitting wooden frames, or filled with blue glass, are much better non-conductors, and may be used in addition to the foregoing means. The old-fashioned white curtains are very good, especially when they hang in ample folds. Muslin and other perforated materials patronised by modern fashion are useless as a protection against heat.

On the subject of outside blinds he has nothing new to tell us. A suggestion to keep them wetted, after the fashion of Indian "tatties," by means of a garden syringe, fitted with a fine rose, might perhaps be useful in many cases, whatever its effects on the durability of the sun-shades.

After noticing the refrigerating effects of window-gardening, when foliaceous in place of floral subjects are chosen, not alone by the shade thus produced, but by the calorific absorbed by the plants in growing, he continues his remarks as follows:—

Coolers.

"I have never been able to understand why the mechanical means which are resorted to for the alleviation of wintry cold should not be equally applicable to the reduction of the extreme heat of summer. It appears to me that this might easily be effected, even were it desired to produce a degree of temperature far below that which sanitary considerations render advisable."

He proposes that one or more chambers, having each a cubic content of 1 ft., should be formed into the thickness of the outer wall. In each should be placed a case or chest containing pounded ice and sea-salt, or some other refrigerating compound, and having in the centre a close spiral coil of pewter or other metallic tubing, one extremity of which should be open to the external air, while the other enters the room at about the height of a man's head from the floor. The temperature would, of course, be dependent upon the length of the spiral coil, and the power of the refrigerating mixture. He believes that this arrangement which would not only introduce a supply of cooler air to the apartments, but as a necessary consequence would create a constant circulation of the air therein, might be applied, not only to dwelling-houses, but to carriages, palanquins, &c., at a cost little, if at all, exceeding that of the ordinary warming apparatus commonly used in winter.

To obtain the full benefits of the refrigerating mixture, the case should be coated with some non-conducting material, as cork or straw. In a foot-note, he suggests that perhaps it would be better to divide it into three compartments by means of a couple of diaphragms. The upper and lower compartments should each contain a spiral coil of tubing, surrounded with refrigerating mixture. The coil in the upper one should have one extremity opening out to the air on the extreme surface of the wall,

and the other leading into the middle compartment; in like manner, the lower coil should communicate between the middle compartment of the chest and the room. The passage of the air would thus be made as gradual as possible. The admitted necessity of a continuous renewal of air in rooms leads to the subject of

Ventilators.

Even the simplest descriptions of ventilators have certain advantages, seeing that the disagreeable effects of extreme heat are in a great measure due to stagnation of the air. Air is a bad conductor of heat, and, in habited rooms becomes speedily saturated with moisture, to the impediment of respiration. When the air is set in motion, even though its temperature differ but little comparatively from that of our bodies, and though in all cases it is a bad conductor of calorific, the continued contact of fresh particles of a slightly lower temperature, and but lightly charged with humidity, relieves the skin of a large amount of calorific, and promotes the exhalation of moisture from it and from the respiratory organs, whereby the unpleasant sensations referred to are greatly alleviated.

For this reason, all ventilators have their uses, be they the old-fashioned notion of Hales' pulkals, or windmills; blowing-wheels, like those of Desaguliers; the latifs of the Egyptians; or any other analogous invention designed to set the air in motion; for it must be remembered, adds the Professor, that few districts are blessed with natural ventilators such as are in use at Cesi, in Umbria, where the cool air from the numerous subterranean grottoes in the vicinity is conducted, by means of conduits made for the purpose, into the upper rooms of the houses of the inhabitants.

Colouring.

The colouring of rooms has a certain effect upon their temperature, as some hues are more favourable to the absorption and radiation of heat than others. In this respect we should follow the example of Nature, who is lavish in her blues and greens—the azure of the skies and the green of the fields,—and never employ white, which possesses the minimum of reflecting power, or black, which is the most perfect absorbent, except when combined as a neutral tint at once less offensive to the eye and less readily affected by the rays of heat.

Furniture.

Should be light and not cumbersome, and constructed of good heat-conducting materials. At first sight it would appear that substances which absorb heat least readily would be preferable, but experiment shows that these in course of time become saturated with calorific, and retain it with intolerable pertinacity; on the other hand, materials which heat rapidly cool again with equal facility. Marble and scaglioli should, therefore, be preferred to wooden floors and draped walls, and metallic furniture to ordinary cabinet-work. Foliage plants have a good effect in a room so long as they are not of species requiring much moisture, which would be objectionable.

Amongst other artificial means of reducing the temperature of dwellings, Signor Orioli notes—the practice of sprinkling the floors with water, which he holds should only be done during the hours the rooms are unoccupied; closing the windows and doors by day and opening them at night, which he observes is impracticable in many parts of Italy by reason of the malaria which rises after sunset; roof-gardens like those of Naples and Malta; trees planted in front of the houses so as to shade the walls, which he has heard is the custom in the streets of London (save the mark); and he would like to see adopted in Italy.

Lastly, he suggests that the streets—at any rate, the most fashionable—might be shaded during the hottest periods of the day by means of ample awnings, similar to those sometimes used for horticultural purposes, which would secure a far cooler temperature, not alone in the thoroughfares themselves, but in the adjacent houses, whose walls would thus be perfectly shaded.

"Painter in Ordinary."—We mention with very great pleasure that Mr. James Sant, R.A., has been appointed to the office of Painter in Ordinary to Her Majesty. The fact that it came unsought and unexpectedly must have increased the gratification with which the intimation was received.

THE VENTILATION AND WARMING OF THE ROYAL ALBERT HALL.

THE subject of ventilation has within the last few years received much attention on the part of scientific men; and, from being a comparatively unconsidered detail in the arrangement and construction of our public buildings, has come to be regarded as a most important feature in the architect's labours. As might be expected in a matter so complicated and uncertain, much difference of opinion exists with reference to the most suitable means of attaining success; and there are probably few subjects with which the architect has to deal in which his judgment is more sorely tried than in forming a decision upon the respective merits of the many plans open to him for ventilating and warming the buildings under his care. It would be impossible, of course, to pick out any one system, and to affirm that that was the best and most applicable to every description of building; for various buildings differ so entirely in their requirements and internal arrangements that very important modifications, at any rate, would be needed in the plan we had decided to adopt, say in the case of a church, a hospital, and a theatre. But it is not only in this respect that difficulties arise; we are called upon to judge between hot air, hot water, and steam, between ascending and descending currents, between driving or exhausting, and between the advantages or disadvantages of every conceivable position for the air inlets and exits. In the midst of all these conflicting theories it is satisfactory that all are agreed upon one thing, namely, the advantages of natural ventilation and plenty of it; and when we come to artificial ventilation we can refer in most cases to some building or buildings of a similar nature to the one upon which we are engaged in which this or that plan has proved a decided success. In the Royal Albert Hall, however, Colonel Scott was, in the matter of ventilation and warming, as in many other details of the work, almost entirely without precedents: the only buildings which we possess at all structurally similar—the old Roman amphitheatres—being uncovered, and therefore quite incapable of assisting him in some of the most difficult problems he had to solve. Regarding the question of ventilation from a common-sense point of view in connexion with the known laws of pneumatics and calorific, it is evident that in such a vast hall any attempt to subvert by artificial means the natural direction of the currents of heated air would be useless, and he was thus led to choose that system which appeared best to accord with and to supplement the ascertained direction and movements of heated gases.

Before further commenting upon the principles which have been adopted at the Albert Hall, it will perhaps be as well if I explain the apparatus and the contrivances which have been introduced into the building for the purpose of warming and ventilating it. To begin with the arrangements which have been made for the heating. In a boiler-house outside the hall are three powerful 30-horse tubular boilers, which supply the motive power to the various engines, and heat the water in nine condensers, which in turn feed 25,000 ft. of 4-in. cast-iron hot-water piping. The pipes are disposed in heating-chambers in the basement, and these chambers are so distributed as to facilitate the escape of the heated air into all parts of the building. The condensers are supplied with steam direct from the boilers, and each one heats the water for two distinct coils or systems of piping, arranged on the ordinary circulating principle of flow and return. The pipes, which run about 130 ft. to the ton, are made in 9-ft. lengths, with socket joints put together with yarn and iron cement. A provision in the contract is that the pipes should all be proved before they are used. They are arranged in tiers, and fitted into cast-iron coil boxes, with the necessary expansion cisterns, air vents, ball-cocks for the supply of water, and shut-off valves from cisterns, &c.

In connexion with each coil of pipes is fixed a moistening tank to ensure the requisite hygro-metrical degree of the air.

The condensers, I need scarcely say, consist of numerous metal tubes enclosed in a chest, in which the steam from the boilers is made to impart its heat to the water from the return pipes. By the plan of using condensing hot-water boilers, it becomes possible in a large building like the Albert Hall to work a part only of the coils at once without interrupting the series.

It will readily be seen that by checking the flow of air into and from these chambers containing the piping, a very high temperature may be attained; and that by regulating the current of air through and among the pipes, any desired degree of warmth in the chamber may be produced: I may therefore speak of them as hot-air chambers. The external air is supplied to these chambers by means of two down-cast shafts, each 6 ft. by 6 ft., and passes through a long underground passage, in which it will be strained through fine wire-gauze screens, and washed with water sprays, in the same way as is practised at the Houses of Parliament. It is then drawn into the fan chambers, from which it can be forced into the building at the rate of 3,600,000 cubic feet per hour. The fans are each 6 ft. in diameter, with four blades, and work on the principle of the screw. They are driven by two small five-horse power engines, of somewhat peculiar construction. To supplement the action of the fans, and, in cold weather, perhaps, to replace them, a powerful system of exhaustion has been introduced into the centre of the roof,—namely, an elliptical shaft, of nearly 700 square feet in sectional area, carried above the roof of the main building. The portion of this shaft above the roof-level is surrounded by movable louvres, which are arranged to open to any required extent. The suction-power of this shaft is capable of being increased by means of the heated air generated from three rings, containing 960 gas-burners, situated at its lower extremity. It is calculated that the vitiated air can thus be extracted, without the danger of the formation of descending currents of cooler air from the upper part of the building. The concave shape of the ceiling will, doubtless, favour the action of the extracting shaft by conducting the heated gases to its aperture in the centre. When speaking of the fans, I should have stated that the air from them is conducted in separate cold-air-channels, carried beneath the hot-air-chambers, but communicating with them through numerous orifices; and that the amount of air entering these chambers can be adjusted to a nicety, by means of iron valves, of simple construction. A further control over the amount of air entering the building is provided for by the introduction of a patent self-acting valve, with proper counterpoise into the main air-channel supplying the fans. To this valve is attached an indicating dial which registers the quantity of air passing through the fans, and enables the engineer to work them according to the requirements. Before explaining the mode in which the air is distributed, I must briefly describe the form and arrangement of the building. The hall proper, which is nearly a true ellipse, is 220 ft. by 186 ft., and 135 ft. high; it is surrounded externally by a zone of staircases, crush-rooms, and waiting-rooms, 20 ft. in width, which, at a height of about 60 ft. above the floor-level, is thrown into connexion with the main hall by an arcade of thirty arches. The picture-gallery thus formed, which is top-lighted and may, if required, be separated from the hall by means of curtains, entirely encircles the building, and measures on the outer wall 800 ft. in length. The floor of the hall, called the arena, is 102 ft. by 70 ft., and occupies the centre of the room. Round the arena, and raised 6 ft. above it at its lower extremity, is an amphitheatre composed of thirteen rows of seats rising one above the other, beginning with a rise of 7 in. and ending with one of 18 in. Surrounding the amphitheatre are two tiers of boxes, above which again is a balcony projecting 21 ft. from the main wall, and seated with eight rows of seats, the upper one of which is only a few feet below the arches of the picture gallery. Behind the boxes, and round the amphitheatre and arena, are corridors, 9 ft. wide at each level; which corridors are in communication with the boxes on the one side, and with the staircases, exits, and waiting-rooms on the other.

From this brief explanation it will be easy to see that we have here several distinct parts to deal with, and in arranging the heating chambers special provision has been made to meet each case. Beneath the floor of the arena a vast heating-chamber has been constructed, from which the heated air is emitted over its entire area through numerous small apertures in the boarded floor. A second heating-chamber is allotted to the amphitheatre, the air from which issues through a succession of small opening in the risers. The third and principal chamber is beneath the zone of corridors, and just against the main wall of the Hall on the

side, and the wall carrying the boxes and balcony on the other. From this chamber flues situated in either wall convey the air to every level, and issue finally in the floors of the picture-gallery and balcony. Numerous distinct openings in these flues distribute the fresh air into every enclosed room, and these openings are in all cases where practicable placed at points distant from the inmates. By these various arrangements the entire power of the apparatus may be concentrated on the Hall at the same time, affording the opportunity of heating the enclosed rooms independently when needed. As will be, I think, understood from my description, the air-chambers can be used for the admission of either warm or cold air to the Hall, and by certain special valves, connecting flues, and distributing channels, it becomes possible when the Hall is full to continue to introduce heated air over the whole floor area of the building, and to force in cold air at every level by means of the main chamber, and the flues in connexion with it, or vice versa.

I now come to the temperature stipulated for in the contract—this is for the main hall and the enclosed rooms, during the winter months, a mean of 58° Fahrenheit, and not lower than 55°. For the corridors, stairs, &c., the temperature to be a mean of 55°, and not lower than 52°, Mason's hygrometer to register not more than 10°. During the summer months the mean temperature is to be below the external temperature of the air.

In a lofty room containing close upon 5,000,000 cubic feet, and destined to accommodate, at times, 12,000 individuals, placed at different levels, the supply of fresh air is a matter of vital importance; and whatever be the plan of ventilation adopted, the vitiated air can only be properly carried off by means of powerful ascending currents. The danger of powerful currents is the numerous draughts they occasion; and, as in the hall the foul air from 5,000 persons at or about the floor-level must pass, on its way out, certainly an equal number of persons on the upper floors of the building, the problem was so to contrive the inlets and exits as to avoid, as far as possible, the discomfort of draughts, which cannot be quite obviated in such a large room, and to drive the vitiated air from below, away from the people at the higher levels. The methods employed for attaining these results, which I may briefly describe as the forcible introduction of pure air (heated in the winter-time) over the whole of the lower portion of the building, and the forcible extraction of the vitiated air at one large orifice in the centre of the ceiling, seems to point to the successful solution of the problem; for it gives a cone-shaped collection of currents or draughts, the apex of which cone is in the centre of the roof, while its base is extended, extinguisher-fashion, over every inmate of the building. Having thus endeavoured to point out, both practically and theoretically, the systems of warming the Hall, I have only to add, in conclusion, that this plan has, together with the various contrivances and appliances which I have described, been designed under Colonel Scott's direction, by Mr. Wilson W. Phipson, C.E., who has also taken the contract for the work. GILBERT R. REDGRAVE.

SIGN-WRITING AND GLASS-EMBOSSING.*

A CLEVER little book has just appeared upon sign-writing and glass-embossing, which will, we think, interest many persons besides sign-writers and glass-embossers. The author has ingeniously tackled on to his subject several others, which, without being identical are sufficiently kindred to deserve to be associated with it, and which give it an antiquarian and historical lineage. Long before we are introduced to sign-writing proper, in its every-day modern aspect, he tells us of the *signes* of old that pilgrims purchased; and straightway we have Chaucer and his Canterbury pilgrims before us; then he steps up to the texts and writings formerly fixed about churches; and thence to the scrolls artists in stained glass, as well as painters, placed in the hands of the figures they delineated, either to identify them or to furnish speech to them. Wall-paintings, both "texts and gloses," thus come in; illuminated missals are touched upon and quoted for the forms of their letters; Mr. Hotten's capital book upon house and shop

signs, noticed a short time ago in these columns, is dipped into; inscriptions upon tombs and monumental brasses are brought to bear; and, in fine, before we have got through the first chapter, the reader begins to look upon sign-writing with a different degree of respect to that he would have been apt to accord it, but for Mr. Callingham's mode of introducing the art. He tells us that it is on the eve of a great access of consideration; for the revived custom of adorning churches with passages from Scripture, requiring at the hands of the sign-writer a knowledge of the grammar of ornament, as well as taste and neatness of execution, will call for more gifts than mere facility of lettering. Hitherto, in modern times, the sign-writer has been grouped with the sign-painter, ticket-writer, and grainer; and sign-writing has been without its literature; but Mr. Callingham has brought the sign-writer to the front, and headed the possible literature of the art with the agreeable little book we now recommend. There is a technical chapter, devoted to a description of the proper modes of drawing essential lines; and there is another to the setting out of writing so that the letters may appear at even distances from each other, which they would not do if placed at exactly regular intervals; and then we come to two of more general interest, though equally useful for trade purposes, on alphabets and numerals. The first of these relates to modern alphabets, and in the second we have some Mediaeval specimens. The mysteries of thicknesses and shadows, of perspective, of colour, and of methods of gilding, fill five full, explicit chapters; and then we are formally introduced to glass-embossing.

There is no antiquity claimed for this art. It is absolutely our own, and this is the first work, the author thinks, that has appeared upon the subject. Perhaps it is, we admit; if, with more rigour than Mr. Callingham has used with respect to sign-writing, we exclude treatises upon subjects that are so nearly akin to it as to be scarcely distinguished from it. But our writer argues that it is an art that is the result of the great improvements in the manufacture of plate glass. Etching on glass was discovered, he owns, by Schwanhardt in 1670; but then, etching is not embossing. It takes a metropolitan writer to become a good embosser; when a provincial undertakes the work it is generally unsatisfactorily executed, probably from want of practice. Hence all provincial orders, by common consent, appear, he says, to be forwarded to London houses. What do Messrs. Chance and some other country houses say to that? The great gin-palaces are the principal buildings decorated in this manner, and, let us add, mostly badly.

Besides exact details for mastering this art and that of burnishing, to which we refer all who are thinking of practising as embosser and burnishers, there is a concluding chapter calling attention to the frequency of error in sign-writing owing to an ignorance of orthography by the writers or their employers; and further to obscurity in written announcements from want of giving proper prominence to the words expressing their leading meaning. "Dying done here," "chops and stakes," "mangleing," are instances of the first kind; and we will quote an instance of the second:—

"At the Vauxhall Railway Station there is a good example of this. The following words are painted on a board:—'Passengers are requested not to pass beyond this point.' There are four large lines, which are,—'PASSENGERS,' 'REQUESTED,' 'PASS BEYOND,' and 'POINT,' the last being the largest of all. The other words are painted very small. At a short distance, the request reads just the opposite of what is intended, the 'NOT' being almost imperceptible; whereas the words, 'NOT TO PASS,' should form the principal line on the board, as they really contain the gist of the announcement."

Taking it from first to last, indeed, Mr. Callingham's little book is smart and clear, and will give a new dignity to the somewhat humble art of the sign-writer. He is ready with his jokes, too, to lighten his student's labours, and little flashes of criticism and observation to make them wary. The extraordinary manner in which the late Mr. Charles Dickens was encountered in the most unexpected places, has been the matter of comment. And now, again, we are startled in this unobtrusive book on sign-writing by a page upon his eccentricities of orthography:—

"We remember an instance in which a sign-writer had to paint on the door-post of a doctor's residence the words 'visitor's bell'; and the workman, having been reading some of the late Mr. Charles Dickens's works, rendered the first word as the great novelist himself was in the habit of spelling it, substituting 'v' for 'v' in visitors. . . . Speaking of Mr. Dickens recalls another peculiarity of his, which it is as well to caution the sign-writer against. It

* Sign-Writing and Glass-Embossing; a complete practical illustrated Manual of the Art. By James Callingham. London: Simpkin, Marshall, & Co.; Brodie & Middleton, Long Acre. 1871.

is that of rendering the plural of Miss by adding 's' to the end of the surname. Thus, in the case of two young ladies of the name of Brown, he would write, 'The Miss Browns,' instead of 'The Misses Brown.'

As to visitor, by the way, "er" is just as right as "or."

To go back, the greater part of the writing we see in our streets is vulgar and bad. The little book before us should do something to improve it, but the lesson needs carrying on further with the aid of a cheap set of beautiful examples in colour, for the proper production of which an artist is needed.

REVELATIONS OF THE TRUCK SYSTEM.

We may expect shortly some more disclosures concerning the working of this system in the centres and outposts of our several industries; but before we are favoured with a report by the Commission now engaged upon the subject, we will briefly touch upon the evil as we have come in contact with it in many parts of the empire. We have witnessed the serious consequences resulting from its working, and we can, in anticipation of other evidence, join in its condemnation, while we can admit that it is possible to work the truck system in a modified form, in a humane and philanthropic way, and make it confer advantages upon the working men and women, particularly in localities distant from towns. We must assert this has not been done. The men and families who were perforce compelled to deal at these "tommy-shops" were obliged to pay often, in fact always, a higher price for the necessities they wanted than these could be procured at in free shops; and generally the tommy-shop and the truck store vended the worst description of goods. We have known instances, in our experience, where no money at all was paid for labour, but provisions, groceries, and articles of clothing had to be taken in lieu. The workman, of course, in this case, was often obliged to take more things than he actually wanted. To get rid of his surplus articles he was obliged to hawk them about, and resell them at a loss, or make an exchange in the primitive fashion,—barter one article for another; the consequence was, that the workers under the truck system were always in a miserable condition. They never could procure what they required, the food was bad, and the articles of wear were often worthless. Looking back a quarter of a century, we can see the truck system at full work in various ways and in various places. The contractors or sub-contractors of many of our early lines of railway in the three kingdoms, contrived to add to their gains by establishing "tommy-shops" in different towns on the lines of their contract. We have visited many of these extemporised stores, which, although they were not licensed to sell malt liquors, yet contrived to have it for those who could hold their tongue. Tobacco, the other great necessity, could be had in abundance, and even other contraband things. The navy being a bird of passage, with no settled home, cared little so long as he had constant work and a little surplus in cash for a drinking bout on Saturday night and Sunday.

The "tommy-shop" supplied him with tea and sugar, tobacco and bacon, on "tick," and he was certain that his job would last until the works were finished, without a discharge. Independent of the railways, the "tommy-shop" and the truck system flourished in connexion with the iron-mines, collieries, weavers, glove-makers, lace-makers, cloth-makers, mill-owners of different descriptions, and even among the agricultural labourers in the south and southwest of England. The same principle that induced large contractors or their agents, or large manufacturers and their overseers, to establish a truck system in estates and drinkables, also actuated them to build dwellings for their workpeople, and compel them to live in them. In the great majority of the mining districts of England and Scotland there are villages almost exclusively inhabited by miners and colliers. If there be an empty house, the fresh hands that may be taken on are expected to remove at once to it. In some instances we must admit that the houses built by the mining proprietors are more fit for habitation than many which are to be found elsewhere, but the evil of compulsion is not the less to be condemned. Any large employer, or firm of employers, who like, as at perfect liberty to speculate upon the wants of their workmen, and in a legitimate manner to build homes for their well-being, or supply food for their convenience,—provided that it is optional

with the workmen to do as they please in respect to their patronage. We have, however, in our experience, been a witness to acts not only of coercion but of tyranny in this matter. The system of paying tradesmen and mechanics by monthly and fortnightly settlements is fraught with serious evil, and it is a cruel hardship when this system is enforced with agricultural labourers. Fortnightly payments are quite common; and even where there is no truck system in connexion, a fortnightly payment to workmen is productive in most cases of bad results. When the money reaches the wife for housekeeping duties, it will be found that the half of it is already owing, and that the pawnshop will have to be more than once visited to square matters before the next pay-day.

There are many large manufacturers and mining firms who will no doubt aver that the truck system is no advantage to them. If it be of no advantage, in either saving the workman's time or making double profit out of his labour, why has it been so generally adopted over the country? It is not the manufacturer or proprietor in chief in some instances who benefits exclusively by the truck system, but his agents, overseers, and underlings, who are supposed to manage the business for him, but who very cunningly contrive to work the profit and per-centages for themselves.

Where workmen are single men the evil of the truck system is not so widespread in its effects as in the case of workmen with families, but it is all the same to the managers and overseers, who have the power of employing or discharging.

While upon the subject, we will just remind our readers and the public that there are many kinds of the "truck system" rife amongst us, and the offshoots of the parent tree are widely ramified through society. The present Commission sitting upon the matter might with advantage widen their labours, and when ready give the public what they expect,—an exhaustive report upon the whole subject and its surroundings.

It will no doubt surprise many people to be informed that a species of truck system exists in many of our City workshops in the building and other trades; but the system is not confined to London alone. It exists in a similar way in Glasgow, Edinburgh, and Dublin,—indeed, it is general over the kingdom. We will just show how the little dishonest scheme works, and how the thin end of the wedge is driven in. Many of the overseers, managers, and foremen of various firms have public houses, groceries, and provision stores. Where they have not the ownership, their relations have; so to the new hands who may be taken on it is softly insinuated by a friend that he is expected to patronise Mr. So-and-So. We have known this *sub rosa* species of truck system to be extensively worked in many parts of the country, and in the City too. We have known instances of workmen drinking half of their hard earnings in beer-shops and public-houses kept by foremen and overseers, and this practice many of them had to continue for the purpose of keeping themselves in employment. All men of course would not stoop to this debasing practice. The inferior workman will be found to do it, and, in some instances, the good workman who is unfortunately addicted to drink. Thus we have bad workmanship because we have debased foremen and overseers. And this is the truck system, under a modification, profited in by the employer's agents instead of the employer himself.

Reverting to the original truck or "tommy-shop" system, we will add that we have known food unfit for use to be often sold in these places, and always a higher price charged than it could be had for elsewhere. The wife and children of the workmen were, however, obliged to take what was in the store, for there was no choice left to them.

The canteen system in all our military barracks and regimental depôts in different towns and cities is little better than the truck system. These soldiers' "canteens" are rented or leased by the barrack-master to the highest bidder, and every article that may be had in an ordinary public-house, grocer's and provision shops combined, may be purchased here. It is intended for the use of the soldiers, but civilians and outsiders, who, as workmen, assistants, &c., have business in connexion can avail themselves of the privileges. The articles here are supposed to be sold on a cheaper scale to the soldiers than outside, but what they save in pence they generally

gain in poison. The drinks are bad, and the food is inferior. There is a distinction made, however, by the canteen landlord; he will not sell a bad article if he can to an officer's servant. The wall is for the weaker still, as the old proverb has it, and it is the privates who have to suffer.

Soldiers' canteens should get an overhauling, and where the old system on which they were carried is still in vogue it should be exposed. It is a matter that calls for inquiry. It embraces a species of both truck and traffic in its management not very creditable.

The rise and growth of the co-operative store system in the north of England has nearly annihilated the old tommy-shop. The Rochdale experiment being a success, other ventures and successes follow. Here in London we have the Civil Service co-operative store, and a seemingly well and thriving concern it looks. There is no end to the working of the system, but, like every other great change, there are dire evils in the state of transition. The retail trader, if the co-operative system spreads much more, will certainly feel a severe pinch. Tyranny, coercion, and injustice belong to the truck system in less or greater degrees, and as hardships belonging to the tommy-shop produced the co-operative store, and gave the workman purchaser a share in the profits resulting from his outlay, so the overcharge made by the retail dealers for articles which are undoubtedly adulterated will gradually drive other classes in London besides the Civil Service into co-operation for mutual protection and advantage.

Workmen should be paid weekly, and not in public-houses; and all their payments should be the same as with the classes above them,—in money. If they make bad use of it, they are themselves to blame. They should be at liberty to choose their own residences, and purchase their daily or weekly necessities where they think fit. It is true philanthropy to give them better homes, and to give them facilities for obtaining better goods, and at a cheaper rate, than their own individual exertions can procure; but it is neither philanthropy nor justice, but the very reverse, to make it obligatory upon them to live wherever a bad landlord may desire, and to make them purchase where and what his agent, acting under him, will.

We anticipate that the Truck Commissioners will supply the public with statistics, gathered in the north, south, east, and west of the country, Wales included. The figures ought to show the immense sums that are paid, or should be paid, in earnings; the amount of capital represented by "certificates," which pass current as legal tenders in some places; and the amount of probable double profits that find their way back again into the employer's business. In a word, the Commissioners' Report should show us the truck system as it exists, with its advantages, if it possess any, and with all its acknowledged and obvious defects.

LAND PURCHASES OF THE TUNBRIDGE AND DARTFORD RAILWAYS.

A PAPER on this subject, by Mr. Edward Ryde, was read at the ordinary general meeting of the Institution of Surveyors, January 30th,—Mr. E. J. Smith in the chair.

The property actually purchased, including houses and land for stations, not provided for in the Parliamentary estimate, extended to an area of 513a. 2r. 31p., and cost 230,156l., an average of 448l. per acre, or 6,800l. per mile. Of this quantity, the land taken for stations amounted to 32a. 1r. 2p., and cost 11,069l.

A little line, called the Mid-Kent Loop, not contemplated in the original works, consumed an area of 1a. 1r. 21p., and cost 500l.

An area of 4a. 3r. 10p. was taken, at a cost of 1,700l., for temporary and special purposes.

Surplus lands, to the extent of 80a. 0r. 16p., have already been sold for 15,610l., and surplus lands and houses remaining, to the extent of 23a. 3r. 35p., are at least of the value of 14,911l.

All these extra items, together amounting to an area of 92a. 2r. 4p., and to a cost of 43,790l. reduce the land purchased for the railway proper to 421a. 0r. 27p., or an average of 12.44 acres to the mile, acquired at a cost of 186,866l., an average price per acre of 442l. 10s., and per mile of 5,506l., as compared with an estimated quantity of 409a. 2r. 38p., a cost of 192,000l., an average per acre of 468l. 12s., or per mile of 5,673l.

The claims sent in numbered 431, of which (regardless probably of the vested interest of surveyors) 397 were settled by agreement without the intervention of juries, arbitrators, or professional witnesses. Of the remaining 34, 26 were referred to arbitration, and 8 were settled by the verdicts of juries.

The arbitrators were Mr. John Clutton, Mr. Henry Arthur Hunt, Mr. Daniel Norton, Mr. George Pownall, Mr. John Shaw, Mr. John Oakley, Mr. Frederick James Clark, Mr. Robert Collier Driver, Mr. Francis Vigers, and Mr. George Barnes Williams.

To go into further details. In Lewisham parish 31 houses and 4a. 3r. 3p. of land cost 27,218s. Market-garden ground to the extent of 4a. 1r. 13p. cost 3,945s., or an average of 911s. per acre. The brickfield land, measuring 2a. 1r. 11p., cost 4,114s., or 1,774s. per acre. And 33a. 1r. 17p. of building land, 17,766s. or an average of 533s. per acre.

In Lee parish, 27a. 2r. 32p. cost 8,161s., or 295s. per acre.

In Bromley, 26a. 1r. 36p. cost 20,197s., or 763s. an acre.

In Chislehurst, 16a. 1r. 29p. cost 8,692s., or 529s. an acre.

In Orpington, 29a. 2r. 8p. cost 4,701s., or 159s. an acre.

In Farnborough, 10a. 1r. 12p. cost 1,920s., or 186s. an acre.

In Chelsfield, 21a. 1r. 1p. cost 4,479s., or 210s. an acre.

In Halstead, a farm homestead and 1a. 2r. 38p. cost 1,861s.

In Shoreham, 15a. 2r. 9p. cost 3,249s., or 209s. an acre.

In Oxford, 31a. Or. 37p. cost 8,789s., or 281s. an acre.

In Sevenoaks, 72a. 2r. 24p. and four cottages cost 22,952s., or 316s. an acre.

In Leigh, 3a. 2r. 10p. cost 746s., or 209s. an acre.

And in Tunbridge, 66a. 3r. 23p. cost 13,172s., or an average of 231s. an acre.

On the Dartford line, 20a. 2r. 35p., in Lewisham, cost 6,200s., or 299s. an acre.

In Lee, 13a. 1r. 12p. cost 5,423s., or 407s. an acre.

In Eltham, 43a. 1r. 4p. cost 14,332s., or 331s. an acre.

In Bexley, 64a. Or. 13p. of land and some houses, a tanyard, and a brewery, cost 31,407s., or an average of 490s. an acre.

In Grayford, 6a. 1r. 22p. cost 3,281s., or an average of 513s. an acre.

And in Dartford, 6a. 1r. 38p. cost 1,400s., or an average price per acre of 216s.

BUILDERS IN ACTON.

In connexion with occurrences in Acton to which we referred recently, a meeting of builders was held there last week, to take into consideration the actions of the local board, and to form a builders' association. Mr. Parsons was called upon to preside.

The Chairman, in opening the proceedings, said it was evident from the gathering of builders present that they felt there was a grievance under which they suffered, and this meeting had been called by them to form an association to protect their interests, that all might combine to help a fellow builder when it was thought that arbitrary measures were being used against him. If that was to be the object of the association, he for one would do all in his power to assist the association. He was sure that the association was not in any way intended to act in antagonism to the local board, but simply as a protection. He believed that the board had not yet contradicted the statement of Mr. Robertson, and he was not sure that they could do so. They might be sure that when such a paper as the *Builder* took the question in hand, there was something at the bottom of the affair. If it was shown that the statements were not true, then he had no doubt the local board would seek a proper remedy. But what was wanted was the adoption of the Metropolitan Building Act. If that Act was adopted in its entirety, the builders would then know what to do, and not be in the doubt they now were with the bye-laws of the local board.

After some discussion, the "Acton Builders' Association" was constituted, its first purpose being to obtain the adoption of the Metropolitan Building Act. It was afterwards resolved "to support Mr. Robertson in the event of proceed-

ings being taken by the local board against him."

The Acton local board have since published a denial *seriatim* of the charges made against them.

A FRENCH ARCHITECT AND THE WAR.

THE *Daily News* prints a letter received by one of its correspondents from M. César Daly, of the *Revue Générale de l'Architecture*, giving a sad picture of the loss the war has brought upon him:—

"The Prussians have occupied our country-house, near Paris, since the third week of September. A battle took place in our grounds, and the whole commune is devastated. The park and gardens, which, you remember, were improved at such great expense, and on which such an endless amount of care was bestowed, are now a miry waste. All the shrubs, I am informed, were torn up for firewood by our amiable German visitors. My pictures were vainly destroyed, that is to say, all that I left behind. The looking-glasses were looted, as well as the library, which I used to flatter myself attracted you to. My wife had the prescience, when she knew Paris was going to be invested, to take up the carpets and send them with the beds within the fortifications. To avenge the want of sleeping accommodation, the Bavarians ruthlessly cut down the fruit-trees, which we were at such pains in collecting and planting, and smashed the melons and cucumber frames. The green-houses are entirely things of the past, and there is not a floor nor window-frame in the house. Whenever we get back, what shall we find of our house and grounds? A field and little more. Our villa at Neuilly were razed by the Defence Committee. God knows that I do not repine at this loss, and shall rejoice in it if I learn that Paris has been the gainer by it. Bombs are falling around our town residence. A chimney and a part of the roof next door to our house have been broken down. Had the projectiles gone another yard farther, those ceilings which you so much admired would have been destroyed."

M. Daly thinks that England has lost all weight in the councils of Europe, because she has not interfered to stop the war. It is distressing and vexatious to find that a man of the capacity and enlightenment of M. Daly,—loving England, too, as we know he does,—should be able to hold such an opinion. Supposing that the French had succeeded in the objects with which they rushed into war, had invaded and held the Rhine provinces, and had marched a victorious army into Berlin, what would they have said if England had sought to induce them to resign the spoil? All England has grieved bitterly and sincerely at witnessing the frightful disasters that have overtaken France; but to go to war with Germany because France had not succeeded in her evil designs, and had brought upon herself revivification, over-bitter as it has been, could never have been thought of by a sane community. Our esteemed friend, M. César Daly, with whom many of our readers will warmly sympathise, will hereafter, we are persuaded, view very differently the position and doings of England.

GRAY'S ELEMENTARY SCHOOL COMPETITION.

THE promoters of Gray's Elementary Schools, Essex, recently advertised for designs in competition. Twenty-eight sets were sent in, and a design by Mr. Thos. Rook Maples was selected.

AN ACCOUNT OF ST. THOMAS'S HOSPITAL.*

THE designs were completed in June, 1865, and were exhibited to the governors and others interested in the subject at the London Bridge Hotel for some weeks, and were ultimately approved by the General Court of Governors and by the Court of Chancery, whose sanction, under a special Act of Parliament, it was necessary to obtain. In April, 1866, the contractor for the Embankment having made considerable progress with the river wall, and being about to commence filling in and levelling the site, I reported to the governors that it would appear most desirable that the foundation of the hospital and the Embankment works should proceed simultaneously, and thus avoid the great expense of excavating and removing the material which was about to be filled in, and save a considerable amount of time in preparing the foundations, while the necessary details and contract for the superstructure were being prepared. A contract was made with Mr. Webster for the foundation works, and he at once proceeded vigorously with the same on the foreshore; but great difficulty

was experienced in obtaining possession of the several properties which fringed the bank. The building stands partly on land reclaimed from the river, and partly on the shore. The foundations on the river portion are carried down to the London clay. Those on the shore stand on a sound bed of gravel, which overlies the London clay, the difference in level being obtained by wide steppings, as shown on the sections. The ends of the blocks next the river have a solid foundation of about 22 ft. deep over the entire surface, forming a toe to the whole. The long flank walls of the pavilions have a foundation of 10 ft. in width, and the same depth, 22 ft., up to the old river wall. The concrete is then stepped up, and a platform of concrete, about 5 ft. deep, is laid over the whole surface of the remaining portion of the building. The land or spring water stands at a level of about 4 ft. above the clay. A drain was laid along the whole length of the hospital, at the back of the river wall, to a sump, and the excavations were all pumped dry before the concrete was put in. The whole of the concrete is composed of blue lias lime and clean Thames ballast up to a little above the land water-line, in proportion of six to one; all above that in the proportion of eight to one. The strata on the shore consisted of made ground; then gravel, varying in compactness, resting on the London clay, which rises gradually up from the river. The strata on the river portion consisted of loose and sandy gravel down to the clay. The Embankment wall is also carried well down into the clay. As regards the terrace wall, which intervenes between the end of the hospital blocks and the Embankment wall, there was no weight of superstructure to carry, but it was necessary to go down to the clay to get anything like a bottom. To have carried the whole down would have been very costly. It was therefore determined to build it on piers and arches. These piers were carried down 5 ft. square in concrete, six to one, as before, and arches turned from pier to pier in Portland cement concrete, in the proportion of five to one, the ballast being fine and small. The arches were turned on boxed centres, which were shifted from time to time, as the concrete hardened, and the ground filled in all round. Two or three of these arches were turned in Coignet's *béton*, as an experiment; but the Portland cement concrete was found equally strong and cheaper. The foundations of certain portions of the low outbuildings at the extreme end of the ground are executed on the same principle, on piers and concrete arches. I am glad to state that, owing to the care with which the foundations generally were put in and the superstructure raised, I am unable to discover the slightest settlement over the whole area of the extensive building. Scarcely any relics of antiquity were found in the excavations.

During the execution of the foundations the working drawings and specification for the superstructure were completed, and the bills of quantities were prepared by Messrs. Strudwick & Co., and Mr. Richard Roberts, and tenders were received on July 18th, 1867, from fourteen of the most eminent builders, the amounts ranging from 382,000s. to 332,748s., which latter was submitted by Messrs. John Perry & Co., of Stratford, and which after full consideration was accepted. Had stone ashlar been used instead of red bricks, the additional cost would have been about 25,000s., which the governors did not feel justified in incurring, and which, personally, I see no reason to regret. The contract was settled in October, 1867, and the contractors commenced erecting stone-sawing machinery, laying down tramways, and making other preliminary arrangements, and on the 13th of May, 1868, her Most Gracious Majesty laid the first stone. The ceremony was conducted with much state, in the presence of 3,000 spectators, in a pavilion erected specially for the occasion, and the arrangements appeared to give general satisfaction. The stone laid by the Queen forms the north-east angle of the substructure of the chapel, and stands above the ground-floor line at the foot of the public staircase.

I will now proceed to state a few details of the construction the warming and ventilating arrangements, and the cost. The footings were built with what is technically known as No. 2 wire-cut Gault bricks, and the specification provided that the walls generally were to be built with the very best stocks, but that the piers in the flank walls of wards were to be built with Gault bricks, for reasons which I will presently

* By Mr. Henry Currey. See p. 59, ante.

describe, but owing to the great difficulty in obtaining a satisfactory stock brick in such quantities as we required the contractor found it to his advantage, considering the small amount of fracture and waste, to use Gault bricks, and the whole of the work is executed in that material. They make excellent, good, sound work, but unless the joints are left very rough on the edge they do not afford so good a key for plastering as ordinary stocks. The greater portion were supplied by the Burham Brick Company. Inverted arches are turned under all window openings above the footings, and the piers in flank walls of wards being reduced to a small area by the large window space desired, and having to bear on the ground story an accumulated weight of 110 tons, were carried up with the very best Gault bricks in Portland cement, with Portland stone bonders the whole size of piers, introduced at every 4 ft. in height. Every alternate window in the basement was omitted with a view to obtain a larger area of piers on that story. Hoop iron bond is introduced at the level of each floor where it runs continuously round the building without any necessity of severance. The area walls, 14 ft. in height, were built, as shown on plans and sections, with a view to resisting the great pressure of earth filled in at back, and to preserve the facing from being disfigured by percolation, the base of the pockets being filled in with concrete. The building is faced with red bricks, and great pains were taken in ascertaining the best quality for the purpose, and none appeared equal in quality and colour to the Fareham brick. Negotiations were therefore entered into with Mr. Cawte, of Fareham, in Hampshire, who opened a new field adjoining his old works, and made special arrangements for supplying the quantity required, which were put into vessels at his yard, and brought alongside at Westminster, thus avoiding the damage and breakage of railway transit and carting from station. The bricks were made specially, and the size so arranged as to bond accurately with the Gault backing. The bricks are excellent both in colour and quality, and Mr. Cawte used every exertion to keep us supplied with material as the work progressed. The number of bricks consumed, exclusive of the facing bricks, has been about twenty-five millions. The stone used is for the most part brown Portland, from Messrs. Hollande, Weycroft, & Maggott's quarries. No. 17 saw-frames, besides hand-saws, have been constantly at work sawing the material, and the capacity of these saws appears to have been the gauge of the progress of the structure. Steam mauling machines and large rubbing beds have also been used to a considerable extent. The quantity of stone used has been about 370,000 cubic feet. The consoles under the main cornice, the caps of columns and pilasters, the balusters, and the vases and terminals on the balustrading were executed in Ransome's concrete stone. The material appeared peculiarly fitted in the present case where there was necessarily a great repetition of the same model, and consequently a considerable economy. Had it not been for this useful material I should probably have had to be content with the long line of balustrading unbroken by any vase or terminal. The pedestals would have remained vacant as they do in many instances where designed for sculpture, but the sculpture never arrives. It harmonises well with the Portland stone, and although many of my professional brethren would hesitate to use any artificial material, I venture to think that such hesitation may be carried a little to excess. The floors and flat-roofs are constructed with wrought iron girders and "Donnett" arching. The latter material, as you are well aware, is composed of broken bricks or stone and sulphate of lime, in the proportion of three of brick to one of sulphate of lime, spread as concrete on a centre; a large quantity of the slag from the potteries at Lambeth has been used, and forms an excellent material for the purpose. The spans are for the most part 8 ft. or 9 ft., the thickness at the crown being 4 in., increased to about 9 in. at the haunches.

It was thought desirable throughout the wards to have flat ceilings, but throughout the corridors and a great portion of the hospital the arches and girders are left to show the construction, the soffits of the arches being finished with a setting coat of plastering. The joists and sleepers, or concrete and paving, are laid on the top of the Donnett arching in the ordinary way. The wagon-headed ceiling of the chapel and the groining of the aisles are also executed in the same material, the aisles having stone ribs. The thickness in the panels is 5 in.,

and in the stiles 10 in. The reason which induced me to adopt this mode of construction for the chapel roof was not only the satisfaction of having a real sound solid construction, but it afforded an opportunity of carrying up several flues to the apex of the roof, which must otherwise have cropped up in an objectionable mode on the balustrading. The flues are carried across the groining of aisles on the back of the main ribs, then up the piers of the clearstory walls, and again on the back of the main roof, provision being made for sweeping at certain points easy of access. I may here mention that the flues from all the low buildings are taken across the corridor ceilings, and carried up with the main building, thus avoiding all risk of smoke and disfigurement. The ceiling of the governor's hall is constructed with iron girders and "Donnett" arching for the same reasons. The flues for the rooms on the lower floors had to be disposed of, and instead of interfering with the parapet and balustrading, were carried over the back of the coeve, and taken out of the roof in the ordinary way. The "Donnett" material is certainly very handy in execution; it accommodates itself to any form of arch or groin; it is strong, has great resistance against fire, and, when set, does not exert any lateral pressure; but care must be taken, and a liberal allowance made for expansion during the process of setting; and, finally, I believe it is as cheap, if not cheaper, than any other fireproof construction. The superficial area of arching used at the hospital in floors and flats is about 337,000 ft.

The riveted iron girders, of which there are about 1,250 tons, were made in Belgium, at the Sclais Works; and although not quite so neat in finish as one would wish (many being exposed to view), yet, at the same time, they are composed of excellent material, and stood the proof tests well. They were delivered very regularly, and the delay which so often occurs from the non-delivery of ironwork was avoided. The flat roofs over low buildings and corridors, which in many parts form terraces of communication, are constructed in a similar way. The surface of the arching is covered with concrete, laid to the required fall, and then covered with asphalt,—"Pilkington's Patent," which consists of the introduction of a layer of felt between two coats of asphalt. The lower coat is laid in Polonoese, about $\frac{1}{2}$ in. thick, and the upper coat in Seyssel, $\frac{1}{2}$ in. thick, with flushing of the same material. The whole, as well as the paving in the basement, has been executed by Mr. Pilkington, in an excellent manner. The paving and channel stones used in the areas are the patent Victoria stone, composed of granite chippings and Portland cement, cast in moulds, and indurated by a process somewhat similar to Mr. Ransome's. It forms a capital paving, and a considerable saving has been effected by using it in lieu of rubbed York. The traffic in the areas is, of course, unimportant, but the paving in question has been severely tested in the Poultry and on Blackfriars Bridge, and is standing the test well. The corridors are paved with tiles 1 ft. square and 1 in. thick, in alternate squares of red and buff, with black borders. They are executed in Ransome's material, specially indurated; and when one considers that this material is found most effectual as a grindstone, I am induced to expect that it will stand the effect of friction as well, if not better, than any natural stone. The cost of such paving, bedded and jointed in Portland cement, is very moderate. The quantity required will be about 30,000 ft., and I do not think so good an effect could be produced in any other material with equal durability at so small a cost. The floors of wards are laid with wainscot, as being non-absorbent, and the walls are plastered with Parian cement, with the same object. It has been endeavoured to incorporate a tint with the finishing coat of the Parian, with a view to avoid the glare of the natural white colour, and painting hereafter. Certain experiments were tried, and it was found that, with a backing of Portland cement and a setting coat only of Parian, a more uniform tint was produced than by using Parian throughout. Although great care has been taken in the manipulation, the result is not wholly satisfactory. Had we been able to wait until the walls were completely dry, a more uniform tint would probably have been produced.

The ward windows are constructed in three divisions, as shown on sections, the lower part being hung to open in the usual way, and the upper sash drops to the depth of the transom, which is quite sufficient for clearing the upper stratum of air in the wards. The whole of these

sashes and frames and the greater portion of the doors were made in Sweden, by the firm of Messrs. Eckman. My assistant, Mr. Harris, went purposely to Sweden to inspect the works, and brought back a most satisfactory report of the machinery, drying chambers, and general capabilities of the establishment for turning out good work, and the result has fully justified the confidence placed in them.

The ground floor of one of the pavilions has been used as a drying-room, by building up temporarily the various openings, in which all the floor-boards and other joiner's work have been thoroughly seasoned. One of the many newspaper critics, seeing these openings built up, regretted that the governors were unable to utilise the whole of the hospital, and that some of the wards have consequently been built up. A little inquiry would have enlightened him and explained the reason of the temporary blockade.

In designing the joiners' work, all mouldings and quirks have been dispensed with as far as possible, as such parts only afford harbour for vermin. The wainscot floors are tongued with hoop-iron, the nail-holes stopped with coloured putty, and prepared for waxing and polishing. The windows of the pavilions are glazed with plate-glass, with a view to a more equal temperature, and the corridors are glazed with fluted crown.

It was determined to depend as much as possible on natural ventilation, avoiding all costly arrangements and fanciful theories, at the same time providing the means of changing the air during cold and boisterous weather, and at night. The main extraction-shaft is carried up in the wall-hole of the staircases, and in this is placed the smoke-flue from the boiler, consisting of a wrought-iron tube 15 in. diameter. The boilers for warming purposes would not of course be available in the summer, but the furnace for the supply of hot water and baths would be continuous in its operation. In the upper part of this shaft are also placed the hot-water cistern, and, if found necessary, hot-water coils will be added to assist the rarefaction. Shafts are carried from the ends of all the wards, both at the ceiling and floor level, and from the centre at the stove-shaft hereafter mentioned, communicating with a horizontal trunk in the roof, which trunk is connected with the heated shaft previously referred to. To replace the air thus extracted, fresh air is introduced by means of zinc tubes laid between the "Donnett" arching and the floor-boards communicating with the stoves and hot-water coils, thus passing over a cool surface in summer, and tempered in winter by contact with the heated surfaces before entering the wards, the whole admitting of regulation by valves. Each pavilion has its independent means of warming and ventilating, avoiding as much as possible all complication in the arrangement, but the pipes are so arranged that in the event of a break-down in any one block, its neighbour can come to its assistance during its temporary failure. A chamber is formed under the ceilings of the corridor in basement and ground floor, into which the whole of the rooms in the low intermediate buildings forming the out-patients' and casual departments are ventilated, and this chamber communicates at each pavilion with the main extraction-shaft before described. The wards generally are warmed by three open fireplaces, sided in cold weather by an auxiliary system of hot water. The corridors and staircases are also warmed by hot water. The open fireplaces stand in the middle of the wards, with vertical shafts. These fireplaces might have been arranged against the outer walls, but bed-space would thus have been sacrificed. The stoves might have been placed as they are, but with descending flues to the outer walls. This, however, would have involved great complication in the arrangement, risk of smoke, and difficulty in sweeping, and the piers, already small enough, would have been so riddled with flues that they would have been unequal to carry the weight imposed. It was therefore thought best to carry up a vertical shaft throughout. It may detract somewhat from the appearance of the wards, but it has, I think, great compensating advantages. The shafts are constructed, as shown on the drawings, with an outer case of cast iron, and an inner wrought-iron smoke-tube, 15 in. diameter. The hot metal does not, therefore, come in contact with the atmosphere of the wards, but the space between the two tubes becomes an efficient ventilating shaft which is connected as before with the main trunk in roof. The smoke-

tube is carried down to the basement, and will be swept from below without disturbing the wards. The whole arrangement is capable of easy removal for repair. A cast-iron socket is built into each floor, supported on two small bearers running from girder to girder, and the "Donnett" arching is made good to the same all round, thus avoiding any communication from floor to floor. The outer casing is of cast iron, put up in pieces and bolted together, and is easily removed at any time, should it be necessary to repair the smoke tubes. In the upper story the iron casing is discontinued, and a brick casing built on the concrete floor, which is more convenient for passing through the roof and carrying the external shaft. It will be observed that the three stoves go into one flue. This is made of simple dimensions, and a valve is provided at each stove to close the connexion with the flue when the stove is not in use. As far as it can be tested in the present unfinished condition of the work, the arrangement works satisfactorily. The stoves are formed with an air-chamber at the back, having a large heating surface of metal (but which cannot be heated sufficiently to vitiate the air), standing in a pan of water, somewhat similar to the Gurney stove. The ventilation of the watercloset and lavatories is entirely independent of the wards, and is carried up the shaft in the river turret, in which are placed the hot-water tanks for supply of baths and coils. The stone shafts at the angles form the termination of the foul linen and dust-shoots, which are carried right up to the external air. The ventilation of the museum and school-buildings is on the same general principle, the ventilating and smoke shaft being contained in the tower at the southern end of the building. The whole of the warming and ventilating works have been most satisfactorily carried out by the well-known and experienced firm of Haden & Son, of Trowbridge, and I am glad to bear testimony to their ability and the careful and considerate attention to all works entrusted to them.

The risk of fire is reduced to a minimum; but considering that an alarm even of fire would act most injuriously on many cases, a system of fire-mains and cocks is provided throughout the building. The cocks admit of being served either from the rising main or from the large tanks provided in the towers. A special main has been laid by the Southwark and Vauxhall Company to supply the building, and a constant service will, it is expected, be supplied; but in the event of any accident happening to the main, provision is made by an arrangement of back valves to supply the fire-cocks from the tanks. These arrangements have been carried out by Messrs. Shanks & Mason, whose name is a guarantee of their efficiency. The gas services have been executed by Messrs. Strode, and although not calling for any special description, I may say that they have been carried out in the usual satisfactory manner by that firm.

The lifts, of which there are one in each pavilion, demand a few words of explanation. They are constructed upon the hydraulic ram principle. A boring was made to a depth of 70 ft., and lined in the usual manner for about 22 ft. through the gravel, with cast-iron cylinders to keep back the water; and from this point to the bottom, through the clay, the well is lined with brickwork. In this well is sunk a cast-iron cylinder, 11 in. internal diameter, strongly bolted together in 9 ft. lengths; and within this again comes a hollow ram, 9 in. diameter, working through this cylinder, screwed together in 9 ft. lengths. On the top of the ram the ascending-room is attached, consisting of a strong iron frame with iron roof, all strongly trussed together, and lined with match-boarding. At the top and bottom of this room, on each side, are V guides, lined with gun-metal, the top ones having springs, to prevent oscillation or sudden shocks. At each side are suspending irons, to which are attached strong chains, passing up a groove in the brickwork and over wheels, 3 ft. 8 in. diameter, to the counterbalance; on each side these counterbalances work in recesses, and are grooved to run in guide-irons. The guide-bars for the ascending rooms are of cast iron, placed the whole height, to insure a steady movement. A gear-rod passes through the cage to control the lift, and self-stopping gear is attached. The lifts are worked by fall of water from large tanks fixed in the roof of each block, 104 ft. from basement, each tank containing 2,500 gallons. The stroke or rise of each lift is 63 ft. The pressure of water is 45 lb. per square inch, and the lifts are calculated to raise six persons each

time. This principle has been adopted as affording the most perfect safety attainable. The over-head gear is placed at the sides, in a chamber specially provided, so that in the event of any fracture thereof, no damage would arise to the cage. There is also one foot lift to each block. They are upon the rack and piston principle. The machinery which is in the basement consists in each case of a cylinder, 11 in. in diameter, with piston and rack working in it, with tooth wheel and large drum wheel, on which is coiled the wire lifting-rope, passing to the top of the building and over a one-grooved pulley to the cage, which has guides top and bottom; this cage runs in T iron guides, fixed in each side of the walls, from top to bottom of the lift-hole. A separate wire rope is attached to the top of the cage, passing over a grooved top wheel to the counterbalance, which is also guided on each side by angle-iron guides. The lift is worked by a rod passing up at the corner and communicating with the valve at the bottom. The weight intended to be raised is 1 cwt. The height is 63 ft., and these lifts are worked from the same tank as the passengers' lifts. They are easily controlled at any floor, and stop themselves at the highest and lowest points. The whole of the lifting apparatus has been specially designed and carried out by Messrs. F. Colyer & Co., engineers, St. Mary's Ironworks, Leman-street, London, the whole of the work being of the most substantial character, and nothing has been neglected to insure thorough efficiency, combined with perfect safety.

The electric communication has been executed partly by Messrs. Reid, Brothers, of the City-road, and partly by Messrs. Moseley; the ornamental ironwork by Messrs. Skidmore; and the cooking arrangements by Messrs. Benham & Sons.

In conclusion, allow me to say a few words as regards the cost. The ultimate cost, exclusive of the site, will probably be about 400,000*l.*, including foundations and fittings, or 650*l.* per bed, which, in the absence of any detailed explanation, appears to be a large sum; but if all extraneous buildings are allowed for, and the cost of one pavilion taken which accommodates 111 beds, it will be found that the amount would be reduced to 250*l.* per bed; and considering the cubic allowance of space, the number of attached rooms provided, and the character of the work generally, such amount does not appear to me to be excessive. The cost of the building, exclusive of the concrete foundations and the enclosure railing, is about 94*l.* a cubic foot. The contract, among other things, provides a large medical school building, a building for the training of nurses, large administrative offices for the civil department of the hospital, five residences, and extensive out-patients' department, and the enclosure of eight acres and a half of land, with stone curb and iron railing and parapet walls.

I have now only to bear testimony to the excellent manner in which Messrs. Perry have carried out the work; and to thank Mr. Bullivant, the clerk of works, and all parties who have assisted me, for the zeal and ability with which they have performed their several duties. I fear I must have exhausted your patience by the dry details which I have brought before you; but whatever may be the architectural merits or defects of the building, the magnitude of the structure, and the important position it occupies, renders it perhaps not altogether an unfit subject to be recorded; at all events, you will all agree with me in the expression of a hope that it may be effectual in alleviating the sufferings of the poor, and in advancing the noble art of medicine and surgery.

OWEN'S COLLEGE, MANCHESTER.

THE new buildings for Owen's College are in course of erection on the west side of Oxford-road, Manchester, from the designs of Mr. Alfred Waterhouse. The style of the buildings is Collegiate Gothic of early type. The walls will be faced throughout with York stone, and the roofs covered with slate. Over the centre roof will rise a lofty *flèche* to be used for purposes of ventilation. A similar feature, but lower, will rise over the Chemical Lecture Theatre. The staircases are arranged in large octagonal bays, 33 ft. by 14 ft. and cut off from the corridors by arcades of double columns. The floors of the buildings throughout will be on the Donnett-arch principle.

The scheme includes a main block upwards of 300 ft. in length, set back about 200 ft. from Oxford-road, and running parallel with it; and

it is this portion that is being erected, and which we illustrate in our present number. It is intended that this should ultimately form the western side of a quadrangle or court, 200 ft. in length by 100 ft. in width. The three other sides will not be enclosed at present, but when the entire scheme is carried out there will be a Natural History Museum on the south; a Library, Examination Hall, and other departments on the east (Oxford-road front); while to the north there will be space for additional lecture and class rooms, or for the Medical School.

In our volume for 1870,* we gave a full description of the intended buildings. We repeat, however, some of the chief particulars.

At the rear of the main block is a large space of irregular shape, on the south of which (Barrington-street side) the chemical laboratories are being erected in a detached building; while on the north ample space will be left for an extension of the laboratories, if needed; for various subsidiary buildings; and for a gymnasium.

The main block contains the various lecture-rooms, class-rooms, &c. Each half is approached by a separate staircase, entered from a porch on the east side.

As the full development of the scheme is reserved for the future, some ingenuity has had to be exercised to make temporary provision for wants which will be more adequately met when the whole of the buildings contemplated shall have been erected. Thus one large arts class-room, not required as such at present, will be used as a temporary library; another large room, in the basement, will form a temporary dining-hall.

The southern extremity of the building is devoted, on the basement and ground floors, to the chemical theatre, a room 68 ft. by 40 ft. The Professor's table is at the western end, on the level of the basement floor. The floor of the theatre rises eastwards until it reaches the level of Oxford-road. The other principal rooms on the ground floor will be the engineering drawing-room and lecture-room; natural philosophy rooms; a large arts class-room, with rising floor; the board-room; and secretary's office. On the first floor there are three large arts class-rooms, Professors' rooms (which for the most part are common rooms), the temporary natural history museum, temporary library, students' reading-room, and various small arts class-rooms.

The chemical laboratories already mentioned will form a block 95 ft. square. There are two large laboratories placed side by side, each of them 70 ft. by 30 ft., and 22 ft. in height. There are store-rooms below, and various subsidiary rooms adjoining the laboratories.

The stories will be, except in special parts, of the following heights from floor to ceiling:—Basement, 15 ft.; ground-floor, 17 ft.; first floor, 17 ft. 6 in.; rooms in the roof, 10 ft. The chief exception is the chemical theatre, which averages 28 ft. in height, and some of the large arts class-rooms have been made about 22 ft. high.

The four large arts class-rooms are of the following dimensions: one of them 40 ft. by 45 ft.; two, 40 ft. by 33 ft.; and one 31 ft. by 35 ft.; that devoted temporarily to the library is 40 ft. by 45 ft. The students' reading-room is 34 ft. by 33 ft.; the engineering drawing-room, 52 ft. by 31 ft.; the board-room, 37 ft. by 30 ft.

There are in the buildings now in course of erection 90 rooms in all, of which the Chemical department takes 28; Natural Philosophy, 9; Arts Class-rooms, 9; Engineering, 8.

In the sub-basement there will be hot-water boilers and a steam-engine; the latter to drive a fan for forcing fresh air (warmed in winter) into the corridor and lecture theatre. In the ordinary class-rooms there will be openings for ventilation above the doors, and all the windows will be double hung as sashes, with a light above, hung on pivots, for summer ventilation, to open diagonally, so as to throw the fresh air upwards towards the ceiling.

The whole of the rooms will be warmed by hot-water pipes; but provision is made for the introduction of fireplaces hereafter, if found desirable. Fresh air is also brought into the rooms behind the coils of hot-water pipes wherever practicable. A fine for the extraction of vitiated air will be taken from the ceiling of each room into large shafts in the roofs leading to ventilating turrets, in which steam cores will accelerate the draught.



OWENS COLLEGE, MANCHESTER.—MR. ALFRED WATKINS, ARCHT.

VOLUNTARY ARCHITECTURAL
EXAMINATION.

In August last, a report was received by the council of the Institute of Architects, submitting the following opinions:—

"Proposal 1.—That it is expedient to appoint a standing committee of the Institute, to take charge of the examination, and to add subject to existing regulations; such committee to consist of past examiners and moderators, and other members qualified to deal with the subject.

"Proposal 2.—That it is desirable that the examination be allowed to the competitor who, passes both sections together, a certain concession in respect of the minimum of marks required to pass.)

Further, that the said two sections may be designated the Artistic and the Scientific sections, and that the following divisions of subjects may probably be found convenient, the titles of the subjects, and the number of hours devoted to each, being the same as those adopted for the Class Proficiency in 1870, with only three variations, viz.,—the separation of geometrical drawing and mensuration, the introduction of perspective as a special subject, and the addition of probationary work of practical bearing in the scientific department.

ARTISTIC SECTION.

1. Probationary Work, as at present, prepared beforehand.	
2. Details as at present, but including details and notes of specification.	10 hours.
3. Geometrical Drawing, as at present.	2 "
4. Perspective.	4 "
5. History and Literature, as at present.	4 "
Total.	20 "

SCIENTIFIC SECTION.

1. Probationary Work of practical bearing, to be produced beforehand.	
2. Mathematics, as at present.	3 hours.
3. Mensuration, ditto.	2 "
4. Practical Frases, ditto.	4 "
5. Physics, ditto.	4 "
6. Materials, ditto.	6 "
7. Construction, to take the ordinary form of questions, instead of detail drawings, &c., of the design.	6 "
Total.	25 "

Further, that each of these two sections may be appropriated to it one whole week, on the following, or a similar plan:—

Monday Afternoon	4 hours.
Tuesday Morning	4 "
Wednesday Afternoon	4 "
Thursday Morning	4 "
Friday Afternoon	4 "
Total.	21 "

(Note.—If twenty-two hours, for example, were determined upon as the time for each week (being two hours less than the above), this would enable the artistic section to have two hours more than the total before set forth, which seems desirable; while the scientific section would be relieved of three hours, which seems also desirable. But all such details, as well as the classification itself, might be left to the proposed committee.)

"Proposal 3.—That with a view to afford facilities for students in the preliminary examination, it is desirable that this examination should be held in such provincial towns throughout the United Kingdom as may have resident therein a sufficient number of fellows of the Institute willing to conduct the examination and to make efficient arrangements for subentering the work of the candidates, in accordance with the regulations and to the satisfaction of the council and the proposed committee.

(Note.—This is the whole extent to which it is considered expedient at present to attempt the introduction of the principle of provincial examinations, but it is to be hoped that this measure would gradually result in a large number of architects' pupils throughout the country becoming matriculated students of the Institute, who would thus be induced to come forward in due time for the proficiency examination.)

Further, that every such passed candidate in the preliminary examination should be entitled to the privileges of a student of the Institute for three years following, including the presentation to him of a copy of the sessional papers, upon his satisfying council annually of his progress in study.

"Proposal 4.—That a candidate who passes the proficiency examination with great credit, as indicated by the number of marks, should have a record of "merit" introduced in his certificate. But if any candidate, after having passed the proficiency examination, in both sections, should desire to obtain a certificate of distinction, he must pass a special examination, and prove very high attainments in the leading subjects of the two sections, and in the scientific section.

"Proposal 5.—That the certificate of proficiency should be given only to those candidates who have passed the examination in both sections.

Further, that in all cases, if possible, convey more distinctly than at present the idea of educational qualification for the practice of the profession of an architect, so as to be similar to other professional diplomas. Further, that past examiners, as they be members of the Institute, might be advantageously recognised by the title of graduates of the Institute, with or without honours, as the case may be.

"Proposal 6.—That it would be desirable to identify the examinations with membership of the Institute upon some such principles as the following:—

Every passed candidate in proficiency to be held entitled further to the special consideration of the council for his nomination as an associate,

In conclusion, the examiners and moderators beg to state that any alterations in the rules or mode of conducting the examination which may be rendered necessary by the adoption of their suggestions, are intended to be applicable to the examination of 1872, and following years, but not that of 1871.

This Report is now adopted, and has been referred to a standing committee, to be charged with the general management of the voluntary architectural examination.

HOSPITAL ACCOMMODATION FOR
SHOREDITCH.

OWING to the rapid increase of the small-pox epidemic, the Shoreditch vestry has been obliged to erect a temporary hospital for the district. Messrs. Hill, Keddell, & Waldram, the builders, have had during the last week a number of workmen expediting the erection of a timber structure, on the site of the Hackney-road disused burial-ground, lately occupied as the drill-ground of the volunteer bodies. The building is 100 ft. long, 22 ft. wide, and about 20 ft. high. It is ventilated from the roof by ordinary wooden louvres. It is entirely composed of timber, with a felt covering over the boarding of the roof, and it is well lighted with six windows on each side. The cost of the erection of this temporary shed, independently of fittings, furniture, &c., is 3697. odd. As usual, the voicing of the supplies for this urgent need was the signal of factions opposition on the part of some of the members at the vestry meeting.

We cannot agree with the wisdom of the vestry, however, in their choice of site. Surely an old disused churchyard was not the proper place whereon to erect such a structure. We do not wonder that the inhabitants in the vicinity of this improvised small-pox shed are indignant at its erection in its unseemly situation. If the epidemic continues to increase, this building will prove altogether too small, and then enlargement will be impossible, consistent with the proper treatment necessary to the recovery of the patients. The providing of extra accommodation for only forty patients, or under, though a measure of relief, is not one including foresight.

We sincerely hope, however, that the vestry, or the parish, will never require further accommodation, and that the serious epidemic with which London is visited will rapidly decrease.

The Bethnal-green vestry and board of guardians, instead of being at loggerheads, should at once set to work in providing hospital accommodation also for the pauper, and ordinary poor and indigent of the parish. To our own knowledge, no district with which we are acquainted requires it worse. The poor are dying in both parishes under notice, dying in the poorhouses and outside of them: they are dying in many yards and alleys a double death, dying of starvation and the small-pox.

A NEW STYLE OF ARCHITECTURAL
CRITICISM.

ALTHOUGH it may be thought in this age that we have more than enough of critics for every species of work and composition, yet it is a curious fact that the architectural critic is a being who has still to see the light. We have had many men who wrote accounts of buildings, and many of the papers throughout the kingdom have often a description of some structure in course of erection; yet they show a lamentable amount of ignorance, and no more bear comparison with the criticisms on an author and his book, or an artist and his painting, than an after-dinner speech does with a polished essay. The style of the so-called architectural criticism generally is in the following strain:—"The church is Early English Gothic. It is in the form of a cross, and has aisles, transepts, and a chancel. It has a large handsome tower and spire, 200 ft. high. The porch is in the centre of the front gable, and is surmounted by a beautiful three-light window. The interior is handsomely decorated, and the roof is open. It cost 10,000*l*. Mr. — was the architect, and Mr. — was the contractor for the works." Suppose we try how a criticism of a painting, written in a similar manner, would look:—"The landscape painting entitled "Morning" has some purple hills in the background, a green meadow in the foreground, and some cattle grazing beside some willow trees. A brown brook flows past the trees, and in the distance a man is fishing. The picture is 2 ft. high by 4 ft. long. Its price is 500*l*. Mr.

— was the artist, and Mr. — stretched the canvas and made the frame." Thus we find that the absurdities of our architectural criticisms are not known till we show them by contrast with others, and what is absurd in one instance ought surely to be absurd in the others.

But how is it, then, that such a persistent and ubiquitous race like critics have not entered the arena of architectural criticism?

In the first place, there was no occasion for them. So long as a man does mere mechanical machine-work he does not deserve praise, but as soon as he emits ideas of his own, and works by his brain, then every one is willing to do him honour. No man is praised for copying an essay written by another, but as soon as he composes one himself, then, if there be any merit in it, the public will do him justice. Since the time of Inigo Jones and the Renaissance, therefore, architects have been satisfied to be the mere essay copyers, content, not to give their own thoughts, but the thoughts of ancient Grecians and Romans, Venetians and Frenchmen, whose names have long been forgotten; and as they never aimed at anything higher, of course no critic arose to praise them. There being no occasion, then, for an outsider learning anything about architecture, as the architects themselves knew very little besides the one style they copied from, the latter had it all their own way; and thus, for want of educated critics, such plagiarisms were permitted, and such essays were erected, that had anything similar happened either in painting or literature, it would have been enough to drive its professors into everlasting disgrace.

Fancy eminent artists making themselves a name, by painting pictures professed to be partly copied from celebrated works by Michelangelo, Raffaele, and others. Or celebrated authors writing books which were partly copied from the works of Bacon, Shakspeare, or Milton, and getting great praise for their copying and imitative powers. Yet this is exactly what has been happening in the architectural world for three hundred years, and scarcely a word has been said against it. The great reason why architects have done so is because the names of the men who designed those ancient buildings have been lost. The structures have been considered, not as the work of men, but as a part of nature; and, as nature is considered a great storehouse for art and thought, so these wonderful buildings were looked at merely in the same light, and held to be a vast repository of ideas and details which were at everybody's service. While an architect, therefore, would have no hesitation in saying that he borrowed some feature from the Ducal Palace or Ely Cathedral, he would extremely dislike it to be said that he plagiarized from Pietro Bessaggio or Alan de Walsingham.

In the present architectural criticisms no one is ever seriously found fault with, and all get a modicum of praise, in a set form of words, which mean little or nothing. There cannot be life where there is such apathy. It would be much better for architecture if there were more quarrelling and fighting, not among themselves, but with others; more hard things said, and severe things meant. There is no doubt that the over-praise of Turner, to the detriment of all else, by Ruskin, did a world of good to painting; and we would hail with pleasure the critic who should deal similarly with architecture, denouncing the works of some of our so-called greatest architects, and pointedly telling them their fanes, their weaknesses, and their ignorance.

Architects unfortunately have no special reputation to maintain, like an artist or an author. How often is an artist violently assailed when, after reaching eminence in figure-painting, he attempts to paint a landscape; or an historian, when he attempts to write poetry. They are quickly told their mistake, and almost forced back into their several departments. Why should it not be so in architecture also? It may be all very well for a country architect, like a country grocer who combines many stores in one, to design everything, from a stable to a church. But a city architect, like a city store-keeper who restricts himself to selling only one class of goods, should restrict himself also to designing only one class of buildings. We could name many well-known architects, whose mansions were admirable, but whose churches were hateful, and *vice versa*. There is so much to learn in all the different classes of structures, that it is impossible for one man to be proficient in them all. It is only by our architects dividing themselves into classes, such as church architects, house architects, theatre architects,

&c., (just as we have portrait-painters, landscape-painters, and historical painters,) and bringing up their pupils and apprentices only in the one branch, that our art can ever make the progress which we all desire it should have.

Unfortunately such an object cannot be accomplished in a day, for so great is the rage at the present time for money, that no architect, however large may be his business, will ever refuse an order, and send his client to one more versed in the style of building required. Although he prefers to design houses (having given almost all his attention and study to them), yet if a church is offered him, he eagerly accepts it for the sake of the per centage, knowing well that whatever kind of an erection he may put up, there are no critics to cry him down, and blast his name for any future work. Thus have art and the people to suffer for the chaos in the architectural world. Yet if we can read the tendencies which are at present showing themselves in this direction, we may be sure that before this century closes, many of the reforms which are now considered as merely visionary chimeras, will be accomplished and established facts.

Now, then, that the copying era which has disgraced our profession for so many years is at last subsiding (not from any noble motive, alas! but simply because there are no other good styles to copy), and that it is evident there is a great field open for vigorous and enterprising minds, we may hope that a new race of critics will spring up to do it justice—men who are thoroughly acquainted with every living and dead style of architecture, and yet are largely gifted with that ungrateful faculty of common sense; men who will understand, appreciate, and assist the efforts of those few aspiring geniuses who are throwing off the trammels of custom and stupid veneration, and are endeavouring to form a style more worthy of our country, and more in unison with our enterprising and inventive century; men who will give honour where honour is due, and help the architect to restore himself to that high position from which he has excluded himself for so many years.

Nova Scotia.

ANDREW DEWAR.

THE RECENT SALE OF HOLBORN VIADUCT LAND.

SIR,—On the 11th of last November, the City authorities offered for sale by auction certain portions of the lands which they have become possessed of and cleared in forming the Holborn Viaduct. Out of curiosity I attended the sale, and now send you, with the utmost brevity at my command, such details as I noted. The question of waste land in London is becoming so important, whether from a ratepayer's point of view, or a London improver's point of view, or a mere inhabitant's point of view, that you may perhaps deem the particulars now sent of sufficient importance for a place in your valuable columns. The lands were offered on building leases of eighty years, and the biddings were all rental biddings. Thirty-one lots were put up.

Lots 1 to 4 face Farringdon-street, and are situated on the east side of that thoroughfare, close to the south of the Viaduct. They run from Turnagain-lane to the bridge stairs.

Lot.	Feet Frontage.	Feet Superficial Area.	Reserve Rental.
1	22 to Farringdon-street } { 50 to Turnagain-lane	1,050	£75
2	20 to Farringdon-street	900	55
3	20 " " "	700	50
4	20 " " "	500	50

Lot 5 was the most important lot in the sale. It is situated at the top of the new street (St. Andrew's-street) now forming from the Viaduct-circus to Fleet-street, and has a frontage of 20 ft. to Holborn-circus, and 52 ft. to the new street. The price fixed for the freehold of this was twenty-seven years' purchase, all the rest of the lots in the sale being twenty-five or twenty-six years' purchase. Lot 6 adjoins lot 5.

Lot.	Feet Frontage.	Feet Superficial Area.	Reserve Rental.
5	20 to Circus; 52 to Street	1,588	£250
6	20 to Street	550	100

Lots 7 to 12 face the Viaduct, and are situated in its north side, occupying the front of the

piece of ground between Messrs. Fearon's premises and Shoe-lane, lot 7 being next to Messrs. Fearon's, and lot 12 next to Shoe-lane.

Lot.	Feet Frontage.	Feet Extreme Depth.	Feet Superficial Area.	Reserve Rental.
7	20 to Viaduct	43	810	£130
8	20 " "	53	1,065	125
9	20 " "	65	1,310	145
10	20 " "	68	1,310	160
11	20 " "	69	1,373	170
12	{ 21½ to Viaduct } { 73 to Shoe-lane }	73	1,400	200

Lots 13 to 21 are situated in Charterhouse-street (the new street from Holborn-circus to the Meat-market), and occupy the whole of the south side of that street, from Messrs. Fearon's back premises to Shoe-lane. The backs of these lots meet the backs of other lots.

Lot.	Feet Frontage.	Feet Extreme Depth.	Feet Superficial Area.	Reserve Rental.
13	20	61	1,240	£150
14	20	69	1,380	170
15	20	74	1,480	180
16	20	74	1,400	175
17	20	61	1,157	145
18	20	63	974	140
19	20	43	760	110
20	20	32	646	Unknown
21	{ 65 to Charterhouse-street } { Shoe-lane } { together }	...	730	110

Lots 22 to 26 are in Shoe-lane, at its extreme north end, and on its west side. They lie between lot 21, which has a face in New Charterhouse-street, and lot 12, which faces the Holborn Viaduct.

Lot.	Feet Frontage.	Feet Extreme Depth.	Feet Superficial Area.	Reserve Rental.
22	20	23	445	£50
23	20	31	610	55
24	20	49	774	70
25	20	49	937	90 (?)
26	20	57	1,100	100

Lots 27, 29, 30, and 31 are on the west side of Farringdon-road, near Charterhouse-street, just where the City has committed the enormous blunder of narrowing noble Farringdon-road; and lot 28 is at the back of lot 27, and has frontages in Charles-street and Saffron-hill. The northernmost of these lots, lot 27, has one face in Charles-street:—

Lot.	Feet Frontage.	Feet Extreme Depth.	Feet Superficial Area.	Reserve Rental.
27	To Farringdon-road, 39 ft. To Charles-street, 50 ft.	...	1,368	£135
28	To Charles-street, 43 ft. To Saffron-hill, 14½ ft.	...	905	55 (?)
29	To Farringdon-road, 20 ft. To Saffron-hill, 20 ft.	84	1,680	125
30	Ditto .....	...	1,620	120
31	Ditto .....	...	1,560	115

The result of the sale was that lot 1 was sold, and all the rest of the lots bought in.

OBSEVER.

THE COMPLETION OF ST. PAUL'S.

A SERMON in aid of the fund now being raised for the completion of St. Paul's Cathedral, was preached last Sunday, at the afternoon service in the cathedral, by the Rev. Canon Liddon, before an immense congregation, which filled the choir and the great space under the dome. The preacher selected as his text the 14th verse of the 5th chapter of Matthew,—"A city that is set on a hill cannot be hid;" and having dwelt on subjects suggested by the text, proceeded to say:—"Looking at the past history of our country, St. Paul's has been a central sacred spot in London since London has been Christian. Upon this very site, where, as it would seem, the heathen goddess Diana was once worshipped, as patroness of their sports, by the officers of the Roman Pastorian camp, who hunted in the neighbouring forest, Christ has been now adored for at least thirteen centuries. Here, in the time of the Roman occupation, or at least in the days of the Saxon city, whose walls extended half-way down Ludgate-hill, the great teacher who had preached the unsearchable rules of

Christ gave his name to this temple of the Divine Redeemer. Since then it has undergone vicissitudes which it is no part of my business to detail, because this present fabric is, every stone of it, a modern church. The Great Fire of London left a ruin which, after a moment of hesitation, it was found necessary to remove, and the present building has not yet seen its 200th birthday. Now, looking at the matter from one point of view, we might regret that the St. Paul's of our day has no visible connexion with the great cathedral which stood on this site during the most stirring and critical periods in Church history; but from another point of view we may find matter for congratulation that it is of modern origin. It has been said of the Reformation, that whatever else it achieved or swept away, it sounded the death-knell of Christian art. In the centuries which preceded the Reformation the religious use of art had been made the occasion of some conspicuous abuses, and the reaction which reached its limit in the destructive fanaticism of the seventeenth century was, perhaps, more natural than at this day we can entirely understand. But to this criticism I dare to say that the Cathedral of St. Paul's is a magnificent rejoinder. The rebuilding of the cathedral after the Great Fire of London was not the work of this city alone, but of the whole church and country. It was announced in letters patent; it was carried out by contributions from all parts of the kingdom, and by the taxation of London and Westminster. It was re-erected, according to the letters patent, "to the glory of God and for the promotion of the divine services therein to be celebrated." It was "to equal, if not to exceed, the magnificence of the former cathedral church when in its best days, and to become much more than formerly the principal ornament of our city and an honour to our Government and realm." And this was not far from being achieved when it seemed as though the great work—the consummate effort of its architect, Sir Christopher Wren—was to be lost, after all; and that when St. Paul's had reached a point at which, for its exquisiteness of external form, it stands alone amongst the churches of Europe, it was denied all that was to be gained by ornamentation and colouring. I will not dwell on the mistakes and petty jealousies which dashed the hope of the great architect, since they have been described by one whose name can never be mentioned here but with honour—the late Dean Milman. Doubtless this latter church has glories of its own—some that are attested to by its monuments, some that live only in history, some that you who are now close to the dust of Nelson and Wellington need not to be reminded of.

The question is whether the work of Wren is still to continue an unclothed skeleton—whether the seventeenth century, with its infinitely poorer resources of wealth and art, is still to reproach the nineteenth, with its purer and stronger enthusiasm for God's honour—whether this city, set on a hill before England and before Europe, is to be continuously conspicuous, not merely for the high eminence of beauty at which its structures aimed, but for the utter failure to attain it. Taken altogether, St. Paul's is the most important ecclesiastical building in this country. I do not say it is the most beautiful. That is a question of taste, and I do not dispute the glories of Lincoln, and Durham, and Westminster. They belong to a different category of beauty; and while they may be fitly compared with each other they cannot be compared with St. Paul's. Nor do I say it is first in ecclesiastical rank. It is, as we all know, subject to the metropolitan church of Canterbury, and it cannot of itself, as do York or Canterbury, claim the rank of a metropolitan church. But apart from these questions of taste and precedence, the superior importance of St. Paul's lies in this simple and most pregnant fact—that it is the cathedral church of London, of this mighty city, the capital of England, the capital of this vast empire, the capital, in some respects, even of the whole civilised world. St. Paul's is a representative Christian church; nor are its outward form and fabric unworthy of its position, as its mighty dome towers above all the surrounding mass of buildings, and even not seldom above the dense atmosphere, that attests a year by year more and more surprisingly the onward march of your vast industrial civilisation, and thus lifts high into the upper skies the symbol of our Lord's own work, and seems silently to continue the

great apostle's determination to glory only in the cross of our Lord Jesus Christ. It is a public advertisement, seen and understood by all of the power and triumph of Christianity.

It is marvellous that the English people, whose bridges, and palaces, and senate-houses, and quays, and railways, and streets, and viaducts are so numerous—that this English people, so truly imperial in its conceptions, so prodigally lavish of its wealth when this world and its wants are in question, should be so little capable of rising to the level of moderate generosity when it stands on the threshold of the next.

It is for you to say whether another generation shall pass away, leaving St. Paul's as it is; or whether, by your present efforts, and by your persevering interest, a most important step is or is not to be taken in our day towards making this church worthy of its great position in the metropolis of England and in Christendom.

DANGEROUS STRUCTURES: BUILDING ACT.

At Guildhall, the Rev. Dr. Stabbing, of Hampstead-rolled down summoned before Mr. Alderman Stone, as the proprietor of the house, No. 5, Fish-street-hill, to show cause why an order should not be made on him to pull down and rebuild the party-wall of that house, which was dangerous to the public.

Mr. Baylis appeared in support of the summons, which was taken out by the Commissioners of Sewers. He said that some time ago the Metropolitan Board of Works pulled down a house next door to Dr. Stabbing's house and left the party-wall in a very unsafe state. The board had shored it up, so that there was no immediate danger, but from the fact that some houses had fallen recently in the same street the Commissioners of Sewers had felt it their duty to apply for a peremptory order to have the necessary repairs done. They had also summoned the Metropolitan Board of Works, as it was alleged that they had an interest in the ownership of the party-wall.

Mr. Goddard, surveyor to the Metropolitan Board of Works, said that he attended out of respect to the Court to say that the Board had no interest whatever in the party-wall.

Evidence having been given as to the state of the wall and to the service of the proper notices on the owner, Alderman Stone made a peremptory order for the repairs to be made immediately.

METROPOLITAN BUILDING ACT CASES.

DISTRICT SURVEYOR'S FEES.

In the month of March, last year, a person signing his name James Roots, builder, Catherine-street, Poplar, sent a proper notice, on a form approved by the Metropolitan Board of Works, to the district surveyor of Bow and Poplar, and therein stated his intention to erect two offices and a dwelling-house at Dingle-lane, Poplar. The buildings were erected as stated in the notice, and duly surveyed by the district surveyor. Several weeks after the buildings had been completed, on the 22nd of September last, a bill was sent to the address given on the notice, in a registered letter, of the amount claimed (£1. 10s.), but the letter was refused, and returned through the post. The district surveyor's clerk afterwards called at the address several times, to inquire into the matter, and to apply for payment of the charges, when he was informed that the buildings had belonged to Mr. Roots, and that the James Roots living at Catherine-street is not a tenant of the buildings, and was not doing about it or the buildings which had been erected at Dingle-lane. In consequence of this remarkable circumstance, a summons was taken out at the Thames Police Court, and after two adjourned hearings, before Mr. Paget, on January 19th, it was proved to the magistrate's entire satisfaction that the James Roots mentioned in the notice was the builder, that he had been seen giving directions to the workmen actually doing the work, that he had also himself assisted in the erection of the buildings, and had brought several of the materials in his cart to the premises. The magistrate considered it as an attempt at imposition, and ordered the defendant to pay the amount of the claim forthwith, with the costs of the summons and witnesses, and the attendance of the district surveyor on each occasion, or in default one month's imprisonment. The money was paid.

DANGEROUS STRUCTURES.

SIR,—Your well-timed article as to the catastrophe in Thames-street, and cogent reasons for the district surveyor's performing a necessary duty as to the buildings in the City, induces me to call attention to some houses in Widgeate-street especially, and the houses in that district generally.

Having occasion two or three times each week to pass through the above street, I have been surprised that the City authorities have not ordered the demolition of those premises, as has been done in the case of the houses in the same street actually doing the work, that he had also himself assisted in the erection of the buildings, and had brought several of the materials in his cart to the premises. The magistrate considered it as an attempt at imposition, and ordered the defendant to pay the amount of the claim forthwith, with the costs of the summons and witnesses, and the attendance of the district surveyor on each occasion, or in default one month's imprisonment. The money was paid.

SLATE CISTERNS.

SIR,—I have lately put up a slate cistern, of 14-in. slab, 12 ft. 6 in. deep, which covers a W.C. and lavatory, and found a complete and perfect fit, and is open to the atmosphere; the cistern is carried on iron girders, wood joists between it, and lath and plaster to which forms ceiling to W.C. and lavatory. Since the building has been erected and completed, which was done during the heat of last summer, and as rain and damp weather came on, there has been found a continual discharging of water on its under-side, and running through the ceiling and down

the walls. On taking down the plaster ceiling, and applying charcoal fire, I find that the joints of the cistern are all quite tight, and that the water comes from no one or two places, but commences as a mist all over the cistern, and increases until perfectly loaded, and then discharges itself and runs down. I find this continues to be the case when left to its natural temperature. The question I want to know is, it is possible that the water can sweat through a 14-in. slate slab, and thus collect on the bottom of the cistern? And is it possible that two small pieces, of 6 ft. square, with a small air-brick near the bottom of the cistern, for the purpose of giving it air, as fixed in the walls for that purpose, can supply a vapour sufficient from the air to cause such a constant discharge of water. I find it quite dry in frosty weather. Some practical information on this matter will very much oblige A. BUILDERS IN A PUZZLE.

KITCHEN BOILERS.

SIR,—We have lately been schooled into various modes of preventing the bursting of kitchen boilers, and many suggestions have been made, requiring an entire change of the usual water-fittings in dwelling-houses. One of the simplest and most practicable plans that I have seen noticed is that of allowing the water-taps to drip during frosty weather. This being not only waste of water (sometimes extremely scarce in a season as we have been lately experiencing), but also entails trouble, or is a tax upon the memory. We may remedy the former, but should not trouble ourselves about the latter. I have long since, indeed for years, adopted a very simple remedy. In nearly all houses in large towns supplied with water by public companies, there is a stop-cock where the water-pipe first enters the house. I have had attached to the pipe two small taps, one at each side of the stop-cock. On frosty nights I turn off this main cock, then open the one nearest the entrance from the street, to allow a small drop to run from it; this will not freeze so long as you keep it running. I next empty all the pipes through the house by opening all the taps, and as the stop-tap prevents their running, I open the other small one near it, which gives vent to the whole. Of course when the pipes have to be refilled next day, the two small taps are turned off, and the main stop cock turned on.

SEVERAL manufacturers have devised means to prevent the bursting of kitchen boilers in the event of accumulation of steam, and have sent us particulars. We can only specify them:—Messrs. Tylor & Sons make an improved dead weight safety-valve, not dependent upon any lever or hinged joint.

Mr. Geo. B. Cooper has registered a safety hot-water circulator, for insertion within the back boiler of kitchen ranges, bath supply, and hot-boiler of kitchen ranges, bath supply, and hot-boiler of kitchen ranges. It consists of a cast-iron gronp of narrow water passages, forming a condensed continuous line of heater from inlet to egress, and is immersed in the boiling water of the back boiler of the kitchen range, which is open by communication with the small service cistern.

Messrs. Waterson & Co.'s plan consists of an iron tube screwed on to the up or down pipe near the range: the water cistern at the bottom and comes out at the top of this tube. The tube is a cylinder, and open top and bottom, with a jet of gas burning through it, the whole thing being not unlike an Argand lamp-glass, only the water causes a strong circulation through the pipes, and makes it impossible for them to freeze.

And Messrs. Roper & Russell have patented a valve in the shape of a thin diaphragm of copper fixed over a hole cut in the top of the boiler, which splits in the event of undue pressure, and lets off the steam and hot water by means of a pipe above the diaphragm.

HOLLOW BRICK WALLS.

SIR,—In your impression of the 21st January a correspondent, "asking for information as to the construction of hollow walls," objects to the use of "brick ties," which, he asserts, will convey the moisture "in vertical lines, just as if the wall was solid brick, which, in fact, it becomes at the tie."

His assertion is not based on fact, and if left uncontradicted, may prevent many in the future from enjoying the luxury of living at any season (more particularly such a one as the present) in a house constructed with hollow walls, and unaffected by external changes.

A house is defined as "an enclosed space," and I see no reason why it should be so defined, and the film of air, which by its influence prevents, to a great extent, our butter from melting in the summer or from freezing in the winter, will also preserve the temperature of all interiors from the ever-varying influences of the weather.

The value of an air space as a non-conductor of heat, cold or damp, is known to all understanding practical science, and as the patentee of the only "brick tie" employed to secure this great desideratum, which your correspondent condemns, I am prompted to address you in its defence.

Sixteen years ago I patented a glazed stone-ware bonding brick, of peculiar form. Profiting by the experience of the past, I have more recently patented another form of brick, made of the same material, and of a shape that not only practically prevents the passage of moisture from external to internal walls, but also tends from its form to greatly strengthen any structure in which these "brick ties" may be used.

By their employment hundreds of basements and retaining walls, many of them below the Thames level, have been converted into dry and valuable spaces, for storage purposes. Among these I would more particularly refer to the basements in the docks, now used for the storing of tobacco, and thousands of houses of every class, standing in most exposed situations, all of which are warm in winter, cold in summer, and dry at all times.

These "brick ties," and also those on the same principle in iron, have often been illustrated, and described in the advertising columns of the *Builder*, and to those who desire to know more about them, I shall be pleased to send an illustrated description, showing their application to walls of any thickness.

My whole life has been one continued experiment, and but for the value of your space, I would furnish many interesting results. Permit me to give one as illustrating the advantage of an air space in party-walls in cases of fire.

On an old stone landing I built four walls, the back and one of the side walls being hollow, and bonded with the "brick ties," the remaining side I built solid, "every course well flushed in." The front was constructed with openings for the admission of air to the fire I proposed to make within this enclosed space.

At the end of three days, the work having become set, I made a fire in the interior, and this I kept up until my solid wall was nearly red hot. At this time the external faces of the two walls, built hollow, were not more than warm, proving that many fires would be prevented from extending, if party-walls were thus constructed. I have also tried other experiments, as to the conduction of sound, with equal success; but hoping soon to be able to publish my experiences in these and other subjects, I will not further trespass on your patience.

GEORGE JENNINGS.

In Hampshire it is the general practice to build hollow brick walls, either two half-bricks with iron ties, or two 3-in. walls with the same. These walls are more effectual against damp than 14-in. solid walls, as in these parts the bricks are so porous as to be like a sieve or sponge, for want of breeze, and are at all times obliged to be battened. In the case in point two 3-in. walls should be adopted.

W. B. W.

THE PRICE OF EARTHENWARE PIPES.

SIR,—Having for some time represented a manufacturer of sanitary drain pipes, I can fully testify to the good office of your correspondent in ventilating this subject, more particularly for the benefit of country builders and contractors; at the same time, it is due to large manufacturers, as Messrs. Beaumont, Doulton, Knowles, Cliff, Stiff, Millichamp, and others, that they adhere to the set Lambeth list of prices. It is the immense disparity in allowance of discount that forms the greatest detriment to the trade. I may add, that my firm, buying largely for cash, are enabled to sell at lower prices than those quoted by small manufacturers, to whom, I presume, the writer in your valuable journal directs attention.

A MANAGER.

FROM ITALY.

A CORRESPONDENT from Florence writes to us:—Various plans are suggested for the prevention of further inundations in Rome, but none acted upon as yet. The damage done by the last is incalculable. I have heard many accounts of the state of Rome,—the walls of the houses still saturated with water to the height of 2 metres; the mud that was cleared out of the shops left in heaps in the streets, instead of being carried away. A friend told me that there was so unhealthily a smell pervading most parts of Rome that he was afraid of staying there. The doctors are advising all those bent on going to go at once, before the sun draws out the malaria. We had a pretty sharp shock of an earthquake on Sunday night. It was severe at Ravenna, and we had only the fog-end of it. They have appointed, after many changes, a young, active man, as minister of public cleansing in Rome (Silvestrelli). The office was refused

by many, the cleansing of the Augean stable seeming too difficult a task to attempt. As to Florence, it is having its last fling of gaiety while it is a capital, and will settle down, after Jane, into its quondam state. All projects of improvements *begun* are to be finished; all improvements of which the plans are made are to be carried out; those only talked about, not begun, to be relinquished. The Society for the improvement of the town is going to carry on extensive improvements in Rome. I am anxious to see what will be done with the Campagna. Italy is certainly making strides in science, but not in literature. Much good will come to Italy by the Mont Cenis Tunnel, the St. Gothard Railway, and the Suez Canal.

MODESTY OF A BOARD OF GUARDIANS.

SIR.—At a meeting of the Portsea Island Board of Guardians, on the 25th ult., one of the subjects under consideration was a communication from an official of the Poor-Law Board, requiring certain information (indicated on a printed form), such as the cubic contents of rooms and wards, and a few other matters equally simple. After considerable discussion, the guardians confessed their inability, without professional assistance, to direct any officer of their union (a large one, by the way) how to proceed to fill up the return asked for. In justice to the guardians, however, it should be mentioned that one of their number (intuitively, perhaps) came to the conclusion, that if the required particulars were not given,—i.e., if the Poor-Law Board did not know whether the laws it was appointed to administer were fulfilled or not,—this same Poor-Law Board would "insist upon adding a new wing to the building, which would involve an outlay of 10,000*l.* or 12,000*l.*" Whilst another gentleman, more logical if less learned, came near to solving the difficulty by suggesting that a schoolboy should fill up the form in question.

My object in making the above remarks, sir, is not to throw ridicule upon gentlemen who devote their valuable time to the public service, but merely to hint that the foregoing example might profitably be followed by other public bodies under analogous but more important circumstances. To illustrate my meaning more clearly,—suppose, for instance, such a slice of patronage as that shadowed forth in the happy thought of the "new wing" falling to the lot of such a Board, and its members candidly admitting their inability to decide, *unaided*, upon the merits of competition or any other designs for accomplishing the object in view, what an advantage it might be to the community!

ONLY A BUILDER.

Books Received.

Ancient Irish Architecture, Kilwalkedar, County Kerry. Drawn by ARTHUR HILL, B.E., Architect. 1870.

Templenhoe, Ardferd. By the Same. 1870.

FOLLOWING up his publication illustrating Ardferd Cathedral, mentioned in our volume for 1870, Mr. Arthur Hill has illustrated, in two separate books, the churches of Kilwalkedar and Templenhoe, both small and early buildings, more interesting in an archaeological than an architectural point of view, though not without value in the latter respect, too.

The Hiberno-Romanesque building at Kilwalkedar was originally covered with a stone roof, on the corbel or overlapping principle, and the jambs of the entrance doorway slightly incline inwards towards the top. The chancel is later than the nave, though still of the round-arched period. The interior of the nave is decorated with a series of half-round shafts, that divide the side walls into panels immediately below the curving of the roof.

Templenhoe terminated with an apse, now gone. The south window in the nave, which is in good condition, is moulded and surrounded in the inside by a band of elaborate ornament, consisting of a series of conventional flowers and figures, delicately carved. In both cases a number of photographs show the actual (and very ruinous) condition of the building. It is very desirable that careful records should be obtained of these buildings, fast passing away; and all who are interested in the antiquities of the country, especially Irishmen, should aid Mr. Hill in his

undertaking, by purchasing his books. It is a pity that his first work was not published of the same size as those now issued, so that all hereafter might range.

VARIORUM.

"THE Sixteenth Annual Report of the Wesleyan Chapel Committee, 1870," just now published, shows that since the Conference of 1869, the committee have sanctioned the following cases:—

138 Chapels, at an estimated cost of	£12,354
16 Ministers' houses ditto	13,825
23 Schools ditto	8,479
68 Enlargements and alterations, ditto	30,037
53 Modifications of cases previously sanctioned, at an estimated additional outlay of	19,723
27 Organs	5,545
390 total cases.	Outlay £219,904

Compared with the preceding year, these figures show an increase of 11 chapels, and of 18,938*l.* in proposed outlay; an increase of 3 ministers' houses, and of 2,332*l.* in proposed outlay; a decrease of 1 school, and of 6,450*l.* in proposed outlay; an increase of 23 enlargements and alterations, and of 14,581*l.* in proposed outlay; an increase of 10 modifications, but a decrease of 4,626*l.* in proposed additional outlay; and an increase of 8 organs, and of 2,558*l.* in proposed outlay. The number of chapels is the largest sanctioned in any one year; but the proposed outlay has been once exceeded. New schools, built in connexion with new chapels, and settled upon the same trustees and trusts, are not separately reckoned. Upon all the classes of cases sanctioned there is an increase of 54 cases, and of 26,938*l.* in proposed outlay. The report includes views of a number of the chapels and schools that have been erected. The design for the most important, the Scott Memorial in Westminster, site for which has cost about 10,000*l.*, is not one of the best works of its architects, Messrs. Wilson & Wilson, of Bath. The size of the tower and spire contrasts oddly with the excessive meanness of the side elevation.

—The *Art-Journal*, speaking of the International Exhibition of 1871, says,—"With regard to the foreign contributions, Belgium has applied for a large increase of space; and having obtained somewhat, has asked for more. Sweden and Norway will fully occupy the space allotted to those Scandinavian kingdoms. In addition to the articles they will exhibit under the ordinary conditions, they have engaged to erect a model school-house on the grounds adjoining the galleries, to fill it with their scholastic appliances, and, in fact, to transport to London a working model, or rather, an actual sample, of a northern school. Under the present state of public feeling on this subject this idea is eminently happy, and its accomplishment can hardly fail to secure a great success. The smaller German states will fill their respectively allotted divisions."

Miscellaneous.

A Self-Delivering Tunnelling Machine.

The Duke of Sutherland, Captain Tyler, and other gentlemen went down recently to Snodland, Kent, to witness the working of Brunton's tunnelling machine in grey chalk. The addition has been just made to it of a self-delivering apparatus, as it was found that hand-labour could not at all contend with the quantity of debris produced. The machine operates by revolving cutters, which continually chip away the end of the tunnel. There is no concussion, as every motion of the machine is circular. The debris is collected by revolving scrapers, and delivered on to an endless band, which tips it into wagons or barrows at the rear of the machine. The rate of working was 3 ft. 9 in. per hour, and was continued for about two hours, with intervals. The machine was working with only six cutters, and taking a chip of only 1 in. in depth. It has been proved that a chip of 2 in. can be taken as readily as one of 1 in., and twelve cutters can be used. The result would be a speed four-fold that attained; but it was considered that 3 yards an hour in a tunnel of 9 ft. diameter would be as fast as the full wagons could be conveyed away.

New Theatre, Dublin.—Mr. C. J. Phipps writes,—"Allow me to say, with reference to your notice of the new theatre about to be erected at Dublin, that it is expected to seat 1,900 persons, not 2,500, as stated."

The Mortuary at St. Mary's, Stratford. This public mortuary and post-mortem room, of which we gave some account before it was erected, has at length been built by the vestry of St. Mary's, Stratford-by-Bow, in the churchyard of that parish. The plans of Messrs. Hill & Fletcher, architects, were followed; and the result is that there is a striking contrast between the wretched ladder-shed in which post-mortem examinations were wont to be held, by the aid of a dark-lantern, and the present erection at the other end of the churchyard. The selection, in the present instance, of the churchyard obviated all difficulty as to site, but presented others from the limited area of ground at disposal and the desirability of avoiding any injury to the general appearance of the church and its surroundings. The mortuary is situated eastward of the church, and is approached by an inclined plane with a turfed slope on each side. The parts of the churchyard immediately contiguous have been laid out and planted with evergreens. The building is sunk 3 ft. in the ground, and has an air-chamber running entirely round it, ventilating-grates being inserted at intervals. The walls are of Kentish rag and Portland stone, and the roof of brickwork, cemented: there is also an iron skylight, glazed with rough plate-glass. Internally, the walls are of Portland cement, with smooth face; the floor is of planed slate, and there is a solid slate table for post-mortem purposes. Water is laid on by means of one of Dalziel's patent regulating taps, by which a constant supply is obtained without the uncertainty and loss of space which a cistern necessitates; and there are arrangements for drainage also. In the wall of the end opposite the door are brackets for four coffins. The dimensions of the whole are only 13 ft. by 9 ft. The total cost has been about 236*l.* The vestry, thinking it inadvisable that a building chiefly set apart for the reception of dead persons should present an appearance which might from the bareness of its aspect pain the feelings of friends and relatives; and the situation of the building demanding some architectural effect, instructed Messrs. Hill & Fletcher to plan for them a structure meeting these requirements. Hence the cost of so small a building.

Dwellings for the Working Classes.—The directors of the Improved Industrial Dwellings Company, Limited, agreed to recommend to the shareholders the payment of a dividend at the rate of 5 per cent. per annum for the half-year to the 31st December, 1870. The receipts for the half-year amounted to 8,225*l.*, and the payments to 4,486*l.*, leaving a profit of 3,739*l.*, being equal to 5*l.* 19s. 7d. per cent. per annum. This, added to the balance brought forward from the last half-year, gives a total of 6,040*l.* available for division. The dividend of 5 per cent. will absorb 3,125*l.*, and the directors propose to carry forward the balance, amounting to 2,915*l.* The capital invested is now 180,610*l.*, and the report states that the position of the company's business remains highly satisfactory. A proposal will be submitted to the shareholders at the ensuing meeting to raise an additional 125,000*l.* capital, the whole of the present capital having been invested, and there being a continued demand for improved dwellings by the working classes.

The Gallery of Illustration.—Mr. W. S. Gilbert has again provided Mr. and Mrs. German Reed and Company (Limited) with a successful entertainment in the shape of "A Sensation Novel, in Three Volumes," satirizing with great cleverness productions of that class. Mr. Reed has himself provided some very lively music, and Mr. J. O'Connor has painted as frontispieces three capital scenes, especially a view from the top of the round tower at Windsor, including St. George's Chapel, Eton College, and the Thames. The indefatigable proprietors are assisted by Miss Fanny Holland, Mr. Corney Grain, and Mr. Arthur Cecil, and all sing and act throughout with wonderful energy and relish. The whole thing is what prosaic listeners will call nonsense; but it is very amusing nonsense, and includes two of the best buff songs that have been heard for many a day.

St. James's Hall.—Mr. Henry Leslie announces concerts of unaccompanied music, and his own oratorio, "Immanuel." In these performances Mr. Leslie's choir will be assisted by Madame Viardot Garcia, Mdle. Titiens, Mr. Sims Reeves, Mr. Vernon Rigby, Mr. Santley, and many others. The first concert will be given on Thursday evening, February 9th.

Small-pox and Fever Hospitals for South London.—Following the opening of the small-pox and fever hospitals at Homerton there was a formal inspection and opening of similar institutions at Stockwell, for the benefit of the South London district. The two hospitals are within one enclosure, and will be this week ready for the reception of patients. The site comprises 7½ acres, and the dwelling-house, which was included in the property, is now the headquarters of the medical officers and committee, situate in the centre of the ground. The two hospitals are, in fact, completely divided by it. The small-pox hospital will accommodate 102 inmates, in eight wards, each containing a dozen inmates, and there are two special wards for the reception of three each. The fever hospital will accommodate 72 typhus cases, in four wards of 18 each; 48 typhoid or enteric cases, in two wards of 24 each; and 36 scarlet fever cases, in two wards of 18 each. In addition to these there are 16 special-case wards, each to contain 1 patient. The cost of the two buildings, which are upon the block system, and arranged to afford 2,000 cubic feet of air for each patient is as follows:—Site, 15,500*l.*; building, 50,000*l.*; engineering and heating apparatus, 6,000*l.*; and furnishing, 8,000*l.* Special attention has been paid to the corridors, which are wide and lofty, and in some instances 400 ft. long; while the wards average 100 ft. long, 28 ft. wide, and 10 ft. high.

Metropolitan Board of Works.—At the weekly meeting of the Board, Colonel Hogg in the chair, on the recommendation of the Works and General Purposes Committee, it was resolved, on the motion of Mr. Runtz, "That the Native Guano Company be permitted to erect, at their own expense, for not exceeding twelve months, works at Crossness, for the purpose of treating, by their A.B.C. process, about half a million gallons of sewage daily, subject to the works being carried out to the satisfaction of the Board's officers, and to the effluent water being made to flow into the river by means of an open channel; subject also to the company entering into an agreement to be prepared by the solicitor for carrying the arrangement into effect, and for preventing the Board from being in any manner bound to the company." A voluminous report was presented from the Finance Committee as to the amounts required for the expenses of the current year. The total charge is 260,862*l.* 6*s.* 8*d.* Mr. Richardson explained the different items, and afterwards moved that precepts be prepared on the basis of 3*d.* in the pound. The motion was put and agreed to, and after the routine business had been disposed of, the Board adjourned.

The Windsor Surveyorship.—Mr. Brown, the Windsor local board of health surveyor and inspector of nuisances, having been requested to tender his resignation, a memorial from nearly 100 large ratepayers intervened on behalf of Mr. Brown, but, on the mayor's suggestion, it was unanimously resolved that the surveyor should be paid up to the 25th March, and that his services should be dispensed with immediately on the appointment of a successor. The mayor then referred to the steps necessary to be taken for the appointment of a new surveyor, and observed that previously to advertising it would be necessary to decide whether they would have a professional surveyor or a person receiving a small salary. There was a feeling that the office of inspector of nuisances should be given to another person; but that would depend greatly upon the character of the person they selected. A committee was then appointed to consider the subject. Mr. Brown's salary from the Board as surveyor was 140*l.* a year, including 10*l.* as inspector of nuisances; but it was stated on the one hand that he was paid nothing as inspector of nuisances, and on the other that he received 25*l.* a year from the Council, the Bridge Trust, &c.

A Monster "Strike."—A strike of an unprecedented nature has just taken place in the coal-mining districts of Pennsylvania, by which 100,000 men have ceased work. The collieries in the Schuylkill County and the Lehigh and Wyoming Valleys struck work on the 10th of January. Is there no man of integrity to whom both sides would listen, so that such a preposterous mode of settling a dispute might be abrogated?

New Workhouse for Lambeth.—Mr. Crockett's tender, 44,390*l.*, has been accepted, and the works will be commenced at once.

The Stockport Co-operative Society.—The annual *soirée* of this society has been held. The Chairman said,—The time was when they had been short of capital, but now they had 8,880*l.* odd at their disposal, and they could go into the markets of the world. A shilling would make a person a member, and they had paid 7½ per cent., which was more than they could get at the bank, the post-office, or, in fact, almost anywhere else. Mr. T. Spedding said that two or three years ago, when their receipts were 22,000*l.*, he thought they might reach 28,000*l.*, and then he began to fancy they might perhaps get up to 30,000*l.* or 32,000*l.* The past year had, however, passed all his expectations, as they had reached 34,493*l.* He saw from a report of the Sun Mill Co-operative Cotton Spinning concern, at Oldham, that they had paid 6½ per cent. for the quarter. He commended the co-operative plan to those who had not already adopted it; and in reply to those who had a doubt as to the safety of the society, he would only say that it passed through the cotton famine.

Pneumatic Despatch Tubes in Postal Telegraphy.—The Post-office Department have recently adopted an improvement on the old pneumatic despatch tube, of which improvement Mr. Siemens is the inventor and patentee. The operation of the new system was witnessed by a number of gentlemen of eminence in the scientific world on Saturday at the General Post-office, on the invitation of Mr. Soudamere. It has been some time in operation in Berlin and Paris. The new lines of tubes extend from Telegraph-street to Fleet-street, with a station at the General Post-office, and it is intended to carry them to Charing-cross, the Houses of Parliament, and all the central telegraphic stations in the metropolis. The result of the working of the system up to the present time has, it is said, been most satisfactory, the tubes now doing the work of 12 telegraph clerks, and being capable of doing the work of 100 if necessary.

Value of Property.—Messrs. Cobb submitted for sale, at the Sun Hotel, Chatham, the freehold wharf, trade premises, and dwelling-house, No. 61, High-street, Chatham. The premises consist of a wharf, which has a frontage of 25 ft., with a landing-stage of 40 ft. by 10 ft.; extensive stowage, 122 ft. in length, with loft over, and an approach from the High-street. Land-tax, 1*l.* 9*s.* per annum. Mr. Cobb valued the property at 60*l.* a year. The attendance of purchasers was not large. The biddings commenced at 500*l.*; they went up to 750*l.*; the property being sold to Mr. Gill.—Messrs. Moore & Hill offered for sale at the Fleece Inn, Cirencester, about 14 acres of freehold land, at the Foss, South Cerney. There was a spirited bidding, and the property, which was put in at 600*l.*, was eventually knocked down to Mr. William Garne, at 980*l.*, exclusive of timber.

Fatal Building Accident in Fenchurch-street.—A gentleman, named John Frew Royle, having offices in Mark-lane, has died in the London Hospital, from the effects of shocking injuries which he received while walking along Fenchurch-street a few days since. It appears that the front of some premises on the north side of the street, nearly opposite Mincing-lane, are being rebuilt, and the workmen were raising a large stone to the top of the building, when in some way in its progress it displaced a stone which had been set in position, and the stone fell with a fearful crash on to the pavement beneath, carrying away a portion of the scaffolding in front of the premises. The deceased was struck on the head and chest, and received shocking injuries, of which he died. A banker's clerk, who was also passing, was hurt, and a lady had a very narrow escape.

Destruction of a Theatre by Fire.—The fine Theatre of Santiago has been burnt. Two thousand persons had just retired from hearing Madame Carlotta Patti, otherwise the results might have been frightful. The fire broke out on the stage, by the incautions ignition of gas accumulated below. Three employes and an officer of the salvage corps lost their lives. The building cost half a million dollars, and was not insured, no company being willing to insure it.

Art in Liverpool.—The want of an exhibition of pictures in Liverpool is becoming felt, and is being commented on. What has become of the admirable determination of the town council to erect a building and form a permanent gallery of fine art in Liverpool?

Newcastle-upon-Tyne Chemical Society. A report of the proceedings at the ordinary meeting of this society, on December 22nd, has been printed. It contains an inaugural address by the president, Mr. John Glover, on various subjects, but especially on the importance of solving the sewage problem. After drawing the attention of chemists to this and other useful subjects, and to the pursuit of science for its own sake, Mr. Glover concluded his address by saying,—

"I believe that such of you as devote yourselves to purely scientific investigation, from the promptings of a pure and devoted love, may not, as your reward, gain material wealth, but you will have formed, what is of infinitely greater value, a noble character, and a capacity for enjoyment which mere wealth cannot give."

This address is followed up by a report of a paper "On the Manufacture of Copper on the Tyne," by Mr. R. C. Clapham.

A Mortuary for Central London.—Last week a special meeting of the Strand District Board of Works was held to consider a notice of motion by Dr. Joseph Rogers to the following effect:—"That, with the view to the prevention of disease, and in the interest of the health, convenience, and comfort of the poorer classes, it is desirable that a mortuary house, similar in character to that which has been in existence in the parish of St. Anne, Westminster, for many years, should be constructed, either in each parish, or a central one only for the use of the whole of the other parishes of the district." After a long discussion, the motion was carried by a majority of nineteen to two.

The Government and the Drainage of Towns.—At the last meeting of the Windsor Local Board of Health, the clerk read a letter from the Local Government Act officer, Whitehall, in which it is said, on the part of Mr. Bruce,—"It is generally expected that some legislation affecting the whole kingdom, in relation to local improvement, of which town sewerage must form an important element, will be the result of the report of the Sanitary Commission; but that report has not been sent in, or, if sent in, has not yet reached this department."

Lambeth School of Art Concert.—The students of the Lambeth School of Art, on Friday evening, the 27th ult., gave, at the Vestry-hall, an amateur concert. Twenty ladies and gentlemen, students, formed the chorus, and, with the assistance of two or three relatives and friends of the members, took the entire labour of rendering high-class music. It is to be hoped that the effort now being made to enlarge the present small and ill-provided buildings will meet with efficient support.

The Purchase of Hampstead Heath.—In the annual report of the Hampstead vestry, just issued, satisfaction is expressed at the agreement that has been come to between the Metropolitan Board of Works and Sir John Mayson Wilson and his eldest son for the purchase by the Board of Hampstead Heath. The sum to be paid is 45,000*l.*, which is to be raised by a loan, and will be payable by instalments extending over sixty years, and chargeable on the rates of the whole metropolis.

Architectural Association.—A course of lectures on "Limes and Cements" is about to be delivered by Lieut.-Colonel Scott, R.E. The first, on Monday evening, February 6th, will treat of the present state of knowledge, the composition of calcareous minerals, their origin, the chemical properties of the substances composing them, and their action under the various conditions of the preparation of limes and cements, and of their employment in mortar.

A New Road Material.—The extension of the use of iron slag in making and repairing roads is talked of. The trial of two years since in Park-street and Grosvenor-square has been considered by the vestry of St. George's, Hanover-square, to be satisfactory enough to induce them to decide on extending its use; and the St. Pancras vestry intend also to make use of it for the repair of roads, and have accepted a tender by Mr. Coulthard, of Westminster, G.E., for a supply.

Effect of Cold on Iron and Steel.—A series of interesting papers have been read before the Manchester Literary and Philosophical Society, bearing upon the question of the effect of intense cold upon the strength of iron and steel, and the results show that the cold has no appreciable effect, and that it certainly does not diminish the strength of the iron.

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New Romney 25th January, 1871.

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Spring Gardens, 27th January, 1871.

The Builder.

VOL. XXIX.—No. 1462.

Breweries.*

It is now 236 years ago that the first patent was taken out to secure the advantages accruing to a contrivance for an improved mode of brewing. Sea-coal had just begun to come into use, and the improvement consisted of its adoption and the manner of its adoption. We read in the lists of patents, against the date 1635, July 23,—“Nicholas Halse. Making kilns for drying malts and hops with sea-coal turf or other fuel, without touching smoke; capable also of being used for cooking, drying, and starching at one time with one fire, and thereby lessening the consumption of wood and straw.”

In the following year Sir W. Bromwich took out a patent for drawing double the quantity of *aqua vite* from a given quantity of liquor and more strong water from malt than had been done. A year afterwards, Thomas, Earl of Berks, patented a kiln for drying malt, grain, and hops. It was a time when country gentlemen and their dames took great delight in what were called “country contentments.” The days of the old flookings to the king’s standard, to march against France or Scotland, were over the possession of town houses was the happiness only of those attached to the State or the Court; hence the worthies of those days seem to have made their own homes into centres of interest. The contemporary works of Gervase Markham show precisely the attention paid to the great household matters of banquets, brewing, baking, dairy operations, and so forth, by the families of wealthy country squires of the seventeenth century; but as customs changed, and the London season gradually became more and more engrossing, those arts were left to persons who made them their sources of livelihood. Following the fortunes of brewing only, for the present, we may see, that since those homely days 600 persons have taken out patents connected with its perfection. Moreover, carrying out still further the principle of division of labour, the structural arrangement of a brewery is now considered the province of engineers whose experience has been specially concentrated upon the subject.

A “brewers’ consulting engineer and architect,” Mr. Scamell, has just completed a volume pertaining to this special class of experience. In it, he not only unfolds the general principles that should be carried out in the erection of a brewery, and instructs in such important details as sites, wells, engines, and other machinery; but he dilates upon every detail; and then

supplements his instructions with twenty plans. To this information he has appended a list of the large number of patents just mentioned, which, in its way, is a veritable beacon.

Looking into Mr. Scamell’s book, the conviction comes to us that he has really been at great pains to master his subject. In the matter of wells, for instance, he might have been content with the old method of lining them with bricks, with or without rings of cement or concrete; but, we perceive, he has given the newest use of iron cylinders. A deep well sunk at the Albion Brewery, Mile-end, through a highly diversified section, was thus lined with tubular iron with complete success, we may state, a few years ago; and any work not recording the method would not be up to the mark. And so on, throughout. He by no means intends, however, that his work should supersede the services of the architect or engineer, and frankly states that it would only mislead to recommend any particular arrangement without a knowledge of the circumstances and place where they were to be made; consequently, he deals in generalities. But out of these generalities it is pretty easy for any one thinking over the project of building a brewery to ascertain the main points to insure a successful issue to the undertaking.

A model brewery should be built upon a gentle slope, far away from gasworks, or other ill-smelling manufactory, but near a river, canal, or railway, so as to admit of an inexpensive supply, as well as distribution of its products; for this gentle slope will admit of the principle of gravitation being applied to the brewings, and thus save pumping. It should have a good water supply; and borings should be made to ascertain the presence of this indispensable article, before any other outlay is determined upon. The foundations of the building should be laid with concrete; except in extraordinary cases, when special treatment would be required. The tun-room should face the north, and be tiled. All floors should be fire-proof; and they should be laid with asphalt or concrete, because these materials can be swept cleaner than bricks or stones with chinks between them. The rain-water should be collected from the roofs and stored, either for brewing, or for the horses, or for other purposes. With regard to the wells, although Mr. Scamell, as we have seen, gives his readers choice of brick and iron lining, there is something to be said for concrete:—

“In place of lining the excavation of wells with bricks, Portland cement concrete is now being used with great success. The operation is very easily carried out in soils of ordinary tenacity and firmness, greater difficulty being of course met with in the case of loose soil or running sand. When the well is of no great depth, and the soil firm, so that an excavation can be made at once, a drum is made, the external diameter of which is equal to the internal diameter of the well, the excavation being made so much greater in diameter than the drum, as the thickness of the concrete and lining of the well is intended to be; 9 in. is a thickness which will do in ordinary soil. The space then left behind the internal diameter of the excavation, and the external diameter of the drum is filled or packed in with the concrete, the depth of which packing is, of course, equal to the depth of the drum, which may be 18 in. or 2 ft.; the level of top of packing flush with the top of drum. The drum is then raised, and supported by uprights and braces when another packing of concrete is made, when the drum is again raised, and so on till the whole depth of excavation is lined with concrete. The bottom of the excavation should be lined with a layer of concrete 9 in. thick, and the top may be arched over, leaving a man-hole door in the centre, and a bore for the pump-barrel to pass down. If the soil is not very sound, a drum had better be sunk from the top, diving in the concrete from the top, then excavating below the drum, and lowering this, and then filling in the concrete lining.”

Nothing could be more explicit than this, if the brewer-elect could only decide which material would suit his particular well best. But for this information he must still resort to the engineer in person. In the case of the well in the Albion Brewery, to which we have alluded, it may be useful to state, that the metal cylinder is surrounded with 96 ft. of brickwork lining, and below the cylinder there is a boring 156 ft. deep into the chalk. The total depth is 357 ft. It was commenced in November, 1858, and finished by July, 1860. The strata were found to be curiously diversified. After removing a top

dressing 10 ft. deep of made ground, there came 10 ft. of gravel, then a layer of blue clay 5 ft. deep, with one of boulder-stone below it of 1 ft. before the great bed of London clay was reached. This was 50 ft. thick. Below this was a thin layer of wood and metal. Then came 6 ft. of sand and loam, with a sandy clay bed 21 ft. deep beneath it. Pebbles, shell-rock, mottled clay sand and water, brown and blue clay, blue clay unmixed, then a depth of 1 ft. of wood, followed. Shells and metal, silting-sand, oyster-shells, next told of further old seas. Then there were loam and sand, mottled clay, green sand, the same with pebbles, the same with clay, flint pebbles sand, flint, stones, and at last the chalk. The metal cylinder served for all below the first depth of 96 ft.

To return to the model brewery. It should have its vast rain-water tanks lined with Portland cement; and it would be as well to have these tanks of a circular form. Mr. Lowe has furnished a table showing the number of gallons contained in circular tanks of different diameters, and the number of bricks required to line them, which will facilitate the needful calculations. It should have either a vertical or horizontal high-pressure engine, with a single slide valve, governor, &c.; unless, indeed, it is to be a very large concern, when the engine should be fitted with an expansion slide regulated by the governor or by hand. Its boiler must be of ample dimensions; but it may be of the form known as the Cornish boiler, with an internal tube, or that known as the Lancashire, with two internal flues; and either of them should be placed in a separate building, detached or semi-detached from the brewery. The pump that applies the boiler should have a “pet-cock” on the conducting pipe from it, so that it may be readily ascertained whether the water is actually passing freely into the boiler, or whether the valves are sticking, or the piston fitting so loosely that it draws air; or, better still, a “Giffard’s Injector” should be procured. This contrivance, Mr. Scamell urges, is almost entirely free from the ills pumps are heirs to, and “that it works with so small a pressure of steam on the boiler that it may be said to be practically independent of the working of the steam on the engine.” But it has its drawbacks, nevertheless, for it will not work when water is used at a high rate of temperature, nor will it draw water from a greater depth than 6 ft.; consequently, a third contrivance, “the donkey engine,” may be preferred to this clever injector, which is, doubtless, well known to most of our readers as being in pretty general use. The claims of the donkey engine are thus introduced:—

“Recently, however, several firms have introduced forms of donkey-engines, which, for simplicity of construction, and from the ease with which they are set at and maintained at work, and also from the ease with which they are repaired, are nearly all that can be desired for supplying boilers with water. They are capable of pumping boiling water from the full practicable depth or distance. They can be set to work, also, with a pressure of steam in the boiler as low as 15 lb. to the square inch; and, by merely giving a larger cylinder, or using the next size to that required to do certain work, as low a pressure as 10 lb. steam can be used. They work freely at a rate of 150 revolutions per minute, although we have seen them work at a higher rate than this, delivering the water to the boiler with the greatest precision.”

Next come contrivances to ascertain whether the water-supply is deficient or over-abundant, such as water-gauges, gauge-clocks, and floats. Of these the water-glass gauge is the best, and two of them should be provided, and kept clear and bright. In like manner two safety-valves should be provided, and one of them should have a lock-up weight, as an extra precaution against carelessness. There should also be a scum-pipe to remove the incrustations to which the interiors of boilers are liable. This contrivance has been only recently adopted for land boilers, and it is admirable.

In the matter of machinery: a model brewery should be provided with duplicates of the principal wheels; a good supply of wooden cogs

* “Breweries and Maltings: their Arrangement, Construction, and Machinery.” By George Scamell, A.R.T.S. A. Pullerton & Company, London and Edinburgh, 1871.

and an extra pair of malt-rolls. For the sake of tightness, Mr. Scamell recommends that the shafting should be turned all over; except, perhaps, in dark or out-of-sight places, where it may be left "black," or unturned. "The shafts," he continues, "are best retained in their places by means of collars fitted on the shafts, so as to work against the sides of the brass in plummer blocks, and secured in their places by screws, bolts, and nuts." The malt-mill arrangement to be preferred is the adoption of a double screw, one fine and one coarse; and a good malt measurer should not be forgotten. The "Jacob's ladder," or elevator, by which the malt or grist is raised, should be cased in cast-iron. The head of it should be fitted with brasses for the spindle of the top pulley to work in; and the lower end, with brasses and adjusting screws, for the leather strap. Tin or light galvanised iron buckets may be used. Iron mash-tuns, cased with felt, are commended, but not insisted upon, as some brewers entertain fears that iron acts injuriously upon the wort; but whether of wood or iron, it is desirable to have a door at the bottom of each tun for the removal of the grain. For a mashing-machine, there is a choice between an internal and an external arrangement, with a recommendation to have both, as an internal machine can manage a stiffer mash than one of external application. The hoisting tackle is best worked by hydraulic power; but when this is not to be had, it must be worked by friction. Grist cases should be made of well-seasoned deal, ploughed and tongued. Hoppers if made of iron, should be lined with deal.

It does not appear to be quite settled yet whether beer is better when the wort is boiled by fire or steam, in open or close vessels, or by coils or "steam jackets." While this question is pending it would be, perhaps, unwise to make an arbitrary selection of either system for our model establishment; but we may mention that Mr. Scamell says he has been called upon to substitute an open copper with a steam jacket for a copper, which experiment was attended with excellent results.

Everywhere, we perceive, the brewers' consulting engineer has to contend with this diversity of opinion upon the proper conduct of the various processes entertained by brewers. If the brewers could come to one consistent system of brewing, the arrangement of a model brewery would be much simplified. But their contending opinions lead to indecision and doubt. Some brewers, for instance, consider the once indispensable coolers quite unnecessary and even hurtful to the wort. To these, Mr. Scamell would recommend a powerful refrigerator. But for the brewer of the old school a model establishment should have coolers of sufficient amplitude to contain the whole gyle, so arranged as "to allow the wort to flow over the first cooler, and back over a second." Then again, the technical opinion of the brewer must be consulted as to the material. The engineer would recommend that great source of most of his power, iron. But there are some brewers who will stand out for bright shining copper; whilst others will have wood, as being least liable to affect the brew either one way or the other. Deferentially, Mr. Scamell gives way, and will let them choose: provided they refrain from coolers lined with tiles, which he abhors, because the numerous joints prevent them from being kept sweet. An ice-making machine should be in every brewery of any pretensions. The newest agent employed in these is ammonia, and the old plan of evaporation of ether is laid by. The fermenting tuns, under ordinary circumstances, should be made of yellow Dantzic planks and square: aiming at perfection, however, they should be slate. But if the brewer should have Yorkshire sympathies, and think no ale like the Yorkshire ales, his tuns must be made of stone slabs:—

"The practice of fitting heads to fermenting-tuns appears to have gone out entirely, as, during the last thirteen years, we do not know of a single instance in which they have been adopted, while, on the other hand, several old tuns have had the heads removed under our superintendence. Where circular wood tuns are employed, the simplest and best way is to allow the staves to run up, so as to form the yeast-board, having a man-hole cut in front, fitted with sliding-doors. And in square tuns, although the expense may be a trifle greater, by far the best plan is to construct the tuns of sufficient depth, allowing for the yeast, having a man-hole cut in front, as before mentioned. . . . For brewing prior or stout, the tuns may be of any size, containing in some instances, in some of the London breweries, from 1,600 to 1,800 barrels. For ale, however, the size of the tun should be limited, from 60 to 120 barrels being a good size."

Another practice that appears to have gone out entirely is vating. The vats in a brewery used to be one of its lions; but now it is doubtful

whether any need be erected in a model building. Should, however, it be settled to use them, they should be made of English oak, and placed on iron columns and framing high above the electrical currents on the face of the earth that are so disastrous to the quality of beer.

For wort mains, tinned copper pipe should be used, in convenient lengths, with unions, and at a fall of not less than 1 in. in 10 ft. For water and steam pipes, cast or wrought iron may be used. Pipes that cannot drain themselves, such as stand-pipes, should have draining-cocks. Gun metal should be used for all cocks and valves. Waste-pipes should be made to discharge into an open cistern, and not into a drain.

The hop-presses should be worked by hydraulic power. Mr. Scamell recommends the kind invented by Mr. King, consisting of two endless chains placed either vertically or horizontally, set, not parallel with each other, but at an angle, which press the wet hops, and throw them out into a receptacle prepared for them. A yeast-press is another requisite. The best is that in which the liquor is forced into bags, by means of a force-pump regulated by a safety-valve attached to it. There are several kinds, and one of the simplest, according to the writer whose recommendations we are tracing out, is that patented by Mr. Waller, in which the needful pressure is obtained by the force of water acting upon an india-rubber bag, or by allowing the beer to fall from a sufficient height.

A more considerable item is the malting. The best arrangement for this is one working floor, with the couch and cistern at one end, and the kiln at the other. Over it could be the barley and malt stores. But if space should not permit this easy working plan, and two floors must be adopted, place the cistern midway between them. Here, both in couch and cistern, the excise regulations insist upon certain dimensions, and a good light for the sake of the excise-officers when ganging. The kiln should have a perforated tiled floor, from 12 ft. to 18 ft. above the firing-place; and it should be provided with a cowl in preference to a fixed ventilator.

And, now, what is the cost of such a model brewery? Mr. Scamell gives several estimates. A "five-quarter brewery," delineated with "cast-iron cold-water tank, wooden hot-water back, malt-rolls, with hopper and flat screen, grist case, self-acting mashing-machine, mash-tun, with sparger and cast-iron false bottom; steam-boiling wort-copper, wood hop-back, with cast-iron false bottom, refrigerator, four fermenting tuns, cleansing casks and stillion, Cornish boiler and engine, with two sets of three-throw pumps, driving gear, all pipes and cocks, and well, not exceeding 30 ft. deep," would cost about 2,200*l*. A twenty-four-quarter brewery would cost about 7,700*l*. As the scale is enlarged so is the well deepened, and the appliances increased in number as well as extent. A "hundred-quarter brewery" with plant, but without a tun-room, would cost about 9,600*l*. And a brewery, illustrated, intended for four fifty-quarter mash-tuns, with the best fittings, an Archimedean screw, hydraulic hoppers, and similar perfections, is estimated as likely to cost 12,000*l*., without the tun-room.

When we close Mr. Scamell's book, we seem to have passed through a well-appointed brewery; and it is hard to believe there is not an odour of grain in the air, nor a difficulty in getting out of the way of dray-horses. We feel, despite the differences in the modes of brewers, that any one about to build or remodel an establishment of the kind, would do well to give it personal, before even he looks out the site, or the direction in which an addition to it should be made, for the chances are he will find many a hint and recommendation in it that will prove useful. Architects to whom the class of work is new, would increase their general information, at a small cost, by looking into it, and placing it upon their shelves for reference. We should add that the author was for some years in the engineering department of the well-known establishment of Messrs. Truman, Hanbury, Baxton, & Co.

Fall of a Chapel Gallery.—On Sunday evening, the gallery in the United Methodist chapel, at Troon, Camborne, gave way soon after the commencement of the sermon, and fell to the ground. The gallery itself was moderately well filled, but fortunately there were few persons sitting under it at the time, and they escaped with a few bruises.

IMPRESSIONS OF BRISTOL AND CLIFTON.

BY A VISITOR FOR THE FIRST TIME.

A CONGERIES of streets, intersecting at all possible angles but a "right" one, and with every variety of gradient, from 1° to 45°;—streets too narrow in many places for the traffic, and where every one seems to be in the way of somebody else; much mud; rows of dingy-looking houses and shops, between which creeps squalidly a dirty brown river, looking, with its walled banks and rows of heterogeneous shipping, more like an elongated and irregular dock than a stream;—such is the general impression conveyed in driving from the bare and uninviting railway-station into the city of Bristol, properly so called, the lower town, where the commerce of the place is carried on, in no slack or indolent manner. The business part of the town, in fact, reminds one more than anything else of the less-attractive commercial quarters of the city of London, which are still unembellished by palatial-looking offices and chambers; and the visitor requires a more detailed investigation to correct his first impressions, and to discover that Bristol contains, scattered about, more objects of architectural interest than he would suspect at first sight. Foremost among these, of course, are the two well-known churches, the Cathedral and St. Mary Redcliff.

The special work now being undertaken at the Cathedral, readers of the *Builder* need not be reminded, is the adding of a new nave to the existing choir and transepts, under the direction of Mr. G. E. Street. It had been intended to build two bays of the nave completely, before proceeding with the rest; but this intention has been abandoned; and, while the two eastern bays are now completed, so far as the masonry is concerned, the whole of the rest, westwards, is already carried up to a considerable height from the ground. The nave will, however, be a comparatively short one, as the available ground is limited in extent westward. In the new work, the main design of the choir, with its three aisles of equal height, and its remarkable internal horizontal flying buttresses across the side aisles, is being repeated, the material used being the Doulting stone, a hard, light-coloured freestone, which has been much used in buildings in this part of England for many generations back. The shafts attached to the piers are, we were informed, of blue lias. The perishable quality of this material is evidenced so strongly, not only in the exterior, but in the interior of Wells Cathedral, where it was largely used, and where, even in the most protected situations, it has cracked and rotted away more like wood than stone, that we may hope we may have been misinformed, unless it be that a harder bed has been found. The wall forming the western boundary across the transept is retained till the completion of the nave, the two large buttresses which formerly occupied the position of the eastern responds of the nave arcade having of course been out away to make way for the new work. There is little to attract in the exterior of the cathedral, but the architectural student will not fail to note in the interior the unique expression produced by the lofty and very pointed arcade occupying nearly the whole height to the springing of the vault, without triforium or clerestory, and giving a dignity of effect to what is really but a small building, and which, if treated on the ordinary plan, with low aisles and an arcade in the usual proportion to the superstructure, would have seemed a mere model of a cathedral. There is matter for much suggestion to the architectural designer in this treatment of a small building, as well as in the practical device before referred to for carrying outward across the aisle the thrust of the wider and heavier vault of the nave; the tall, massive exterior buttresses into which this same thrust is finally resolved giving to the exterior a slightly French aspect as compared with most of our other cathedrals. The choir-screen has been removed from the position in which it formerly stood (two bays to the eastward of the crossing, so as to leave a kind of quasi-nave), and a new stone one erected in the usual position. A feature in the choir is the series of monumental arches in the aisle walls, each with an odd canopy over it forming half of an eight-pointed star with finials at the points. While retaining this feature in the nave, Mr. Street has judiciously altered the design, which is more cautiously than beautiful, and substituted an ogee canopy with a finial: the carved ornament here, in the new work, is deserving of all praise. Among monuments in the cathedral, the bust of

Southey, in the north aisle, should not be overlooked; and on the south wall of the chancel is a brass to the memory of Bishop Butler (he of the "Analogy"). The good folk who "decorated" the cathedral for Christmas should learn to do the thing well, or not at all; anything more deplorable than the things like star-fish, hung about the walls at the time of our visit, could scarcely be imagined.

Crossing two bends of the river, and winding along the narrow "Redcliff-lane," we come to the real architectural glory of Bristol; for the Church of St. Mary, though mostly late in style, is for size, loftiness, unity of design, and richness of decoration, almost paramount among our parish churches. Restoration is progressing here also, under Mr. Godwin; the work at present going on consisting in the re-instating of the greater portion of the tower. The general aspect of this grand tower is too well known to need description; but it is not all who notice the difference of dates between this and the architecture of the church attached to it, the latter being Perpendicular, whereas the tower is Early Decorated, built before the completion of the lower structure. The door of the north porch shows some wonderfully elaborate and fine carving. But the grandeur of the church consists mainly (next to the tower) in the completeness and lofty proportion of the interior, with its aisled transepts and splendid vault, as yet undisturbed by the aerial effect by the hand of the modern decorator; and the large window in the north transept (by Clayton & Bell) is a very good specimen of delicate and harmonious colouring. The north aisle of the choir is terminated by a memorial window to Handel, put up at the hundredth anniversary of the great composer's death, and consisting of compartments illustrative of the subject of the *Messiah*, with a text and a few bars of the music over each. The decoration of the roof of the Lady Chapel is to be commended for moderation in colour; much more so than the east window of the chapel. The church contains a large double organ, placed half on each side of the choir. The most recent work in the church, the new reredos, will doubtless soon be illustrated.

Further on, in the parish of Badminton, is a new church of some pretensions, in a respectable style of Regulated Modern Gothic. In Redcliff-lane we may notice the new tobacco warehouses designed by Messrs. Foster & Wood, in Egyptian style, with thick tapering columns and lotus capitals. What is the connexion of this style with the sale of "Bristol birdseye" it would be hard to say, but it may, at all events, prove a good advertisement to the owners, as few would notice so exceptional a building without stopping to inquire what it was. Some brick warehouses, not far from the railway station, built for Messrs. Waite & James, are worth notice, as a good specimen of bold and effective treatment of this class of erection, mainly in brickwork.

Exchange Buildings, near the top of Corn-street, must certainly, judging from the "hand-writing on the wall," be the design of Wood, of Bath, architect in his day of the Town-hall at Liverpool and of other buildings of more than average merit in the style then in vogue. Opposite this the West of England Bank shows a dignified and effective interior, and an exterior front, which, like that of the Liverpool and London Insurance Company on the other side the street, is overdone with classic ornament in the way of wreaths, scrolls, &c., in the manner which seems proper to banks. Decidedly the best recent building in Bristol, however, is the New Assize Courts, by Messrs. Pope & Bindon, who gained the first premium, a little while since, in competition. This is a comparatively small and unpretentious edifice situated very much out of sight in Small-street (out of Corn-street), in late Gothic style, quietly but very picturesquely treated, all the details in good keeping and good taste, and the whole forming a pleasant contrast to some of the violent and spasmodic designs which are now put forward so often under the name of "Gothic." The Assize Courts lose nothing, it must be confessed, from comparison with the Post-office opposite,—a piece of threadbare classic design that might have come from the "Board of Works." Then there is the Colston Hall (so called from the well-known charitable citizen whose name is had in remembrance in Bristol), a large music-room, consisting, architecturally, of some acres of white plaster, with columns and Corinthian capitals in the same material, handsomely furnished with deal rush-bottomed chairs and with cold draughts in great variety, and culminating at

one end in an orchestra, and a large organ, the case whereof, we will charitably hope, was designed by the organ-builder's joiner. In this attractive temple of the Muses do attentive audiences assemble weekly to listen to the "recitals" of organ music on the instrument above-mentioned (a very good one by Willis), given by Mr. Bisleley, a comparatively young player, who is already known beyond his native town, and whose sterling abilities ought eventually to secure him a high place in his profession. We should not quit the lower town without a glance at the "Mayor's Chapel," a small church, the end of which faces College Green, opposite the cathedral; the interior of this also is well known to be worth inspection.

Park-street, a long, fine, very steep street, forming the main road to the upper suburbs of Bristol, has recently undergone at the bottom a treatment similar, on a small scale, to that bestowed on Holborn-hill, and a level approach to College-green substituted for what was a deep and inconvenient hollow. Near the bottom of this street, on the left side, is a bit of the hand-writing of the late Mr. Cookerell, in the shape of a semi-circular porch, forming the entrance to what was the Philosophical Institute, and marked by the purity and elegance of detail and treatment so conspicuous in all his adaptations of Greek architecture. Philosophy, however, has lately made a move up-hill, and (like many other things in the present day), taken up a Gothic tabernacle, in a building recently erected near the top of Park-street, and illustrated last year in the *Builder*. The main feature of the front is a porch or narthex, running right across the building, with an open arcade of pointed arches resting on thick shafts or piers of the proportions common in modern Gothic buildings; the two extreme piers at each side octagonal, the centre piers, which front the flight of steps for access, circular; the variation forming a happy little bit of architectural expression worth noticing. The general effect of the front is satisfactory, except the two little birdcage canopies over the angles of the cornice. The interior of the building is very plain and dead in comparison with the front, perhaps an insinuation that modern philosophy has more outside show than inside worth. A passing glance may be given to what is called "the Triangle," at the top of Park-street, on account of a long row of shops (by Messrs. Foster & Wood), showing one of the few attempts we have seen in modern streets, to give something like architectural character to the ground story of a row of shops. This is here done by a series of circular arches, springing from a square rusticated pier opposite the party wall of each shop, and from circular granite columns between the doors and windows, the whole thus arranging itself into groups of three arches. There is thus a sufficient basis, architecturally, for the superstructure, while no complaint could be made that the shops have not a light enough; and though the details might be a little better, the general effect is very good, and quite worth imitating in other parts of Bristol and elsewhere. It is so easy to do something in this way to redeem shop architecture from the common absurdity of standing on a wall of plate glass, that the utter neglect of such an attempt in most places is as surprising as it is inexcusable. Further on, Queen's-road, a fine, broad "Boulevard"-looking street of good houses and plenty of trees, brings us opposite the Fine Arts Academy and the Victoria Rooms, both classic structures, Italian and Greek respectively, of the kind usually called in newspapers "handsome edifices"—an expression which speaks volumes to the architectural critic. White Ladies'-road (the name a reminiscence of a former convent or nunnery) continues the line, by a perpetual ascent, up to Redland, a pleasant suburb adjoining Clifton. The number of ecclesiastical edifices up this line of road is surprising. Keeping rather to the left from the top of Park-street, we come into the larger and better known suburb of Clifton, which has now extended down to the town, or the town has climbed up to meet it. Clifton is in one sense a remarkable example of what may be done to provide really pleasant and attractive residences in the immediate neighbourhood of a large town, where natural advantages of site are properly made use of. There are large towns in England possessing the same advantage of a fine rising ground behind the town, where this has been suicidally abandoned to the dominion of small and mean streets, redolent of public houses, and the whole advantage of the site completely thrown away: a stupidity with which the Bristolians cannot be

charged. The only drawback to Clifton, as a residence, in relation to Bristol, is the steepness of the direct approach, which in bad weather renders it sometimes a real "Hill of Difficulty" to the pilgrim, whether on foot or on wheels. There is talk of a railway, after the manner of the "Metropolitan," from the town up to Clifton. There would have to be a good deal of tunnelling, and very heavy gradients; but, with proper appliances, there is no doubt the ascent could be accomplished, and it would probably prove in the end a paying investment of money. Architecturally, however, there is not a great deal to interest in Clifton. A series of wide, clean, cheerful-looking roads, very similar to each other, with plenty of gardens and foliage interspersed, and lined with a superior class of residences, in terraces or detached, cannot but convey a generally pleasant impression; but these houses are almost entirely of that same regulation "handsome" type which is so peculiarly uninteresting to the architect. Almost the only dwellings showing architectural feeling in design and in the use of materials, are those in connexion with the Clifton College, and a few near, which show a better style. The large, open square, thickly planted with trees, and with the tall and rather pleasing spire of Christ Church rising as a central object, forms, however, a very charming and picturesque suburban view. The new church of All Saints, by Mr. Street, of which only the chancel and transept are as yet built, must not be left unnoticed, as an almost typical specimen of the style and manner of its designer. The exterior will be like other churches by the same hand, plain, even to severity. The interior is diversified with natural polychromy obtained by the use, in piers and arches, of three tones,—cream-coloured, warm brown (in small quantities), and a light blue. The effect of this in the piers is not altogether happy: the horizontal rings of colour crowned by an unusually high proportioned capital, with foliage of almost Egyptian type in its flatness, give to the whole a half-Oriental—one might even say barbaric—appearance, original, certainly, but somewhat out of keeping in an English church. In the arches the effect is good; but here, again, we like not the introduction of the light-coloured soffits—member inserted under the variegated arch-vault, especially as constructive considerations have required an impost in one stone (blue) immediately over the capital, which thus stops the white stone a little above the springing, and gives it rather the appearance of a piece let in as an afterthought. The brass and iron chancel-screen is an unusually good specimen of design and workmanship, and the chancel roof is being elaborately painted; but the effect of this cannot be judged of while the scaffolding is up. A large east window by Hardman, representing the company of saints to whom the church is dedicated, is very pleasing in general effect of colour, but, as a composition, too crowded with figures. 13,000*l.* have already been spent on this church, and the work is now suspended for the collection of further funds; a temporary nave being erected for service, round which the walls of the real nave are partially raised. Whatever be the internal effect of the church when completed (and it is scarcely fair to estimate the design till this is done), it may be predicted that the treatment of the side aisles (intended for passageonly), roofed by a series of small stone vaults at right angles to the main wall, will give an unusually severe and monumental expression to this portion of the church,—an expression which we only regret will not be carried out in the main roof also, which from appearances, is, we conclude, to be ceiled with the architect's favourite wooden barrel-vault in three or four bays, with ornamented iron tie-rods at the springing. The visitor may pass, by no very long stroll, from an architectural to an engineering work; we allude, of course, to the Clifton Suspension Bridge, a successfully-accomplished work carried out under considerable difficulties. Indeed, so impressed have the constructors been, apparently, with the hard nature of their task, that they have cut into the stone above the bearings of the chains their opinion on this head—"Suspensa via via fit," which may be translated, "It's no easy thing to make a suspension-bridge,"—a statement no one will think of disputing, but which it hardly seems worth while to stereotype on the forehead of the undertaking. Whether from the banks above the bridge, or from the bridge itself, the view here is beautiful, with the lofty wood-crowned rocks rising up from the river as a foreground, and the view down the valley of the Avon, across the smoke

and towers of Bristol, to the distant rising ground beyond. Across the bridge are Leigh Woods, haunt of sketchers and other lovers of Nature, the beauties of which have been commemorated too in print, in as pleasant a book as one could wish for at an idle half-hour,—the "Sketcher" papers, formerly contributed to early numbers of *Blackwood*, by an amateur artist, the late Rev. J. Eagles, of Clifton, and afterwards published separately. It may be recommended to those who can find enjoyment in the descriptive writing and reflections of a thoroughly refined and educated mind, pursuing landscape art as a recreation, at a period when that branch of art, though happily showing less of accurate imitation than now, was certainly more of an intellectual and poetical study than it is with many of the artists of the modern school.

It would be almost ungrateful to take leave of Clifton without a word in appreciation of the amateur Madrigal Society's concert, an annual event here. The Victoria Room, with its "compo" pilasters and rows of plaster statues, is no very attractive place in itself (indeed, Bristol sadly wants a really fine public room); but the brilliant gathering this year at least amply made up for what the architecture wanted in colour and charm; and the sound of some of Wilbye's six-part madrigals, sung by a choir of ninety voices,—music, as Kingsley has truly said, "worthy of an age of heroes,"—is no unpleasing reminiscence for those "who have ears to hear," to carry away with them after a chance visit to Clifton.

ORNAMENTATION CONSIDERED AS HIGH ART.*

I wish to make evident to you certain facts:—
1. Ornamental and pictorial art have been united in order to the production of certain works, as the decorated windows of the twelfth and thirteenth centuries, and the conventionally-treated floral subjects (and, I might add, figure subjects also) which adorned the Egyptian temples.

2. That when thus united they constituted, in the truest meaning of the expression, works of high art.

3. That those works which are most fully of mental origin, provided the impress of mind which they bear is holy and pure, are which are most noble.

4. That pictorial art can, in its highest development, only symbolise imagination or emotion by the representation of idealised reality.

5. That true ornamentation is of purely mental origin, and consists of symbolised imagination or emotion only. I therefore argue that ornamentation is not only fine art, but that it is high art, and that it is, indeed, even a higher art than that practised by the pictorial artist, as it is wholly of mental origin.

This being the case, it is worthy of notice that ornamentation in its higher forms has always been the handmaid of religion, waiting upon it and serving it with a purity of purpose. The faith of the Greeks was expressed in their ornaments, and with the decorative forms of Arabian, Turkish, Moorsque, art-passages from the Koran have always been richly interwoven; thus the aim of the artist has been to call attention to the sentiments uttered, by giving to them beautiful surroundings, and to convey an idea of the value of the truths recorded by placing them in contact with such works as is most beautiful and most true. It is so also with Celtic ornament. The finest patterns are here formed surrounding texts from our Scriptures, and thus calling attention to them. And these, by the intricate, yet beautiful, entanglement of lines which they present, symbolise the mystery to be unravelled by searching into the meaning of the Scriptural expression. Religion will go hand in hand with a pure development of that creative mind which God has given to us; but, directly purify of purpose is replaced by any low or sordid motives, then religion departs and leaves man to work out his own degradation; while it is a high art, and while a high art only, will religion continue to associate itself with it in the work of moral teaching.

There is one fact which I cannot now ask you to notice,—a fact in which I take the utmost pride, which is this,—that ornamentation has even united itself with works of utility, whereby it has attained to universality of power.

I take pleasure in the thought, I say, that ornamentation has even joined itself with works of usefulness; and this I do because it is pleasant to me to feel that I am ministering to other things in a manner that bestows upon them qualities such as ennoble them, and make them better than they would be without such ministrations. It has been said that "it is not good for man to live alone," so I think it may be well that art should not live alone; and as it is right that the child be ministered to by those who give to it education of the intellect, grace of manner, and general attractiveness, and as it is right that the sick be ministered to in such a way as shall induce the bestowal of the charm of health, so I think it right and pleasant for our art to minister to common objects in such a manner as gives to them excellent qualities.

Especially do I take pride in this association of my beloved art with works of utility, when I think it has lent an exalted charm to that which would without it be merely an article of usefulness, and that it has taught many an earnest lesson, as it has appealed from the wall which, without it, would merely keep out the weather, from a mat on which the knee has been bowed, or from a simple object of domestic service, as a cup or a bowl. If ornamentation is a high art, and consequently a moral teacher, as it certainly is, how interesting is the thought of its universality, both as regards time and geographical area. Ornamentation is the first art which man originates. The savage carves his war-spear and the paddle with which he propels his canoe into ornamental devices; and this he does long before he seeks to imitate, in a pictorial or sculptural manner, the forms of nature; and this ornamentation which he produces is not a form of art which is to lead up to pictorial work, as something which is higher than it, and then be abandoned; on the contrary, it is an art the highest developments of which have been contemporary with the highest forms of civilisation. It arose in a far-off antiquity as a sort of natural outgrowth of man's mind; it developed itself with the civilisation of the Pharaohs; it flourished in Greece during the period of its highest refinement; and it has been the unvarying accompaniment of every marked period of mental or moral refinement.

Notice also its universality, as regards geographical distribution. In England we have ornamentation of some sort, or attempts at its production, associated with any object to which it can be applied. There is scarcely a carpet, a lamp, a bowl, a wall-paper, a window-hanging, on which some sort of pattern is not found. And England presents no exception to the general rule; for it is so, not in England only, but in Europe only, but wherever civilisation is found, and even further yet; for the wandering and savage tribes employ it on the few simple articles which they make. Works of ornamental art are not confined, then, to the few; they are not the inheritance of the rich merely; for it is amidst them that we live, and move, and have our being. Ornamental, beyond all other art, is cosmopolitan in character. This being the case, what a power it might become for good if always employed as high art,—if always utilised as the teacher of morals, and the handmaid of religion. I rejoice in its universality, as it may become a mighty instrument of good.

These considerations are all-important to us, as England is the manufactory of the world's goods. Believe me that it is not sufficient that an art ministers to the caprices of the uneducated, or the depravity of patrons, nor even to those who seek after beauty merely. If a true art, it is above all this; and the artist, the producer of art, is unworthy of the name which he bears, if he does not use his every influence to so employ form and colour as to elevate his fellow-men. Think, my brother artists, of the vast area over which your works may spread, in these days of quick transit. Think of the good which you are sowing broadcast, if your works are but noble and pure; and then, I pray you, devote yourselves earnestly to the good work at which you labour.

These considerations lead me to notice that ornamentation as a high art must be truthful, beautiful, and powerful in expression, for if not so it cannot be a moral teacher. There is no expression of which man is capable which is more god-like than that of truth. Truth, how noble, how beautiful, how righteous to attend it, and how degrading is falsehood; yet we see falsehood preferred to truth—that which debases

to that which exalts, in art as well as morals; and I fear that, as now practised, there is almost as much that is false, degrading, and untrue in my beautiful art, as there is of the noble, righteous, and exalted, although art should only be practised by ennobling hands. It is this grovelling art, this so-called ornamentation, which tends to debase rather than exalt, to degrade rather than make noble, to foster a lie rather than utter truth, which brings about the abasement of our calling, and causes our art in many instances to fall in taking hold of and clinging to the affections of the noble and great. If it were but invariably truthful in its utterance, we could then reasonably expect that it would prosper, having the sanction of the Most High.

All graining of wood is false, as it attempts to deceive, the effort being made at causing one material to look like another, which it is not. All "marbling" is false. A Brussels carpet that imitates a Turkey carpet is false, so is a printed fabric that imitates one which is woven, a gas-lamp that imitates an oil-lamp, and a flat ornament that imitates carved or relief forms of any kind. These are all untruths of expression, and are besides vulgar abominations, which are the more lamentable as the imitation and false representation are always of a lower order than the works imitated.

To some present, a portion, at least, of the falsities which I have mentioned may appear as little matters, but this is not the case. I cannot believe in little sins and big sins; and even were there such, the little leads to the greater. The thief commences his downward career by little thefts. Mark this,—if not truthful in little things, there is but a small chance of a man remaining so in great matters. To the ornamentist I say, and this I do earnestly, that if our art is to prosper, and to take hold of the affections of the noble and the pure,—if it is to have the sanction of that Being who has given to man the power of producing the beautiful, it must be truthful in its minutest utterance.

Away, then, I say, with those detestable decorations which are now beginning to falsify the ceilings of the South Kensington Museum, and are teaching the public that a lying art is that which is worthy of their consideration and of national regard. Away with that, I say, which does not conform to this, the first of all requirements,—truth. Do you not know that whenever art has nationally departed from truthful utterance,—when it has sought to deceive, rather than lead the mind upwards to the fountain of all truth, that there has come its final overthrow? Pompeian art was false, and Pompeii was destroyed. French art, with all its prettiness, was not truthful, and France has fallen. Unless there is a noble aim in the production of our art,—an aim beyond that of merely pleasing the beholder—it cannot be a high art, and it cannot maintain a prolonged existence.

I must now notice my second statement, which is, that ornamentation must be beautiful in its expression. I need not enlarge upon this assertion, for that which is not beautiful can rarely be ornamental; but this I may say, that that which is beautiful manifests no want, no shortcoming. A composition that is beautiful must have no parts that can be taken from it while the composition yet remains equally good, or better. The perfectly beautiful is that which admits of no improvement. The beautiful is lovable, and that which is lovable takes hold of the affections and clings to them, binding itself firmer as time rolls on. If an object is really beautiful, we do not tire of it; fashion does not induce us to change it, the merely new does not displace it. It becomes as an old friend, more loved as its good qualities are better understood.

My third statement was this,—that ornamentation must be powerful in its utterance. If power is absent from a composition, weakness is the result, the manifestation of which cannot be pleasant. Weakness is childish, it is infantine; power is manly; power is Godlike. With what power do the plants issue from the earth in spring. With what power do the buds develop into branches. The powerful orator is the man we admire, the powerful thinker the man we esteem. Even the simple power, or brute force, of animals, we involuntarily approve, for power is antagonistic to weakness. Power also manifests earnestness; power means energy; power signifies a conqueror. Our compositions, then, must be powerful.

But besides all this, we, the professors of the art of ornamentation, must manifest power in our works; for, being sent as teachers to instruct,

* By Dr. Christopher Dresser. From a paper read at the Society of Arts, February 5th.

ennoble, and elevate our fellow-creatures, we shall not be believed if we do not utter our truths with power. Let truth, then, be uttered with power, and in the form of beauty.

Here, again, we find the new ceiling decorations at the South Kensington Museum wanting, for they are not only without truthfulness, but they are as feeble in expression as a new-born babe. Look at the sketch decoration of the refreshment-room, or at the finished ceiling in the Majolica Court, and you will be astonished, I think, at the almost total absence of all that is beautiful, true, and ennobling in art. If a selection of the deformities of the most debased styles of ornamentation had been made, and that when these styles were in their worst periods, I cannot conceive of more unworthy results being achieved. In the name of truth, in the name of beauty, in the name of power, I protest against such.

I can only account for this national fostering of a quasi-Romanesque or Renaissance art in this way. Such a style does not consist of true ornament at all, but of pictorially treated fragments, as I have before said. It is, therefore, misapplied pictorial art, and has no association with true ornamentation. This being the case, and the authorities of the South Kensington Museum being either pictorial artists, or men with pictorial tastes, this fostering of a detestable mongrel art can be understood, yet it is none the less lamentable.

One great aim of the ornamentist must ever be the production of repose. The great ornamentists of past ages have been those men who achieved this most desirable result. To spend life where this is not achieved is, to the informed and sensitive mind, to be subjected to continued misery. This repose cannot be achieved by any Romanesque and Arabesque treatment; for these involve the production of pictorial fragments, each of which must be a "spot" in the composition, as it is a centre to which the eye is called. For this reason, were there no other, I should object to these styles; but, beyond all these, these treatments are untruthful in their expression.

In this one fact, however, I rejoice. The authorities of the South Kensington Museum, if I rightly understand their characters, are men who have only to be shown that they are wrong in order that they may put matters right. I hope, then, that my remarks may reach their ears.

My time is gone, or I should have sought to show you that the art for which I now plead can soothe, as does sweet music; can cheer, as does the merry air; can hush to reverie, as does the solemn anthem; in short, that it can express and minister to all the various emotions of the passions or soul.

SCIENCE IN ARCHITECTURE.*

Cementing.

Good cement face-work will stand well for many years without being painted. Cement that requires painting for durability, and not for appearance only, is of inferior quality; the principal object in painting cement work is to give it a fresh appearance. The front of the old Compton House, in Church-street, which had all the appearance of stone, was good cement that had not been painted. Good Portland cement may be always told by its bright colour of bluish tinge; the common is a dull slate colour. For face-work, two of gravel and one of cement is the best mixture, with the finishing coat half and half; too much cement in the mixture makes it, technically, too rich, is a common cause of cracks. Good cement, the second day, should be so hard that it cannot be broken without difficulty; that which will crumble easily in the fingers on the second day may be condemned at once as not good. Specifications often require that gravel only shall be mixed with the cement; that for mouldings should, however, be mixed with sharp sand, otherwise a smooth finish cannot be obtained. Portland cement should not be wetted on finishing: this perishes the cement. The first coat should be well wetted and soaked, then the last coat put on, and this not touched again with water. If rain gets to it before being quite dry it is very liable to perish; on the other hand, fire-cracks, common in cement works, often arise through the under coat being too dry when the last is put on. If cement be put upon a

wall liable to damp, the wall should be allowed to dry first, otherwise the cement may perish. If this precaution is not taken, and the damp in the wall does not dry out quickly, or becomes renewed, the cement is sure to perish. The cracks that occur in the lining of rain-water tanks are not generally due to inferior cement, but to insufficient provision for bearing the weight of water. In making a rain-water tank of brickwork, it is well to build the half-brick lining in cement, and then form the bottom of the sides of the tank with cant angle bricks; this takes a great deal of the pressure of the water off the bottom, and throws it on to the sides, preventing leakages through cracks occasioned by settlements. The cant bricks may be put in after the tank is formed, set in cement, but they are better built in as the work proceeds, and bonded. For pointing about roofs, hair-mortar, mixed with cement, is better than cement only; it adheres when the heat and cold cause expansion and contraction, and does not crack through uneven drying; half and half is a right proportion. Good cement is often spoilt at buildings through undue exposure, or otherwise by want of care; when the men are disposed to put this into their work, it becomes difficult for the architect to detect the evil until too late. It is necessary to be very strict with men on the first evidence of indifference.

Plastering.

In lathing for plasterwork laths should break bond, an arrangement technically termed enatching; this gives a good hold to the joists, and makes a firm ceiling; instead of the lathing being executed with rows of laths of equal lengths, joined by other rows of similar lengths, the bond should be broken by changing the length of the laths every 5 ft. or 6 ft., and so causing one set to stretch across the joists to which the others have been fastened. This system takes more time than the ordinary system, and will not be adopted by men unless they are well looked after; it requires to be distinctly specified, on account of the extra labour. It is well to examine the cow-hair provided for mortar before it is used; hair ought to be long and sound, but often it is brought to the building in bags, of short length, and quite rotten, no strength in it. This sort of hair makes the plaster far worse than it would be without any. The plaster should also be examined before being put upon the ceilings, by holding a little up with a spade; the quality in this respect can be detected by the hair hanging down. The finishing coat of plaster is sometimes set with hair in it; the plasterer picks out the white hair and beats it fine, then uses it with plaster of Paris. The last coat should be composed of about one-third plaster to two-thirds of lime putty. The blotches or streaks sometimes seen in plaster walling are generally the result of bad work, though not so in all instances: a sooty or burnt brick in a wall will sometimes cause an unsightly patch on the plaster; marks from this cause have been known to come not only through the plaster, but the papering also. New ceilings ought not to be whitened; whitening eats into the new work and injures it. Lime for mortar should be burnt but little; much burning destroys its nature; the phrase "lime to be well burnt" is apt to mislead. When slacked lime is much better than when slacked, in the common way; by sluicing I mean letting it fall to pieces, instead of running it with water; it becomes much more durable for mortar, and especially for pebble dashing in mortar. If in mixing the lime for mortar or plaster the least bit remains whole, though as small as a pin's head, it will burst in time and throw the plaster off the wall. This explains the cause of bursting occasionally seen on plastered walls. When the lime is run with water, this defect is not so frequent as when the lime is allowed to fall. The latter mode, however, makes a superior mortar; but the lime for this purpose is best prepared two or three months before-hand, which precaution prevents any portion of the lime remaining whole: it involves extra trouble in turning it over, which makes the mortar very expensive. I have known the following practice to be observed in making good mortar. The lime spread on the ground and a little water thrown over it; the whole then covered with sand, and left for three or four days. The water soaks the lime into a powder; this is then mixed with the sand, and the whole passed through a sieve; it is then ready to mix with water to form mortar or plaster.

The best way of forming plaster cornices is to run a moulded mould, muffled with plaster of

Paris, upon a ground of hair mortar, and leaving about one-third of an inch to be run afterwards with plaster of Paris and lime putty; this makes a much stronger cornice than is made by the present system, which is only a result of a wish to expedite the work and make it cheap at the expense of quality of workmanship. Plaster cornices often crack through there being common plaster mixed with the good; the common sets more quickly than the good, and the uneven setting produces cracks. It is a common practice to mix glue with plaster when there is doubt as to its quality; the glue causes the whole to take a longer time in setting.

Plumbing.

No branch of the building trade requires more careful supervision in the execution of the work than this; defects creep in from all conceivable causes. I was recently asked to look at the iron cistern attached to a circulating boiler that had only been in use three years, but was now worn out; the house was of good class, 150l. rental. I found, on examination, that the bottom was completely worn through, and accounted for it thus: no steam pipes had been fixed, and hence the pressure of the steam had exercised a force upon the bottom and sides of the cistern, resulting in the effects named,—mild compared with what they might have been, for though the necessary steam pipes had been omitted, stop-cocks to the pipes had been carefully fixed. Evidently the steam had found its only escape through these pipes, and hence, had the stop-cocks happened to have been turned at any time, there would then have been no possible escape for the steam, and an explosion must have resulted. The work had to all appearance been committed to the care of apprentices, who did not understand it, and this is one source by which errors creep into this important branch of the building trade. On another occasion, on being asked to look at some property in course of erection, I found the lead pipes were all of considerably less weight than specified, and having them, as I thought, all changed, I discovered a length of the old piping left in a place where not exposed, the new being jointed to the old in such a position as almost to escape detection; there was an abundance of lead piping supplied for the purpose by the contractor, and the only conceivable cause for this deception was the disinclination of the man employed to put himself to the necessary trouble involved; and here again another source may be observed by which errors creep in. As another illustration, I recollect, on the completion of a first-class villa, part of the flashings proved to be of three pounds lead only; this, on being discovered, excited suspicion as to the whole of the leadwork; on examination, however, the remainder proved correct; and the contractor, who was an honourable man, accounted for the circumstance by supposing the man whom he had employed when engaged with that portion of the work found himself short of material, and used what was nearest to hand. Such circumstances show special necessity for careful and intelligent supervision of this branch of works, since, apart from malevolence, carelessness and accident may result in so much defective work that, though not at once apparent, is in the end the more injurious. Where there is a disposition to deceive, the facilities of plumbers' work are so numerous that the results are often infamous. In a recent erection in this locality, the sole contractor for which was a most honourable man, the roof, on completion, proved to be flashed with zinc, painted to resemble lead, as per specification, being fixed so as to deceive in those positions likely to be examined. The eye may soon become familiarised with the various thicknesses of lead sheets and pipes, and it is advisable to make an effort to retain this familiarity. In the islands at the north of Scotland I found, on a recent visit, that ordinary flashing is executed with 7 lb. lead. This is an unusual strength with us, but should be adopted everywhere, when the flashings are long or exposed to unusual tempest. Ways and means are continually evidencing themselves for saving expense in the manufacture of the numerous fittings required in plumbers' work, and a strong check is required on the part of the architect, while, on the other hand, it is no less important that he makes himself familiar with the numerous improvements that are continually being invented. To enlarge upon this latter subject would be out of place in this paper. Common brass-work in taps, &c., is often deteriorated by a mixture of zinc in the metal. This may be known by the light yellow colour of the brass when polished. The best brass-work, con-

* By Mr. Wm. Parslow. From a paper read at the Liverpool Architectural Society.

taining gun-metal, has a much darker colour. Lead-piping is often obtained cheap in Liverpool, made of old pipes, from which the solder has not been extracted in the ordinary way, and which, being left in the lead, necessarily destroys its properties. The regulating cisterns of some houses I recently examined leaked in most instances, though they were comparatively new. I found the cause was in the valve being flush, instead of being raised, a difference which considerably reduces the cost of cisterns, but detracts materially from their usefulness. The action of the plug and chain, assisted by corrosion, soon wears down the metal round the valve, causing it to leak; but when the valve is raised, as it should be, the thickness of the valve has to be worn down, which is hardly possible, before this tendency to leak can begin. A little difference such as this makes all the difference between good and bad plumbing; and, again, in reference to fixing these fittings, the cheap ways of jointing pipes may be soon detected; but we cannot readily observe when taps and cocks are secured with a mixture of poking and solder, instead of being neatly soldered only, which is essential for such fittings. Boss taps are best having a square knob attached to the boss to secure their hold in the wood or stone work. Otherwise, when the tap is screwed or unscrewed, the pipe will be twisted and so injured. Since the subject of using lead pipes lined with block-tin has been before us recently, I will not, as I intended, go into its merits, particularly as the chemical properties of the Liverpool water have not the action upon lead that is experienced elsewhere, rendering such pipes necessary with us; but, in reference to the subject, I heard of a case of lead palsy, where the doctors were at first puzzled to find out how the lead had entered the patient's system. They subsequently found, however, that he had been accustomed to drink water taken from a lead pipe, which, for a considerable distance, had been exposed to the outer air; and this circumstance was regarded by the medical men as the cause of the disease, inasmuch as chemical action sets in through the influence of water on lead pipes, much more seriously when aided by the external air than when the pipes are covered in the usual way. The circumstance suggests the necessity of caution in covering lead pipes. Lead pipes are liable to being injured by vermin. I have known rats to gnaw holes in gas and water pipes, and make serious havoc in a single night. Covering pipes with gas-tar is a good preservative, since rats will not touch this.

THE PRESERVATION OF BASILBEC.

SOME few days ago Mrs. Burton made a very interesting communication to the *Times* on the subject of the remarkable ruins of Basilbec, describing their present unsatisfactory condition, and the failure of an attempt to remove some of the modern obstructions, in consequence of caprice on the part of his Excellency, Rashid Pasha, who at first sent from Damascus Mr. Barker, chief engineer to the Government of Syria, to superintend the work. Mrs. Burton says:—

"After examining the Saracenic capping of large stones overlying the southeastern axis of Jupiter, and which seems to crush down the cornice and to extrude the columns at the joints, it was judged unadvisable to remove them. The cornice, broken in two places, inclines slightly outward, while the stones are disposed exactly over the centre of gravity, and serve to diminish the thrust. We therefore left with regret this hideous addition, this *boutet de nuit*, which must now be regarded as a necessary evil; and I may here remark, for the benefit of your general readers, that no one can form a conception of the size of the stones used for building Hieropolis, unless they have seen them. The three famous ones, measuring 64 ft., 63 ft. 8 in., and 63 ft. long—each 13 ft. in height and breadth, and raised to a height of 20 ft. or more—take away one's breath, and compel one to sit before them only to get more and more puzzled, and to think how very superior in stone-lifting and transporting the Pagans must have been to us in 1870."

The first work was to demolish the ignoble eastern making wall. At an interview with the local authorities it was agreed that they should supply labour on condition of the *tailor* to carry off the building material. During our stay of five days, the upper part of the barbarous screen had been removed, much to the benefit of the temple; and it was a great excitement to the small population of the village of Basilbec to see the huge masses of stone coming down with a thud.

We intended next to expose, by clearing away the rubble-heap at the proper entrance, the relief extending on both sides of the great portal. Lastly, we had planned to underpin the falling key-stone with a porphyry shaft, of which there are several in the *Jami-el-Kaher*, or chief mosque. The prop was to be as thin as possible, so as not to hide the grand old eagle, emblem of Basil, the sun-god, which occupies the lower surface of the middle soffit stone."

As soon, however, as the work was commenced, Mr. Barker was summoned to Damascus by

Rashid Pasha, who, after having offered to carry out the improvements, changed his mind suddenly, inexplicably, *à la Turque*. He objected to the building materials being given away, and gave Mr. Barker something else to do. Now, although the motive may have been different from our own, we are forced to say that we agree with his Excellency in this objection, and trust some other mode of payment will be found. It may be quite true that the only materials Captain Burton and his party were willing should be taken away were those of the modern additions and disfigurements, but the system is a most dangerous one, and its introduction would probably lead to great loss and injury.

Mrs. Burton gives a programme for a morning's work there:—

"The temples are, doubtless, the main attraction, but they are not everything, at Hieropolis. Walk up the hill to the south-east of the *Kadi's*, examining the remains of the western wall about the gate now called '*Banuel-Dawia*,' or '*El Barr*.' Visit the rock tombs and sepulchral caves, the remains of the small temple and Dione columns, and the Saracen *Kubbat*, or dome, under which lies Melok el Amjad, of the Seljukian dynasty. From this high point the view of the ruins and of the valley is absolutely charming. Descend to the nearest *quarries* (quarries), and measure every one does with different results—the *Hajjar el Habish*, or 'pregnant stone,' as the huge unfinished block is called. Our measurement was 70 ft. long, 14 ft. 2 in. high, and 13 ft. 11 in. broad. It was doubtless cut and prepared for building, but not detached from the quarry at one end, and the extraordinary sight makes you exclaim, 'Something must have frightened them away before they had time to carry it off.' Ride to the *Kubbat Dawia*, the Wall, named from a neighbouring village; its eight columns of fine granite have doubtless been removed from the classic building. Thence proceed to the other quarries to the north of the temples."

Some of our readers who have lately visited the City of the Sun (we know two or three) will perhaps tell us a little about the actual state of the temples, and the steps that might wisely be taken in their favour. These marvellous relics of the past are the property of the whole civilised world, and all the world is bound to look after them.

THE CENSUS IN APRIL NEXT.

DOCUMENTS have been sent out all over the country to the local officers, in order that they may at once make the arrangements necessary for enumerating every living person in England in one day (Monday, April 3d).

It is an arduous and important undertaking, and can only be accomplished with the assistance and goodwill of the public at large.

The first duty of the superintendents and registrars is to plot out the country into some 33,000 enumeration districts and to appoint enumerators. This is now being done. The assistance is required of the municipal and all other authorities in marking boundaries on maps, naming and numbering streets, &c., and in such other ways as are indicated in the Registrar-General's letter to the mayors and chairmen of local boards.

The scale of payment sanctioned by the Lords of the Treasury will afford a higher rate of remuneration than that assigned in 1861. It is hoped, therefore, that efficient persons will be induced to arrange for doing the important day's work, and that the returns relating to persons and houses will be both accurate and complete.

The public ought to be made widely aware that they are liable to heavy penalties if they refuse or fail to fill up the schedules, or do not fill them up truthfully and properly, to the best of their knowledge or belief. The local officers appointed will no doubt, when the time comes, give them every requisite information; and indeed the schedules themselves that will be left to be filled up are very simple and explicit, and give specimens, in print, of the way to fill up the blanks.

GENERAL EXHIBITION OF WATER-COLOUR DRAWINGS.

THE 655 pictures constituting the Seventh Annual Exhibition of Water-colour Drawings, in the Dudley Gallery, Egyptian Hall, include, with a large amount of small and namby-pamby art, a sufficient number of charming works to make a visit to the Gallery delightful. Artistic feeling and earnestness are to be seen scattered about, and serve, even where technical power may be less apparent, to attract attention and gratify the thoughtful observer. We cannot do better than send our art-loving readers to examine for themselves. Mr. F. W. Burton's "*La Romanina*" (172), Mr. Poynter's portrait of Lady Wensleydale (253), Mr. Marks's "*Thoughts of Christmas*"

(269), "*The Enchanted Forest*" (8), by Mr. J. A. Fitzgerald, "*Left Behind*," by Miss Claxton (15), and "*The Mystery of Faith*," by Mr. S. Solomon (89), will not be overlooked. The drawing by the last-named artist on a screen, and Mr. Cave Thomas's sketches for decorations, are less likely to be seen unless looked for. Mr. Andrew Donaldson, Mr. Jas. Hayllar, Mr. Jopling, Mr. Joseph Knight, Mr. Playfair, Mr. A. C. H. Luxmoire ("*The White Cockade*"), Mr. Waite, Mr. Haynes, Mr. A. Severn ("*Evening on the Tiber*"), and Mr. H. Schlesinger, also send interesting examples of their art. Mr. Edward Fahey, in "*Glaucus*" (200), makes a jump forward. "*Flooder Sparring*" (217), by Mr. Hamilton Macaulan, should not be missed, nor Mr. Macquoid's drawings of Spanish buildings.

PERMEABLE AND IMPERMEABLE FOUNDATIONS.

AT the close of Professor Ansted's paper at the Institute, part of which we printed in a recent number,* a discussion of much value followed. We must confine ourselves to some of the principal points mooted.

Dr. Henry Letheby said, "I think that in a sanitary point of view too much consideration could not be bestowed upon the application of geology to the whole question of building; as, for example, to the ground upon which a structure is erected, and also to the materials of which it is to be constructed; for every medical man of large sanitary experience must have been constantly brought into relation with very expressive facts, showing how terribly the question of the character of the soil, and the nature of the materials of buildings, have been neglected. The views to which Professor Ansted has directed our attention are, I think, especially worthy of the consideration of architects, because they show how intimately the geological features of a soil are related to many endemic diseases, and to most epidemics. This has been especially observed by Professor Pettenkofer in his examinations of the various outbreaks of cholera in different places; and his views were singularly confirmed by the fact that epidemic cholera in London during the last epidemic of cholera in 1866. It happened, indeed, during the epidemic of 1866 that certain places in the eastern parts of the metropolis were entirely exempted from cholera, while neighbouring places were seriously affected by it; and when the whole of the facts were inquired into, it was found, most remarkably, that the character of the soil was essentially different in the two places, showing that it had much to do, on the one hand, with the prevalence of the disease, and, on the other, with immunity from it. In the City of London Union Workhouse, in the Bow-road, for example, where the force of the epidemic was most severely felt, and where in the course of three or four days there were no fewer than twenty-six cases of cholera in one set of rooms only, namely, the infirmary. In fact, during the interval from the 26th of July to the 4th or 5th of August, there were nearly fifty cases of cholera, and with one exception they occurred in that set of rooms only. This was a remarkable fact; and when it came to be inquired into, it was found, from an examination of the geological map of the district, that this infirmary of the workhouse in which the cholera cases occurred stood upon gravel, while the whole of the other portions of the building were erected upon brick earth or clay. Another case, to which I would refer, is equally instructive, for it shows how the geological character of the soil may affect cases of this description. In a pauper school, at Limehouse, with about 400 children, situated in the very midst of cholera that was raging about it right and left, even in the same street, there was not a single case of the disease. When the circumstances of that case were inquired into by Mr. Whitaker, of the Geological Survey of England, at the instance of the medical officer of the Privy Council, he ascertained that the school building stood upon a thick bed of island of brick earth, and not upon gravel as was supposed; while the neighbouring houses, in which cholera had been so severe, were built upon made earth and gravel. There are many such instances quoted by Professor Pettenkofer, and which might be mentioned if time permitted: possibly, indeed, the immunity from cholera at Wansstead, Walthamstow, Buckhurst Hill, Leytonstone, Stamford Hill, and North Woolwich, may

* See p. 22, ante.

have been due to this very same circumstance; but, on the other hand, though clay may be to a large extent a protection during a visitation of cholera, it is in other respects a most unhealthy kind of soil for a permanent residence; for it is provocative of rheumatism, phthisis, and other diseases produced by a damp atmosphere. It would seem, therefore that the immunity of a population from cholera, typhoid fever, and endemic bowel complaints, is dependent on the freedom of the soil from excremental soaks, and from variations in the level of the subsoil water. As regards phthisis, it is now abundantly proved that dampness of soil is an important cause of the disease, and that when works of drainage are carried out in any town, the mortality from phthisis notably diminishes.

Again, the character of a stone of which a building is constructed is not without its influence in the sanitary condition of a building. This is especially so in the case of public hospitals, where the porosity or non-porosity of the stone of the inner walls may actually determine the question of healthiness or otherwise; for a porous stone will so absorb organic effluvia, that it may at last be the means of rendering the wards uninhabitable. In such cases there is no remedy but the clearing of it out, and the thorough cleansing and disinfecting of the surface walls. All this would, I think, be prevented to a large extent by a careful consideration of the geological and physical qualities of the materials with which architects and builders have to deal; and this is especially needful in the case of hospitals and infirmaries, which require a stone of an impervious character.

Dr. Druitt said, I think my friend who preceded me is a little hard upon architects, when he suggests that they have not hitherto paid sufficient attention to the geological features of sites of buildings, and the materials of which they are constructed. When human beings employ physicians they expect them to cure the disease, though they will not help by giving up one error in their mode of living. In like manner, we expect architects to build healthy houses, although their clients prescribe not only the site, but the materials, the aspect, and every other circumstance connected with it. The lesson one learns, is what an exceedingly complex matter human life is, and how much it is affected by circumstances, whose influence no one dreamt of before. My friend Dr. Letheby may seem to some of us to have entered a kind of paradox, when comparing Pettenkofer's researches with Dr. Buchanan's. In the first place, he pointed to the danger of too dry, too porous a foundation, and in the next place to the danger of too wet a foundation; and showed that in our endeavours to avoid phthisis we come in the way of incurring typhoid and cholera. Now, though somewhat puzzling, these statements are no doubt each perfectly true and consistent. Professor Pettenkofer promulgated the theory that the prevalence of cholera and typhoid was coincident with a low level of water in the subsoil.

It has been shown by an American physician, and by Dr. Buchanan, that the prevalence of phthisis coincides with a high level of subsoil water. If we look at a town situated on a porous soil, we find multitudes of human beings contaminating the soil with those pollutions which are soaked up by the ground and usually carried away by the water which percolates the gravelly soil on its way to the nearest river; but when dry weather comes, then it is that what Dr. Letheby says happens—the soil becomes a medium of giving off the most dangerous miasmas, and the soil of the locality being foul and half dry, assumes the condition of an aquish country, which, if not thoroughly drained, had better be left wet than half dry. One is delighted to assist at a meeting like this, in which gentlemen engaged in one important function relating to human life, in providing buildings to insure protection from the weather, and the enjoyment of civilised society, are seeking for their profession a true scientific basis. With regard to geology, I have nothing to remark, but if it is within the scope of the meeting, I would call attention to the practice of erecting dwellings on what is called "made ground." It is a very remarkable circumstance that on what used to be the fields round London, where notices were exhibited that rubbish might be shot, and the scrapings of roads, and all other offensive materials were deposited for a series of years, there has now arisen a city of palaces. If there is any truth in the statement that emanations from the soil have an injurious effect upon the health of the people living in the houses

placed in such situations, it is difficult to conceive that they can dwell in houses on such sites without deteriorated health. We have now before us the puzzling phenomenon of the great increase of scarlet fever, and other disorders which appear to defeat all our efforts for their suppression. Probably the condition of the soil below the foundations of the houses may be one element in the matter. If there be truth in the views of those who hold that water is the great vehicle of cholera and other diseases, there can be no question that when water containing impurities is allowed to soak into the soil and is retained there, it will give off emanations highly detrimental to health. Whether taken as a drink, or inhaled as vapour, poisonous water is probably at the bottom of a large number of diseases.

Professor Donaldson.—We know, if we refer to old Vitruvius, that he has devoted the fourth chapter of his first book on architecture to the choice of site, and throughout his work we find allusions to the importance of careful consideration being given to the selection both of site and of water sources. I could wish that each young student possessed a copy of Vitruvius, and would read it through, for in it would be found not only illustrations of the canons of the ancients in regard to art, but practical lessons as to materials and construction, which are of the utmost value even in the present day. His was a comprehensive and judicious mind; and I am sorry to say that he is less valued than he deserves to be. In many cases it is necessary to attend to the substratum, to see whether it is sound naturally or artificially, and to ascertain whether there is cause to doubt the sufficiency of the substratum to support the buildings which would come upon it. We have a notable instance of this in St. Peter's at Rome. The edifice was built upon the ancient site of the Circus of Nero, and two bell towers were built on the front, which were obliged to be taken down from the insecurity of the foundation, there having been old constructions beneath. In the case of London artificial substrata arise from a variety of circumstances. There was, for instance, the old Walbrook. Many have been the casualties to the foundations of buildings in the bed of the old brook. Nothing could be more unreliable than building on such soil as that; and many of us here recollect the Fleet ditch lying an open stream northwards of Holborn, and since covered. The memory of the circumstances passes away. Architects build, not knowing the facts, on what they think is a good substratum; but below it is treacherous, and serious consequences ensue. In Egypt there are whole towns built in series one upon another. I have seen a hill cut through, and there were laid bare the strata of villages of different epochs one upon another. Occasionally the Nile overflows, sweeps over the mound, and reduces the mud-built houses to mud again. Then comes another generation of occupants, who build their houses upon the same mound. You find tombs, and sepulchres, and mummy cases of different successions of ages, of the successive inhabitants. Therefore it requires great care to be fully aware of the previous circumstances that have prevailed in certain localities. We have had some useful references made with respect to the unwholesomeness of houses. With respect to the Bow-road case mentioned by Dr. Letheby, it was certainly a very remarkable one. I should have thought myself that a substratum of that kind would have conducted to the health of the occupants, being partly on a gravel soil and partly on old brick rubbish. We have hitherto always considered that a permeable soil, which will carry away the surface water, was rather healthy than unhealthy; and that a compact soil, like clay, would retain the impurities that were carried into it. Therefore one can hardly find a solution of what appears to be an anomaly. Professor Ansted mentioned the Holborn Viaduct. I do not think that there is any fault in the foundation. The defect is either in the material used, or in the mode in which the joints are set. That I believe to be the cause, and not the effect of the subsoil of the Holborn Viaduct.

Mr. Wm. Haywood (learning that the lecturer's impression was, that the foundation had, to a certain extent, given way), said,—This is a practical point; and as there is nothing more instructive than an account of a failure when truthfully given, and though for reasons which I need not state here, I cannot enter closely into the cause of the fracture of the columns—though undoubtedly it will hereafter be discussed either

in this Institute or before another body, to which most members of this Institute have access—still, as regards the foundation, I am quite prepared to tell the meeting all about it. The Fleet river was, at that spot, perhaps from 100 ft. to 150 ft. wide. In the course of time it became the Fleet sewer. The bottom of the old Fleet river was something like 20 ft. below the level of the street. The tide rushes up the Fleet-sewer, and fills it about two-thirds of its height. The height of the sewer is 13 ft.; the bed of the sewer and the bed of the old Fleet river being about the same level, has from 10 ft. to 12 ft. of water on it twice in every twenty-four hours.

The bed of the old Fleet river was in clay, and the bed of the sewer is in clay. The foundations of the Holborn Viaduct at that spot were put in bit by bit, without a coffer-dam, with the Fleet sewer between them, subject to the enormous scouring action which results from the drainage of so many miles of country, and to the tidal action; therefore, as you may suppose, the foundations were put in under great difficulties, and very much anxiety, and they were carried to something like 7 ft., and in places 8 ft. below the level of the old Fleet river, and solidly embedded in a compact mass of the London blue clay. I believe if you take the bearing area of the concrete base on which the granite pillars stand, it will bear per square foot of surface five, six, or seven times as much as it can possibly have to bear, supposing the bridge to be packed with human beings; and when a close examination was made by myself, and perfectly independently of me by three engineers not selected by myself, they found, as closely as it is possible to ascertain anything of the sort, that the foundation had not yielded in the slightest degree.

And now all I have further to say is, that those three engineers made their report, attributing the fracture to bad jointing, and I think any man who will take the trouble to go and look at this somewhat instructive partial failure, will be of opinion that the defect in the columns is attributable entirely to the bad jointing. Now, although I do not admit a defect, if there was a defect in the design at all, it was that I endeavoured to make to fine a joint, and expected as conscientious workmanship as if I had worked the stone myself. I did not get it, and a space of the thickness of a sixpence between the surfaces in such an inelastic material as granite, would be as likely to be the cause of fracture as if it were a much greater space. When the columns cracked they found their bearing, and they have never moved from that time to this.

Professor Ansted (in the course of his reply upon the discussion) said,—From the account which Mr. Haywood has given of having reached the London blue clay, it is clear that the view I entertained was incorrect, and therefore I at once withdraw my remarks with respect to the Holborn Viaduct foundation. At the same time, I would take the opportunity of reminding the meeting that a bed of clay reached under such circumstances in preparing foundations for a large construction might, though apparently thick and steady, have had below it another mass of alluvial matter and loose sand. I have myself seen such cases where loose and quick sands have underlain 40 ft., 60 ft., and even 90 ft. of thick sound clay. Similar cases are not even uncommon in river valleys, and I regret I did not quote some instance more distinctly to the point, and one in which I had the facts more completely before me. I hope, however, that Mr. Haywood will not think I had the slightest intention of throwing blame upon him. I was aware, from the reports of the engineers appointed to examine the work, that so far as he was concerned he was held perfectly blameless. There is one point alluded to by Professor Donaldson, which calls for a word or two from me: that is with reference to the case in which a permeable rock is supposed to carry away the moisture which falls upon or runs over it. Whatever may be the contents of the water that passes over or comes in contact with such permeable rocks, there will be no harm done if the whole can escape by natural or artificial deep drainage; but if the impermeable rock below is basin-shaped, the sewage matter that is carried down with the water is collected there, and may prove very mischievous. When the impermeable rock is clay, and the hollows on the surface are filled up with clay, the worst instances of miasma are, I believe, likely to arise.

WANT OF PROPER CLASS-ROOMS FOR SCHOOLS OF ART.

SOME remarks in the last report of the Head Master of the Manchester School of Art, Mr. Muckley, may be usefully read and considered in other places besides Manchester:—I must now, he said, be permitted to ask your attention to the subject of lighting the class-rooms, for the more the students advance, the more the defect, in this respect is felt by them, and it is quite impossible for me to make you acquainted with the hourly difficulties we have to encounter from this deficiency. The study of art is arduous enough when circumstances are favourable, but when impediments are increased by one the worst of all others, namely, the want of proper light, I am certain it often proves too much for the student to deal with. Nor shall we, I fear, be better suited with regard to this matter until a proper building is erected for the purposes of the art education of the neighbourhood. I trust you will give to this your fullest consideration, and that in a short time you will see your way to meet our wants. None but painters themselves can know the importance of a properly-lighted room for their work, and the most dignified object may be rendered mean and weak by improper lighting, while the most worthless one in nature may be invested with consequence by a well-arranged light; and I do not exaggerate when I say that a small apartment, not more than 12 ft. square, might furnish better accommodation as to light than the best room in this Institution. In some cases the studies will appear feeble and unreal, and this defect does not arise so much from want of power on the part of the student as from the imperfect arrangement of light under which the drawing or painting has been executed; and I am persuaded that the task of making a good study under existing circumstances is so great, that pupils become disheartened with their undertaking, and frequently leave the school altogether.

It is felt that art and its belongings require to be brought repeatedly before the notice of the English public, more than any other department of education; and if we are to succeed, it is necessary for assurance of its value to be insisted on continually by those who understand it best. The love of the beautiful in art has yet to be recognised amongst us as one of the subtle and for the most part hidden instincts of our nature, and to those who can cultivate it from proper motives, new and continuing sources of delight and happiness it will bring as a reward.

BUILDERS' BENEVOLENT INSTITUTION.

THE annual ball, in aid of the funds of the Builders' Benevolent Institution, took place at Willis's Rooms, on Thursday, the 2nd inst., and went off well. It was attended by a numerous company, among whom we observed representatives of many of the leading firms. Dancing was kept up till very early hours to the good music of D. Godfrey's band. Those present were much indebted for their comfort and enjoyment to the indefatigable exertions of the stewards, and the secretary, Mr. Harris.

About 400 tickets were sold, and we are happy to add that the funds of the Institution were considerably benefited. It must be agreeable to those who originated this ball to know that altogether more than 2,000l. have been appropriated to pensions from the profit derived from these annual gatherings.

HOLBORN VIADUCT FRONTAGES.

SIR,—If your correspondent, "Observer," is correct in the figures he gives in the *Builder* for the 4th February, of the reserves fixed for ground-rents, he quite explains the cause of the lots being bought in. The amounts are excessively high and far beyond the value. It is well known to persons conversant with London property that house-rents in Cheapside are very high, and also in Oxford-street, though not so much so; but rather curiously it happens that in Holborn, although in the same main route, rents are very much lower than either. A good commodious house, with a 20-ft. frontage, can always be rented in Holborn for between 120l. and 150l. a year, and therefore it is out of all character to ask 120l. to 170l. ground-rent. The Farringdon-street frontages are also not worth high sums; for rentals in that street have always been low. It is a dull though a wide spacious thoroughfare. ESTATE AGENT.

REDCLIFFE SQUARE, SOUTH KENSINGTON.

IN the year 1861, a large tract of open land existed, lying between the Fulham-road and the Old Brompton-road. It was all used as market-garden ground, and the only communication between those roads was an ancient path known as Walnut Tree-walk. In less than ten years, Messrs. Corbett & McClymont, who took the whole of this ground upon building leases, have erected a very handsome estate, to which before we have had occasion to refer. The roads and sewers have all been made, and made well. Houses have been built to suit persons of different means, the rents varying from 46l. to 300l. per annum. The total number of houses, shops, and stables, now standing on the *ci-devant* gardens and rural lanes, is about eight hundred, and it is certainly a surprising fact that nearly all the completed houses are let.

The approach to the Redcliffe estate from the Brompton-road, after leaving the Gloucester-road station, was for some time open to objection, in consequence of its narrowness; but we learn that the road is now being widened, and it is but a few minutes' walk from the north-eastern corner of the estate to the Gloucester-road station. The West Brompton railway station is within a few minutes' walk of the north-western corner of the estate, and the Chelsea station and the South Kensington station are pretty close. These circumstances coupled with the nearness of the South Kensington Museum, and the Horticultural Gardens, may serve to explain the rapid letting of the houses.

For some years Messrs. Corbett & McClymont confined their building operations to houses, ranging between 46l. and 180l. per annum; but as they proceeded they got nearer to the district of South Kensington, and having laid out a handsome space as Redcliffe-square, they have erected two blocks of larger houses, designed by Messrs. Godwin, which they have styled Redcliffe Mansions. They are now about to erect, in the same square, a third block, the elevation of which we illustrate in our present number. Describing briefly one of these houses, we may say that the kitchen, scullery, butler's pantry, housekeeper's room, and so forth, are in the basement. On the ground-floor there are—billiard-room, 23 ft. by 17 ft. 6 in.; dining-room, 22 ft. by 17 ft.; and library, 11 ft. by 15 ft. The first-floor includes drawing-rooms, respectively 23 ft. 6 in. by 18 ft., and 14 ft. 9 in. by 10 ft.; the second-floor, third-floor, and attic, being devoted to bed-rooms, dressing-rooms, and baths.

Arrangements have been made for the erection of a large church, in the western half of Redcliffe-square, and the first meeting of the church committee is to be held in a few days, preparatory to putting up an iron building for temporary accommodation, whilst the church is being built.

THE CATHEDRAL OF BOIS LE DUC, HOLLAND.

OF this very noble structure we have already spoken, giving some description of the interior and an illustration of the remarkable metal font and cover it contains.*

This church may be looked upon as the Dutch Cologne; and, although far inferior to its German rival, it has the advantage of having been completed, with the exception of the tower and two chapels at the west end of the nave, nearly all in the same style, Early Decorated.

The church consists of a spacious choir and aisles, with a chevet and seven radiating chapels. To the north of the choir is the Chapel of the "Blessed Sacrament," as large as an ordinary parish church, consisting of a nave and one aisle, and ending to the east in an apse. On the south of the choir are two sacristies, the larger one ending also in an apse. Eastward of the chapel of the "Blessed Sacrament" is a remarkable octagonal structure, the lower portion of which forms a crypt; the walls of the superstructure are only raised a few feet, but are excessively elaborate. This building is shown to the right in our engraving. Could it have been intended for a chapter-house? If so, it is very interesting, as it is the only example of an octagon chapter-house we know on the

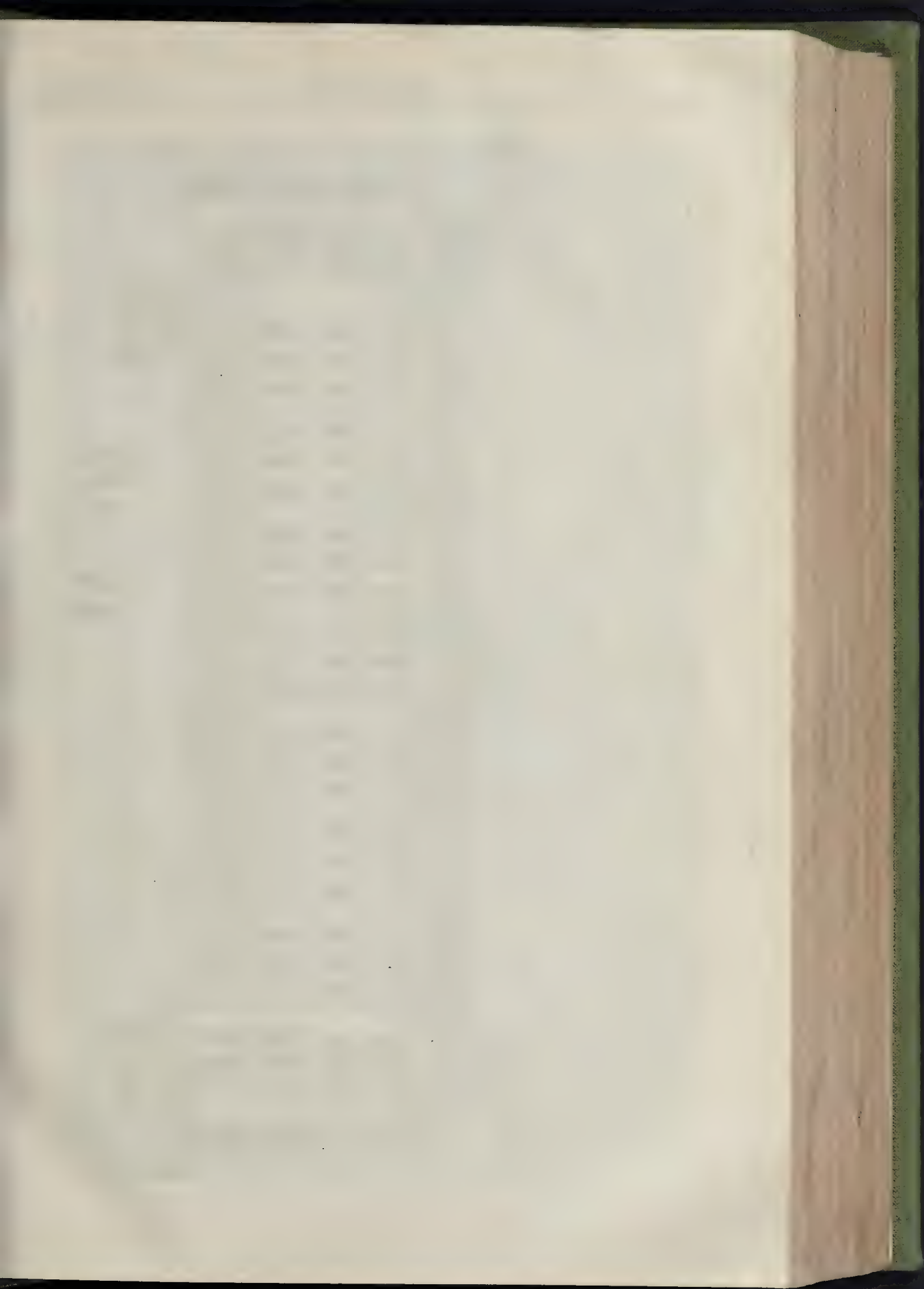
Continent, except Bourges. There are spacious transepts, each three bays deep; and over the intersection is a square lantern-tower, open to the church. The nave consists of nine bays, and has four aisles, two on each side. There is a large brick tower at the west end, which does not stand in the centre, but is quite out of square with the rest of the church. The lower part of this tower is used as a porch. Projecting from the north side of this tower is a transept opening into the two northern aisles of the nave. At the end of the south aisle is another transept, but only half as deep as the northern one; and attached to the south-west angle is a small tower and spire. The great western tower is capped with a lofty Late Dutch spire, consisting of a series of lanterns and bulbs, and, of course, out of all keeping with the rest of the building. It is, however, very graceful in form, and certainly adds to the picturesque appearance of the church.

The general effect of the exterior of this church is singularly rich and fine: the best point of view is from the east, the point which our artist has selected. No church in Holland is so rich in sculpture as that of Bois le Duc; and, although much mutilated and injured by neglect and ill-usage, it still retains more than any other church in the Netherlands. The statues in the pinnacles over the windows (two in each) are exceedingly good, and also those in the great north-transept doorway. These latter have been carefully restored; but we cannot say the same for the rest of the sculpture in this portion of the church.

The centre lantern is a fine feature, and as its treatment is rather unusual we will give a brief description of it. In plan it is square, with the corners cut off, the place of the angles being supplied by octagonal turrets. On each of the large sides are two round-headed windows with circles above them. These were probably all filled with tracery originally. The peculiarity of this lantern is that instead of being raised above the ridge of the roof upon a square base it commences directly from the top of the four great arches at the crossing, and the roofs of the choir, nave, and transepts are hipped back to make room for it, and give light to the eight large windows with which it is pierced. This is also done at Antwerp, in the Cathedral and St. Paul's Church, and also in the church at Zutphen, but in these examples the effect is exceedingly disagreeable, as it gives the church the look of a dilapidated house of having been cut in half—a defect which is avoided at Bois le Duc by the hipping being exceedingly steep, and in plan semi-hexagonal instead of square. Of course, the object of this arrangement is to get rid of the blank wall space above the great arches at the intersection, and to bring the windows low down, and certainly the fine effect of light given to the interior of the church is worth the experiment.

The transept fronts are singularly noble: the southern has a great open porch with two lofty arches, and the northern has a most superb doorway. This front has recently been restored by Messrs. Hesseman & Veneman, architects, in the town, and we wish these gentlemen had been a little more careful with the sculpture. The large group of the Coronation of the Virgin Mary in the gable is certainly not a faithful copy of the ancient one, in which our Lord was represented in the act of placing the crown on the head of his mother; whereas in the restoration the Virgin Mary is already crowned, and the Saviour is pointing up to the sky in a very theatrical manner, which suggests the ridiculous idea that he is giving a lecture upon astronomy. The new statues of the twelve Apostles on either side of the doorway are very tame and poor; the sculpture, however, of the doorway itself has been well and faithfully restored, and is of singular beauty. It is but just to the architects to state that all the new sculpture which was shown us in the workshops, and which is destined for the north side of the nave, is very good, especially the grotesques, gurgoyles, &c., which are careful reproductions of the old ones as far as they could be reproduced. The tracery of the windows, most of which had been removed many years ago, is being replaced, and all the windows filled with stained glass, arranged in geometric patterns. The windows of the apse of the great north window, and those of the two western chapels and the lady chapel, have been filled with stained glass, which is not so bad as much modern stained glass is; but is not quite satisfactory, as there is too much shading and too little transparency in it.

* See p. 10, ante.





B. SLY DEL.

STREET ARCHITECTURE: REDCLIFFE MANSIONS, SOUTH KENSINGTON.—MESSRS. G. & H. GODWIN, ARCHITECTS.

W. H. BARNES DEL.



THE CATHEDRAL OF BOIS LE DUC, HOLLAND.

HOLLOW BRICK WALLS.

SIR,—I am pleased to see this subject revived in your columns. Personally, I am beyond the reach of help, but in the interest of those who may hereafter build, I would desire to relate my experiences.

After a life of labour, I determined, having 3,000*l.* to spare, to build for myself a house. The ground floor I planned, the elevation and all constructive detail I left to my architect, desiring him, nevertheless, to give consideration to the employment of all such means as would be likely to produce the greatest amount of comfort.

In due course I received the plans, sections, and elevations. The walls were all shown solid, no provision was apparent for the utilisation of the "90 per cent. of heat" which, we are told, goes "wastefully away up every chimney," but in lieu thereof brick chambers were shown, and these I was assured, by reason of the heat due to the flues, between which they were to be formed, would carry off all heated or vitiated air.

I expressed a desire to have the walls built "hollow," particularly those south and west, but on being told that "hollow walls were the exception and not the rule," I gave it up, as I did also the use of "pottery smoke-flues, formed in the centre of an air-chamber."

My house has been completed six years; the walls, being solid, condense within the house as much moisture (this cold weather) as the windows, although the condensation is not so apparent. In wet seasons, the paperhangings on the south and west fronts are yearly spoilt, and boots or books placed in cupboards are covered with mildew. The flues constructed to carry off the vitiated air, instead of doing so, bring to the rooms (to the surprise of my architect, who always thought warm air "must ascend") a regular down-current of cold air; in fact, until the openings were stopped, no one could sit near the fires.

My house, instead of being a comfort, is quite the reverse; at this season, we are miserably damp and cold, and in summer we shall suffer equally from the extremes of heat; and this I now feel might have been obviated, had I insisted on having hollow instead of solid walls.

I trust you will find space for these remarks, as they may induce architects to consider the comfort of their clients, equally with the elevation they are called upon to produce. G. A.

It does not positively follow from what is stated, that our correspondent's architect did not give full consideration to the question of comfort. Fear of increasing the expense beyond the desire of the employer, and of running risk with new inventions, often leads architects to avoid desirable precautions, trusting that what has answered the purpose in other places may do so again. The simple adoption of a hollow wall, costing no more money than the solid one used, might have led to no better result. A hollow wall, unless built under continuous intelligent direction, has inconveniences of its own, and may prove a delusion. In the formation of the openings for doors and windows, for example, where the work must be solid, great care is necessary, especially in forming the heads to prevent the dripping of water, that may find its way in from above. Hollow walls, in theory, are excellent, but in practice they do not always prove so.

SIR,—In reply to your correspondent, who asks for some information about hollow walls, I beg leave to forward some remarks:—

In the first place, with regard to hollow brick walls built as he supposes of bricks on edge, alternate header and stretcher, he is mistaken in supposing that the damp will penetrate as easily as it does through a solid 9-in. wall; for here we have the middle 3 in. of each header exposed on all sides to a current of air, which will absorb nearly or all of the moisture before it can penetrate to the inside of the wall. We must remember that the air in the hollow of the wall will be dried by contact with the inner stretchers, and will be in motion on account of the difference of temperature between the upper and lower rooms of the house, whilst the numerous minute cavities in the work will allow of its escape and expansion.

In proof of one benefit to be derived from even such a wall as we are considering, I may mention a fact told me by a late resident in Canada. He was there acquainted with a working man who built himself a house with (for the sake of economy) such walls as we are describing; and it

was found that the milk, &c., standing in that house remained unfrozen, whilst his neighbours' houses with solid walls afforded no such protection.

I am now building with hollow concrete blocks. I have made them to receive a half-brick wall on the outside with every third course binding into the blocks. A large villa erected on this plan last year has withstood all the damp out-giving powers of this very wet season. I may add that my plan is designed to give a house the advantage (if so considered) of appearing to be built of bricks; but, if cement is preferred outside, there is no reason why the cement blocks should not, if properly made, constitute the whole thickness of the walls, bearing only in mind that, for convenience in bonding into the flues, &c., they must correspond to a given number of courses of bricks in height.

ED. F. HUTCHINS, Builder.

YEOVIL AND THE YEOVILIANS.

SIR,—You have given our glove-making townsmen some hard hits: I cannot say they were undeserved. Instead of thanking you for pointing out social and sanitary evils, they have enlisted a crusade against your excellent journal, and the services of three journals are counted upon to crack stale jokes in the "Zummerzet" jargon. The state of the Yeovil Union has been notorious for years to everybody here, and the man who never put his foot into the town could know this by reading the local and county papers that circulate in Yeovil. If Messrs. Palman & Clinker were to send you up a file of their papers for the last three years, you would find a surfeit of town council squabbles and board of guardians rows here and there through them. On the whole, sir, we are not so bad that we might not be worse, nor so good that we might not be better; and if certain clacklers in the council were only to attend to the business they were elected to perform, sanitary and social reforms would soon be apparent. Town clerks, instead of chairmen or committees, are often here the Sir Oracles. They are often the lord chancellors of Yeovil on a small scale. It is so with the masters in the union, and all goes "merry as a marriage bell" so long as the doctors are obeyed and posted up to the "latest intelligence."

If the Board of Guardians do not wish to bring down an old house about their ears they had better discreetly hold their tongues; if not, the best thing the ratepayers could do would be to demand *de novo* a searching Poor-law inquiry, dating back at least five years. I do not think that some of the present noisy clique would care to be put through their facings before a stern Commissioner. Yeovil is, as you say, "a slowly improving town," but if there were less draining within public-house doors, and more drainage through the town without, the social condition of the inhabitants would be wonderfully improved. We Yeovil folk are a queer, obstinate race, and many of us would die of the lock-jaw if we were deprived of our weekly "penn'orth of scandal." Thanks to the *Builder*, our rather unimportant town has been lifted from a region of eclipse into a region of light, and this fact has made the heads of some of our local authorities dizzy. Ever since the memorable 17th of December, in the town council, and at the meeting of the Board of Guardians, the moral of the frog in the fable is forcibly illustrated by officials and officious, in and out of office.

Peter-street, Yeovil.

TOM CORRYATE.

PRICE OF EARTHENWARE DRAIN-PIPES.

SIR,—A letter from "A Manager" under this heading calls for some remark to be made upon it, and, when analysed, will go far to explain the present scandalous disparity of prices.

Before proceeding with this, however, I wish to call the attention of your readers to the complaint made by "S. E." in your number of Jan. 21, that there was not the same uniformity in the price-lists that there used to be. This is incorrect, as the ruling standard price in London and the South of England is still the "Lambeth list."

Your correspondent seems to be utterly unaware that there is also another standard list in use in the trade, for the Midland and Northern potters, equally authentic in these districts, where, from the close proximity of coal and clay, pipes have always been made cheaper, and of a

stronger nature, than those of the Lambeth and Dorset manufacture.

Unfortunately these lists are being disseminated by travellers from some of the Northern potteries as a tempting bait to country customers, some of whom are not quite so *au fait* in the matter of discounts as they might be, and who give their orders at these "works' prices," and pay their own carriage. This is a matter with which every estimating clerk ought to be perfectly cognisant.

To come now to the real evil, I return to "A Manager's" letter; and, in passing, must call in question either the policy or the good taste of singling out the names of any particular firms, especially when, as in this case, two out of the firms so mentioned are notorious in the trade for never having abided by the rules or discounts of the London Pottery Association, and other names are omitted of really respectable firms. The latter part of "A Manager's" letter is singularly candid. His firm are not manufacturers, merely dealers, and here lies the scandal; these dealers buy from small manufacturers, generally speaking, a very inferior class of pipes, and at ruinously large discounts, of course, in many instances so much larger for cash!—that essential to small men!—enabling them, the dealers (I quote "A M.'s" own words) "to sell at lower prices than those quoted by small manufacturers." For this word "small" read "respectable," and you have the truth, as good firms will not sell without a fair business profit.

There is also another form of competition, which we regret has been resorted to by some Lambeth and Dorset houses, and this is, their determination to have contracts at any price, sooner than allow the country firms to have a share of their monopoly. This they have been trying for years, with signal failure, and with a sacrifice of at least half a million of money; but still they pursue the same tactics, instead of letting their motto be

LIVE AND LET LIVE.

SIR,—If your correspondent, "S. E.," relies upon a uniform rate of discount as a basis for contracts, this may explain the great disparity we sometimes see in tenders for drainage.

The firm I represent has for several years discarded discounts altogether, and published a net list of prices of earthenware pipes, which for quality will bear comparison with those of any maker in the kingdom.

It will be London firms, chiefly, which are inconvenienced by the "disparity in discounts," as "country builders and contractors," and one or two West-end drainage engineers, are quite alive to the advantages of a list which quotes 6-in. pipes, for instance, at 10*l.* per yard, delivered at King's-cross or St. Pancras, or stations of equal carriage-rate thereto, to those which quote the same thing at 7*l.* per foot, with a discount ranging from 30 to 45 per cent.

ANOTHER MANAGER.

ARCHÆOLOGICAL SOCIETIES.

The Norfolk and Norwich Archæological Society.

At the annual meeting of this society, held at the Guildhall, Norwich, the very rev. president, the Dean of Norwich, in the chair, there was a good attendance of members, and the table contained some interesting specimens. The Rev. C. R. Manning (honorary secretary) read the annual report, which was adopted. The Dean, in thanking the meeting for his re-election to the office of president, adverted to the restoration work going on in the nave of the cathedral. He said that no doubt most of the members were aware that at this time the roof of the nave of the cathedral was in process of being cleaned of the dreadful wash—not white-wash, but "brown-wash"—put on it at the beginning of this century. In the easternmost bay of the nave proper, the bosses had been painted, but the paint used was like that with which they were formerly covered, and of which traces remained. He thought that was a safe plan on which to proceed; and, upon the whole, he was tolerably satisfied with the effect; but others were not. An authority in these matters, the Rev. Whitwell Elwin, of Booton, paid him a visit, and he represented to him that nothing had been done but that for which there was ancient authority. Mr. Elwin said that he was quite aware the bosses were originally coloured in the manner now being done, but he said, "In restoring anything, you must remember that you should never do so independently of the conditions under which the thing was done originally. I have no doubt," he said, "that when the roof was put up in the middle of the fifteenth century, the whole of the windows of the clearstory and of the triforium also were filled with the most beautiful coloured glass. That, of course, would throw a vast amount of coloured light into the cathedral, and

you would see the bosses not spotty as now, but harmonised and mellowed. Therefore, unless you can restore the windows (which would be so vastly expensive as to be impossible), do not restore the colouring; only remove the brown-wash." Since Mr. Elwin's visit, he had discovered more colour, not on the roof itself, but on the spaces intervening between the roof and the clearstory, and on the columns above the clearstory,—a tracing of lines, sometimes red and sometimes black, apparently to represent brick-work, and in one place Parbeck marble. Some of the colouring had been restored, and, to his mind, carried off very much of the spotty effect to which Mr. Elwin referred. He was not at all sure whether, if the whole colouring was reproduced in that way, the spotty effect of the bosses would not be entirely removed. He should be glad if the members of the society would visit the cathedral, and give him their opinion on the subject. Mr. Morant, engineer to the Norwich Board of Health, contributed some Roman relics, found in the sewerage excavations, accompanying them with a paper, which was read by Mr. Fitch.

The Leicestershire Architectural and Archaeological Society.—The annual meeting of this society has been held in the Town Library, Guildhall, Leicester; the Rev. J. H. Hill, F.S.A., in the chair. Mr. North, the honorary secretary, read a statement of accounts for the past year, showing a balance in favour of the society. He also presented and read the report of the committee for the year 1870. Some architectural plans, antiquities, &c., were exhibited.

THE WINCHESTER TOWN-HALL COMPETITION.

After long discussion, and the proposal of several amendments, the design No. 25, marked "*Utile Dulce*," was selected as the best, and was found to be the work of Messrs. Jeffery & Skiller, of Hastings. The second premium, 50*l.*, was awarded to No. 1, "*Tria Juncta in Uno*."

METROPOLITAN BOARD OF WORKS. TRAMWAYS—EMBANKMENT FOUNTAIN—BUILDING DISPUTES.

At the last meeting of the Board a communication was received from the Board of Trade, stating that the resolutions of the Metropolitan Board of Works giving consent to certain portions of the tramway scheme had been considered, and applications had been made by the companies for provisional orders.

A report was received from the Parks, Commons, and Open Spaces Committee, submitting a design for the erection of a fountain in the ornamental grounds of the Victoria Embankment, and recommending that the general features of the design be approved, subject to the whole of the working drawings being submitted to the committee previous to the contract being let. The cost of erection and the specification together would, Mr. Westerton stated, be 900*l.* After some discussion, and more than one amendment, the report was withdrawn, and an amendment by Mr. Roche accepted, to the effect that the design should be reported upon by the engineer and architect to the Parks Committee. Before the Board were called on to agree definitively to a design, Mr. Roche said, he thought two or three ought to be submitted for consideration. For the credit of the Board they ought to take some little time before coming to a decision, and secure a fountain that would be satisfactory when erected. It would save them from a great deal of unpleasant criticism hereafter.

The Board then proceeded to consider and determine several matters of disagreement between Mr. George Legg, district surveyor of West Hackney, and Mr. William Henshaw, builder, of City-road Basin, respecting the mode of construction of a Presbyterian Church at Downs-park-road, Clapton; and with Messrs. Dove, Brothers, builders, of Islington, respecting the mode of construction of a Congregational Church and Lecture-hall at Stamford-hill.

The Board having heard the persons in dispute, and considered the reasons advanced by Mr. Legg in support of his requirements for greater strength in the buildings, resolved in most cases to enforce his recommendations. Protests were entered by several members against the proceedings as being a farce, the

only guiding motive in the decisions seeming to be a determination to support their officers. One point was reserved for discussion for next week.

SLATE CISTERNS.

Sir,—I do not know of any easy or good plan whereby the leak in the cistern (if leak there be) may be cured. The leakage does not arise from the slab being too thin, as 1½ in. is quite thick enough for the depth of 1 ft. 6 in. I am inclined to think the slab came from a particular kind of slate rock, most likely from what is called bastard rock, some of which is comparatively soft, and consequently porous, which makes it easy for the workmen to work. A large number of cisterns are in use in Devon and Cornwall, and other counties, made of slabs from the Old Delabole Slate Quarries, but I have not heard of one of them sweating in the way named by the "Builder in a Puzzle." The rock from which those slabs are produced is well laminated and solid.

FORT ET FERME.

Sir,—In your last impression, page 91, a puzzled builder asks "if it be possible that water can sweat through a 1½ in. slate slab, and thus collect on the bottom of the cistern."

In reply, I beg to say, it cannot. The water which "collects and craps" is not due to percolation, but to condensation. Slate, glass, and iron condense moisture in air more rapidly than any other materials; and the cistern, being charged with water, lower in temperature than the surrounding air, increases the condensing power of the slate bottom. The small air-briek near the bottom of the cistern referred to, "for the purpose of giving air," should be immediately removed, and the space between the ceiling and the bottom of the cistern made, if possible, perfectly air-tight; as, in the absence of an air-supply, condensation would be checked.

The bottom being dry in frosty weather need excite no surprise, as the air at such a season is lower in temperature than the slate cistern and the water it contains.

As the bottoms of slate cisterns or slate slabs form excellent coverings for roofing-in small inclosed spaces or projections from principal buildings, I would advise your correspondent to continue their use; but in the future, before fixing them, he should mix up sufficient Portland cement and sand to cover the whole of the under face, leaving the surface as rough as possible. At any convenient time, after the cement has set, the slab may be raised and fixed. When the external arrangements are complete, I would advise the rendering of the under side of the cistern or slab with Portland cement; the first application will form an excellent key for the second.

This coating of cement, if it does not wholly neutralise the condensing power of the slate bottom, will certainly diminish it, and by absorption prevent the "dripping" of which your correspondent complains.

GEORGE JENNINGS.

READY-MADE PLANS.

The following letter appeared in the *Guardian* last week:—

"SCHOOL PLANS.

Sir,—If your correspondent "G. F. B." will communicate with me, I shall be happy to furnish him with good plans, as well as decent-looking plans for a village school and teacher's house, together with specifications.

Having had some practical experience in building, I have prepared a set of plans for school buildings in my own parish. They consist of ground plan, chamber plan, three elevations, three sections, drawn to quarter scale, carefully figured and ready to go to the builder, or be laid before the Diocesan Board.

Our school is intended to accommodate thirty-two children, but I shall be happy to adapt the plans to any larger number. The above have been approved by our Diocesan School Board, and have obtained a grant.

Having both schools and parsonage-house to build, I cannot afford to give the plans, but will furnish them to any brother priest in return for a small contribution to our building fund. Address, in the first instance, B. A. OXON, care of, &c."

Because a parson has made some plans for a school the size of a Manchester omnibus, licensed to carry thirty-two inside and out, he wants to sell them to any person silly enough to buy them, for the purpose of raising the wind necessary to blow together an amateur parsonage-house.

It has been often decided that the clergy shall stick to their clerical duties, and "not serve tables;" nevertheless, some manufacture and

sell lithographed sermons, but we never knew any man, woman, or child the better for listening to them. The clerical plan-maker seems to think his building can be equally well made in brick, stone, or stucco, and be equally well placed upon gravel, clay, fen bog, or rock foundation. Surely, in this latter part of the nineteenth century the public are wise enough to know that every building should be specially designed for its own locality by men specially trained for such work.

BRESSUMMERS.

Sir,—Will any of your readers kindly inform me of a formula by which I can ascertain the breaking-weight of an ordinary Bressummer, constructed of two deals, with an iron flitch between, and bolted together? T. D.

WHO IS SPOTLESS?

Sir,—Time sets its imprint on us all; and we leave our footprints everywhere, during this muddy weather; but it is exceedingly annoying to be spotted by every "hansom" and other fast-going vehicle that dashes by us. A splashed Adonis and his spotted Lily are pitiful. It is of no avail to speak to the bespattered constable—he will not stop drivers from splashing mud; but if they receive liberal contributions of opaque tears, which trace down the faces, painful enough to shakey peas. Now, sir, for the remedy,—two short pieces of plate-iron or tin, about 4 in. in length, bent low outside of the wheels. They would receive all splashes, thus preventing much annoyance, at small cost. These plates can be fixed on the iron rod under every hansom-cab. If adopted, it would be a spotless improvement. R. T.

NOISY IRON SHUTTERS.

Sir,—Will you allow me to call your attention to a most intolerable nuisance under which I and my family suffer (also, as I understand, most of my neighbours who are not concerned in its perpetration), which seems to me to be clearly a case of defective construction. It is this. Right opposite my parlour-window,—I will not say where, in the meantime,—there has recently sprung up one of those showery corner tenements, adorned with revolving iron shutters on all the shop-windows and doors, which are now so very common in the principal thoroughfares of our large towns. I will not complain of its architectural design, though that is an eyecore (we must submit to eyecores now-a-days), but I do complain most bitterly of the horrible infliction my poor ears are made to suffer from the opening and shutting of those confounded shutters. In this same block there are six shops, with three openings each, in all, eighteen shutters; and the noise of opening and shutting each shutter is something, I fancy, which can only be compared to the fearful grating of a *saw-trail*, when it is in action. It would be some consolation if they were all opened and shut at the same time; but some open at six, some at seven, some at eight, some at nine in the morning, with a similar prolongation of the agony every evening, when they are shut. And so the peace of a quiet neighbourhood has been spoilt, and our rest disturbed, and we are so annoyed, as we actually possess amongst us robbers of their repose. Can nothing be done to help us? A. M.

THE PREVENTION OF KITCHEN BOILER EXPLOSIONS.

Messrs. A. BORN & SON write,—"Regarding the mercantile valve suggested in your paper, we beg leave to say we have been engaged for a month in investigating and perfecting this invention. Medical men and analytical chemists, whom we have consulted, say there is risk, although very slight, in using water, for drinking or for culinary purposes, that has stood in contact with mercury. We have, however, so built the tube that water and mercury are completely separated. This we have patented."

SATURDAY HALF-HOLIDAY.

It has been suggested that something should be done to obtain the Saturday half-holiday for such in the architectural profession as at present are denied it. And as it will greatly facilitate the matter to know to what extent the half-holiday is recognised by the profession, will you kindly allow me to ask, through your columns, if one gentleman in each office in London will communicate with me, stating whether or not the Saturday half-holiday is customary in his office. The result of this I shall be glad to forward you, but of course without naming names. By inserting this you will confer a great favour on such as, like myself, are kept behind the age. A. Y. Z.

10, Walbrook, E.C.

THE PLAGUE OF ASHES.

The enormous sums now demanded by the gentlemen contractors in the "breeze line" to rid us of this commodity should induce the vestries to offer a premium for the utilisation of it. It is said that brick-making near London has almost ceased; but there must still be a great deal more than there was some forty years ago, when "flying dustmen" abandoned, and a dust-heap was a dowry for a belle at Battle Bridge. Has the gas-coke lowered the value of the cinders? And why not use the fine sifted ashes for mortar, at half the expense of river sand? And, no doubt, it might be profitably used with dry stuff off the macadamised roads and tar in making up the footway, in the suburbs, at a cost

of about 1s. 6d. per yard, instead of the present graveling, which is an annoyance in a dry summer and in a wet winter, if the parish surveyors were induced to make a few experiments to that end.

PRETIOSUM QUOD UTILE.

CHURCH-BUILDING NEWS.

Workop.—After the death of the late Mr. George Saville Foljambe, of Osberton Hall, near Workop, which took place twelve months ago, it was deemed advisable that some fitting memorial should be erected to perpetuate his memory. It was decided to erect a *eredos* in St. John's Church, the money to be raised by subscription. The memorial, which surrounds three sides of the chancel, consists of a *eredos* and an arcade of sixteen panels. The arches of the latter are moulded and filled with polished Sicilian marble, and are intended to record the names of the successive vicars of the church. The space below has been filled with geometrical mosaic tiles. The *eredos* is formed of three moulded arches, cusped and supported on shafts of Belgian marble. The panels are of figured Derbyshire alabaster, the centre one containing the sacred monogram illuminated in gold and colours, while those on each side are decorated with incised symbolical devices. With each device is interwoven an illuminated ribbon, bearing the texts, "I am the living bread," "I am the true vine." Immediately above the communion-table are the words, "This do in remembrance of me." The *eredos* terminates in a crocketed gable, in the centre of which is a carved trefoil panel emblematic of the Trinity. The memorial is Early English in character, to harmonise with the style of the church, and has been designed and carried out under the superintendence of Mr. Theophilus Smith, of the firm of Messrs. E. & T. Smith, Sheffield.

Southport.—The newly-erected church of All Saints, situated in Queen's-road, near the Hesketh Park, in this town, has been opened for divine service. The town, we believe, is indebted to the Rev. Charles Hesketh, rector of North Meols, and his family, for the ground upon which the church is built, and for the entire cost of its construction. The edifice is in the Early Decorated style of architecture, and the dimensions are as follows:—Length, 73 ft., and width 42 ft.; chancel, 25 ft. by 20 ft.; height to the ceiling line, about 34 ft.; and belfry with spiral, height 90 ft. There is also an octagonal vestry on one side of the chancel, with entrance from it direct to the pulpit, while on the opposite side is placed the organ-chamber. On the west side there is a three-light window, and above this a large deeply-recessed rose window, about 12 ft. in diameter. All the windows are in tracery. The exterior is faced with stone throughout. All the woodwork, including the seats in the body of the church and in the chancel—the latter for the choir—is of pitch pine, stained and varnished, and the pulpit is of Caen stone, with red Mansfield stone shaft, while the whole of the aisles, approaches, and chancel are laid with Milton's encaustic tiles. The church is intended in the first instance to seat 500, and it is so constructed that, by means of a gallery, room for 100 more may be easily provided. The whole structure, in fact, is so planned, that by means of transepts it may be enlarged so as to accommodate 1,100 persons. The building is heated throughout with hot water. Mr. J. Sidebotham, of Southport, was the architect; Messrs. Wishart & Irving were the contractors; and the sub-contractors were,—for brickwork, Mr. Smallshaw; stonework, Mr. Greenwood; plastering, Mr. Blanchard; plumbing, &c., Messrs. Barland; painting, Messrs. Raith & Co.; and heating apparatus, Mr. Seth Moore. Messrs. Sidebotham & Co., of Manchester, have had the entire fitting up of the seats, pulpit, &c., in the interior.

Bayham.—The parish church here has been re-opened, after having undergone a restoration. The walls were much out of repair, as was the interior generally, whilst the church was fitted with old square pews and a gallery at the west end. Externally the church, which is dedicated to St. Peter, and which consisted of nave and chancel, with west tower and south porch, was a fair specimen of the simple village church. The additions which have been made consist of north and south transepts, that on the north side being built over a vault belonging to the Acton family. The old pews have been cleared out, and oak benches substituted for them, considerable additional accommodation being thus obtained in the nave; and to this the further floor-space of

the transepts must be added. The west gallery has been taken down and the tower arch opened. The space in the tower is used as a vestry, the screen separating it from the nave being formed out of part of the old rood-screen, of carved oak, which was discovered when the pews were removed. The screen is about 7 ft. in height, and does not in any way interfere with the two-light west window, which was formerly blocked up by the gallery. In this window some old stained glass has been reset, and in common with all the windows in the building, it has been replaced in lead quaries. The centre passage of the nave is some 6 ft. wide, and at the junction of the transepts with the walls of the chancel, which is on the same level as the nave, this is extended so as to make a broad open space. The tiles used in paving the chancel and transepts are *Maw's*, and those within the communion-rail are encaustic. Stone arches springing from moulded corbels open from the chancel to the transepts, and a new stone arch separates the nave from the chancel. The walls have been re-faced and re-plastered throughout; the old lath-and-plaster ceiling has been removed, and a new one, composed of chestnut boarding formed into panels by moulded ribs, substituted. Two oak beams, part of the original construction of the building, still remain, but additional support is given to the roof by carved king-posts which spring from these beams. A new oak reading-desk, in which the remainder of the old rood-screen has been utilised, has been placed on the south side of the nave, and a pulpit of chestnut wood on the north side. The church is warmed by an apparatus by Rimmington, of Skipton. Externally, the plastering of the walls has been removed, and the rubble facing repaired and the joints pointed with blue mortar, both old and new work being thus given a uniform appearance. Wherever possible the old windows have been preserved and new stone has been used to repair the dilapidated portions. There is ample evidence that the building was repaired at various periods, almost every variety of style being noticeable. In the south wall of the chancel, which has been taken down in order that the transept on that side might be added, was a Perpendicular window; this has been placed in the north wall at the west end of the nave, where there was a deficiency of light. In face of the absence of anything like uniformity in the style of the old building, the architect, Mr. F. Barnes, Ipswich, has not felt himself bound to any particular style in the new work; and he has put windows belonging to the Decorated period, with tracery of a flowing character, in the transepts, those in the gables being three-light and those in the side walls two-light. The old east window was found to have been badly mutilated, wooden mullions having been inserted in the place of masonry, but some portions of the original outline remained, and from these examples the architect designed a new stone three-light window, of early character, and this has been filled with stained glass, by Clayton & Bell, presented by the family of the late rector, the Rev. W. Colville, as a memorial of that gentleman. The east wall has been strengthened by the addition of two buttresses. The tower was found to be in a very fair state, and has required no external repairs, but the interior was completely renewed; the peal of five bells being taken down and rehung. The work has been executed by Mr. Vine, stonemason, and Mr. Daniel Day, both of Eye, from the designs and under the direction of Mr. Barnes. The total cost has been about 1,000*l*.

St. Asaph.—The erection of a *eredos* in the cathedral, presented by Mrs. Hesketh, of Gwrych Castle, has now fully completed the ornamentation of the choir and chancel. The design is by Mr. Gilbert Scott, and the sculpturing by Mr. Earp, of London. It consists of an entablature in alabaster, with arcading on either side. The sculpturing which adorns the entablature represents the procession to the place of Crucifixion. In the centre, which is surmounted by a dome terminating upwards in a pinnacle of rich tabernacle work, is the figure of Christ bearing the cross; to the right are Roman soldiers preceding, and on the left the three Marys, and several of the disciples following. All these figures are in *alto-relievo*, appearing at first sight to be altogether detached from the background; but behind the effigy of the Saviour, a Roman centurion on horseback is delineated in *bas-relief*. The arcading is in the Decorated style, the capitals being supported on polished marble pillars. The cost of the *eredos* is about 600*l*.

PROVINCIAL NEWS.

Dudley.—At a private meeting of the Town Council in committee, the question of selecting a plan for the alterations in the Town-hall has been discussed. Mr. Stokes moved a resolution to the effect that Mr. Borradaile's plans should be accepted. Mr. Sheppard moved, "That the Council be recommended to apply to builders for tenders or the proposed alterations, and in case the lowest tender did not much exceed the estimate of Mr. Borradaile (2,000*l*.), his plans be adopted, and the matter placed in his hands as architect, at a commission stated; but if the tenders were much higher than the estimate, the whole affair to be left with the Council." Mr. Dudley seconded this amendment. Mr. Warrington moved, and Dr. Higgs seconded, as a further amendment, "That the matter be deferred a fortnight, and that in the meantime Mr. Borradaile should satisfy the committee that the work could be done at an estimate." Three voted for Mr. Warrington's amendment, twelve for Mr. Sheppard's, and thirteen for the original motion.

Cambridge.—The new building for the Cambridge Young Men's Christian Association has been opened. The site is a central one, at the upper end of Falcon-yard, and has four public ways to it open on three sides, without any annoyance from carriage traffic. This site was purchased for 1,100*l*., and on the 30th of March in last year the foundation-stone was laid. Mr. Loveday, of Tibworth and Cambridge, is the contractor; and Mr. Waterhouse the architect. The building has a corner situation, and is approached from St. Andrew's-street, by Post-office-terrace; from Petty Cury by Alexandra-street; from Downing-street, *via* the Corn Exchange, by St. Tibb's-row; and by the Falcon-yard. There is a double entrance from Alexandra-street and Tibb's-row to the entrance-hall; and on ascending a wide stone staircase (fitted with mahogany handrail and iron balusters), the visitor is ushered through double doors into the lecture-hall. This is about 50 ft. long, exclusive of the orchestra and gallery. The latter is 10 ft. deep, and the orchestra—in a semicircular form—runs back about 12 ft. more. The average width of the hall is 31 ft., the narrowest point being about 30 ft., and the broadest 37 ft. The lecture-hall is 22 ft. high, and is said to accommodate 400 people. The gasfittings are of Mr. Waterhouse's designing, and were manufactured at the Midland Architectural Works, Coventry. Communicating with the reading-room is the library, with an extensive array of shelves; and this leads to the secretary's room. Along the reading-room and the secretary's compartment runs an extensively glazed corridor, at the end of which is another entrance to the conversation-room. Descending another lot of stone steps, the basement is reached, to which entrance is gained from the south end of Tibb's-row. Here are lavatories and other conveniences. On the right and left of the passage in the basement are large classrooms (20 ft. by 14 ft.), which are designed for the double object of allowing benefit societies to hold their meetings in, and keeping them away from the public-house. For quarterly meetings large societies would take the large hall. The flooring in the basement is of red and black Chesterton tiles. The whole of the basement is heated with hot water, and the upper compartments with hot air—both heated at one furnace. There are kitchen and other conveniences for supplying tea to any meeting held in the place. The total cost is nearly 5,000*l*., and the building has been carried out under the superintendence of Mr. Tift, clerk of the works.

VARIORUM.

"SANITARY SCIENCE and the Sewage Question; a Lecture in King's College, London. By Lewis Angell, C.E. London: Spott." This lecture was addressed to the Department of the Applied Sciences in King's College in July last by Mr. Angell, the West Ham engineer and surveyor, who is an honorary fellow of King's College. It does not introduce theories, but simply presents a sort of epitome of established facts in both a popular and scientific form; its object in a published form being to circulate information and prevent the recurrence of past errors, to which end it is well adapted to be useful.—"Report of the Drainage of the Borough of Belfast; J. J. Montgomery, engineer; also Report on the Proposed Plan by J. W. Bazalgette. Belfast:

Baird, 1867." Of date 24th of December, 1860, in a printed prefix, Messrs. Bazalgette & Montgomery say:—

"The accompanying general plan shows the scheme which we propose for the drainage of Belfast and the reclamation and sewage irrigation of the sea marshes of Belfast Lough. In republishing the following reports, it is necessary to state that the irrigation having been decided on, and the levels and other data having been more accurately determined, an improvement of the whole scheme will be effected by the modifications shown approximately on the plan. Other alterations have become necessary in consequence of the new buildings, docks, &c., but the scheme remains virtually as we had previously proposed. It is satisfactory to be able to state that further investigation confirms the opinion that the works will be very successful, not only as regards their efficiency in promoting the health and comfort of the inhabitants, but as regards their financial results. The profits from the irrigated lands will go a long way towards repaying the cost of the thorough drainage of Belfast."

"Boston Harbour and Outfall, 11th October, 1870: Report of W. H. Wheeler, C.E., to the Boston Harbour Commissioners. Buck, Printer, Boston." This is a report on the scheme for improving the outfall of the River Wilham by fascine training works in the Scalp Reach. Mr. Malcolm, M.P., having written to the local commissioners in March last, strongly advising the scheme of their engineer and surveyor, Mr. Wheeler, to be carried out, the commissioners instructed their surveyor to prepare a report on his scheme, with plans, &c., showing the land proposed to be reclaimed, the course of the training work, and the estimated cost; and the report and plans now printed and before us have been accordingly prepared and circulated:—

"Shortly," says the report, "the scheme here proposed is to extend the fascine work a distance of about two miles below Hobbole, so as to confine the tidal and fresh waters to one channel, and to fix the shifting sands which now choke up the river; to dredge out the clay, so as to deepen the channel and make the bottom of a uniform level with the sill of Hobbole Sluice; to purchase the right of the Crown over the barren sands lying on each side of the channel.

The cost of carrying out this work is estimated at £1,000, the interest on which would be £40 per annum. The principal to be repaid by the sale of the lands which the training will assist in reclaiming."

The benefit derived, according to Mr. Malcolm, will be the immediate lowering of the water in the upper portion of the river to the extent of 4 ft., a general improvement of the channel below Hobbole, and the formation of agricultural land from the shifting sands, which mainly contribute to the annual silting up of the river.

F. May's "London Press Directory and Advertiser's Handbook: a Classified Guide to the Metropolitan Press, 1871. London: May, King, street, St. James's." This seems to be a useful handbook. In the prefatory remarks it is stated that there are now issued 316 London newspapers. Of these, twenty-one are daily, one, oddly enough, five times, and one four times, a week, two three times a week, and thirteen twice a week. There are 215 weekly, and others fortnightly and three times a month, and forty-six monthly. Of London periodical publications, magazines, reviews, &c., there are 473, besides those enumerated under the head of newspapers. Of the former, 338 are monthly, seventy-six quarterly, thirteen irregularly, thirty-seven weekly; and others are bimonthly, half-yearly, and annually published.—Messrs. Groombridge's "Rainbow Stories" promise to be popular. We have the first two before us—"Phil Thorndyke's Adventures," by Frances Wilbraham, and "The Rift in the Rock," by Mrs. S. O. Hall. The latter is directed against jealousy in the child mind, and is a very interesting story charmingly told.—The *Rectangular Review* has some agreeable papers on Modern Portrait Painters, Modern Poets, and the Drama. It contains an overdose of very speculative Masonry.—"Historical Diary of the War between France and Germany," by H. Alnutt, part I., shows in small compass the remarkable events that followed each other up to the end of October. Other parts will follow.—Last year's volume of *The Sunday at Home*, and that of *The Leisure Hour*, now ready for delivery, are full of very interesting and safe reading, very fully illustrated.—*The People's Magazine* continues its account of the Mont Cenis Tunnel, and has a view of the Royal Library, Windsor Castle.

Miscellaneous.

The Surveyorship of St. Saviour's.—The Local Board of Works for the district has unanimously voted an increase of £60 per annum to the salary (£200.) of their surveyor, Mr. Greenstreet, "for the excellent way in which he has carried out his duties."

Notre Dame de Paris.—Mr. John Ruskin writes to a London paper:—"It may perhaps be interesting to some of your readers, in the present posture of affairs round Paris, to know, as far as I am able to tell them, the rank which the Church of Notre Dame holds among architectural and historical monuments. Nearly every great church in France has some merit special to itself: in other countries, one style is common to many districts; in France, nearly every province has its unique and precious monument. But of thirteenth-century Gothic,—the most perfect architectural style north of the Alps,—there is, both in historical interest and in accomplished perfection of art, one unique monument,—the Sainte Chapelle of Paris. As examples of Gothic, ranging from the twelfth to the fourteenth century, the cathedrals of Chartres, Reims, Amiens, Rheims, and Bourges form a kind of cinquefoil round Notre Dame of Paris, of which it is impossible to say which is the most precious petal; but any one of those leaves would be worth a complete rose of any other country's work except Italy's. Nothing else in art, on the surface of the round earth, could represent any one of them, if destroyed, or be named as of any equivalent value. Central among these, as in position, so in its school of sculpture; unequalled in that specialty but by the porch of the north transept of Reims, and, in a somewhat later school, by the western porches of Bourges; absolutely unreplaceable as a pure and lovely source of art-instruction by any future energy or ingenuity, stands,—perhaps, this morning, I ought rather to write stood,—Notre Dame of Paris."

Moab and the Moabite Stone.—At a meeting of the Bath Literary and Philosophical Association, the Rev. Prebendary South in the chair, the Rev. W. J. Odgers has read a paper on "Moab, the Moabites, and the recently-discovered Moabite Stone." After referring to what had been written in reference to the stone by M. Ganneau, Professor Rawlinson, Professor Weir, Professor Schlettman, Dr. Ginsburg, and others, Mr. Odgers brought together, from various sources, such facts as appeared most likely to interest the members of the Association, giving some account of the country in which the Moabite Stone had lain for about 2,500 years, and of the people who have inhabited that country during those long ages. The inscription on the Moabite Stone describes the various works accomplished by King Mesha, especially his building a bridge across the Arnon. The banks of this river are so steep, that the descent on the south side occupied Irby and Mangles an hour and half. Traces of a paved Roman road are still to be seen on both sides of the ravine, and there is still standing one arch of a bridge, 28 ft. 9 in. in height, and 31 ft. 6 in. span; and there seems little room to doubt, said Mr. Odgers, that this old Roman road and old bridge are on the basis of the ancient road and bridge constructed by Mesha, as recorded on the Moabite Stone. Other points of interest were noticed in the lecture (which occupied more than an hour in delivery). The lecture was illustrated by large maps, drawings, &c.

A Roman Cemetery.—An unexpected discovery has been made in the grounds of the Rev. C. P. Peach, at Appleton-le-street, on the line of Roman road from Malton and Isurium, and about half a mile from the extensive Roman floors found by the Rev. James Robertson a few years ago. In excavating for garden work, several human skulls and disturbed bones were found in the top soil, and lower down, in fine oolitic sands and gravels, undisturbed burials in good preservation were met with. These were of men, women, and children. They were all lying east and west, or nearly so, some on the back, with hands down, in the Christian fashion; others on one side, recumbent, with hands up to the face in two cases. There were some shards of Roman pottery, some animal bones (split), and a few burnt stones. The bank is doubtless full of interments.

Carlisle Bridge, Dublin.—At a meeting of the Royal Dublin Society on the 16th ult., Mr. Chas. Geoghegan, architect, read a paper on "A New Method of Extending Bridges and Reducing Steep Gradients," with special reference to his design for improving Carlisle Bridge. He maintained that for 29,000, it might be made a bridge 153 ft. wide, perfectly flat, economical, symmetrical, enduring, and architecturally superior to most of the modern flat bridges in Europe.

Rateable Value of Metropolis.—The following returns, showing the total annual value of the rateable property in the metropolis, was prepared by Mr. W. F. Jebb, clerk to the managers of the Metropolitan Asylum District, under the provisions of the Valuation of Property (Metropolis) Act, 1869:—St. Marylebone parish, 1,159,187; St. Pancras parish, 1,149,817; St. Mary, Lambeth, parish, 955,804; St. George's union, 1,862,398; St. Mary, Islington, parish, 984,041; St. Leonard, Shoreditch, parish, 451,611; 10s.; St. Mary, Paddington, parish, 941,811; St. Matthew, Bethnal-green, parish, 270,624; 5s.; St. Giles, Camberwell, parish, 478,118; St. Luke, Chelsea, parish, 341,749; Mary Abbott's, Kensington, parish, 935,720; St. George's-in-the-East parish, 184,175; Mile-end Old-town (hamlet of) parish, 263,499; St. John, Hampstead, parish, 263,915; St. Giles and St. George, Bloomsbury, parish, 307,392; Westminster union, 623,511; 15s.; Whitechapel union, 314,850; Greenwich union, 421,537; Wandsworth and Clapham union, 695,023; Hackney union, 580,376; Holborn union, 726,022; Strand union, 553,706; 1s.; Falmham union, 281,244; Stepney union, 256,687; 10s.; Poplar union, 448,882; St. Saviour's union, 724,345; Lewisham union, 386,821; St. Olave's union, 579,596; City of London union, 2,556,404; Woolwich union, 216,306; 10s.: total, 19,900,072, 11s.

Another House-Boiler Explosion in the North.—One of these alarming accidents has occurred at the residence of Mr. T. C. Temperley, Claremont-place, Gatehead. Some time ago Mr. Temperley determined to erect, in the rear of his house, an outshot building, the upper story of which should include a bath-room. To supply the bath a boiler was fitted up behind the kitchen fire-place, communicating with the new bath-room by means of pipes. The kitchen is on the basement story of the house, and is sunk about 3 ft. below the level of the street. The drawing-room is immediately above the kitchen; and the eastern gable, close against which the boiler was laid, is at present exposed, the ground immediately adjoining not having been built upon. The boiler was put in its place only about a month ago. So far as was known, it had been in good working order from the time it was brought into use, and no danger was apprehended, the water in the tap outside the house being "on," although a severe frost had been prevailing all night. The fires were lighted as usual in the morning, and nothing was supposed to be wrong until about one o'clock, when, without a moment's warning, the boiler exploded, with a terrific shock, wrecking everything in its way to pieces. The house was so shattered by the explosion as to be little better than a wreck.

Archæology in Rome.—An ancient tomb has just been discovered in one of the side towers of the Porta Salara, which is in course of demolition for the restoration and enlargement of that gate. The architect, Vespignani, who directs these works immediately informed General Lamarmora of the discovery. The tomb, says the Roman correspondent of the *Morning Post*, consists of a square monument of travertine stone, measuring about four metres on each side, with basement and pilasters in slight relief. It had been built up in the tower, on the right hand of the gate, on going out of the city. The British Archaeological Society, according to the same authority, has resumed its meetings at the Foll Palace. The opening discourse was delivered on the 30th December, by Mr. J. H. Parker, "On the Excavations in Rome during the year 1870." On the 6th ult. Mr. C. J. Hemans gave a lecture upon the "Foundations in Rome." On the following Friday, the 13th ult., Mr. Parker delivered a lecture on "The Leonine City, from its foundation by Leo IV. to its present condition," followed by a rapid but learned epitome of the varied destinies of the Mausoleum of Adrian up to its present denomination of the Castle of St. Angelo. The Rev. Mr. Shadwell, on the 21st ult., read a dissertation of the Chevalier L. Visconti, upon the Colosseum, or Flavian Amphitheatre.

Ireland.—The new church and rectory buildings have been completed at the College of St. Stanislaus, Tullabeg, one of the most important educational establishments in this country. The recent additions measure 100 ft. by 36 ft., and have been completed under the direction of the architect, Mr. Charles Geoghegan.

Opening of a New Reservoir at Lakenham.—The Norwich Water Works Company have just completed an important work in connexion with the water supply of the city, in the building of a new reservoir at Lakenham. It was designed by Mr. Thomas Hawksley, C.E., of London, the engineer-in-chief to the company. In the first instance contracts were solicited, but it was ultimately determined that the company should itself undertake the work. The total cost has been 6,000l. or 7,000l. The company's manager, Mr. Ayris, had the charge of the undertaking, and Mr. W. H. Bishop acted under him as clerk of the works. The site adjoins that on which the old one stands, namely, near the church of St. Mark. Some 7,000 cubic yards of excavation had to be made. The reservoir, a covered one, is 128 ft. square inside, and 17 ft. from floor to roof. It is constructed on the principle of groined arches carried on independent piers, 64 in number, the outer walls, for strength, being made to form a series of bays, the roof of each bay terminating in a half-dome. A tank is formed at each corner, the outer walls of which are circular, with a domed roof, the whole constituting a corner tie in binding together the walls of the reservoir. The floor is made up of a bed of concrete, overlaid with a bed of clay, covered with bricks, the concrete being extended beyond the foundation of the outer walls to a puddle clay bank, which is carried up from it to above the water-line of the reservoir. The quantity of water which the reservoir will contain is about 1,400,000 gallons.

The Sanitary Measures of the Government.—Sir C. B. Adderley, M.P., writes as follows to his constituents:—"The work which has now occupied me two years, and during this recess has kept me much away from the country, namely, the chairmanship of the Royal Sanitary Commission, seems to be approaching a successful end. The report is forthcoming, which gives a history of our confused and multifarious sanitary laws up to the present time, and extensive evidence, oral and written, on the imperfect working of local government,—the most vital essence of our national vigour,—in most parts of the country. It elaborates, through comment and argument, a complete consolidation into one clear statute all the provisions which in every town and parish of England and Wales, except the metropolis, are required for the health and social well-being of the community. Mr. Bruce assures me that he and two of his colleagues are now hard at work preparing a Bill from these materials; and I hope that, while the better organisation of our national defences will be necessarily the main subject of the labours of the approaching session, this great work of domestic reform may find its quiet opportunity. The idea of the one comprehensive Act will be to render uniform, general, and active the powers of local government in every place, under the inspection and stimulus of a central authority."

Ditching by Steam.—The *Scientific Press* (American) gives the following sketch of a steam ditching-machine now on exhibition in San Francisco:—"On a frame, 41 ft. long and 12 ft. wide, mounted on four wooden wheels, are placed a 23-horse power steam-engine, the cutting apparatus, and the belts for raising and discharging the earth. There are four revolving knives for pulverising the ground, 2 ft. in width, and having on each side a blade for turning the sloping edge of the ditch. These can be raised or lowered as desired. The earth is thrown upon a gutta-percha apron or belt, which elevates it to the rear of the machine, whence it is thrown off to the side of the ditch by a horizontal belt. The machine is claimed to be able to cut daily from one or two miles of a ditch, 4½ ft. deep, 4 ft. wide at the top, and 28 in. wide at the bottom, three workmen and an engineer being required to run it. The entire weight is about 8 tons."

Reformation of Funerals.—A Reformed Funerals Company, in Langham-place, speak of their improved system of conducting funerals, and "the new and superior hearse and carriages which have been built for the Company from novel and artistic designs, by Messrs. Corben & Sons, of Great Queen-street." The company will dispense with mutes, velvet horse-cloths, ostrich feathers, and all such mere theatrical display. Their capital is 10,000l., in 2,000 shares of 5l. each, of which one-fifth (400 shares) have already been agreed to be subscribed. The Dean of Armagh is one of the directors.

"On Landscape."—Professor Raskin is lecturing on Landscape in the theatre of the New Museum, Oxford. In his first discourse, as reported in the *Athenaeum*, the lecturer thus sketched out a mode of operation:—"In beginning a subject, the first thing is to outline it with a definite terminal pencil-line; but note, previous to commencing your sketch, (1) The date and time of day; (2) the temperature and the direction and force of the wind; (3) the direction in which you are looking, and the side from which the light proceeds. As the outline of solid form represents natural limits, your pencil-lines should correspond exactly with these limits. In landscape, the outline is often so complex that it is impossible to imitate it; it is no outline, but only a softened edge. This tempts painters to neglect outline and think only of colour, thus losing their sense of organic form, their precision of hand, and their respect for every law and for all the safeguards and dignities of their art. Hence it is that landscape has become frivolous and justly despised. Turner is a great landscape-painter because he can really draw an outline. It is true that he often loses his outlines, but he can invariably find them again at his pleasure. The just law of landscape, then, is, that whenever one space of colour is distinguished from another by a clear limit, it must be marked by a plain and accurate outline. The outline should at first be equal throughout, though this may be modified afterwards. In some of Durer's best pictures the outlines are all of the same breadth; and yet he gets by means of them all the details of feature and expression."

Proposed Public Building and Market for Windsor.—We understand that Mr. Chareley is taking active measures to obtain this necessity for the town and neighbourhood. He has communicated with the Mechanics' Institute, the Local Government Board, the 5th Bucks Rifle Corps, the Building Society, the Gas Company, and the Water Company, to propose to build suitable rooms for holding their meetings, and for the accommodation of the senior officers, and also a fire-proof room in the basement for the safety of their books and documents, and an armoury for the rifle corps, on their promising to give fair rental for the accommodation. Satisfactory replies have already been given by some of the bodies, and the local *Express* says there is reason to believe that all will gladly avail themselves of this opportunity of having in one building accommodation for all the institutions of the place. This public building, if thus applied, will have a large room capable of holding 500 persons. Mr. Chareley has promised to give the site, which will be in Mackenzie-street, near the railway station.

Water for the Mild Hindoo.—"A noted man among the Hindoos," writes the Calcutta correspondent of the *Times*, "has declared himself in favour of his countrymen using the ordinary water brought into the town by the municipality. This has been for some time a very serious question, and the declaration will be of value—in fact, will be a real sanitary victory. Hindoos cannot, the learned gentleman says, use any but the Ganges water for religious purposes; but for every-day use they are quite justified in taking the supply from the municipality, especially since no leather but only indiarubber is used about the pipes. There is little doubt but that this will decide the question. The great mass of the people only waited for some one to do what every sensible person among them has wished to do if it could be done without breaking caste."

Society of Biblical Archaeology.—This society has been formed. It has for "its objects the investigation of the archaeology, history, and chronology of ancient and modern Assyria, Palestine, Egypt, Arabia, and other Biblical lands; the promotion of the study of the antiquities of those countries; and the preservation of a continuous record of discoveries, now, or hereafter to be, in progress." The secretary is Mr. W. R. Cooper, 9, Conduit-street.

Somerset County Lunatic Asylum Chapel.—We have received a letter complaining that Messrs. Parr & Strong, architects, who made the design for the chapel, have been employed to carry out the works themselves—and without the intervention of any building contractor. Further, that the excess of the cost over the estimates is well-nigh incredible. We shall not be surprised to find that the matter is explainable.

Fires in the Metropolis in 1870.—From Captain Shaw's report on London fires, which has just been presented to the Board of Works, we learn that the total number of calls to fires, or supposed fires, received during the year 1870 was 2,188. The fires of the past year, compared with those of 1869, showed an increase of 374; and compared with the average of the last ten years, there was an increase of 555. The proportion of serious losses was, however, about the same as that of the last few years. The number of fires in which life was lost was twenty-one. 11,161,446 gallons, or about 50,000 tons, of water was the quantity of water used,—an insignificant quantity, the report states, for the work done. Captain Shaw presumes that London will not submit much longer to the inconvenience and risks of intermittent water supply, and anticipates that when constant high-pressure services have been established, the quantity of water used for extinguishing fires will be still further reduced, as in many cases a single gallon in an early stage is more effective than a million half an hour later.

Great Guns.—A correspondent writes,—People are talking of pebble powder and the great 35-ton gun which blows out a quantity of the 120 lb. charge unexploded. Now, sir, I presume it is desired to urge on the 700 lb. peace-makers quicker and farther with the same number of pebbles (David won a battle with only two). The great gun is fired by electricity, the swiftest thing known. My proposition is to place amidst the pebbles a number of long platinum wires, as fine as hair; the instant the electricity is transmitted, the platinum becomes red hot the entire length of every wire, and would give instantaneous ignition to every pebble. It may not be generally known that barristers' wigs of the more costly kind are made of fine platinum: it is preferred to horse-hair. If these legal ornaments (?) were touched with a conductor, you would in an instant see a red-hot-headed lawyer! It could be tested on some testy Q.C. in any of our law courts, and an explosion would doubtless take place.

Amalgamated Society of Engineers.—The annual *soirée* and ball of the Amalgamated Society of Engineers has taken place in St. George's Hall, Liverpool. There were upwards of 1,500 persons present. The chair was taken by Mr. N. Wade, president of the Liverpool branch of the society. Mr. James Samuelson and a number of other gentlemen were also on the platform. The society was established in 1851, and has now 322 branches, of which 288 are in the principal cities and towns of the United Kingdom, nine in Australia, four in Canada, one in Malta, one in Turkey, one in France, eighteen in the United States of America, and one in Bombay. In February, 1851, there were only 7,417 members, but in December last the number had reached 34,769. The following amounts have been expended in benefits during nineteen years:—Donation benefit, 485,824l.; sick benefit, 179,165l.; superannuation benefit, 53,327l.; accidents, &c., benefit, 17,600l.; funeral benefit, 55,850l.; benevolent grants, 14,877l.; assistance to other trades, 10,425l.; total, 817,068l.

Boards of Conciliation and Arbitration. At a meeting of the Social Science Association on the 30th ult., when Mr. Rupert Kettle read a paper "On Boards of Conciliation and Arbitration between Employers and Employed, and what is required to give them further Success," the following resolution was passed:—"That this meeting requests the Council of the Association to procure the insertion in any Bill before Parliament next Session clauses to secure, for modern boards of arbitration, formed to settle trade disputes, [the provisions of the Act of 5 George IV. c. 96, or to provide some other] means for enforcing the attendance of parties and witnesses, and the production of books, papers, and documents before such boards, and for the enforcement of awards duly made by them."

Mysterious Death of an Architect.—Mr W. Carter held an inquiry at the Red Lion Hotel, Barnes, respecting the death of Mr. John Cooper, an architect and surveyor, late of The Cedars, Putney, who disappeared from home under mysterious circumstances on the 7th December, and whose body was found in the Thames, near Barnes Bridge, on Monday last. The jury returned as their verdict that the deceased was found drowned, but there was no evidence to show how he came by his death.

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The Builder.

VOL. XXIX.—No. 1463.

The Improvement of Rome.

CONSIDERATIONS of much importance are suggested by the late inundation at Rome. The long back-bone of the Apennine range of mountains, when covered with winter snows, offers a broad surface to the morning and evening sun. When the wind veers to the south, and the fierce Sirocco lashes the waves of the Mediterranean into the petulant agitation which the Italians call storm, the temperature rises with extreme rapidity. Each slope of the long ridge of hills then sends off a sheet of water, such as no rain-cloud could precipitate. Italy is almost destitute of large rivers, from the very laws of the formation of her peninsula; Eridanus, the *Rex fluviorum* of Virgil, being the one great exception. But Tiber, and Arno, and Aufidus, and

all the eastward and westward flowing streams, are overpowered by a sudden thaw. Every petty torrent and streamlet through the hill country leaps hurriedly to swell the tide of these natural drains. Thus, in the present day, as in the time of Virgil, a sudden displacement of the upper and under current of air, when snow lies thick upon Soracte, is enough to produce such disaster as this with which Italy has now wept for the downfall of the Papacy.

If the war which has so rudely disturbed every industry, and interfered with every occupation, should have a speedy close,—if even we were sure that it would drag no other country into its infernal vortex, Italy would soon come to England for aid against the irregularities of the Tiber. Not that it is needful for her so to do on scientific grounds. The engineers of Italy rank high in the practice, no less than in the theory, of their profession. The men who have first bored through their half of the Alps, meeting their French rivals on their own territory, may well consider themselves capable of restraining the fury of their native streams within salutary bounds.

But, notwithstanding, it is not likely that the grand series of operations to which the secularisation of Rome points the way will be undertaken without at least seeking English aid. For capital, if not for design, Italy is pretty certain to come to us. And, while works of irrigation, of embankment, and of storage of mountain supplies of water, may seem more familiar to the Italian engineer than to his English brethren, the corresponding portion of the work, reclamation by means of drainage, lies less within his experience. We have heard Italian engineers of eminence speak of the drainage of the Pontine Marshes as an impossibility. We

have witnessed the tardy and timid steps which were taken, in the immediate vicinity of the port of Brindisi, for drying a marsh, which was a pestilent and altogether unnecessary source of malaria in that half-deserted city. Around Brindisi alone, of all the numerous and populous Adriatic cities, stretches a broad zone of untilled, uninhabited land, as is the case with Rome itself. It is true that the greater part of this desert belt, as the road from Bari runs across it, is high and healthy, covered, in the summer time, with the white and pink roses of the rock cistus. No physical reason is apparent for leaving this ground unoccupied. But below the town, and to the south of the noble double harbour, lies a marshy hollow, which, like the marshes near Rome, is haunted by the pestilent malaria. Drainage here is a mere matter of moderate outlay; and, with good drainage, all admit that health may be restored to the city, half of which consists of untenanted houses. That the great Roman plague may be satisfactorily attacked in the same manner we are among those who venture to believe.

The engineering which Italy has to apply to the long-neglected States of the Church will, therefore, consist of three branches. The first is the provision for arresting and storing the storm-water in the hills. The second is that for the embanking, clearing, and generally regulating the course of the rivers. The third is the draining and cultivating of the marshes and waste grounds. Connected with this series of operations must be such a treatment of the water-way of the Tiber through Rome itself as will be likely to bring to light stores of the utmost value; the marble, the bronze,—it is even thought the silver,—over which the yellow flood rolls as it washes the city; the objects which, in the successive storms of Rome, from the time of King Brennus to that of Constable Bourbon, have been cast into the stream to save them from the avid grasp of the Gaul, the Goth, or the Vandal.

We have seen what, in our own country, may be expected from turning the skill of the engineer to the service of the agriculturist. But in our soil and climate, with one simple recurrence of seed time and of harvest, we have little idea of the ample returns which may be derived from the soil in the garden of Europe. The great stimulant of vegetation, the sun, there exerts a steady and certain power unknown in our variable skies. Let full supplies of water be afforded, and Italy reaps eleven harvests in the year. The wealth that may be created by turning the long-neglected ecclesiastical property, which now only produces miasma, around Rome, into garden and *masseria*, is more than that which has been already torn by the State from the close and affectionate gripe of the Church in the southern provinces.

Order and security alone are requisite for working out this great industrial problem in Italy. The same may be said with regard to Spain. The Ebro is so neglected as neither to afford a perfect line of water-communication with the interior nor to irrigate the rich soil on its banks, which lies, in some parts, virgin since the expulsion of the Moors. As we write, the telegraph brings tidings of inundations in Spain. Coal from Logrono might be brought into the ports of the Mediterranean, were the canalisation of the Ebro once properly carried out, at a price which would affect the industrial condition of the entire seaboard. We do not despair that this century, now septuagenarian, may yet witness the intelligent and well-repaying cultivation of both the Iberian and the Italian peninsulas, by the aid of the civil engineer.

One yet greater work of the same nature remains to be noticed. It is a work which would add a new granary to Europe, and a new kingdom to Africa. It is a work which, if carried

out by the Khedive, would give him a fame more enduring than that caused by the second-hand temples and sham hieroglyphics of the entire dynasty of the Ptolemies. There is no reason why a large tract of Nubia should not be rendered as fertile as Egypt itself. An engineering work, very simple in its nature, although of a certain magnitude, would make this arid and stony desert blossom as the rose.

At a period which is somewhat obscure, though it is probably not much antecedent to the Christian era, a natural convulsion changed the entire aspect of the valley of the Upper Nile. At the spot now known as the First Cataract, the natural barrier through which the river foams and struggles, was so burst and overthrown by earthquake, as to make a difference in the level of the head water of full 30 ft. The effect of such a dam on such a river as the Nile is obvious. We now know, thanks to the intrepid toil of Sir Samuel Baker, that the perennial stream of the Nile, fed by the snows and rains of equatorial Africa, flows from that great lake system which was indicated by Ptolemy, although it was left to our own times to verify the statement of the great geographer and astrologist. The flood of the Nile, recurring annually almost to the very day, as indicated by the festivals of the fixed Coptic year, is derived from the showers that are squeezed from the clouds by the mountains of Abyssinnia, as the sun passes the solstice. When the great natural barrier at Syene was intact, the Nile, at two permanently different levels, fertilised by its flood first Nubia and then Egypt. With the barrier destroyed, the upper valley is left unblest by the grateful overflow.

The Khedive has for some time entertained the idea of canalising the First Cataract, and of calling in the aid of English skill to overcome the difficulties opposed by the present state of the Nile to the navigation of this dangerous part of its channel. Alternative reports have been laid before his Highness, proposing, with more or less ability, to effect this object. But the master-idea has been left out of sight. What we are called on to do for the Tiber, with the promise of an ample return, would pay a thousandfold in the case of the Nile. The establishment of a safe and unimpeded navigation would in itself be a great boon to Nubia. But if the works undertaken for that purpose were so designed as to restore the ancient dam shivered by earthquake,—to collect the Nile flood at the gate of Nubia, and thus to restore that upper district to its annual fertility, the results would be worthy of the greatest sovereign whose name is recorded in the annals of Egypt.

Egypt, indeed, is the very cradle of engineering. The series of mighty works which, during more than 6,000 years, have been successively reared in that little strip of watered valley redeemed from the desert, are without rival in the world. The ancient Lake Moeris was a work as wonderful as, and far more useful than, the Great Pyramid itself. The most colossal work of the present century has been the Suez Canal. That which it is requisite to do, in order to restore the level of the Upper Nile, and to fertilise Nubia, is as nothing compared to the work of the early Egyptian monarchs on the one hand, or of Ferdinand de Lesseps on the other. Rarely does it fall to the province of a ruler to have within his grasp so sure a source at once of immortal fame and of incalculable wealth. If to the labours of the engineer in reclaiming the waste lands of Italy and of Spain, and in bridling the Po, the Tiber, the Ebro, and their sister rivers, be added that of the restoration of the fertility of Nubia, we shall see an indication of the future multiplication of the human family, afforded by the immense increase in the supply of food that will be poured into the basin of the Mediterranean.

ARTIST WORKMEN'S EXHIBITIONS AND ART IN CONSTANTINOPLE.

It would be a very difficult thing to name influences more important in national life and art than those we so slightly touched on a few weeks back; first, the tendency there is in nations speaking the same language to what may be termed centralisation, or the gathering together of a whole people under one head and centre of rule, and the consequent tendency there always must be in such a state of things to reduce them to a dead even level, and to make the subordinate and distant parts of such a nation thus constituted, mere copies, and feeble copies, of the central and governing force. There can be in such a state or condition of things no competition; everything is alike, and the more complete the central organisation the less of variety of action can there be. May it not, therefore, be fairly put as a great modern question, whether and what advantages are there, or can there be, in immense empires as contrasted with smaller states; or rather, in other words, are not a number of small states, theatres of local and individual action, better for fine art and for artists than the same number of small states gathered into unity, as it is called, by the not of their consolidation into one great state? This would seem to be a thought worthy of the consideration of those who are seeking so strenuously to absorb all small places and organisations into one whole, and to make of them a single large one. The Germans under their leaders are now performing this modern feat, and it is impossible not to ask ourselves whether or no German art is to advance, or rather grow up, under such new state of things, better or worse than it has done during these latter years under the system now so rapidly passing away. Will the artist workman be the better for it or no, and will, or can there be, under the new order of things, a higher and nobler fine art and better means and opportunities for the exercise of the gifts and talents of the workman? That a few privileged men at the centre of action will be richer and gifted with increased means of doing good or ill, there can be no doubt; but the real and national question is, Will those who do the work of society be the better for the change or no?

This at first sight may seem to many to be but of small practical interest as regards the art of architecture or building, and things connected with them; but a moment's thought will convince any one that it is a subject of most vital interest, for it is impossible not to see in the course of events a continuous and certain tendency to approximate not only nations speaking the same language together, but even all Europe is in rapid progress of having things in common, and after the same pattern. We do not remember to have seen anywhere noticed—how gradually, and step by step, but surely and certainly, all the capital cities of Europe are getting alike. Judging from all accounts, and from sight of new photographs, which cannot mislead, it would seem to be the ambition of all such important places so much in the world's eye, to copy, as far as possible, that for the present unhappy city, Paris. Looking at a long perspective of street shop architecture from St. Petersburg, nay, or Moscow; at another from Berlin; another from the improved parts of Madrid, behind the modern world though it be; another from Rome, or Naples, or Florence, and our poor Board-of-Works-ridden and regulated London, it is impossible, without close looking at, to tell where you are. There is in all of them the same idea, poor as it is, of a shop, the house supported apparently by a sheet of plate-glass, the same sort of windows, the same "facia" with name of tradesman, and, of course, the self-same monstrous bit of plate-glass in front of all. To our minds, there is nothing in the whole course of things as they are now going on more significant than this; for does it not show how entirely all individuality of artistic thought in each separate nation is giving way before the modern and universal idea of a Paris or London? Any one, therefore, going up or down our Regent-street, or improved part of Oxford-street, may consider himself as in the improved and thoroughly civilised parts of St. Petersburg, or Moscow, or Naples, or, indeed, in any other of the great cities of the Continent, wherein the energy, as it is called, of an industrious people has enabled them to borrow or buy in the lump this great idea of the time,—a modern London or Paris improved shop-front, and all else that goes with it, nay, and the whole

of the house-front as well. But may it not fairly be asked, is this progress or improvement, or art-advancement, or architecture in a state of progress, that the whole of Europe shall be as one town, with every place alike and everything out from the same pattern, and almost out of the same piece of stuff? However good a thing may be for Paris, it does not follow surely that it is equally good for Madrid or Moscow, or that the Spaniard or the Russian has nothing to say or invent for himself, without coming so far as Paris or London for an idea as to how to do it. If this be civilisation, all we can say of it is that it is not and cannot be worth the having at such a fearful sacrifice of all that is original and creative in the heart and mind or by the hand of man. For all Europe to be made up of New Oxford-streets, and back slums of Carnaby-streets, and Oxford-markets could hardly be an edifying spectacle, even to those who are doing their utmost to bring it about. If this be indeed its fate in the future, it would seem to be but a needless and a thankless task to urge improvement in art; for is it not indigenous art itself cut short at its very commencement and primitive source? All that is worth the having is impossible of attainment; for no man, under such a system will be allowed to work in his own way, and to follow the ways and special peculiarities of the country of his birth.

There is yet one other place in this category of artistic woes which cannot be passed over even in this slight notice of what things are tending to,—we mean, as the reader will anticipate, Constantinople. Now, this wonderful city is but half in Europe; but it is so much in it, and belongs so much to the "European system" of things, that it is all but impossible that it should escape the general contagion. There are shops in Constantinople, of course; so that there is an opening for improvements and Western ideas. Unfortunate city! it has suffered siege, and worse than bombardment, more than once, and has, wonderful to say, got over its many troubles, and is a city still, and not a ploughed up wilderness; but all its sieges and troubles put together have never equalled the truly disastrous state to which it is apparently now doomed,—doomed as it is not to extinction, but to "improvement," or, in other words, to the sweeping away as fast as may be of all its characteristic streets and quaint houses, and odd corners, and out-of-the-way and unexpected architectural surprises to be found at every turn in it, and to find substituted for these perhaps a Baker-street, or a Palmerston Town, or a railway station with corrugated iron roof tied together with wire! In it, indeed, are to be found all those evidences of a past and almost dead art action that once had sway in the world, and which machinery has now well nigh utterly routed out; and not only this which has to do with the executive workman, but the artist himself may yet find in it the picturesque and the "architecturesque," in the true sense of those words,—not on paper merely, or on canvas, but in actual and living reality. It is impossible not to deplore the ruin which is now overtaking such a place as this,—not by a process of wilful destruction or warlike siege and bombardment, but by a process of what is sincerely thought to be "improvement and progress," and a civilising influence—a substitution of manufacture for art.

Thus do we see that not only does the great current of human things set in the direction of universal levelling by the tendency of making all the several parts of a nation speaking the same language, one and the same, and so to produce like results, but that this tendency is extending itself to all civilised Europe. Shops, those tests of the art and mode of art-action of the time, are getting everywhere alike, and are designed after the same fashion. Further and better proof of this momentous fact there cannot possibly be, or one more significant of the probable course of things artistic. There is something wonderful in the fact of this vital subject not having attracted more attention than it would seem to have done,—indeed, we may almost ask ourselves whether it has hitherto excited any one's attention at all. That the Spaniard is a different sort of man from the Frenchman is certain enough; then why should he go to Paris for an artistic idea, or for the way to build and decorate and fill a shop? He has a language of his own,—why not an art of his own, to be developed by himself, and to progress, not in a French way, but in his own? And if this is to be said,—and surely no reader of the *Builder* will be likely to refuse assent to it,—how much more does the principle involved apply to the

Turk, or man of purely Eastern origin, and utterly foreign to European ways and to "Western ideas," and to the very spirit of modernism, as it is called? No one will deny that the Eastern races have been fruitful of ideas, and great ideas, too. Indeed, when we come to reflect upon it, it is not a little humiliating to think on the startling fact that nearly, if not quite all, the great ideas, theological as well as artistic, and otherwise, which nowadays govern the very thoughts and aspirations of the European, or Western man, are Eastern in their origin,—indeed, have been, to a certain extent, worked out by the Eastern races, and put aside for others; and that we, in this tight and narrow little island, are using them simply, and for the very plain reason, that we have none of our own. What a pity, therefore, it seems that such a being, under such circumstances, should come here for an idea for a shop-front and a counter!

There are few things, it is certain, more interesting to the architect than shops; for they, and not public buildings, as churches, chapels, cathedrals, and town-halls, go to make up the brightness and interest of towns and cities over what would London be without its shops? What it is on a Sunday,—the most desolate and dreary place on the face of the earth. You may find something to look at in a desert, or a steppe, but hardly in London on a day when all its bright shops are shut up and invisible. Shops constitute the real and ever visible architecture of a town, and there is nothing in architectural art better worth the exercise of artistic skill than a shop; but surely the problem is not to be wrought out by the perpetual copying everywhere of the stock-in-trade of the model shops to be found in Oxford-street, with their perpetual repetition of plate glass, and their iron supports for wall above, and with nothing visible to keep up this weight of walling. What can be worse? Even were our shops and those of Paris ever so good as models, they are utterly unfit for Eastern towns, the shops of which, in rows and streets, nothing more picturesque was ever invented, but art suited to the countries and climate of those countries where they are built. What, therefore, we may again ask, is to be got by exporting our architecture, such as it is, to foreign places, to Moscow, or Constantinople, or, indeed, to any place whatever possessed of an individuality of its own and an art of its own, and, as we would contend, a progress and a civilisation of its own, and peculiar and natural to it? If civilisation is to consist in taking over to a hot and sunlit city plate glass, thin iron columns, counters, and shop chairs, where they are all worse than useless,—positive inconveniences,—what is to be said of such improvement, but that it is no improvement at all over their own and primitive system of doing things, and that infinite harm and injury are done to art and the cause of art by such acts of destruction as the pulling down what exists, and putting up in its place such stretched stuff as we can take over? Art cannot be copied, but art manufacture, and that worse than all,—perhaps, the substitution of "patent materials," as they are fitly termed, for the genuine materials provided by nature, and which are always good and tell their own tale, but of which it is always necessary that you have enough for its destined purpose, whatever that may happen to be. But, as we have said, this is civilisation, and progress, and improvement, or the future destiny of the race, or whatever other fine word or phrase the reader is prepared with; but real common sense and artistic advance, or even standstill work, we most strenuously deny that it is. No one can contend for an instant that the "drinking-fountains" put up in divers parts of London are an improvement on those to be found in the tumble-down Eastern cities, wherein no improved system of water supply has yet found its way; and will any one be bold enough to pretend that the new kiosks of Sultan Abdul-Medjid, with its club-house windows, orthodox pavement, Greek pattern, and its surroundings of smart hoarding, is a better building, and containing more of artistic or architectural interest, than the building for which it was substituted? In such miserable miserable articles as these, to be bought over a counter anywhere, and needing only to be fitted together, may be seen, visible to the eyes of the very dullest, not only the ruin of the Turkish Empire and the Turk, over whom so many State tears have been shed, but the utter ruin and extinction of the fine art of the East everywhere, and a destruction more complete than any ever wrought by Timour or Attila.

A WORKMAN'S VIEW OF CANADA AND ITS TRADES.

In extent, as in population, Upper and Lower Canada, now called the provinces of Ontario and Quebec, are the most important in the Canadian Dominion. Ontario, at the last census, in 1861, had a population of 1,396,091, and Quebec of 1,111,556, and since that date there is no doubt but they have increased 1,000,000 more. They are well situated for trade and commerce on the great water highway by which the produce of the Western States of the American Union finds its way to the markets of the Old World. The value of their exports of 1869 was 60,471,751 dollars, and of the imports 70,415,165 dollars. They are from 1,200 miles to 1,300 miles long, and from 200 miles to 300 miles broad;—Quebec on both sides of the St. Lawrence, and Ontario on one side of the St. Lawrence, and on the north shores of the great lakes from the Ottawa to the Detroit rivers. They have abundance of fertile land to grow corn and to raise cattle, and are rich in the products of their vast forests and in minerals, which are only awaiting an increase of population to develop, and a water power running waste into the sea sufficient to propel the machinery of the world; so that, with enterprise and those resources, the Canadas could with ease sustain five times their present population. The lower province, if not the most fertile, is decidedly the most picturesque; its physical aspect extremely varied, presenting to the eye a beautiful succession of pictures of bold mountains, wooded hills, lovely lakes, rich valleys with lines of pleasant villages, whose tin-covered roofs and church spires glitter in the sun-light, and charming villas and gardens in the midst of well-cleared farms;—the mighty St. Lawrence, with its numerous isles running through its centre, and its tributaries the Ottawa, the Saguenay, the Richelieu, the St. Maurice, the St. Francois, the Chaudiere, and others of less note, which, rushing through forests and rock-bound shores, over mighty cataracts and rapids, present scenes of majestic grandeur and beauty. Ontario, a vast and level country, with some slight undulations, has also attractions for the tourist. The thousand isles, with their grand and varied scenery, lie in the St. Lawrence close to the shores, between Prescott and Kingston. In the Georgian bay, and amongst the lakes and lakelets of the Laurentine hills, there is exquisite scenery. The loud roar of Niagara's mighty waters resounds for miles along its valleys, while the sublime grandeur of the stupendous Horse-shoe Fall can only be seen to advantage from the Canadian side. Lower Canada is principally peopled by the descendants of the early French settlers, who still retain the language, customs, laws, and religion of their former mother country, and they are chiefly settled in the fertile valley of the St. Lawrence; but the eastern townships between the St. Lawrence and the United States line are peopled chiefly by the descendants of the United Empire Loyalists, who left the United States rather than fight for their independence of the mother country. The cities, towns, and villages have a good sprinkling of English, Scotch, and Irish; so that upon the whole there is a considerable admixture of population. Like the eastern townships, Ontario was first colonised by United Empire Loyalists, whose allegiance was rewarded by large grants of land from the English Government; but they were not suffered to remain long the sole possessors; for, attracted by the fertility of the soil, thousands of hardy settlers flocked from Great Britain, who, with all their native energy, made was upon the forest, and soon converted a howling wilderness into well-cultivated farms, teeming with corn and cattle, and raised cities, towns, and villages, which are rapidly increasing in wealth and population. The customs, manners, laws, and religions of the old countries are strictly adhered to by the people of Ontario, with an occasional smart motion borrowed from their Yankee neighbours. Canada is warm in the summer, and colder in the winter than England, and Ontario is more temperate than Quebec; the spring is a fortnight earlier at Toronto than Montreal, and the winter a fortnight later. In Lower Canada the snow remains on the ground from November until April; but in the western part of Ontario it seldom remains until after Christmas. But all through this excess of heat and cold the climate is healthy and the soil productive; for the snow destroys all miasmata and fertilises the land. No doubt, the long winter is a drawback; but it is not so unpleasant as people think in England; for the

snow is dry and the air is clear and bracing; so that persons warmly clad can generally work outside. If the farmer finds it expensive to house and feed his cattle, he does other work much cheaper, and finds an easy road to market over the frozen snow, and when the season opens, his land is light and easily tilled; and, although the winter looks the lakes and rivers of Canada, it makes roads into her forests to bring down all their wealth.

The public works of Canada would do credit to an older and richer country. The ship-canal and locks that connect the great lakes, and obviate the rapids and obstructions to the navigation of the rivers, which cost about 20,000,000 dollars, are good evidences of engineering skill and industrial enterprise; and her railway system already extends close upon 3,000 miles, 1,377 of which are worked by the Grand Trunk Company, upon which they have 326 locomotive engines, and 4,405 cars of all kinds. Their main line runs from Rivière de Loup to Sarnia, about 800 miles, and crosses the St. Lawrence, at Montreal, by the Victoria Tabular Bridge, nearly two miles long, and which takes the trains seven minutes to pass through. The tubes are 16 ft. wide, and 19 ft. high, at either end, and 22 ft. high in the centre; and this iron superstructure rests upon two abutments and twenty-four piers of solid stone-work, 60 ft. above the summer level of the river. The centre span is 330 ft.; and each of the twelve, on either side, is 242 ft. There are 3,000,000 cubic feet of masonry in the abutments and piers, and 8,250 tons of iron and 3,500,000 rivets in the tubes. The total cost was 1,250,000, sterling. Most of the skilled workmen who were employed on this stupendous undertaking were natives of the old countries; and a grander work was never raised by British hands. The brain which conceived it and the industrial energy which carried it through never more shall think or work. Robert Stephenson and Thomas Brassey sleep with their fathers, on English soil; but here, 3,000 miles away, their names shall for ever live, associated with this, the greatest triumph of engineering skill; and the noble army of toilers, who, since its completion, have scattered over the earth, and many have gathered to its bosom, have also left behind them, in addition to this work, an enduring and tasteful record of their generous, manly sympathy, by enclosing the spot near the bridge, on Point St. Charles, where the emigrants, chiefly Irish, who died of ship-fever, in 1847, were interred, and placing in its centre, on a cut-stone pedestal, a large boulder, about 5 tons weight, taken from the bed of the river, upon which the following inscription is deeply engraved:—"To preserve from desecration the remains of 6,000 emigrants, who died from ship-fever, in 1847 and 1849, this monument is erected by the workmen of Messrs. Peto, Brassey, & Betts, engaged in the construction of the Victoria Bridge, A.D. 1858." The probability is that all knowledge of the circumstance, or of this place of burial, would soon have been lost sight of, but for this timely interpolation.

Yet, with all those miles of railway, for a country so sparsely populated as Canada, many of the lines pay very well, because they are all single tracks, and made through the level country where the land cost little or nothing, at an average cost of 30,000 dollars a mile, rolling stock and all complete. And the dry is still, they open up the country so effectually, and enhance the value of the land in the neighbourhoods through which they pass, that municipalities and townships grant large bonuses to assist the companies to build them; and during the recent session of the Legislature at Quebec several million acres of land have been granted, on the American principle, to enable railway companies to build projected lines. They have also granted subsidies and charters to several companies formed for the purpose of building wooden railways to connect the outlying settlements with the centres of population. The idea has been borrowed from the Yankees, who in turn borrowed it from Norway, and its successful application is now placed beyond a doubt by the working of twenty-six miles lately opened, from Gosford to Quebec, of the Lake St. John's and Quebec line. It is very simple of construction, and without a bit of iron. When the road is graded sleepers level on their beds in section, a little closer than on an ordinary railroad, and towards either end, 4 ft. 8½ in. apart, notches are cut, into which the rails, stringers of hard maple, 16 ft. long, 7 in. by 4 in., are inserted on edge and made fast by fox-wedges. The rails are slightly chamfered on the edges to prevent

splintering, and to fit the flanges of the wheels of the engine and rolling stock, which are similar to those on iron roads, except that the driving-wheels of the engine are without flanges, to enable it, they say, to travel on sharper curves. This portion of the road, equipped and all, was built for 6,000 dollars per mile, and the Government has guaranteed 5 per cent. upon 5,000 dollars a mile, which almost secures the company from loss. Repairs, when necessary, can be very cheaply done by turning the rails down-side up, or by sawing off the damaged surface, and if they need replacing the cost is only 150 dollars per mile. These roads are peculiarly adapted to lower Canada, for the air is so dry during the summer and winter. The greatest impediment to the use of wooden rails is their liability to become slippery in a damp atmosphere, as was clearly shown during the rains of the fall, when sand had to be put on the steep inclines, to enable the engine-wheels to bite. Their success and general adoption will be a great convenience to the lumberers for sending their supplies to the woods, and bringing down their timber, and they will materially assist to open up and colonise the country, by giving access to rich and fertile lands, now locked up in the recesses of the forest. As might be expected with so small a population, on so large an area, the cities, towns, and villages of the Canadas are not so numerous nor so extensive as they are in old and populous countries, nor their buildings generally so permanent and substantial, where wood as a material for building is in such general use. Still Quebec and Montreal, in Lower Canada, and Ottawa, Kingston, Toronto, Hamilton, and London, in Ontario, have public and private edifices which for beauty of design and solid construction will very favourably compare with those in the towns and cities of Old England,—more especially Montreal.

In plan and general features, the cities of Lower Canada are irregular and picturesque, like old European cities, while those of Ontario are of the true American type, having streets parallel and at right angles to each other. Old Quebec, founded by Champlain 203 years ago, upon the left bank of the St. Lawrence, bears strongly the impress of the Jesuits and soldiers who built it up. Its colleges, convents, and churches treasure noble works of art, and give tone and form to those amenities of social life for the observance of which its citizens are remarkable; whilst high up on Cape Diamond, 345 ft. above the river, is the mighty fortress, bristling with cannon, which has made Quebec the Gibraltar of America; and nestling in the rich St. Charles valley is the suburb of St. Roch, with its bright tin spires and roofs, and long streets of wooden houses, still exhibiting traces of those dreadful conflagrations which have so often reduced its industries French population to absolute want and destitution. Then 180 miles higher up the river is the city of Montreal, with its 120,000 inhabitants, the most beautiful in all America, on an island of the same name, 30 miles by 10 miles, on a lovely site, with the noble river in its front, and Mont Royal to the back, which is wooded to the top, and environed with stately villas, although upon irregular ground. The streets and squares are very well laid out; the houses, shops, and warehouses elegantly designed, and built with a fine blue limestone, which imparts to them a solid and substantial appearance, and many blocks of buildings are unsurpassed by any in London or Paris. The public edifices are very numerous and imposing; the colleges, convents, and hospitals large and commodious; while splendid churches of various denominations, rivalling each other in grandeur and beauty, raise their tall towers and spires over every part of the city. Montreal being at the head of the tidal navigation, hundreds of ships and steamers lie along its fine-cut stone quays during the open season, loaded with precious freights for the rich wholesale houses in the city, from which it is distributed all over the country. Capital and enterprise are also utilising the vast water-power of the St. Lawrence. Of late years many splendid factories have been erected, which give considerable employment to the people. Thus in the exercise of charity founded on religious duty, in the prosecution of literature, and those arts which soften and adorn human life, and in the development of commerce, trade, and manufactures, which administer to material comfort, the people of Montreal stand pre-eminent in the Dominion.

Lower Canada has several other well-built towns, and many handsome villages well

located, whose nice streets of wooden houses, with gardens, terraces, and verandahs, shaded with trees and decked with flowers, look very pleasing in the summer time. The river Ottawa divides the provinces of Quebec and Ontario, and upon its south shore, eighty-seven miles above its confluence with the St. Lawrence, is the city of Ottawa, formerly called Bytown, now the capital of the Canadian Dominion. It is a comparatively new place, with about 25,000 inhabitants. It has very few buildings of importance, except the Roman Catholic Church, the large lumber-mills, and the Houses of Parliament, which are truly noble buildings, and cost about 4,000,000 dollars. The site has been admirably selected on the plateau of a bold bluff overlooking the river, from which there is a fine view of the surrounding scenery, and the celebrated Chaudiere Falls, which are only surpassed in grandeur by those of Niagara. The houses are in the Gothic style, with the main buildings about 40 ft. in elevation, surmounted by tall towers and high-pitched roofs, finely created with wrought-iron, gilt and coloured. They are built of native sandstone, of a light cream colour, with Ohio sandstone dressings a shade deeper, and native marbles for internal decoration. They form three sides of a quadrangle, 700 ft. by 600 ft., in the centre of which are the two Houses of Parliament and the library, and in the east and west buildings the offices for the Governor-General and the several departments of the Government. About a mile outside the town is the residence of Lord Lisgar, the Governor-General, a square, plain unpretending house, but convenient and comfortable. The Rideau Canal, which has some fine locks at Ottawa, connects that city with Kingston, at one time the seat of government for the Canadas, handsomely situated on Lake Ontario, where its waters enter the St. Lawrence, and well built, of blue limestone: it contains about 14,000 inhabitants. The public buildings, for a place of its size, are remarkably good, and consist of the post-office, the court-house, the provincial penitentiary, the Roman Catholic Cathedral, and the churches for other denominations, and two colleges, Fort Henry, Fort Frederick, and Martello towers, which guard the entrance to the harbour, make it second only to Quebec as a military station. It has a considerable trade with the towns of the United States on the opposite side of the lake; still it appears as if its glory had departed with the Parliament and the withdrawal of the English troops, which would have garriooned it from Kingston along the lake shore, and on the line of the Grand Trunk Railway.

There are some good rising towns before you reach Toronto, 160 miles to the west, the site of which, eighty years ago, was a wilderness, and the home of a few Indians; but now, with over 60,000 inhabitants, it is the queen city of Ontario. The streets are broad and well-laid out, parallel, and at right angles to a bay of Lake Ontario, on which it is situated. It has a rich and fertile country at its back and a rapidly-extending lake commerce. The houses, shops, and warehouses are built with white bricks, and the churches and public buildings, which are large and numerous, are built with brick and stone dressings, or entirely of stone. The Roman Catholic and Church of England cathedrals are the best of the churches, but the Dissenters are building one for the Rev. Mr. Fenchon, which will equal any of them when completed. Ospeode Hall, in which are the principal law courts, with a library and offices for the lawyers, has a fine brown stone front of classic design; and the House of Parliament, the Lunatic Asylum, Trinity College, the College of Toronto, the normal and model schools, and the St. Lawrence Hall and Markets, are very good buildings, well adapted to their use. The residence of the Lieutenant Governor, lately erected with red bricks, and Ohio sandstone dressings, in the Italian style, is very beautiful; and the University of Upper Canada, in the Queen's Park, built entirely of stone, is a clever adaptation of Norman architecture to collegiate buildings. There is no city in Canada more rapidly increasing in wealth and population than Toronto, and from 700,000 to 800,000 dollars are annually expended on building.

Hamilton, which lies on Burlington Bay, at the western extremity of Lake Ontario, and thirty-eight miles from Toronto, is also a prosperous and rising place, with over 20,000 inhabitants; it is sometimes called the ambitious little city, because of its eagerness to keep pace with Toronto, for which it has facilities in its delightful situation, and through the Great

Western railway, which, crossing at Niagara, brings a great deal of American traffic through it. Railroad iron locomotives, cars, stoves, boots and shoes, and sewing machines, are amongst its manufactures; and a good evidence of its enterprise is the fact that 500 of the latter are sent to England every month for sale.

From Hamilton to Detroit, by the Great Western Railway, is 186 miles, and a little less than half-way is London, in the county of Middlesex, on the river Thames, spanned by Westminster Bridge. I thought I was at home when I heard the names. It is a nice, well-built town, with over 12,000 inhabitants, in the centre of a splendid agricultural country, where every one appears to be doing well, and where the working classes live in bright, clean, and neatly-painted houses,—a luxury not very generally enjoyed by that class in most of the other towns and cities of Canada; and, although they have many substantial comforts, the appearance of their houses is not such as I would like to see, and is not equal to those of their brethren in the provincial towns of New York State, on the other side of the lake. Besides those I have mentioned there are more than a dozen other good towns in Ontario, with from 4,000 to 8,000 inhabitants; and there are villages in every direction, which are fast increasing in population and extent. Good building materials are to be found in nearly every part of the Canadas, more especially timber. During the summer, you see nothing but islands of logs upon the lakes and rivers, and mountains of lumber piled around the saw-mills, which can be purchased at from 5 dollars to 12 dollars per 1,000 ft. broad measure. Red and white bricks, common lime, hydraulic lime, and gypsum are as good and as cheap as they are in England. Granite fit to cut is only found in Lower Canada; but sandstone and limestone, of a blue colour, are found in both the provinces. The limestone used in Montreal, which is soft enough to be moulded or carved to any design, is raised in the neighbourhood to any size required, and is delivered at the building at from 25 cents to 50 cents per 1 ft. cubic. The limestone at Ottawa, Kingston, Otrilla, and other places in Ontario is not so good and solid; and marbles, which, I believe, might be found in many places, are not at present much developed. The sandstones of both provinces are only used for rubble: all required for cut-stone working is brought down the lakes from Cleveland, in Ohio, which cost, delivered, about 75 cents per 1 ft. cube. Roofing-slates, of a very fair quality, are raised in the eastern townships; but the lead, tin, and iron, used for buildings are brought from England.

Every style of architecture since the days of Adam is to be found in Canada, and every degree of comfort in the houses, from the wigwam of the Indian, covered with birch bark, to the elegant Grecian temple in which the bankers of Montreal count their money, and the florid Gothic buildings at Ottawa from which their statesmen rule the land; and the professors of each style, like in England, labour hard to prove that the one most to their taste is best suited to the summer's heat and winter's cold of Canada; but people here, like everywhere else, generally consult their own taste and comfort. The Indians believe, and bring experience to support it, that placing them to live in houses with its concomitant luxury, is the surest way to clear them off their native land; therefore they prefer to live in huts. The bank of Montreal is convinced that if they did not do business in a grand building, they would never get a customer, and so they have one; and the legislators at Ottawa are fully certain that they could never make laws for the Dominion in the winter time, if their splendid chambers were not heated on the most scientific principle. Therefore, the most prevailing styles are those undefined ones which are developed by the circumstances of the occupiers. When a settler, by purchase or by a free grant from the Government, obtains his farm of wooded land, generally from 100 to 150 acres, he commences to clear the most eligible site, and with the trees unsquared, cut to equal lengths, halved at the ends, and piled on each other to a height of 10 ft. or 12 ft., he builds himself a shanty or log-house. In a few years, as his clearing extends, his means increase, and he gets cattle, which take possession of the original house, after he has built a nester one for himself, with logs of squared timber, and the roof covered with shingles or thin boards, 18 in. long, laid on like slates. This in turn is converted into a barn or stable, when his means enable him to build a

frame house, clap-boarded, and neatly painted, to be again replaced by a brick or stone house, covered with slates or tin, when the farm is all cleared, and in good order. Shingles will last on a roof fifteen or twenty years, and a thousand, which cost 2 dollars, will cover a square. The tin covering, which will last over fifty years, and remain bright, cost about 14 dollars a square. Welch slate, which is often brought out as ballast in the timber-ships to Quebec, cost about 9 dollars per square, and the slate from the eastern townships is at the same price. Many frame houses, after being sheathed with sawn lumber, are faced with 4-in. brickwork, and very commonly the sheeting is covered over with lath and plaster. Timber, from its cheapness, is unsurprisingly used in all building construction; even those houses which have the walls well built of stone or brick have the cornice made of wood or zinc. Materials which in England would not last long exposed to the weather, in this dry climate last a considerable time. Even sandstone and Caen stone, which deteriorate so quickly, exposed to the London atmosphere, stand five months' frost here. Good houses have generally green window-blinds, opening on the outside, which are taken off during the winter, and a second glazed sash is put into the openings, which in a great measure prevents the heated air of the rooms from condensing on the glass; those with double doors and stoves heating the passages and rooms make the houses almost too warm, if the inmates have to go out to see in the open air.

Stoves and sleighs are the most popular institutions in America during the winter, and so necessary that Crowns and Constitutions, Democratic and Republican, are not so dearly prized; and many an ingenious device and high-sounding title is registered at Ottawa and Washington by inventors, to raise them in the public estimation. The Battle of the Styles in England is nothing to the War of Stoves here. The Champion and the Bully give way to Victory and Triumph, while the Republic and the Dominion are hard set to hold their ground. But the bulk of them are only iron boxes, in which wood or coal is wastefully burned, and iron pipes and elbows, carelessly put together, which burn up the air and ruin insurance companies. But beyond a doubt is the luxury of the sleigh, whose merry bells do fill the air with music, as it swiftly glides along the frozen snow, while its occupants, wrapped in furs and buffalo robes, enjoy the clear and bracing air. Rich people can have comfort everywhere; but here the man of moderate means is the equal of every one, and can enjoy himself like a prince; and the working man, also, can have recreation and respite from toil during the winter, if with his summer savings he has laid in a stock of fuel and provisions to carry him through the year; and that he can easily do if he keeps away from drink, which here is a deadly poison; for his earnings are pretty good, and his food not very dear. Board, which in New York costs 5½ dollars a week, can be had here for 3 dollars; and every other necessary is proportionally cheap. As at home, in England, the price of labour varies in the Canadas. It is generally higher in the Upper than in the Lower province, where living is a little cheaper than in Ontario; but I think a dollar a day,—equal to 4s. 2d. English,—will average the wages of an unskilled labourer; and 1½ dollar for inside trades; and from 2 dollars to 2½ dollars for outside tradesmen, who find it difficult to get work in the winter. Yet it is easier at this time than it has been; for they now build brickwork during the frost, and point it in the spring, and I have no doubt but it is just as good work as if done in the fine weather. During the summer and harvest labourers' wages rise to 1½ dollar, and good building artisans in some places get a little more than what I have set down as the average wages. The time worked in towns is from nine o'clock a.m. until six o'clock p.m. An hour is allowed for dinner, and breakfast is taken before they commence; and with the farmers in the country men work from light to dark, when work is pressing; but the winter day here is about an hour longer, and the summer day an hour shorter, than they are in England. Building was very brisk the past season, and masons, bricklayers, plasterers, carpenters, and painters had little difficulty in procuring employment wherever they turned, while the supply of labourers to work on new railroads and on farms was far short of the demand. Other kinds of labour were also in demand; for since the repeal of the reciprocity treaty in 1866, Canada is

making a great effort to manufacture for herself. All the leather used is tanned here, and the boots, shoes, and rubbers required are made as good and as cheap by the aid of machinery in her factories as they could be in the United States or in England. 2,000,000 dollars and 10,000 persons are employed in the trade at Montreal alone, while Quebec, Toronto, Hamilton, and other places employ quite as many. The hands are chiefly young persons of both sexes, who get a moderate wage; but there are many men who get from 1 dollar to 1½ dollar a day. The manufacture of furniture, with the aid of machinery, is also pretty extensive, and gives employment to many persons, at wages of from 1 dollar to 1½ dollar a day. Canada tweeds, blankets, flannels, and other woollen goods are rising into favour, and their manufacture is fast extending; but English cotton goods still monopolise the market, and consequently very little is done towards producing say, breweries and distilleries. The refining of sugar, and the manufacture of tobacco, paper, and furs, give a good deal of employment, and as the land is getting cleared of stumps, and the farmers get rich, agricultural implements are coming into use, and many places for their manufacture have sprung up.

For the manufacture of iron, which is chiefly brought from England, there are several rolling-mills, forges, and foundries, especially in connexion with the railroads, which, from their vast extent, employ many men to work them, and to build and keep the rolling stock repaired. In the workshops of the Grand Trunk, at Point St. Charles, Montreal, 800 to 900 men are constantly employed, besides hundreds at other places; and about 2,000,000 dollars in wages and salaries are annually paid by the company. For all workers in iron the supply here is often greater than the demand, and, consequently their wages are not so good, compared with other trades, as they are at home. Moulders, turners, smiths, and fitters get from 1½ dollar to 2 dollars a day; and engine-drivers from 50 dollars to 100 dollars a month; and their wages are regulated by character, time served, and the lengths of the trips they make. Shipwrights get 1 dollar a day, at the port of Quebec, the preference for iron ships having almost destroyed the trade in wooden vessels. The staves and hoops for coopers' work are split and prepared by machinery, and the men get 10 cents a-piece for making flour-barrels, fourteen of which are a day's work. Carriage-makers, wagon-makers, and wheelwrights are often in demand, at from 1½ dollar to 1½ dollar a day. Compositors, bookbinders, working jewellers, tailors, and harness-makers get from 1½ dollar to 2 dollars a day; and lithographers, engravers, when they get employment, receive about 3 dollars per day. Clerks and lawyers are at a discount,—this country is full of them; for many farmers' sons who receive an education become too clever and refined to follow their father's calling, but prefer to loaf around the towns, hoping to lead an easier life, an expectation not always realised. The cost of a working man's living in Canada is, on the whole, cheaper than in England. The rent of a house, of four or five rooms, suitable for a small family, is 4 dollars to 6 dollars per month in the towns, but is much cheaper in the country. Flour, per barrel of 200 lb., 5 dollars to 6 dollars; Pork, 6 dollars to 8 dollars per 100 lb.; beef, 5 dollars to 6½ dollars the 100 lb.; mutton, 6 cents to 8 cents the 1 lb.; butter, 15 cents to 18 cents the 1 lb.; turkey, 60 cents to 1 dollar; geese, 50 cents to 60 cents each; fowls, ½ dollar, equal to 60 cents a couple; potatoes, 49 cents a bushel of 60 lb.; tea, 50 cents a pound; coffee, 20 cents; sugar 10 cents; hard wood, 4½ dollars a cord, 8 ft. by 4 ft. by 4 ft.; boots and shoes about the same price as in England, but all other wearing apparel 20 per cent. dearer.

Like the rates of wages, the prices of provisions vary. Those stated are the prices at Ottawa, which is considered a dear place. There is also a difference in the price of fuel. Coal, at Quebec 3½ dollars a ton, is 7 dollars a ton in Toronto; and hard wood, which is 7 dollars a cord at Montreal and Kingston, can be purchased in other places from 2 dollars to 3 dollars a cord. Although those industries I have noticed employ a large number of persons, still the lumber trade, which I before described, and agriculture are the very foundations of Canadian prosperity, and those who desire to share in it must settle on the land. It is true, the artisan here has less competition in the labour market during the busy

season, and has a better chance to become an employer himself, or to acquire a little property, because much capital is not so much needed here; and land, which is often purchased cheap, increases in value with the development of the country. Still, at home employment at trades is more continuous, and the climate is more genial,—circumstances which make the position of those who have to work for weekly wages as good in England, as I have found that of the same class in any place I have been upon this Continent. No doubt many an artisan emigrant who could not find an employment in England has found one here, and has thereby bettered his condition; but a large country like this, thinly peopled, with comparatively few large towns and cities, cannot be expected to afford employment for a large emigration of that class. Yet it is surprising how completely the 20,000 emigrants who came out here the last year were absorbed in the population, and with what readiness they have adapted themselves to a mode of life so different from what many of them were accustomed to in the towns and cities of England; and wherever I have met them, with few exceptions, they appear to be doing well, and highly pleased that they emigrated. No doubt many will find it hard to rub through the first winter, but people live on credit a good deal here; and although a man may get involved in debt a little, he very soon recovers himself when the season opens. There are poor people here as there are in every country, but not that squalid, hopeless poverty which is to be found in many portions of the towns and cities of Europe. The artisans who, with some degree of certainty might calculate upon doing well in Canada are those accustomed to country life at home, who, on arriving here, would locate themselves in some rising village or town, where, if industrious, they would be sure to rise with its growth by working at their trades until an opportunity offered to settle on land and acquire a little property, as numbers have done here. But the class who would profit, beyond all doubt, by emigrating to Canada are the agricultural labourers in England and Ireland, who now work for a mere pittance, barely sufficient to keep body and soul together. Surely a dollar (4s. 2d.) a day here, where food for a man and his family is cheaper, must be better than half the amount in England or Ireland, and here, with industry and perseverance, he can become the owner of land himself; and it will be some encouragement to find, when he arrives here, that nearly all the land of Canada is owned by men who were poor when they landed, and had nothing but stout hearts and willing hands to begin life in the bush, and who are always ready to lend a helping hand to a new comer. This is the class of emigrants which Canada at present most requires to clear her lands, and develop her vast resources, the bases of her future greatness. For now that our Government has the wisdom to let them stand in a great measure on their own bottom, and manage their own affairs, I believe in a grand future for this dominion, while her hardy and industrious population, composed of different races, are united and self-reliant, and her just and liberal laws are fairly and honestly administered: where there is plenty of room for all, with civil and religious liberty guaranteed, and education within the reach of every one, the progress must be sure and certain. And if any words of mine shall have influenced energetically toiling, and living from hand to mouth in the old countries, to seek new homes, and better their condition, one of the objects for which I have travelled many thousand miles on this continent will be accomplished.

I would like to add, that the accuracy of the statements I have made may be relied on. Knowing full well that the *Builder* is read by every description of workers in England, and I might say, wherever the English language is spoken (for I found it in every reading-room and library of any consequence in the United States and Canada), I have endeavoured to furnish information which would be generally useful to them. THOS. CONNOLLY, Stonemason.
Ottawa.

Proposed Powder Magazine.—The Government has decided on the erection of a large central powder magazine on the uninhabited marsh-land between Chatham and Sheerness, adjoining the Medway, at an estimated outlay of 90,000.

ART-WORKMANSHIP PRIZES.

SOCIETY OF ARTS.

THE following is the report of the judges invited by the Council to award the prizes:—

It will be remembered that the proposals last issued by the Council of the Society of Arts took a shape different from those previously adopted by them in offering prizes for art-workmanship. Desiring that the art-workmen of this country should stand well, and be individually recognised in the coming International Exhibition, the Council announced their willingness to give rewards "for special excellence on the part of all concurring in the production of works of industry of the highest character," offering to manufacturers and designers under whose direction and through whose means these works were produced the highest distinctions the Council were able to confer, and to the various workmen concerned proportionate money premiums. They required, of course, that with the works submitted the names of those who had been engaged in their production should be sent. In addition to inducements for such combined operations, premiums were offered for meritorious works executed single-handed.

In reply to these proposals, 82 articles have been forwarded to the Society's House, including about a dozen produced by a single metropolitan firm.

It might have been expected that a larger number of manufacturers would have taken advantage of the liberal offers made by the Society than is the case. One reason may be found in the unwillingness felt by some manufacturers to make known or give prominence to the men working for them—an unwillingness which would probably not exist if mutual trust and confidence were as complete as is wished for by all who desire the general welfare and advancement. The man who designs a beautiful form, forges well a scroll of iron, puts up a sound, honest piece of work, may find reward and incentive to further efforts in his own mind. The wish of the Society, has always been to give to such men the further inducements of public credit and personal reward; and we believe the wish a wise one, and that the furtherance of it will be for the advantage of all.

We append below a complete list of the awards it has been thought right to make, after an examination of every article *submitted*, and we confine ourselves in such further observations as we offer to works that seem more particularly to call for or justify them. One strong impression that is left on us after examination is the want of knowledge of the living figure that is manifested. It will scarcely be thought that we are leaving our province if we express a hope that English art-workmen may be led to see the necessity for study in this direction. The younger men, at any rate, amongst them might avail themselves more largely than they do of the Government Schools of Art, at this time very generally accessible throughout the country. Opportunities for study, at small cost, are now not wanting in this country, and the inducements for perseverance are not few.

The principal specimen submitted on the present occasion, the inlaid "loo-table," by Mr. Thomas Jacob, may be viewed as the result, to some extent, of the right use of such existing facilities: Mr. Jacob, the designer and producer, having studied in one of the schools of art. In respect of both design and execution this is an excellent work, and we have awarded to the producer the Society's silver medal and 25*l*. The marqueterie-cutter, Cornelius Riech, has executed his part of the table with great precision and feeling. To him and others engaged we have given premiums. We further award to Mr. Jacob the North London Exhibition prize, offered "for the best specimen of skilful workmanship at the Society's exhibition."

We have given the Society's silver medal and 10*l*. to Mr. J. Daymond, for his friezes. These are elegant in design and skilful in execution. Under the same heading—"Modelling in Plaster"—Mr. J. W. Gould's "Figure of a Child" calls for good reward, both for its real merit and as an exception to our statement above, and we give him also the Society's silver medal, and 10*l*. Naturalness and fidelity to nature, which distinguish this model, though not the only qualities nor the highest required in sculpture, must always be regarded as important in judging the productions of an imitative art.

Under the head of "Metal Work," we find a thoroughly good production in the shape of a wrought-iron gate, executed by Mr. T. Winstanley,

from the design of Mr. F. Porter, to both of whom we award the silver medal. To the two apprentices who helped in the execution we give money prizes. This gate affords excellent evidence of the great improvement in the working of iron that has been brought about in England. Some smaller productions,—the hammered bracket, by Mr. W. Morris (the halving god and the curves elegant), and a bracket by Mr. W. Robson, speak to the same effect, and entitle their producers to premiums.

A gas-standard in brass, and an inkstand in the same metal, both designed and executed by Mr. Joseph Taylor, show considerable skill. The damascened steel-bladed trowel, regarded as a piece of workmanship (the design being more quaint than beautiful), is highly creditable to Mr. T. R. Rice. The art of damascening, valuable as it is for the appropriate ornamentation of metals, is much less practised in this country than it should be. We have awarded Mr. Rice a premium of 5*l*.

The portrait in *repoussé*, from a carving by Jean Goujon, is very creditable to Mr. Robert Tow. The "Head of a Satyr," *repoussé* in copper, is skillfully blocked by Mr. Theuerkauff; the chasing being executed by Mr. G. Deere.

From amongst the carvings in wood, we select for award the clever representation, in lime-wood, of a "Dead Bird," by Mr. R. J. Tudsbury; the oak panel, by Mr. J. Osmond, and the mirror-frame, in oak and ebony, by Mr. W. H. Holmes; the forms in the latter are ingeniously flattened and made appropriate. Cameo-cutting is represented by two examples from Mr. Ronca, who also sends a carving in ivory. The neglect of these arts amongst us is the more surprising and regrettable as they offer a field for artistic industry to female as well as male art-workers.

The progress in artistic glass-blowing, which we are slowly making, is shown by some good specimens exhibited by Mr. T. O. Barnes and Mr. Elijah Barnes, to the former of whom we have found reasons for awarding the larger premium.

Looking to the group of articles submitted by the firm alluded to, Messrs. Cox & Son, we mention that it includes a number of specimens of silversmiths' work, in the shape of church plate, a polished brass eagle lectern (worked by J. Skelley), a large wrought-iron gas standard (well forged by W. Prendergast), a font-cover of oak and brass, and a panel for a reredos, in hand-painted encaustic tiles. To the manufacturers we have awarded the Society's silver medal, accompanied with strong commendation of the well-directed and intelligent spirit of enterprise that has led to the mounting of a large establishment for the production of works of an artistic character. We have awarded a silver medal severally to Mr. John Keith, under whose superintendence certain pieces of the silver-work examined by us were produced; and to Mr. B. J. Talbot, as designer of the chief works exhibited. We have further given money premiums to the two principal silversmiths employed.

In conclusion: for the works that we have specially rewarded, the Council may fairly seek to obtain the distinction of being included in the coming International Exhibition at South Kensington; they will assist in showing that skill in the application of the arts to objects of utility is making progress amongst us. Designers and workmen, it may be anticipated, will at this great gathering be able to measure their advances and their shortcomings against the works of other countries, and in either case will find incentive to further efforts. In such contests there are no losses; even the vanquished are gainers.

H. A. BOWLER.

GEORGE GODWIN.

RICHARD RICHARD.

M. DUDMAN.

The following is a list of articles to which prizes have been awarded:—

Carving in Wood.

3. Oak panel; design adapted from an old panel; by J. Osmond, 6, Featherstone-street, Bunhill-row, E.C. Prize 1*l*. Price of 2*l*.
5. Mirror-frame, carved in oak and ebony; by W. H. Holmes, 107, Dean-street, Soho, W. The mirror by W. Evans. Price 7*l*. 10*s*. Price of 3*l*. to W. H. Holmes.
10. Carving from nature, lime-wood; by R. J. Tudsbury, Ladbroke, Notts. Price of 10*l*.

Engraving in Wood.

12. Ambrosia inlaid box-wood, the lower part enclosed by four marqueterie panels (fixed); designed and executed by Thomas Jackson, 4, Upper Church-street, Finsbury-square, W. [The Society's Silver Medal and prize of 2*l*.; also the North London Exhibition Prize.] Assisted

by Cornelius Rich (marqueterie cutter) [Prize of 12*l*.], Charles Helfer (engraver), [Prize of 5*l*.]; George Brown (turner) [Prize of 1*l*.]; Joseph Platt (carver) [Prize of 1*l*.]; and George Jappin (polisher) [Prize of 1*l*.]. Price 10*l* guineas.

14. Cabinet in mahogany and ebony woods, with metal gilt mouldings (panels painted on ivory); exhibited by W. Bertram & Son, 109, Dean-street, Soho, W.; designed by W. M. Holmes; carving by W. M. Holmes and W. Maskell; cabinet work by C. Peterson and J. Hickman. Price of 5*l*. each to W. M. Holmes and W. Maskell.

Engraving in Metal.

15. Table-top; by J. Taylor, 8, Mead's-row, Westminster Bridge-road, Lambeth, S.E. Price 16*l*. Prize of 3*l*. for this and No. 16, Group of flowers.

Carving in Stone.

18. Group of flowers; by James Goudge, 117, Paget-street, Westminster, S.W. Prize of 2*l*. for this and No. 19, Bird and foliage.

Modelling in Plaster.

20. Figure of a Child; by J. W. Gould, 85, Castle-road, Kenilworth, N.W. The Society's Silver Medal and a Prize of 10*l*.

22. Portion of a frieze for a drawing-room, Thoresby Hall; designed and modelled by J. Daymond, jun. (under Mr. A. Salvin, architect), 4, Edward-street, Vincent-square, S.W. The Society's Silver Medal and a Prize of 10*l*. for this and Nos. 23 and 24, alternate centres for frieze of dining-room.

25. Bracket, &c.; executed by A. Aspinwall, Leam-ros, Braintree-moor, Braintree, Yorks.

Metal Work.

Messrs. Cox & Son, Mr. John Keith, and Mr. B. J. Talbot have each been awarded the Society's Silver Medal. A Prize of 5*l*. is awarded to H. Tichell, in respect of Sets Nos. 2 and 4 (of works exhibited by them), and a Prize of 3*l*. to J. Keith, jun., in respect of Set No. 3.

33. Watch case and dial in silver; by P. J. Bowman, 2, Rhedol-terrace, St. Peter's, Kingston, N. Price 5*l*. Prize of 1*l*.

41. Card-tray; designed by W. U., chased by P. A. Price 2*l*. 2*s*. Prize of 1*l*. each to designer and chaser.

43. Damascened steel-bladed trowel; designed by Robert G. R., executed (with the exception of the handle) by T. R. Rice, Messrs. Hart, Son, & Co., Wyndham-street, Price of 5*l*. to T. R. Rice.

50. One of a pair of wrought-iron gates; executed for the Union Bank of London, by Messrs. G. Winstanley and F. Lancaster, apprentices; designed by Mr. Porter, architect. Messrs. Porter and T. Winstanley have each been awarded the Society's Silver Medal.

52. Hammered bracket in iron; designed and produced by W. Morris, 14, Goding-street, Vauxhall, S.E. Price 5*l*. Prize of 2*l*.

53. Gas Standard in brass; designed and executed by William Robson, 11, Parkside-street, Battersea-road, S.W. Price 3*l*. Prize of 2*l*.

54. Gas Standard in brass; designed and executed by Joseph Taylor, 12, Wynford-street, Islington, N. Price 12*l*. Prize of 5*l*. for this and No. 55. Inkstand in brass.

56. Portrait in repoussé, from a carving by Jean Goujon, by Robert Tow, 36, Alderham-street, St. Pauls-ward, N.W. Price of 7*l*. 10*s*.

57. Head of Satyr, repoussé in copper; blocked by W. Theuerkauff, and chased by G. Deere, 111, Hercules-street, Pentonville, N. Price of 1*l*. to W. Theuerkauff, and 3*l*. to G. Deere.

59. Tobacco-jar and cover (Elizabethan period); designed and executed by F. B. 31, Cantelow-road, Camden-square, N.W. Price of 1*l*.

Copper Cutting.

63. "Psyche," designed and cut by J. Ronca, 49, Blantyre-street, Chelsea, S.W. Price of 2*l*. for this and Nos. 64 and 65, "Clytie."

Carving in Ivory.

65. "The Rainbow;" by J. Ronca.

Glass Blowing.

69. Two plain Toilettes; by Elijah Barnes, 13, Hingston-street, Birmingham. Price of 5*l*. for this and Nos. 70-72; one with twisted stand; and champagne glass, with fligree.

73. Two toilettes, with fligree; by T. O. Barnes, 135, Camden-street, Birmingham. Price of 7*l*. 10*s*. for this and Nos. 74, 75, a Flower-glass in green and splashed with gold, and Lovings-cup.

The following from those exhibited by Messrs. Cox & Son:—

76. Polished brass eagle lectern (jewelled); designed by B. J. Talbot; brass worker, J. Skelley; chaser and modeller, A. Barrett; engraver, James Keith. Price 120 guineas. Prize of 3*l*. to J. Skelley, for this and other specimens.

78. Wrought-iron gas standard, relieved with brass and jewelled; designed by B. J. Talbot; forger, W. Prendergast; fitters, E. Emms (lower half of standard), and J. Morgan (upper half of standard, including pumping leaves). Price 36 guineas. Prize of 3*l*. to W. Prendergast.

79. Board with specimens of chasing and modelling; two dragon heads, figure of "Hamlet," A. Barrett; three studies from natural foliage, G. B. Tapley; two classic dishes, E. Richards; hinge for side and front of sideboard, E. Emms. Price of 1*l*. to G. B. Tapley, and of 2*l*. to E. Richards.

81. Oak lat cover with wrought-iron rais mountings and chain; designed by B. J. Talbot; joiner, E. Hooper; wood-carver, T. Butcher; brass-workers, J. Skelley and W. Maradan; beaten cross chased by A. Barrett; engravers, W. Lucas (two upper bands and leaves), J. Letor (lower band and leaves). Price 10 guineas. Price of 2*l*. to W. Maradan.

82. Altar-table, with frontal, the panels of reredos in hand-painted encaustic tiles, subject, "The Last Supper," designed by B. J. Talbot; carver of subject, M. Caspary; the painter, W. W. Robinson; joiner, W. Layfield; wood-carver, W. E. Matthews; embroidery, Fanny Thurling and Susannah Grace. Price of 2*l*. 10*s*. to M. Caspary, 2*l*. to W. W. Robinson, and 1*l*. 10*s* each to Fanny Thurling and Susannah Grace.

Surveyorship, Bridewell and Bethlehem Hospitals.—Mr. Frederick Marrable has been appointed to this office.

ILMINSTER AND ITS ILLS.

At the risk of offending some rather irritable folk, who are displeased at being told unpalatable truths, we have a word or two to say of another place in Somersetshire. We have no particular bias to criticise one town more than another, or exhibit its shortcomings. If county and local chronicles would deal less in small talk, and devote more of their space to advocating local improvements and sanitary reforms, a year or two would make a wonderful change in the condition of many of our country towns.

If it were for nothing more than to view the fine old church of Ilminster, the town would be worth a visit. The streets are not many; what there are, are irregular; and the architecture of the place calls, indeed, for no commendation.

Since the opening of the district by railway, through Ilminster to Chard, a little more life has been infused into the town than of erst; and the commercial traveller is now to be seen here more often, where the philosophic and pedestrian pedlar a few years ago had all to himself.

The Highway Board keep the roads without the town fairly in repair, but we cannot say the same on behalf of the authorities within the town.

The streets and lanes and low places of the town are not half looked over; they are rather in the position of being overlooked. The duty of keeping the streets and lanes of the town in repair, and attending to its drainage and sewerage supply, devolves upon a vestry board; but some of these gentlemen are greater adepts at vandal work than vestry work, as we will hereafter show. With the exception of the main street, and its continuation, or near and about where the central thoroughfares intersect little order or regularity, or tidiness can be observed. Bad roadway, footway, and worse drainage, is the character, without any qualification, we must accord. As we like to be explicit in what we state, and as we write upon the spot, we shall instance Ditton-street, one of the lower situated portions of the town. This has been one of the worst cared for places for a long period in respect to its drainage. The drainage of the town generally is bad, but its inclined position helps to do for Ilminster what its vestry will not do.

The lower parts of the town suffer, however, from a sewage-impregnated subsoil. Surface drainage is one thing, and imbedded sewage another matter. Let the authorities note this. We must also tell them candidly and civilly, that their neglect or ignorance in poisoning the health of the town. Perhaps this mention will not startle them; for men who have the hardihood to declare that fever was always in Ditton-street, and is likely to be there (caused by their own neglect), will console themselves with the lazy and criminal exclamation, "It is better to leave what is well enough alone." Without polluting the River Ille, on which the town is situated, or its tributaries, we could suggest a plan whereby the town could be put on a better sanitary footing at a small outlay; but we doubt not that the vestry board can secure proper professional services in the county of Somerset, and we would advise them in that direction.

At the head of the town, beyond North-street, there is a street called Strawberry-hill. This is a wild-looking locality, and it requires an overhanging front and rear. Strawberry-hill and Behind Butts are certainly behind, and behind-hand in many ways. The old mail-coach road, which led into the town on the north, not being now much used except by the farmers, on the line of its course has gone back into a ruinous condition. Both the highway board and the vestry have placed it in their Index Expurgatorius. The townsfolk use it for a ramble into the country when the summer woos them abroad, and the farmers, who both in winter and summer work it by their traffic into a road of rats, in their charity throw upon it an odd barrowful of field stones, and any number of cartloads of cabbage-stalks, weeds, oyster-shells, and other similarly solid macadamised dressings. This road, on which many of our old judges went the Western Circuit with briefless baristers in their train, is now a broken-down highway in the valley of the shadow of death.

The ancient church of Ilminster is externally a very fine specimen of late Gothic. It has a beautiful central tower, with crocketed pinnacles and panellings, exhibiting good design and workmanship without. There are a nave, transept, north and south aisles, chancel, porch north and south. The nave is modern, a rebuilding of

* This prize consists of 4*l*. 10*s*, the interest of 167*l*. 7*s*. 3*d*. Consols invested in the name of the Society of Arts, to be awarded by the Council "for the best specimen of skilful workmanship" at the Society's Exhibition of Art-Workmanship.

about half a century since. It might have been worse, considering the little taste at that period for Gothic. The tower, transept, and porch were built in the reign of Henry VII. by Sir William Wadham. Within the church, in the north transept, there are some monumental brasses in good preservation, to members of the Wadham family, dated 1410. Near at hand, in the same transept, are other brasses to the memory of Nicholas and Dorothy Wadham, the founders of Wadham College, Oxford, 1609—1618. A variegated marble tomb is also to be seen in the angle, with effigies of the knight and his lady. The knight is in armour, and both are represented as standing under a canopy. This latter monument belongs also to a member of the Wadham family.

The "Curfew" is still heard at Ilminster at eight o'clock each evening. There are not many towns now in Great Britain where—

"The curfew tolls the knell of parting day."

Whether it be a reminder of conquest or not, it is pleasing still to hear the chiming of the curfew on the still summer eve, linking the present with the memories of the olden time. Scattered about through the graveyard are some old and interesting monuments of old date, a few from age not wholly decipherable. On the occasion of our first visit we found a mural mason hard at work smashing some of the flat headstones, for no more blessed purpose than repairing the flagging without the doors and walls of the church. We have known before now of headstones being laid flat in front of church doors, or within the church walls; but we fail to recollect an instance where tombstones have been lifted from the graveyard indiscriminately, and smashed and chiselled for the repair of pathways, as if they had only been lifted from the quarry.

Ilminster, if not very wealthy within, taken in connexion with its environs, may be said to be of an influential character. One of the oldest institutions of the town is the Free Grammar School, dating from the reign of Edward VI.

The endowment will undergo a change by the working of the new Education Act, and so will many others similar to it, whose histories are older, and who owe their formation to the glorious beneficences of our ancestors. Inside the town, in the matter of manufacture, there is a collar factory that gives employment to a good many females, and without the town there is a very large and extensive carpet-twine manufactory, which gives employment to some hundreds of hands, men and women.

The machinery and steam appliances here are novel, and are of the latest introduction for the purpose. Several cottages for workmen have been built during the last year in the vicinity of the mills for the convenience of the workmen, and are now occupied. Ilminster enjoys the use and benefit of a park, which, though not a public one, is free to the inhabitants through the kindness of a resident gentleman, Mr. Lee.

Ilminster requires to be "knocked back" into shape: it has to all appearance been for many years much in the position of a very old, battered hat, woefully "knocked out" of shape. The town has seemingly done its best to struggle up the hill on which its primal portion was built, but each effort has been a failure. The houses and streets are straggling, running zigzag across an inclined plane. We hope its authorities will not take it amiss of us for pointing out its wants. The year will soon advance into the spring, and if they would wipe out some of their misdeeds by good actions let them look at once to the drainage of the town, both along the line of the main thoroughfares and in the lower quarters. The streets and pathways are in anything but a good condition, and there are not a few of the houses of the poor, which, call them by whatever name we will, do not smell very sweet.

ON THE ORIGIN OF THE BYZANTINE AND MOORISH STYLES.*

BEFORE proceeding to make any allusion to the remains of Greek architecture in the eastern portion of the Mediterranean, I would direct attention to the earlier political and social condition of these countries, which will lead us to expect that the arts of that wonderful Hellenic race will be found to have left there indelible traces of their energy and skill. One of the

marvels of history is the fact of the wonderful spread and diffusion of the Greek language itself. Confined at first to the narrow limits of Attica and its immediate proximity, it occupies in turn the opposite coast of Asia Minor and the Ionian Islands; takes possession of Macedonia and Thrace, occupies Asia Minor itself, Syria, and Palestine, the northern parts of Egypt; wherever, in fact, the people aspired to culture and intellectual refinement, there the influence of Hellenic genius became paramount; and considering as well how keen and energetic they were in commercial pursuits, their presence and political weight were, no doubt, as widely spread as their letters and civilisation. It has, I think, been justly remarked by a recent historian that the Greek and Jewish portions of the cities of Judaea leading to constant ruptures and animosities between those antagonistic elements of the populations so irritated the Roman governors that they in some degree led to those severe measures of repression that in the end brought about those terrible calamities, culminating in the destruction of the Jewish polity.

I need not name the Greek city and colony of Alexandria, in its day the great seat of Hellenic learning, art, and science, where Greek manners and Greek vices flourished in tropical luxuriance; neither need I allude to the almost superstitious reverence with which the Romans regarded Greek eloquence, literature, and art. Every Roman who pretended to aspire to excellence in any intellectual department travelled to Athens to drink inspiration at the fountain-head, and took for his models those Greeks who had distinguished themselves as masters in their several departments. I mention these things to remind you that the Greeks were the intellectual pioneers of the old world, and to draw the inference that, as we know that they were all this in the region of science and literature, they could have been no less in the department of art and architecture. As an instance of what I must consider an example of Greek art in the East, I would refer to the ruins of Palmyra; and I would remark, in passing, the prevalence of the Greek names of sites and cities all over the East, even to the present day.

This city, Palmyra, built on a fertile spot upon the route of the caravans, through the great Syrian desert, between the Euphrates and Damascus, had existed at least since the days of Solomon (who most probably enlarged it). It at first bore the name of Tadmor, the Hebrew for City of Palms. Little or nothing is known of its early history, until it appears in the time of the last civil war (under the Greek name of Palmyra, the City of Palms, when Mark Antony attacked and occupied it for a short time, in one of his raids upon the Parthians.

And I would refer to the photographs of the marvellous ruins at Heliopolis (which I have placed on the table), as giving some idea of the fertility and power, both of design and execution, which must have possessed the men who reared those structures. That they were of the Hellenic race, and belonged to that intellectual commonwealth which had Athens for its centre, I think the ease and felicity in style of the remains abundantly testify; and the hints we have in history of the last days of Palmyra lead to the same conclusion; and as it goes towards giving us a notion of the power of the living presence of the Greek in a remote Eastern city, I may be allowed to help my argument by alluding to this closing period of its history.

In the time of Hadrian the city had become the capital of a powerful principality, exercising supremacy over the wandering tribes of the desert, and, taking advantage of the distractions at Rome, extended her dominion throughout Syria and the neighbouring regions as far as Egypt, on the one hand, and Galatia on the other.

The name of the ruler at this time was Odenathus, called Prince of the Saracens. The population of the capital was part Syrian, part Arab, with the interlacing Greek element, brought there most likely by the strong mercantile instinct of the Greek, or by the demands of the wealthy Palmyrans for the products of his genius or his intellect. On the death of Odenathus, his wife, the celebrated Zenobia, seized the reins of government, and ruled with a vigour and military skill that received the recognition of the Imperial government. But, conceiving the ambitious project of establishing an independent empire of the East, she proclaimed herself independent of Aurelian, and advanced to meet the Emperor, with his victorious legions, in Syria. The event proved fatal to Zenobia

and Palmyra, which, after an obstinate resistance, was reduced to ruins. It never lifted up its head again, and though Aurelian made an attempt to restore its temple, it gradually dwindled into a miserable Arab town, forgot its proud title of Heliopolis, and is now again known to its wretched inhabitants by its pristine name of Tadmor.

But what makes its interest to us from our present point of view is, that the catastrophe which ended in the ruin of the city, was brought about by the influence of a resident Greek. The Princess Zenobia was an ardent admirer of Greek letters and Greek philosophy, and was in the habit of consulting, in matters political and literary, Longinus, a Greek, born at Athens, a celebrated rhetorician and Platonist philosopher, who had earned the name of the living library and walking museum, some of whose treatises have been preserved. This Greek philosopher, at any rate, got the blame of the political errors of Zenobia, and suffered accordingly at the hands of the Romans.

Thus we find the Greek looked upon as the leader of thought in this remote city of the desert.

One other example of work which I must look upon as Greek are the remains of the still more obscure city of Petra, situated on the caravan route between Egypt and the East, surrounded by Arab tribes,—in the time of Claudius the stronghold of the powerful chief Aretas,—which maintained its independence till annexed by Trajan. The character of the ruins can only be accounted for by supposing a resident Greek element among those which formed the population of the city. If such was the case in regard to those outlying colonies whose ruins time has spared, how much stronger must the force of Hellenic influence have been in the cities of the coast, and places more immediately within the range of civilisation, whose remains time has obliterated.

Having endeavoured to show what a powerful influence, during what is called the Classic period, Greece (through the prevalence of her race) exercised on the language and manners of the nations of the East, and how, through the peculiar gift of art with which her sons were endowed, rose up those wonderful temples and edifices whose remains fill us with admiration, I would now pass on to what I must consider another phase of the versatile genius of the Greek. We see a powerful transition of style as the Christian superseded the heathen phase of thought in the Eastern empire. What were the causes, and to the genius of what race may we most probably give the merit or blame of the Byzantine style? After the Roman empire became Eastern, the court became more and more like that of a Persian monarchy in its forms, tastes, and proclivities, and the lavish use of colour and ornament in its architectural efforts was natural to follow in its train. But by what natural sequence could such a church as St. Sophia, a type of the prevailing church architecture of the Eastern empire,—by what natural sequence can we account for the entire dissimilarity from the Classic, if built (as I think probable) by artists of the same race as those who built the Parthenon? What a complete change must have come over the whole texture and fibre of the national thought. Now one great cause must undoubtedly be sought in the conversion of the empire to Christianity. The change in the imperial policy from penalties against Christianity to penalties against Paganism, would naturally lead to make as wide a distinction as possible between the Christian church and the heathen temple, and the reiterated admonition of the Christian teacher,—Little children, keep yourselves from idols,—would render it expedient to follow up such teaching by avoiding all external associations of the old idolatry. Now I would merely suggest that, as the eye of the Christian convert naturally turned towards the Holy Land as the mother of his faith, and as we know how the mother of Constantine almost worshipped the soil of Judea, I think it not at all unlikely that the source that inspired the artists who first erected those Byzantine churches came from a Jewish source. Knowing the Eastern taste for colour and the gorgeous which possesses the Jew, I cannot but think that the Temple at Jerusalem, with its lattices and pinnacles, had a relationship—a sort of parentage—to the Byzantine. Tradition, or possibly some kindred structures as the Jewish temples in the neighbourhood of Alexandria, or the rival structure in Samaria, might have given the leading traits; but I think you will allow that the sudden

* By Mr. J. D. Marshall. From a paper read at the Edinburgh Architectural Association.

expression in religious edifices of Eastern taste on the soil of Greece, and in the very forms of classic influence, requires some such solution to account for its existence. Of the first period, of the Byzantine, from the time of Constantine to the middle of the sixth century, we have no very certain remains. The second period, of which we have many important examples, begins with the reign of Justinian, who built the church of St. Sophia, one of the twenty-five churches with which he adorned the capital. The names of the architects of St. Sophia have been preserved,—Anthemius, of Tralles, and Theodorus the Elder, of Miletus. These edifices gave the type to the vast number of ecclesiastical buildings which this pious emperor erected throughout the provinces, and may be said to give the leading features to Christian architecture in the East, until Christianity itself,—and vicious system into which it had sunk,—Christianity at all,—until Christianity itself was drowned out by the advancing tides of Islamism from the wilds of Arabia, on the one hand, and the hordes of Bulgarians and Selsak Turks and Tartars, on the east and north; and as these tribes of barbarians ere their final supremacy on the soil of the Eastern empire had been conquered to the faith of Mahomet, wherever a city was annexed by a Commander of the Faithful, the same process of conversion which was forced upon the consciences of the conquered would naturally be performed on their churches; the whitewash would cover up all Christian symbols, and obliterate all vestiges of the saints; the pious sentences of Christian hope or consolation would be replaced by texts from the Koran, and you have the first type of a Mahomedan mosque; nay, further, it would be something astonishing if hordes of wild men, who inhabited those deserts extending from the borders of Egypt and the Persian Gulf to mountains in Armenia, reputed for no special intellectual gift, if we except a certain native eloquence, should of a sudden seem to change their very nature, and exude in all the arts of civilised life. I should rather expect that the Hellenic and Jewish element that mingled itself with the overwhelming tide, imparted to it some of its own flavour and sweetness; that the chaff which that wind from the desert swept before it, left seeds to take root and fructify, which gave some of those intellectual qualities which dignified the reign of Islamism in its culminating period. The Greek or Jew in Alexandria, whether artist or philosopher, who slipped his faith and went in for Mahomet, would have all the zeal of a new convert to supply the new religion with art or with argument, so that I claim much of the beauty and originality in early Moorish art to Greek genius. I have assumed all along that there are certain qualities in race that are hereditary. I do not say that these qualities never die out—perhaps they do; they certainly deteriorate, and degenerate with the moral decay of a people. It has been remarked that art attains a certain fullness of thought and vigour with the political virtue and strength of a nation; then supervenes a period of luxury and laxity of morals, under which art develops in technical excellence, but deteriorates in manliness and thought; licentiousness following upon luxury; social troubles and convulsions follow, and art goes to the wall. This has frequently taken place in the history of nations, and we can only account for the long lease of life afforded to Hellenic art, by observing that the national existence of Hellenism was rather an intellectual than a material empire,—that it was not an empire at all, but a family life, ramified through the then civilised world. Her own existence, as a national polity, having Athens for its capital, was short and feverish; but the influence of her thought and art rose and fell with every state, large or small, that occupies the pages of history during the Classic period, and far into the Christian, so that its phase of existence is something *sui generis*, and exceptional. But I would remark, in conclusion, the converse of the statement with which I began. One of the marvels of history was the prevalence of the language of the Hellenic race over the East far into this our era. The other marvel is what has become of it? A corrupt form of it still lingers about the place of its birth, among a people whom I do not believe to be Hellenic Greeks at all. But it shows how completely the soil of the Eastern empire was ploughed up and turned over by the share of famine, war, and pestilence, by

every phase of suffering, when in all these lands there is not found a whisper of that language which those who once spoke it considered worthy to be the language of the gods.

SLATE CISTERNES.

SIR,—I have used slate cisternes over w.o. many years, and the simplest way I found to obviate the annoyance of condensation is to form a ceiling of match-boarding put upon fillets of wood or screwed temporarily, so as to be easily removed if required at any time. W. I.

PILASTERS FOR A COMMERCIAL WAREHOUSE, BELFAST.

WE give illustrations in our present issue of the upper portion of some carved stone pilasters, from Ireland, which, as the design of a young Irish artist, indicate the progress of art in that part of the United Kingdom. The pilasters have been executed in alto-relievo, in Danganon stone of good quality, for the principal front of a large commercial warehouse in Belfast (Mr. William Hastings, architect), lately built by Messrs. Fitzpatrick, Brothers, for Mr. Samuel McCausland.

The pilasters, as represented in our engraving, form the external elevation of five piers supporting the front of the warehouse, and are intended to represent the five divisions of the globe,—Asia, Africa, Europe, Oceania, and America,—with the botanical and commercial productions of each continent. In the first pilaster a head of a Chinese girl draped in silk, and ornamented with peacock's feathers, represents Asia, the remainder of the pier containing palms, pomegranates, rice, tea plant, &c. An Ethiopian, decorated with a lily, represents Africa; the productions of that continent including bananas, gourds, and date palms. A chain, terminating in a broken link, intertwines through the fruit and foliage of this country, forming a suggestive feature in its history. The centre pilaster, Europe, consists of a male head, decorated with conventional ornament denoting the superiority of art in this continent; the remainder of the pilaster contains vines, pineapples, melons, figs, flax, grain, and fruit and foliage of the climate. Oceania is represented by the head of a South Sea warrior; the centre of the pier consisting of cocoa-nut palms, bread-fruit, yams, and other botanical productions peculiar to Polynesia. An Indian, with tomahawk and arrows, represents America; the commercial productions including tobacco, cotton, Indian corn, with other vegetable productions from South America.

Mr. Michael Fitzpatrick, the designer of the pilasters, is junior partner of the firm by whom the work has been done.

In connexion with this subject, we have to repeat, what we have frequently expressed in these pages, that stone-carving, as an important department of architecture, should not consist of empty forms, but should be made to convey some meaning. Without invading the domain of sculpture, there is a wide and extensive field for intellectual workers in the decoration of buildings.

THE NEW POST-OFFICE, MELBOURNE.

It is many years since the idea of a General Post-office, suited to the requirements of a colony so progressive as Victoria, was first conceived. It is, after all, simply a question of time whether other institutions of as much importance as the General Post should not be completed in accordance with the original views of promoters.

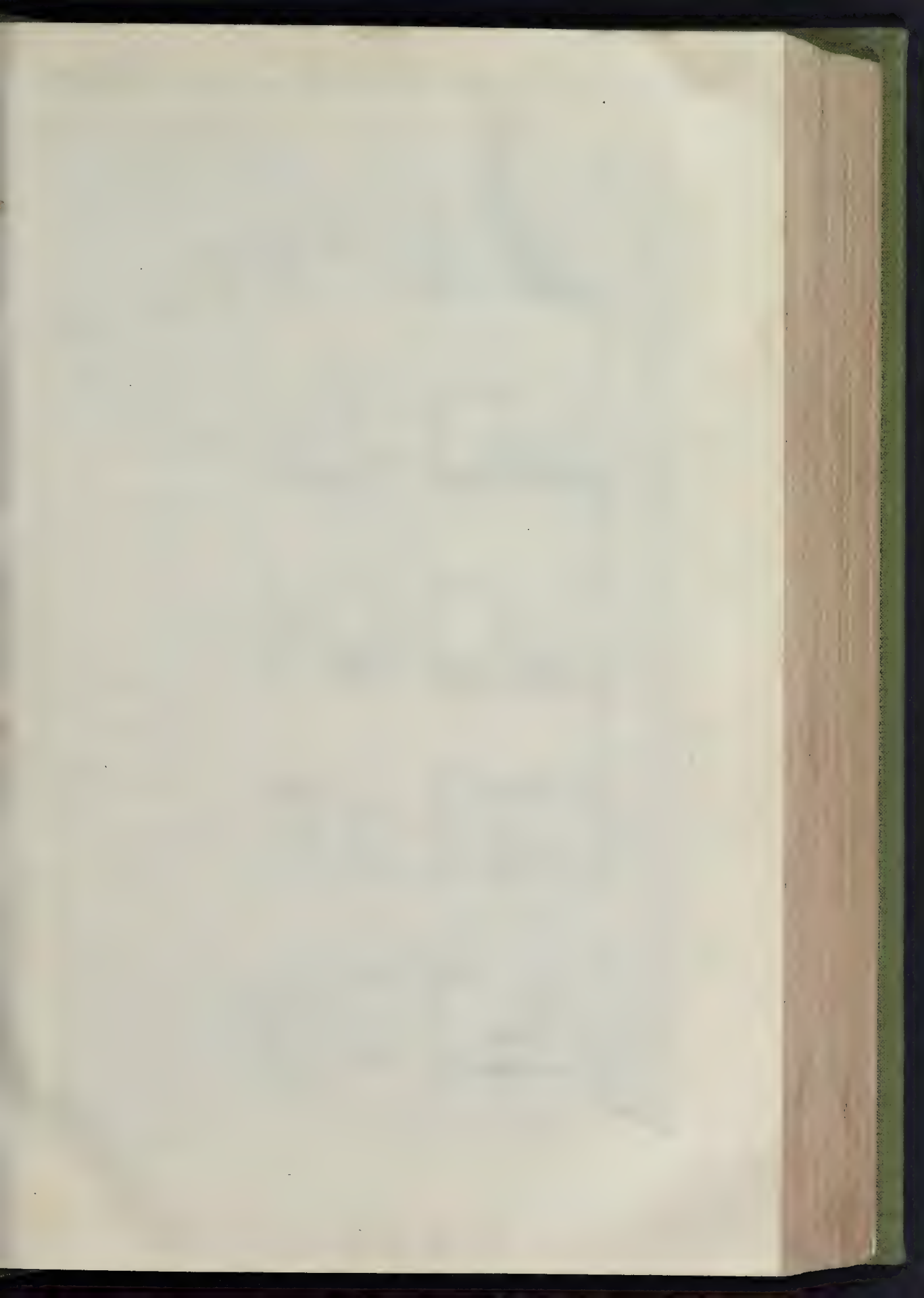
The architect of this building is Mr. Wardell; its frontage in Bourke-street is 130 ft., and that to Elizabeth-street 316 ft. The stone used in the front of the building is freestone from Tasmania quarries, the greater portion being from Point Ventenat, Taylor's Bay, and the remainder from Spring Bay. Both these quarries have been opened up and worked by Messrs. Glaister & Co., of Melbourne.

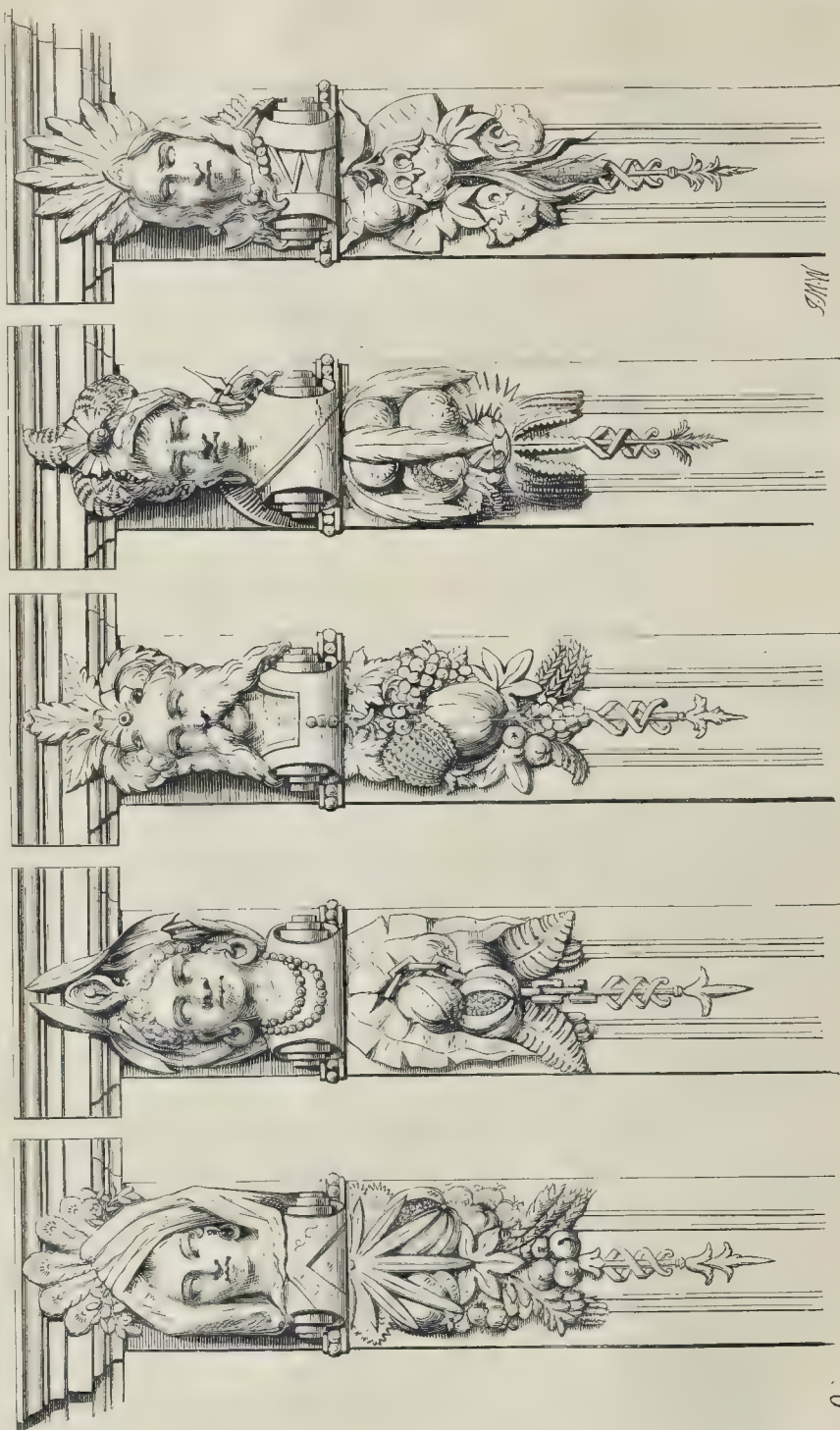
The principal entrance to the building is in Bourke-street, leading to an arcade by a flight of steps to the mail branch department, from which access is gained to the offices of the general secretary, the inspector of country post-offices, and the inspector of stamps. An arcade extends along the Bourke and Elizabeth street fronts of the building, affording general access to the receiving, delivery, and inquiry windows, regi-

stration, sale of stamps, and private letter-boxes. At the north end of Elizabeth-street the arcade affords access to a staircase on the first floor, where the money-order office and the dead-letter office are located, and forms the public approach to the accountant's department. On this floor are also the stationery store, clerks' offices, corridors, &c. The mail branch department occupies the whole of the ground floor, affording a clear space throughout, except where interrupted by the piers carrying the walls of the upper portion of the building. The lower story consists of arches and piers continued the whole length of the two street fronts.

On account of the inequality of street level a basement is formed, commencing at above 12 in. above the footpath in Little Bourke-street, and standing 4 ft. 6 in. above the footpath at the corner of Bourke and Elizabeth streets. The portions of basement exposed to view are of red granite, from Gabo Island, and finished with a rusticated capping, forming a sub-plinth to each pier, and filled in with moulded bluestone steps. These steps extend beyond the plinth, and form a continuous flight to the arcades. The arcades are 10 ft. wide in the clear, and are divided by piers and moulded cross ribs at each bay, and vaulted over with Roman brickwork, and the basement throughout is of chiselled bluestone ashlar. The middle compartment is divided into centre and wings, the centre being relieved by a screen of eight detached coupled columns of the Ionic order, terminating with balustrades above. The pedestals over the columns are to have statues or carved terminations. The walls to the centre portion of the ground space form a central area carried up to the full height of the building, and lighted from above, to be used as a sorting-room, around which are placed successively the stamp, registration, and inquiry windows, and the newspaper and letter delivery, as well as private letter windows; these are on the south side, facing Bourke and Elizabeth streets. On the eastern, or rear side of the building, is the mails receiving-room, entered from the right-of-way joining Bourke-street with Little Bourke-street. The inland and foreign despatch, with outside approach, is on the western side, and the letter-carriers' room is on the north side. By this arrangement supervision is obtained by the superintendent in the sorting-room over the whole of this department. Washing-rooms and W.C.s are provided on each floor. The basement, on the rear side of the building, is appropriated for storerooms, &c.

The architecture is of the Ionic and Doric orders, superimposed after the Italian manner. The angles of the building and the main central compartment to the long Elizabeth-street front break forward beyond the general face-line, and form in the complete design angle-towers to both street fronts. The main central compartment and angle-tower abutting on both streets is carried up another story with the Corinthian order. The angle-tower is surmounted by a turret of octagonal form, with clock-dials on four sides. The two remaining angle-towers are of less elevation, and are simply terminated with a balustrade and raised central compartment in Elizabeth-street is finished with a balustrade. The upper story consists of pilastered arched headed windows, with balconettes continuing the line of pedestal to the upper order, the impost to the windows being continued. Engaged coupled columns mark each bay, and the towers are relieved with pilasters and columns, with detached shafts on each face extending to the three orders, the cornices breaking round. The columns with detached shafts are fluted, and the windows to the central compartment and towers have fluted Ionic columns. In the wings to the central compartment arched heads are omitted, and the spaces above are filled with sunk panels and carved festoons. The angle-tower connecting the arcades to the two streets is domed in brick. The height of the lower order from the level of the basement is 21 ft. 6 in., and the upper order, including pedestal and parapet, 30 ft. 6 in. The height of the angle-tower abutting on Bourke and Elizabeth streets is 98 ft. above the footway. The central compartment is 92 ft. 6 in. to the top of the masonry. The remaining parts are 60 ft. high. The roofs are of wrought iron, and covered part with slate and part lead. On the third floor an attic room is provided for storage and extra office accommodation, as well as living-rooms for messengers. A space is set apart on the basement for heating the mail branch department with hot water.





CARVED STONE PILASTERS, BELFAST, IRELAND.



THE NEW POST-OFFICE, MELBOURNE.—MR. WARDELL, ARCHITECT.

ALEXANDRA PARK.

Mr. F. FULLER has published a second edition of his "Description of Alexandra Park Tontine and Art-Union," and in a new preface states what has been done towards developing his scheme. Mr. Fuller says that "the progress already made and the assurances of support received justify him in confidently expecting that his objects will be carried out with signal success." We shall be glad if it prove so, though we are bound to say we cannot persuade ourselves to believe in the probability of raising the very large sum of money talked of by means of a tontine and 20s. shares. It seems a thousand pities that the handsome building here, painted and decorated and ready as it is, should remain with its charming grounds unutilised, and we should be glad to be able to believe that the present scheme will be successful. We cannot avoid the feeling, however, that this is not likely, and that it must take some other shape. As a first step the owners will have to lessen their expectations.

WORKING MEN'S CLUB INSTITUTE.

A MEETING has been held, presided over by Lord Lyttelton, of the Social Working Men's Club, established for the purpose of forming all over the country working men's clubs and institutes, as well as of reviving old ones where desirable. What does it all mean? Is there not such an institute already existing, not always very well managed, as it has seemed to us, but still professing to do what the new institute is said to be established to bring about? The result probably will be that people will look shyly at both.

THE YEovil GUARDIANS AND THE "BUILDER."

THE fame and froth of the Yeovil Board of Guardians have utterly collapsed. At the last meeting of the Board the names of the two boys kept in the workhouse were given and some feeble excuses made. So the Board has had to eat its leek. One parting word with Yeovil for the season. What we wrote of the town and its local boards was written from careful examination upon the spot. It was written simply with a sincere desire to lead to improvement. The local press has come out but badly in the discussion.

COTTAGE HOSPITAL COMPETITION.

FOURTY-TWO designs were sent in for the cottage hospital proposed to be built at Shaftesbury, Dorsetshire, as a memorial of the late Marquis of Westminster, K.G. The premium has been awarded to the design bearing the motto "Perseverando," the author being Mr. J. B. Corby, St. Martin's, Stamford. At a committee meeting held last week it was ordered that the working drawings and specifications be at once prepared, and tenders obtained for the erection of the hospital.

THE RUINS OF BAALBEC.

SIR,—I am very glad to see that by quoting Mrs. Burton's recent letter you have called attention to the magnificent remains of the temples at Baalbec, and to the precarious condition of some of the most striking features in what is perhaps the most beautiful group of classic ruins in the world. As you invite comment from those who have visited them, I will, in a few words, point out what are, in my opinion, the most pressing dangers, and offer a few suggestions as to the readiest and most desirable mode of meeting them.

Those even who know Baalbec only by pictures will remember that, occupying the most conspicuous place on the great platform, six gigantic columns, surmounted by an entablature, tower high above all else, and stand boldly out in deep, golden contrast to the lilac, snow-streaked range of Lebanon. These six columns are all that remain of the fifty-four which composed the peristyle of the Great Temple. Three fell in 1759. The columns have a height of 75 ft. and a diameter of 7 ft. 3 in. It will appear hardly credible that at the present time the shafts stand on but half their diameter. The Arabs have cut away the other half to abstract the metal dowl which joined the shaft to the base. In a district affected often by earth-

quakes it may be imagined in what jeopardy these columns stand.

Now, with careful workmen and skilled superintendence, considerable additional security might be given to the structure. There are some good Greek masons in Damascus, but as to competent superintendence available I have no information. To act without a skilled architect would be to imperil the group. But I regard the underpinning of these columns as by far the most pressing work.

The great portal of what is called the "Small" Temple (it is bigger than the Parthenon) next calls for attention as described in Mrs. Burton's letter. This portal is 42 ft. high by 21 ft. wide, and has beautifully sculptured architraves. The dropped key of the lintel requires support, which might, I think, more readily be given by metal cramps, or by notching in stone dovetails, than by the granite shaft proposed by Mrs. Burton, which would obstruct the opening and deface the interesting sculpture on the soffit of the stone. To clear away the obstructive Arab wall, now built in between the ante, as well as the accumulated rubbish, which work seems to have been commenced by Captain Burton, is an admirable step. Except, here, however, I should discontinue demolition,—especially demolition paid for with the materials removed. This is a most dangerous course in such a case; and, with such people as the Arab population of the neighbourhood, not to be thought of: not a stone in the place would be safe.

In conclusion, I venture to recommend the subject of the present condition of Baalbec to the consideration of the Institute of Architects. Their committee might probably, without great trouble, gather together whatever information or suggestions are within reach, and found thereupon some simple recommendations. If these were forwarded to Captain Burton, I do not doubt that he would value them, and turn them to account as opportunity allowed.

For my own part I am delighted to find so energetic a man taking an interest in the subject, and I heartily wish him support and success.

J. D. CRACE.

SOMERSET COUNTY LUNATIC ASYLUM CHAPEL.

SIR,—Your correspondent has erred grossly, if not wilfully. The works referred to were executed under our direction in the usual way, and not "by us without the intervention of a building contractor." With the exception of a small portion done by the workmen upon the establishment, the whole of the work was performed by building contractors, tenders having been obtained by public competition. As to the cost, our approximate estimates were based upon the assumption that the walling stone and freestone would be delivered upon the site free of charge. The walling stone was obtained from a quarry upon the grounds of the asylum, but the labour to work it cost a considerable sum, whilst the freestone had also to be paid for, and these amounts were of course charged to the total cost of the building. It is not difficult, therefore, to show how the discrepancy occurred.

PARR & STRONG.

THE DRINKING-FOUNTAIN MOVEMENT.

Bury St. Edmunds.—The drinking-fountain presented to the town by the Marquis of Bristol has been opened. It occupies the open space on the east side of the Corn Exchange, having been erected under the superintendence of Mr. Darkin. The fountain stands on a pedestal of brickwork, and consists of three semicircular basins, carved out of a single large block of the kind of freestone known as Craig Leith, into which the water is spirited from an equal number of dolphins' heads, with erect tails and foliated sides framing three spaces, one of which bears inscribed the arms of the borough; another those of the donor, its High Steward; and the third the date, A.D. 1870. From this pedestal rises a tall circular column of Portland stone, enriched below with a band of arabesque carving in low relief, and surmounted by a cube and urn. On the south side of the cube is a sun-dial; on the west side, a diagram indicating the variation between solar and true time for every part of the year; and on the east side, a passage from Horace's Ode (IV. 7):—

"—monet annus et alumnus
Quæ rapit hora diem."

The north side is blank. The ground on which

the fountain stands falls considerably to the south, and an additional step will be made on that side, and the whole of the space round will be flagged with stone for a certain width, and the remainder paved with asphalt.

Canterbury.—The mayor has presented a drinking-fountain to the city. It has been erected at the bottom of George's-terrace; but complaint has already been made to the council that it will be a nuisance there. Dissatisfaction has also been expressed as to its appearance, although not finished. The surveyor says the site is suitable, and that the mayor suggested it himself. The subject has been discussed in the Council, but nothing has been done as to it, the mayor declining to give his casting vote on a motion to refer the matter to the General Purposes Committee of the Council.

MANCHESTER AND SALFORD BUILDING TRADES INSTITUTE.

At the last meeting of the members of this society, Mr. J. Margatroyd, architect, delivered a lecture on "The Main Principles of the Mechanics of Construction interesting to Building Operatives." The lecturer carefully avoided taking his hearers out of their depth, and brought his subject right home to them, so as to secure the attention not only of the advanced, but also of the elementary class. He aimed at the dissemination of those fundamental teachings which are so essentially requisite in building construction, in the application of the forces borrowed by man from nature. He showed how the builder, in the application of the lever and the inclined plane, appropriates her laws to his uses. The lecturer not only imparted technical instruction, but he drew their attention to such familiar appliances in their daily work, which could not fail to strengthen their faculties of observation, a means of gaining knowledge not sufficiently taken advantage of by craftsmen.

MANGEL CAKE AND SEWAGE UTILISATION.

I WROTE to you some months ago, explaining my patented process of making mangel cake out of raw mangel.

The French convert mangel into sugar for human consumption: my process does not go so far. I merely make it into a saccharine cake for fattening stock. Mr. Colman, the celebrated starch and mustard maker, made a most careful trial of it on his farm last year, and became so convinced of its great fattening power that he has started it this year as an article of manufacture; but as he had to buy his roots from the farmer, it is made this year necessarily on a limited scale. Next year, the Norwich sewerage being complete, it will be easy to get an unlimited supply of roots from that source. Sewaged land, we know by the most conclusive experiments, will grow 50 tons of mangel to the acre. This will make 6 tons of my food, worth 9s. per ton, or 54s. per acre. How can sewage be equally profitably employed, or so surely? Mangel cake, from its large per-centage of sugar, will keep for ever; linseed-cake soon deteriorates in value.

I send you a sample cake, which I should feel obliged if you would allow those of your readers interested in the great question of sewage culture to inspect.

HUGH SMITH.

. The sample cake may be seen at our office, 1, York-street, by any who are interested in the matter.

SCHOOLS OF ART.

The Nottingham School.—The annual meeting of the subscribers and donors to this school, has been held in the Mayor's Parlour, at the Exchange. The mayor presided, and there was a good attendance. The report of the committee was read.

Mr. Rawle, the head-master, then read his report, one or two points in which may be abstracted. "The number of students who attended the school during the past year was 503, showing an increase of ninety-four since the previous year. The general work of the school has been considerably in advance of any former year. The number of works sent up to London for inspection was 1,800, or exactly 50 per cent. more than the average proportion per student throughout the country. A much greater proportion of the works were in the advanced stages than in

the previous year. There were 292 works in the higher stages of instruction, and 1,508 in the elementary stages. Although fewer students were examined last year, the results in Government prizes were 50 per cent. better than they were in 1868. The Nottingham school has again taken the highest number of prizes among provincial schools, which makes the third consecutive year that Nottingham has headed the lists. Nottingham is now the only school in the kingdom which has gained gold medal awards for four consecutive years (South Kensington alone excepted). The last gold medal was obtained for a design for a lace curtain, which has since been manufactured by Messrs. Adams & Co. The school has obtained the highest award in the country for architectural design—a national silver medal.*

It was suggested that an architectural club should be formed in connexion with the Institution. Mr. Walker said he should be glad if the School of Art students started a club to read papers, and study jointly the various phases of architectural work, and he should be happy to give any assistance in his power to help Mr. Rawle to carry it out.

Lord Belper presented the prizes to the successful students at the School of Art. The ceremony took place in the Exchange Hall, which was crowded by a very respectable audience, including a large number of students.

The Dwington School.—The annual meeting and exhibition of this school have been held in the Mechanics' Hall. As on a former occasion, the exhibition was enriched by a large collection of water-colour drawings, photographs, etchings, and other works of art from the South Kensington Museum. Tea and refreshments were provided for the large and fashionable company which had assembled, and the interest of the occasion was added to by selections of instrumental music. The exhibition productions appeared equal to those of any former year in freehand, shading, water-colours, and mechanical drawing. According to the report, the total number of students who have been at any time under instruction during the past year has been 180, an increase of fifteen over the previous year. The average number in the school has been 106, which shows an increase of seven in the average attendance as compared with 1869. The increase is in the ladies' class and the general evening class. The number who presented themselves for examination in March last was 109, and out of these seventy-seven (or 70 per cent.) were successful. As compared with 1869, this shows an increase of thirteen competitors, and the percentage of those who passed was then only 58 per cent. Prizes were awarded for special proficiency to sixteen students, and four completed their full certificates in the four branches of the examination. The works which were executed by the students during the year were forwarded, as usual, to South Kensington for examination, and in the elementary section an award of 15s. each was made upon the works of nine students; of 20s. upon those of two; and prizes were awarded to five students in the advanced section. The sum of 211.15s. was also granted upon the works of the students not included in the nominal list, and a free studentship was awarded to Mr. John Dinsdale. The number of the awards in the elementary section was not so numerous as in 1869. According to the new regulations of the Science and Art Department, the examination will not be held this year until May, instead of March, as before. The alteration has been made so as to let the examination in science and art fall in the same month, it being now the general rule that both of these should be conducted by the same committee. The Mayor distributed the prizes.

The Macclesfield School.—A special meeting of the committee convened on the requisition of Mr. Ford, the master of the school, has been held, at which the mayor presided. The subject before the committee was the proposed adoption of the Public Libraries Act, as to the desirability of which there appeared to be but one opinion in the meeting. It was distinctly stated by the mayor that if the inhabitants would grant a rate of 3d. in the pound, the committee would pledge themselves to raise 2,000l. for the erection of a building; and Mr. Stevens, architect, after hearing Mr. Ford's explanations, said he was distinctly of opinion that 2,000l. would cover the cost of such a building as was actually requisite. A plain, substantial building, well lighted, and with sufficient space, was considered by the committee to be all that was required; but it was thought desirable, that before the

ratepayers' meeting was convened, further communication should be had with Mr. Cole, at South Kensington, with reference to the character of the building which the Department would approve for the purpose of a grant. Mr. Bullock and Mr. Wright, who were shortly about to visit London, undertook to seek an interview with Mr. Cole at an early day with this object, and to report to a future meeting of the committee, to be convened prior to the ratepayers being called together.

AMBULANCES AND HOSPITAL ACCOMMODATION.

We have long urged the vital necessity that existed for ambulances for the removal of the small-pox and fever smitten. We are glad to find that last week instructions were issued by the Poor-law Board to the different Boards of Guardians how to act in future, so that the public panic may be quieted in respect to the alleged general use of the ordinary cabs for the removal of patients. It has been the habit to use vehicles for the removal of the infected of similar make to the ordinary cab; indeed, disused cabs, no longer fit for decent street service, have been so employed. This gave rise to the suspicion that cabs in general were used; so that many people began to fear employing them.

The Poor-law Board recommends that any conveyance in future used should have the word "Ambulance" painted conspicuously thereon, to allay all suspicion. They also recommend that carriages specially constructed for the purpose should be at once built. In this suggestion we quite agree.

There is yet another matter to which we have alluded for years, and to which we would still direct special attention,—the want of local mortuaries for every parish, together with careful daily visitation to the homes of the stricken and to the houses where the dead are being kept for days in waiting. During a late survey of the eastern districts of London, we were almost staggered at the woeful evidences of neglect we encountered. Dirt in quantities was found in various localities, tumbling in from heaps through front doors and back, from collars and gratings in the front, and from ash-pits in the back. In these districts we met not a few whose faces were disfigured, and who suffered, not altogether from their own neglect, but through the criminal apathy of the local authorities.

A fortnight since we noticed in these pages the erection of an auxiliary small-pox shed, for the accommodation of the very poor of Shoreditch. Our worst fears then expressed have been realised. This small temporary structure is quite inadequate. It was completely filled within a few days of its opening; and now, we understand that its enlargement, by the addition of wings, will have to be proceeded with. The place is too circumscribed in extent for any appreciable extension commensurate with the sanitary wants of those who are or will be housed there. The increase of the epidemic has been so large and rapid in Shoreditch and Bethnal-green, that even the Asylum Board has been taxed to the utmost to provide accommodation at Hampstead, Stockwell, and Homerton. Might not some old man-of-war be utilized as a floating hospital?

UTILISATION OF WASTE HEAT IN DOMESTIC FIREPLACES.

SIR,—Having observed the letter of "J. K." on this subject, I wish to call your attention to an improved warm-air chamber grate which I have lately used in my buildings with most satisfactory results.

The advantage of air-chambers behind ordinary fires is obvious, and they have been attempted with partial success for some time, but the preventives to their universal adoption are several.

1st. When they have to be "built up" in fire-brick, there are special drawings to be made, special instructions to be given, and special supervision of the builders required, on the part of the architect, to secure the proper arrangement.

2nd. The thickness of fire-brick requisite is such that it is some hours after the fire is lighted before any appreciable heat is emitted from the chamber.

3rd. There is the difficulty of making the chamber perfectly smoke-proof, and the danger

of subsequent escape of smoke by settlement, or cracking of any of the fire-brick. To obviate these difficulties, Messrs. Walker & Co., of Percy Ironworks, Newcastle-on-Tyne, have lately brought out a fireplace under the name of "Lewis's" (a sanitary engineer of the firm) "patent warm-air chamber fireplace," which has the following advantages:—1st. It is complete in itself, involves no more difficulty, expense, or trouble in setting, and requires no more space than an ordinary register-grate. 2nd. The air-chamber is made of wrought iron, fitted with internal gills or shelves, and is perfectly smoke-proof, and the fireplace is lined with fireclay tile, thick enough to prevent the air being burnt, but not so thick as to prevent the air being warmed half an hour or so after the fire is lighted; and these tiles, when burnt through, are easily replaced. I have used about a score of these fireplaces, in different works, during the last year, with great success; taking the entrance for cold air by a drain from the outside or from the hall or staircase; and the exit for warm air into the room itself, either in the side of the chimney-jamb, front of mantel, or top of shelf, according to circumstances, with alternative openings into a hall or staircase, or to a room above as desired, with valves to send the air into one place or another, as required. I had three of them set in the dining-room, drawing-room, and library of a house I recently built for myself, all of them drawing the cold air from the hall and staircase, and sending it back warmed into the same places, and one behind the kitchen fire, warming a passage, and four bed-rooms over. At the beginning of last winter, when they were put in, I tried some experiments with a Byron's delicate anemometer and a standard thermometer, and send you the result.

External temperature, 25°; temperature of air entering from hall near floor, 39°; temperature of air on its exit from air-chamber, 130°; speed of air exuding 140 ft. lineal per minute, or 9 cubic feet exuding per minute, equal to 82 cubic feet, raised 10° a minute. General temperature of hall and staircase, with the three room fires lighted, 60°. As a general result, I may say that not only has the whole house (which has twenty rooms, is detached, and in an exposed situation) been very comfortable during the late severe weather, but whilst all our neighbours have had pipes bursting and rooms flooded, we have not had any pipe or cistern frozen.

F. R. L. B. A.

A CRITICISER OF CRITICS CRITICISED.

NOVA SCOTIA,—the New Scotland,—what more appropriate name could be found for the land from whence is to issue the new style of the future? And how is this to be brought about? The means are simple. "It is only by our architects dividing themselves into classes, such as church architects, house architects, theatre architects, and bringing up their pupils and apprentices only in the one branch, that our art can ever make the progress which we all desire." Is it indeed so? Are we to come to this at last? We have reached the perfection of pin-making by such means; one man makes nothing but the heads, another does nothing but sharpen the points, and so on. Alas for the progress of architecture when it is parcelled out in a similar manner. Was such the case in the days of old, to which we look back with reverence? Were the artists foremost in the rank of fame content to confine themselves to being either "portrait-painters, landscape-painters, or historical painters," as it is erroneously affirmed is the case at the present day? Our Nova Scotia critic must be ignorant indeed of the history of art, if he does not know that some of the greatest artists not only practised successfully the three branches of their own profession, but were also no mean proficient in the art of sculpture and architecture. Our modern painters certainly do not attempt to practise as architects, but a few of them now and then step aside from their ordinary beat; and notably so is this the case in the matter of portrait-painting; and some of the freshest and most vigorous and expressive portraits we have, were the work of artists who did not profess to be mere portrait-painters. Had Gainsborough,—a landscape-painter,—followed the advice given, where would have been the inimitable "Blue Boy"? Had Landseer done so, where the Trafalgar lions? I shall not touch upon the point of the prac-

* See p. 89, ante.

tiability of the proposed subdivision,—as, for example, how a “theatre architect” could exist,—but will confine myself to expressing an opinion diametrically opposed to that of our would-be reformer. Our architects have, in my humble opinion, been too limited in their study and practice. When the mind is entirely confined to one particular branch of study, it becomes cramped and narrow, and cannot see beyond the bounds it sets itself. My ideal of a great architect is one who can design a structure, model the sculpture for it, sketch the designs for its internal decoration, and who does not consider it beneath him to supply the upholsterer with drawings for the furniture and hangings. We have a few such men amongst us, and these are they who are rising into fame, whose works are the most artistically perfect,—men who can design a church, a college, courts of law, or a town-hall, and imprint their own stamp on each.

It is not by limiting his sphere of action, but by extending it, that you will restore the architect to that high “position from which he has excluded himself for so many years.”

A CRITIC.

THE OXFORD DRAINAGE SCHEME.

THE drainage question at Oxford is practically settled. In a report laid before the Board last March the Committee recommended, in lieu of the scheme to Sandford, “the adoption of the lower side of Ilfey Lock as the overflow outfall, and that a site for the pumping station should be selected on some of the fields lying between Christ Church Meadow and Ilfey.” This proposal was unanimously adopted by the Board, and a further and more important decision has just been arrived at, namely, what shall be done with the sewage when it reaches the outfall at Ilfey? The plan adopted by the Board, with one dissentient, is based on the main upon the system in successful operation at Croydon, by which the solid matter is separated from the effluent water, the former being sold to the farmers in the shape of manure, and the latter, after being applied to land to be obtained in the neighbourhood, would pass into the Thames in such a state as would satisfy the requirements of the Thames Conservators.

The boundary points of the ramification of sewers are,—in the north, the eastern limit of Park Town, and Rackham’s-lane; to the west, the Canal (Jericho), and West-street, Osney; southward, to Folly-bridge; and on the east, Magdalen-road, on the Cowley-road, and Howard-street, on the Ilfey-road. The trunk line of the sewer begins at Osney and runs to near Ilfey—the precise spot to be hereafter determined on. Through the greater portion of its length its size will be 4 ft. by 2 ft. 8 in. Just to the south of the County Gaol the Jericho branch will fall into it. It will tap a smaller branch at the lower corner of Christ Church in St. Aldate’s-street, then follow the lane into the meadow, which it will cross nearly parallel to and on the river side of the Broad Walk. Just about the middle of the island to the east of the Walk it will be joined by the large branch from Park Town; and further on, near the house on the Christ Church Cricket-ground, the stream will be augmented by the large branch coming down from St. Clement’s and Cowley. The last tributary, though a small one, will be near the Ilfey end of the Bullingdon-road.

The scheme will probably entail an expenditure of 40,000*l.*, and if repaid in thirty years will cost a rate of 5*d.* in the pound.

It is to Ald. Castle that the Oxford public are indebted for bringing a troublesome and difficult question to a conclusion. The surveyor has prepared the various plans and sections for forwarding to the central Board of Health office.

SATURDAY HALF-HOLIDAY.

SIR,—Permit me to point out a mode by which this vexed question can be solved agreeably both to employer and assistant. The principle has now had a twelvemonth’s test in my own office, and I am quite sure we should be sorry to return to our old and bad habits.

First, let me premise that, although the Saturday half-holiday is undoubtedly a great boon to assistants, yet it is hardly fair that the employer should have to bear the loss of money its general adoption would incur, especially when it is borne in mind that practically,—at least, such is my own experience,—very little work is done in the mornings preceding such half-holidays.

My plan is simply this,—do not work at all on Saturdays; but assuming forty-two to be the average number of working hours in each week, divide this time over five days, say eight hours and a half per day. My own office hours during the five days are from nine a.m. to six p.m., with half an hour for lunch; and consequently at six o’clock on Fridays we are at liberty to take ourselves and carpet-bags down into the country, or elsewhere, until Monday morning.

An architect, unlike a tradesman, need not fear that his neighbouring professional will get all the Saturday night’s custom, and it is therefore open to all, without hesitation, to adopt my plan or not, as they may deem expedient.

ARCHITECT.

STAINED GLASS WINDOW FROM FRANCE.

A PAINTED glass window has been recently set up by Mr. Henry F. Holt in St. Stephen’s Church, Grove-road, Clapham Park (of which the Rev. George Eastman, B.A., is the incumbent), as a memorial of his youngest son, Richard Cecil Holt. The window is of three lights, and the subject illustrated, “Suffer Little children to come unto me,” the figure of the Saviour occupying the centre light. It is the work of Messrs. Lobin & Co., of Tours, who enjoy a very high reputation in France, and is regarded as an excellent specimen of the French school, the distinctive character of which is essentially different from anything we have in England, its closest approximation being that of Munich glass. We may find an opportunity to see it.

THE NEW COURTS OF JUSTICE.

THE cause of the delay in commencing the building of the New Courts of Justice, has been thus explained by Mr. Ayrton, in the House of Commons. He denied the persistent statements made during the recess, that in consequence of his dislike of the original scheme for the Courts of Justice on the site selected, he had done his best to prevent the commencement of the work. The project of the erection of the buildings was submitted to Parliament by his hon. friend the member for Richmond, about five years ago, and that project was, that the Government should purchase a site at the cost of 750,000*l.*, and should erect upon that site the Courts of Justice, which were to cost the same sum—in all 1,500,000*l.* He gave the plan his earnest support, and urged the House to carry it into effect at the earliest possible period. But the commissioners adopted a scheme which would have involved an outlay of 3,250,000*l.* It was not until the Christmas before last that he was requested to take steps to induce the commissioners and all others concerned to adopt another plan which would give effect to the intentions of Parliament in passing the Act. After going into all the details, they were enabled to bring the project within the original compass. But still difficulties arose with reference to construction, which were so serious, that as early as March last he suggested to the architect that he must radically change his plan if he was to conform to the wishes of Parliament. The architect exercised all his ingenuity to carry out the original design, and prepared plans radically different, which were placed before the Treasury, and by the Treasury forwarded to him, with a request that he would take the necessary steps to carry them out. The first thing he had to consider was the duty of the architect, and it was not until the end of September that a clear arrangement and formal contract was made with him, defining his duties and his relations with the Board of Works. At the end of November, while the sketch plan was in progress, the specifications were sent in, and tenders for the works were at once invited. Contractors protested against the shortness of the time, and in consequence the time was extended from December 1st to February 1st, when the foundations would be actually completed. He did not think this would lead to any delay in the erection of the buildings, because in the mean time all the working drawings and preliminaries for the erection of the superstructure would be going on. The contractors were to go on *pari passu* with the preparation of the working plans and drawings, and as soon as possible they would be in a position to invite tenders for the whole work. He had, in fact, been so desirous, as were the Government, to have this work carried out

properly and promptly, that notice had been given for the purchase of additional land should it be required. The result would be that, apart from the additional expense in the purchase of land, which could not be avoided, the building would ultimately be erected for the original sum proposed, namely, 750,000*l.*, and it would be better, he said, and more useful for the public service, in every respect, than it would have been if the vast expenditure which had been checked had been incurred.

APPEAL FOR RICHARD CORT’S WIDOW.

THE widow of the son and only representative of Henry Cort, who made coal available in the manufacture of iron, and laid the foundations of enormous fortunes for others, while he died in great poverty, is still, we regret to learn, herself in want of the necessities of life, although, to some little extent, her destitution was temporarily relieved a few years since, when the press (including the *Builder*) endeavoured to induce the rich profitters in the iron trade to make her comfortable for life. The poor woman has sickness to cope with as well as poverty; and a renewed endeavour is being made for her benefit. Donations or annual subscriptions may be paid to Colonel Manby, 24, Great George-street, Westminster.

METROPOLITAN TRAMWAYS.

THE schemes for laying down tramways along Knightsbridge and Piccadilly, along Grosvenor-place and Grosvenor-gardens, to Victoria-street, Westminster, and from Knightsbridge to Hyde Park-corner, formed the subject of considerable discussion at the last meeting of St. George’s, Hanover-square, vestry. The committee of works had recommended the vestry to approve of the schemes, but Mr. Farrer, in pursuance of notice of motion, proposed a resolution to the following effect:—

“That in the opinion of this vestry the Metropolitan Board of Works should not leave the construction and maintenance of the tramways within the metropolitan area in the hands of any private company or companies, but should itself undertake them.”

Ultimately Mr. Farrer’s motion was carried by a majority of fifteen. Subsequently the consideration of the respective schemes was postponed *sine die*.

The extension line of tramway laid down from Acre-lane to Water-lane, Brixton, is fit for use. The entire route from Brixton-rose to Westminster Bridge extends over 3½ miles of road. A portion of the additional line of tramway, laid from the Swan Inn, in the Clapham-road, to Clapham-common is ready for the cars to travel over as far as Bedford-road, Clapham, and the other portion will be ready by Lady-day next. The omnibuses on these lines of road are running opposition to the tramway cars, and convey passengers at the same fares, viz., 3*d.* Workmen’s cars are run from half-past five o’clock till seven each week-day morning, for the conveyance of passengers, at 1*d.* the whole distance.

WARMING APPARATUS FOR CHURCHES.

SIR,—I am the parish-warden of a large and beautiful church warmed (?) in the following fashion. Half a dozen long pits have been sunk in the nave and aisles, and in each a close stove has been deposited. Some 18 ft. or 20 ft. of iron openwork follow the flues, which are brought together in a bunch in the vestry, the smoke and, I should calculate, about 60 per cent. of the hot air finding a vent at the tower top. In theory the system is supposed to work thus:—The cold air gently descends on the sides of the stove and pipes, warms itself, and generously returns back to diffuse a genial warmth among the congregation. Practically, the effects are the setting in of a strong current of cold air towards the stoves, and the sweeping of the greater part of the heated air along flues which are carefully cut off from any contact with the outer atmosphere until it reaches high above our heads. We have tried a “damper,” which the builders strangely omitted; but the effect of this is only that the fire does not blow itself out, as it used to do, and we miss the return blast of hot air which adverse winds would sometimes bring up, and which, sulphurous as they were, were preferable to the chilling current to which there is no end. I have tried to delude myself into the idea that the draught was not or was but partial, and that I was getting cold and chilly; but when I saw the folds of my wet umbrella playing with the current, I could deceive myself no longer. Can you or any of your readers suggest a remedy other than the entire destruction of all the stoves,—an act which I prefer to chronic bronchitis?

*** Properly carried out, such a system has often answered. A suggestion without seeing the place is not to be useful; but we will nevertheless make one:—Let the air come to the stoves from without, and let only the warmed air enter the church by gratings near the stoves: supply the stove chamber with some pans of water.

"WRAYSBUURY CHURCH NEW TOWER AND SPIRE."

Sir,—Your leading article of November 26th, 1870, contains some comments upon the remarkable difference between the highest and lowest tenders for the above works (viz., £2,323, and £653), and asks for an explanation from the persons concerned. Having supplied quantities to three of the builders who tendered, I should have thought it my duty to afford such explanation, had not a letter appeared in your next issue, written by Mr. Kelly, of Windsor (who is, I believe, a practical mason), calling attention to the fact that the quantity of Bath stone in the list of quantities contained in your tender, was 1,494 ft. in excess of that he arrived at by his calculations; according to my bill it was 1,548 ft. in excess. As the difference was comparatively small, I considered it would be uselessly extending the controversy to write to you, but I am since advised that I should justify myself in the matter. I should state that, in my opinion, the principal cause of the difference was, that there was no section of the spire shown on the drawing, consequently the thickness of the stonework had to be determined by the persons taking off the quantities.

If you will insert this very tardy explanation, and accept my apologies for the delay, you will oblige me.

JOHN LEAMING.

ARCHITECTURE AT THE INTERNATIONAL EXHIBITION OF 1871.

THE Commissioners have reason to believe that sufficient attention has not been given by architects to the fact that in the approaching Exhibition a gallery will be specially set apart for architectural designs, in which drawings contributed from this country will hang side by side with those of Continental artists. They think it highly desirable, considering the great publicity which the Exhibition will have, and the comparisons which will be instituted between English and Continental contributions, that the works and the studies of English architects should be represented in a thoroughly satisfactory manner, and have put facilities in the way of exhibitors by relaxing the rule excluding works previously exhibited; so that drawings suitable for exhibition, but which have been already exhibited at the Academy or elsewhere, may be sent in. The time for the reception of architectural works is extended until Friday, March 31st.

CHURCH-BUILDING NEWS.

Ampley Crucis.—The chancel of the parish church has been reopened, after considerable alterations, which include the raising of the floor to the original level, the addition of an organ-chamber and vestry, and various other matters of detail. The work has been carried out by Mr. W. H. James, of Cirencester. Stained glass has also been placed in the east window, which is of the Perpendicular period of architecture, and consists of three openings with tracery. In the centre is the Crucifixion, with the Virgin Mary and St. John standing beside the cross. This is placed on a background of antique ruby. On the left is depicted the "Agony in the Garden," and on the right "The Resurrection." Each group is surmounted by a canopy of white and gold glass, and standing on a base, in the niches of which are angels bearing scrolls. The tracery is filled with angels adoring, and at the extreme top are the Martyr's Crown and Palm. The window is the work of Mr. Baguley, of Newcastle-on-Tyne.

Little Budworth.—The restoration of St. Mary's Church, Little Budworth, Cheshire, which has been going on for some time, has been so far completed as to admit of its re-opening for divine service. The present church, which is plain and ugly, was added to an embattled tower of the sixteenth century, a Manchester merchant, Mr. Ralph Kirkham, who died in 1798, having bequeathed the sum of 1,000*l.* towards the building of it. The restoration of this structure has been attended with considerable difficulty. The flat ceiling has been removed, and the timbers of the roof of both the body of the church and of the chancel exposed. A gallery at the west end has been taken down, and the tower opened to admit light from a west window. The old square pews have given place to open seats of pitch pine, varnished; and the inconveniently high box occupied by the Grey-Egerton family has been replaced by open stalls, in carved oak, which are on a level with the other seats. Some little attention has been given to the colouring of the walls and other matters. The work of restoration was carried out by Mr. R. Beckett, of Hartford, under the direction of Mr. Douglas, of Chester, architect, at an expense of about 350*l.*

Wem.—The rector of the Church of Wem is about to repew the body of the edifice at his own expense. Messrs. Wooliam have got the contract, and will commence immediately.

Broughton.—The total expense incurred in making the alterations in the chancel of Broughton Church has been about 400*l.*, and towards the fund a lady of the congregation gave the sum of 230*l.* There remains a deficiency of some 130*l.* or 130*l.* The old deal choir-seats have been removed, and replaced with walnut oak stalls. The style adopted is Perpendicular. The space above the back of the seats and under the window is covered with frame-work (fitted in with tracery), and is further relieved by buttresses, corbels, and carving, the whole being surmounted by a battlemented cornice. The vicar's reading-desk has been altered, and the platform continued to the wall, which is also covered with panelled work of a different design from the stalls. A new reading-desk has been placed on the opposite side of the chancel, and the panelled work behind it is of a similar character. The walls and ceiling have been painted and flatted, and the latter illuminated with gold stars. The walls have not yet been decorated. The cost of the stalls has been borne by Miss Lupton, of Scarr Wheel House; and the whole of the works have been executed by Messrs. Banks & Co., and carried out under the immediate superintendence of Mr. J. H. Banks.

Tunbridge Wells.—St. John's Church, which has been enlarged, has been re-opened for divine service. It is constructed of rag stone, with Bath stone dressings, in the Early English style, and is in the shape of a Latin cross. The cost of erection was 3,000*l.*, and free sittings were provided for 250, but by the recent enlargement this number was extended to 350. The enlargement plans were designed by Mr. H. H. Cronk, under whose superintendence the work has been executed, the masonry being done by Mr. John Walker, builder, and the interior by Mr. Winniffrith. The estimated cost is 1,532*l.*

Colchester.—At a vestry meeting in St. Mary at the Walls, the report of a committee on the enlargement of the church was read. The report said:—

"Mr. Blomfield recommends the building of a new chancel to the church, with a chapel upon the one side of it, and a vestry and organ-chamber on the other, and the re-benching of the body of the church, which should also be warmed throughout."

In addition to this, Mr. Blomfield proposes a plan for remodeling the body of the church, to bring it into harmony with the proposed new work, and for removing the western gallery. Your committee are of opinion that there is no probability of being able to raise, at the present time, sufficient funds to undertake the whole work. They therefore propose that the present effort should be confined to the building of the proposed chancel, &c., and to the re-benching and warming of the church.

The cost of this is estimated at about 2,000*l.*, and the committee believe that the carrying out of Mr. Blomfield's proposals will give 150 additional seats in the church, and will provide proper accommodation for the poor and for children.

They therefore advise that Mr. Blomfield should be requested to furnish details and plans of the parts of his scheme which it is proposed to adopt, and sketch plans showing his entire proposition; and that the vestry should appoint a committee to raise subscriptions and carry out the work.

The report was adopted, and a committee appointed.

Books Received.

Guilds desirable for Art and Artisans. Two Essays, by SAMUEL FAX. London: Joseph Masters. 1871.

An amusing brochure. Its real objects appear to be two:—first, to make known that the writer is qualified "to occupy the post of Master Builder" (see preliminary Notice); and, secondly, to show that the architect, or "middle-man," as he delights to call him, is not merely unnecessary, but damaging to art and degrading to all employed under him, and that it is time he should now resign his authority to some one "who would more correspond in position to the master mason of Mediaeval times." We are so tickled by the corollary of these two main propositions that we do not care to look further.

Church Design for Congregations: its Developments and Possibilities. By JAMES CUNNITT, Architect. London: Smith, Elder, & Co. 1870.

This is a reprint of articles from a weekly paper, and we need do no more than mention the publication. The author points out that a large part of the congregation is shut off from the officiating minister even by columns of reduced size, and that the alternatives in a church of the ordinary type are "thick, or moderately thick, piers, and bad placing of the congregation," or "thin piers

and bad architecture." We do not accept absolutely this last dictum, but the present is not the occasion we shall take to discuss it. The volume contains a number of plans of ancient churches with and without columns.

The Year Book of Facts in Science and Art. By JOHN TIMBS. London: Lookwood & Co. 1871.

The present issue of this standard and useful work is an especially interesting one, in various of its numerous departments. Prefixed is a memoir of Professor Huxley, with a life-like portrait of him.

VARIORUM.

THE "Journal of the Royal Historical and Archaeological Association of Ireland. Vol. I. Fourth Series. October, 1870. No. 4. Dublin: McGlashan & Gill." Besides a report of the proceedings of the society, this number of the renamed Kilkenny Archaeological Society's Journal contains an interesting paper on the Crannogs in Drungay Lake, near Enniskillen, and one on the Corporation Insignia and olden Civic State of Kilkenny, with illustrations of both papers.—The "Inaugural Address of Baldwin Latham, C.E., President, Society of Engineers, February 6th, 1871. London: Spott." This address has been issued in a separate form. It treats of subjects of importance to the profession, more especially on the necessity of sanitary measures.

Miscellaneous.

Chemical Fire-Engines and Patent Respirator.—An experiment has taken place at Bramford, with a chemical fire-engine, called the "Extinguisher," an old name applied to such an engine, whatever novelty there may be in the engine itself, which, however, is probably no other than our old acquaintance, with not even a new name. Fires are said to have been extinguished with it very rapidly on this occasion. The principle of the engine seems the same as that of the old "Extinguisher,"—namely, the generation of carbonic acid gas, by the admixture of certain chemicals in water. In the "Extinguisher" proper the gas which is generated affords the power of propelling the liquid on to the fire; but in the case of a larger engine, called the "Prince of Wales," manual power is employed. This engine consists of two tanks. Into one is put some carbonate of soda, and into the other a similar proportion of acid. The pump is worked by four men. The advantages claimed for the engine are the extraordinary power it is said to possess over ordinary fire-engines, by the introduction of carbonic acid gas; the immediate propulsion of the gaseous fluid upon the fire; the small number of men required to work it; the power to extinguish fire without saturation or destruction of property by water; and its adaptability to irrigation and other purposes by using water without the admixture of chemicals. Mr. Sinclair, of London, the licensee of the patent, explained the action of the engine. An experiment was made with a patent respirator, also brought out by Mr. Sinclair, for the use of firemen and others, who have to contend, in the case of fires or the examination of mines, wells, sewers, &c., against dense smoke, foul gases, or noxious effluvia. The apparatus consists of an air-tight bag, suspended on the back by shoulder-straps, and filled, by means of a pair of bellows, with sufficient air to last for ten, twenty, thirty, or forty minutes. There is a face-piece or cover fitting air-tight over the mouth, nose, and eyes, held on tightly by means of an elastic band, and provided with glass fronts for the eyes. To the mouthpiece is affixed a tube, which the wearer can cause to communicate, by means of a tap, either with the open air or with two tubes, fitted with flat valves, working in opposite directions, and leading to the bag suspended on his back. By this means the supply of air is not used till actually needed.

Value of Property near Darlington.—The Round-hill estate, containing 192 acres, within two miles of the town of Darlington, and the Forth Moor estate, containing 128 acres, about one mile from the same town, were offered for sale at Darlington, on Monday, the 6th inst. After competition the Round-hill estate was purchased by the Rev. R. H. Williamson, of Harworth, for 9,400*l.*; and the Forth Moor estate by Mr. R. H. Allan, of Blackwell Hall, for 5,000*l.*

The Accident at the Imperial Gas-works.—An inquest into the cause of death of Jacob Backland, William Martin Child, and Joseph Andrews, who were killed by an accident which happened at the Imperial Gasworks, York-road, King's-cross, has been opened, at the Royal Free Hospital, Gray's-inn-road, before Dr. Lankaster. The jury viewed the scene of the accident, and the inquiry was adjourned. The evidence as to the nature of the accident was not then taken, but we have learnt the following particulars. It appears that the demolition of brickwork, which forms the carcass of one set of the company's retorts, situated at the extreme northern end of the King's-cross works,—the building in question running east and west,—was in progress for the purposes of subsequent reconstruction, in accordance with periodical usage, necessitated by the action of fire on the bricks and mortar. The iron pipes, &c., had been removed, and four out of the series of six arches had been pulled down, leaving two semi-arches standing, from the top of the outer or eastern one of which one-half of the square heavy blocks of bricks by which it had been surmounted had been removed, thus relieving the outer wall side from any undue pressure. Some forty labourers were employed within the building clearing the bricks of the other arches which had been pulled down, when suddenly the entire side wall of the arch and a portion of the top fell upon the men, crushing and burying them in the ruins.

The Improved Industrial Dwellings Company (Limited).—The report and statement of accounts, presented at the fifteenth half-yearly meeting of the shareholders of Sir Sydney Waterlow's Company state that the sum of 13,142l. 7s. has been expended during the half-year on works in progress, and the total expenditure on capital account is now 180,392l. 19s. 6d. The rents received during the half-year amount to 7,112l. 14s. 1d. The total expenditure has been 3,653l. 1s. 4d., leaving a profit of 3,521l. 1s. 8d. A sum of 5,822l. 14s. 1d. is available for dividend at the rate of 5 per cent. per annum, free of income-tax, which will absorb 3,125l., the balance viz., 2,697l. 14s. 1d., to be carried forward. There has been a slight improvement in the occupation of the "Nelson" buildings at Greenwich, and the general position of the company's estates remains highly satisfactory. At Greenwich it is hoped a further improvement will take place on the opening, by the Corporation of London, of the Foreign Cattle Market to be erected on the site of Deptford Dockyard. The buildings at Ebury-street and Ebury-square, Pimlico, except about twenty homes not yet ready for occupation, have been let to most eligible tenants. Of the Bethnal-green Estate, eight blocks are nearly completed, and it is expected that the remainder will be ready for occupation in September next.

Home Colonization.—A meeting of the working classes has been held at the Mission Hall, White Horse-alley, Smithfield, to take action with reference to a subject we have ere now urged,—the utilization of the waste lands of this country, and to arrange for a deputation to the Government to press upon them the necessity for the cultivation of these lands. Mr. J. Hales took the chair, and said that 11,000,000 out of the 29,000,000 acres of waste land would pay well for cultivation, and thus create a number of prosperous tenants, who would give work to manufacturers, and hence to artisans and mechanics. The first resolution pledged the meeting to present a memorial to Mr. Gladstone relative to the waste lands, and was carried. The second resolution passed was to the following effect:—

"That, considering the vast amount of charity kindly given in this country, and misappropriated to unproductive employment, it is desirable that this Association call the attention of the benevolent to the good that might result from charity being applied to the promotion of productive industry."

A memorial to Mr. Gladstone, to be presented by a deputation, was adopted.

Trade Unions.—In a paper "On Trade Unions in Relation to National Industry," read by Mr. Elijah Helm before the members of the Manchester Statistical Society, he contended that as trade-unions had become a great fact in industrial life, it would show a want of sagacity to attempt to ignore them; that their objectionable features were fast abating; and that there seemed every reason why the evidently peaceful intentions and useful services of the best unions should be acknowledged and welcomed.

Memorial of the Late Town Clerk of Stockport.—A mural tablet in memory of the late Major Coppock, executed in Caen stone and marble, has been unveiled in the Unitarian Church, St. Peter's-gate, Stockport. It is fixed over the family pew, in the north-east corner of the edifice, and is about 13 ft. high, and 10 ft. wide. It consists of three bays forming an arcade, which is supported by marble columns carried on corbels; these and the other portions being built in the wall. The columns are surmounted by carved capitals, consisting of the rose, lily, buttercup, and passion flowers. The centre bay or panel contains a white marble tablet, with the inscription. This tablet is surmounted by a carved canopy with a circular panel, containing a sculptured portrait of the deceased in Carrara marble; the spandrels being filled in with the passion flower, ornamentally carved. At the base of this canopy stand two figures of angels bearing scrolls. The medallion was from the studio of Mr. Papworth, of London. The whole of the work besides this has been designed and executed by Messrs. T. R. & E. Williams, sculptors, Manchester, who also completed a tablet to the memory of the late Mr. Thomas Fernley, which is erected in the Tiviot Dale Chapel, Stockport. The cost of the memorial will be about 200l.

Science Lectures for the People.—Dr. Carpenter, F.R.S., of London, has delivered an interesting lecture in the Hulme Town-hall, descriptive of his own remarkable discoveries with regard to "Temperature and Life in the Deep Sea." Sir Wm. Fairbairn presided, and there was a crowded attendance. Until a recent period, the lecturer remarked, the bottom of the deep sea had been very much what he might call—to make an Irish bull—an unknown land to them, for the means of research into its condition were very unsatisfactory. The results obtained in the expeditions he had accompanied showed the temperature of the ocean in different parts, the movements of cold and warm waters, and the intermixture of strata of water. Coming to the nature of the animal life of the ocean depths, he spoke of the great abundance in which it has been found, in parts of the sea dredged; and the remarkable contrast presented between that animal life in the warm and cold areas. Many of the types of life found, he said, were of great interest from their relation to forms preserved in the chalk. There was a considerable number of representatives of animals of the chalk period—animals that had made and were still making the chalk.

Cooper's Watering Salts.—We have before now recommended this invention. The Westminster Board of Works having determined to try the effect of the salts over the whole of their district during last summer, ordered 80 tons, on the understanding that if they did not give satisfaction in every respect a sum of one hundred pounds only should be paid to the patentee, but if the result proved efficient and economical, a sum of two hundred pounds was to be paid to Mr. Cooper; and at a recent meeting of the board a unanimous resolution was passed for the payment of two hundred pounds; so we may feel assured the experiment has been a success. The parish of St. Luke, Finsbury, has also adopted this system of street watering, which is now in use in several provincial towns.

St. James's Theatre.—The new "classical" burlesque here has the one merit of affording Mrs. John Wood an opportunity to display her remarkable accomplishment as a burlesque operatic singer and actress, and very charmingly she takes advantage of it. Of the piece itself the less said the better. Mr. Hann has painted for it three architectural scenes which, if not strictly correct, are at any rate very effective. Mr. Dance's excellent little comedy, "Naval Engagements," has been revived, and is very well played by Mr. William Farrer, Mr. Leeson, Miss Brough, and Miss Larkin. It is always matter for regret that Mrs. Wood gave up her original programme,—comedy, old and new, done in the best possible manner. If this had been well followed out, the house would by this time have been an Institution.

Competition: Margate.—Mr. Dendry, who advertised in our pages last November for designs for a building at Margate, writes to say that he has "received eighteen sets of designs, which, for minuteness of detail, fulness and finish of work, beauty of design, and also for the great care paid to the requirements, cost, &c., merit very high commendation."

The Revictualment.—Readers may have noticed amongst the subscribers in the Mansion House Paris Relief Fund list the frequent occurrence of the heading, "Some Members of the Stock Exchange." It ought to be known that several members of the Exchange at the beginning of the revictualing, arranged to give £1 each a day for fourteen days, thinking that by the end of that time the worst would be over. They deserve credit for the excellent idea. The total will be over £2,000.—It is not often one can find anything to admire in the phraseology of a telegram, the necessity of brevity superseding that of elegant diction; but the grand simplicity, yet generous amplitude of the governmental message from London to Paris thrills one. "All her Majesty's stores and people are at the service of the Parisians." It is sublime!—R.

The Wire Tramway in the Forest of Dean.—This cheap mode of transferring minerals has been applied for the removal of iron ore from the Devil's Chapel mine to the Severn and Wyre Railway in the Whitecroft Valley. The tramway is $\frac{1}{4}$ mile in length. It is carried at an altitude of some 30 ft. The line consists of an endless wire rope, supported by a series of pulleys, which are fixed to and carried over one of the most rugged tracts in the district. The buckets in which the mineral is conveyed carry about $\frac{3}{4}$ cwt. of ore at the rate of 200 an hour. The rope is driven by a portable steam engine. A wooden sliding has been made near the Severn and Wyre Railway to expedite the delivery.

Bradford—Building Trades' Technical Schools.—The builders of Bradford have established technical schools in Godwin-street, and these schools have been found of great benefit to young men, imparting, as they do, a practical education, combining theory with the practical execution of work, and making the pupil an educated artisan. The schools are not self-supporting. The builders and architects of the town have already contributed handsomely, but a debt of 170l. remains. An appeal is made to the men of wealth, and handsome contributions have already been made by various gentlemen, affording the assurance that the debt will be speedily removed.

Proposed Museum and Free Library for Hereford.—Mr. J. Rankin, Bryngwyn, having offered to provide, on certain conditions as to maintenance, &c., a museum and free library building for the city, the Town Council with much gratification unanimously passed a resolution to the effect that they "have heard Mr. Rankin's very generous proposal to purchase a site and erect suitable buildings for a free library and museum in the city of Hereford, in connexion with the Woolhope Naturalists' Field Club, and are most desirous of rendering every assistance they can in the matter; that they feel assured that the citizens of Hereford will readily assent to adopt the provisions of the Free Library Acts, and have appointed a committee to confer with Mr. Rankin on the subject."

The Victoria Embankment.—It is the intention of the Board to erect an ornamental fountain on the Embankment, near the Charing-cross railway bridge, at a cost not exceeding 1,000l. The designs for the same have been submitted, but not yet finally decided on. The Board has approved of a design for a memorial fountain in honour of the late Judge Payne, the cost of which will be defrayed by the Metropolitan Free Drinking Fountains Association. We hope this is of better character than the majority of those put up by the Association exhibit.

State of All Saints' Church, Southampton.—The ceiling and roof of this church are considered to be so unsafe as to induce the churchwardens to intimate that the building will be closed until further notice. Mr. Joseph Hill & Mr. Howell, architects, have made a preliminary examination of the roof, but of a not sufficiently detailed character to allow of their giving a precise estimate of the cost of the needed repair; but we are informed that it will approximate to 1,200l., exclusive of painting, which will probably be 200l. more.

Society of Engineers.—At the next meeting of the Society on Monday evening, 20th February, the paper "On the Economics of Railway Maintenance," by Mr. E. S. Crompton, will be discussed.

The Organ in St. Paul's.—It is proposed to remove the existing choir organ to the entrance to the choir, dividing it into two parts, and placing the one on the north and the other on the south side, against the blank wall where the monuments of Lords Nelson and Cornwallis now stand. By continuing the choir-stalls to the iron rail, now serving in the place of a screen, it would be possible to erect the organ above the new stalls, and so increase its power, without allowing it to extend more than 6 ft. from the wall on either side.

The Kelly College.—This college, founded by the munificence of the late Admiral Kelly, who bequeathed 200,000l. for the purpose, is to be erected at Tavistock. The Duke of Bedford has offered a site on the Parkwood-road, near that town, consisting of 20 acres, which the trustees have accepted, and which will go a long way towards the requirements of the college.

District Surveyors.—At the meeting of the Metropolitan Board of Works last week, Mr. Charles Fowler was elected district surveyor for Shoreditch and Norton-Folgate. Mr. C. F. Hayward was elected surveyor of St. George's and St. Giles's, Bloomsbury, made vacant by the election of Mr. Fowler.

Leicester-square.—Mr. J. W. Thomson writes to us suggesting that the centre of Leicester-square should be transformed into a Flower Market. We cannot go with him. We wish to see the area retained as an open unrailed space, properly laid out with walks and trees, and architectural adornment.

Threatened Destruction of "Caesar's Camp."—We hear that the so-called "Caesar's Camp" at Wimbledon is to be sacrificed to bricks and mortar. It is rumored that Mr. Drax, M.P., has just let this old British encampment to Mr. Dixon, to be cut up for building. We hope we are misinformed.

London International Exhibition of 1871.—Mr. Buckmaster has been appointed to deliver an address on the value of the Exhibition, and its bearing on industrial instruction, designed particularly for the working classes, in all the large towns of the country which express a desire to have it.

The Literary Fund.—The anniversary dinner of this admirable institution will take place on the 17th of May, at the Freemasons' Tavern, and the Lord Bishop of Winchester will preside. We hope to see a large gathering.

The Smithfield Fountain Competition.—Some sixty or seventy designs have been sent to the Guildhall. The committee inspected them for the first time on the 16th inst.

Bust of Macleish.—Mr. Edward Davis has completed the bust of Macleish in marble for the Royal Academy, and submitted it to the council.

TENDERS.

For Evans's, Covent-garden. Mr. J. H. Rowley, architect. The quantities supplied by Mr. T. Green:—

King & Sons*	£3,340 0 0
Hill, Keddell, & Waldram*	3,255 0 0
Eaton & Chapman	3,187 0 0
Brass	3,117 0 0
Scriveners & White	3,104 0 0
Shepherd	3,093 0 0
Nightingale	3,093 0 0
Sharplington & Cole	2,997 0 0
Crab & Vaughan	2,971 0 0
Snowdon (accepted)	2,944 0 0

Hotel.

Shepherd	£1,395 0 0
Nightingale	1,385 0 0
King & Sons*	1,356 0 0
Sharplington & Cole	1,333 0 0
Hill, Keddell, & Waldram*	1,331 0 0
Eaton & Chapman	1,294 0 0
Snowdon	1,290 0 0
Scriveners & White	1,273 0 0
Brass	1,270 0 0
Homanan (accepted)	1,226 0 0

* Too late.

For erecting new premises for the Finbury Dispensary, Brewer street, North, Clerkenwell. Mr. Reginald E. Worsell, architect.

Morland & Son	£3,150 0 0
Elvage	2,847 4 4
Brass	2,795 0 0
Wood	2,770 0 0
Patman & Potheringham	2,749 0 0
Hosley	2,704 0 0
Henshaw	2,693 0 0
Bainard	2,650 0 0
Brown & Robinson	2,663 0 0
Axford	2,505 0 0

For additional store to Messrs. Rivington's printing-office, St. John's-square, Clerkenwell. Mr. W. P. Griffith, architect:—

Patman & Potheringham	£315 0 0
Lawrence & Sons	257 0 0

For workshops in rear of Northampton-square, Clerkenwell. Mr. W. P. Griffith, architect:—

Wagstaff & Son	£239 0 0
Marten	197 0 0
Bamford	194 0 0
Lidstone	175 0 0

For additions to House in the Portsmouth-road, Guildford. Mr. Henry Peak, architect:—

Pollard & Son	£519 0 0
Wills	510 0 0
Dickenson	453 0 0
Loe	450 0 0
Goff	414 16 0
Garnett	414 0 0

For new shop-front and alterations, No. 145, High-street, Guildford. Mr. H. Peak, architect:—

Strudwick	£247 0 0
West	316 0 0
Burdett	298 13 0
Parce & Clark	298 0 0
Garnett	299 0 0
Pollard & Son	276 13 0

For cottage residence, Woodford. Mr. John Young & Son, architects:—

Rivett	£269 0 0
Turner & Son	223 0 0
Merritt & Ashby	223 0 0
Chesam	519 0 0
Rowbottom	460 0 0
Osborne	450 0 0
Smith	375 0 0

For Tower-hill Catholic Schools. Messrs. John Young & Son, architects:—

Ashby & Sonnet	£4,661 0 0
Brass	4,497 0 0
Conder	4,317 0 0
Leach	4,285 0 0
Sewell & Son	1,419 0 0
Brown & Robinson	3,751 0 0
Hill, Keddell, & Waldram	3,751 0 0
Merritt & Ashby (accepted)	3,666 0 0

For the enlargement of St. Paul's National School, Hook, Surrey. Messrs. Rusforth & C. L. Look, architects:—

Jarvis	£244 10 0
Johnson & Gibley	415 0 0
Wells	395 0 0
Manley & Rogers	395 0 0
Spearing & Stewart (accepted)	366 0 0

For additions to premises, St. John-street-road, for Mr. John Hilder. Mr. F. A. Dwyer, architect:—

D. Taylor	£449 0 0
Ball	397 0 0
Kelly, Brothers	392 0 0
R. Taylor	349 0 0
Heath	324 0 0
Longmead & Way	307 0 0

For the erection of new channel, for the reconstruction of the nave, and for new north and south aisles, St. Jude's Church, Midway Park, for the Rev. P. Penzance, M.A. Mr. Edwin Clare, architect. Quantities supplied by Messrs. Wymouth & Son:—

Crabbe & Vaughan	£4,495 0 0
Brown & Robinson	4,498 0 0
Cole	4,475 0 0
Dove, Brothers	4,463 0 0
Hill & Sons	4,468 0 0
Perry, Brothers	3,809 0 0
Foster (accepted)	3,777 0 0

For a new store to a sugar refinery, Whitechapel. Mr. G. H. Simmonds, architect:—

Wood, Brothers	£283 0 0
Jacobs	623 0 0
Outwater & Son	592 0 0

For three villas, Hornsey, for Mr. L. Friend. Mr. William Smith, architect:—

Marion	£3,476 0 0
Nightingale	2,188 0 0
Hurst	2,060 0 0
Walker	1,797 0 0
Cox	1,790 0 0
Blackmore & Morley	1,793 0 0
Ball	1,720 0 0
Wright (Brothers) & Goodchild	1,715 0 0
Flowers	1,600 0 0
Rooney, Brothers	1,573 0 0
Dinet	1,399 0 0

For new roads, sewers, &c., on the Parkfield Estate, Battersea. Messrs. Beeton, Son, & Breerton, surveyors:—

	Contract	Contract
Hiscox & Williams	£1,500	1,200
Avies & Co.	1,113	1,205
Blackmore	1,345	1,010
Neal	1,345	1,000
Harris	1,645	967

For parochial school, and residence at Peppard, for the Rev. Thomas Williams, M.A. Mr. Frederic Haslam, architect. Quantities supplied:—

Dover & Co.	£789 0 0
Hamilton	723 10 0
Nightingale	711 0 0
Puter	716 0 0
Woodbridge	698 0 0
Samonds	687 0 0
Water	685 0 0
Ponton	672 13 0
Sadler	649 0 0
Harrison & Son	649 0 0
Dodd	633 0 0
Harrison & Edwards	620 0 0
Wright	620 0 0
Clelland	620 0 0
Cot	673 14 0
Wright (Brothers) & Goodchild	570 0 0
Wells	560 15 0
Crook (accepted)	556 10 0

For the erection of a lodge and committee-room on the Henley Cricket Ground, for Mr. J. F. Hodges. Mr. Frederic Haslam, architect:—

Weyman	£285 0 0
Clements (accepted)	230 0 0

For alterations to premises, Market-place, Henley. Mr. Frederic Haslam, architect:—

Sally	£350 0 0
Hamilton	245 10 0
Wills	219 10 0
M. J. J. J.	219 10 0
Clements (accepted)	196 17 0
Barney & Wright (too late)	192 0 0

For Christ Church Schools, Ealing. Mr. J. H. Rusforth, architect. Quantities supplied by Mr. Northcroft:—

Myers & Sons	£2,460 0 0
Perry	2,435 0 0
Brill	2,293 0 0
Adamson & Son	2,193 0 0
Nye	2,064 0 0

For alterations and repairs at No. 39, Devonshire-street, Marlborough-street, W., for Mr. Joseph Chapman, under the direction and superintendence of Mr. Bradley, architect:—

Smith & Co.	£743 0 0
Robb & Son	648 0 0
Watson, Brothers	610 0 0
Abbell	184 0 0
Stephens	490 0 0
Hyde	419 0 0
Higgs	414 10 0

TO CORRESPONDENTS.

J. K.—Mr. M. F. R. & F. F. W. C. J. W. T. W. L. J. L. J. E. C. J. H. B. H. B. J. L. J. D. C. O. P. M. E. R. A. B. H. E. T. E. J. E. C. O. B. W. J. C. F. E. B. & C. W. G. S. Mr. H. A. B. T. R. Jack Plane—J. H. F. E. H. P. H. C. O. B. & Co.—Messrs. K.—Messrs. C. M. & Co.—Brothers—T. O. W. S. B. A. T. (1871) to the Secretary at the N. C. W. Museum.—If you can send a word to show the same purpose.—Quercus (write Value & Co.). Oil of olive oil (1871) W. S. (thanks).—Capt. P. (already mentioned).—Only a Baiter (sent).—Under a chain—E. S. (first week)—W. R. (next week)—F. T. (next week)—M. L. F. (next week).

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The Builder.

VOL. XXIX.—No. 1464.

The Abbey Church at St. Alban's.



THAT grand, bold tower—which is now once again on the highway, and is seen by every traveller, as he is hurried along the rail to Leicester and the Midlands,—is, from its size and situation, not easily to be forgotten, as one of the most notable monuments of architecture in England. Without any of the refinements of later works, or any graces beyond those of judicious proportions,—by sheer mass, joined with a certain air of native dignity,—the pile of three clay cubes, with their sides of 50 ft., forces itself on the memory as one of the most individual of buildings. It is almost unaltered since its completion, within fifty years after Duke William came into England. The only changes are in its termination, and in those of the turrets at its angles, and the alteration of its colour. The present coating of the wall surfaces is a mosaic, to which numerous generations have contributed,—over thirty have gone by since the first coating was intact. The construction is almost entirely of the Roman materials said to have been removed here from the ruins of ancient Verulam,* or, at any rate, of materials similar in form and quality to them; and the character of the detail has been dictated by their use. The tower,—retained thus, with little alteration, in the middle of the very extensively remodelled and widely-differenced portions of the building over which it dominates,—contrives to drive home its own special image to the mind's eye; and, at the same time, the forms grouped round it are awed into a general unity of character and expression. The historic interest attached to it has hitherto derived strong additions from its vigorous air,—promising extended duration; thus permitting discursive imagination to look back into the past, and reach out towards the future. The Brodringnagian iron girdles that cling round so many towers, however skillfully made unobtrusive, inevitably disclose the fact that foresight is guarding against probable ruin; the to-be-expected result of failure that has once made itself visible.

* The structure of these tiles is very excellent. When examining them, one has an unpleasant feeling, that little of our modern brickwork "done to last" will ever reach the very considerable age of that before us. Not to notice cases of rapid decay,—as, for instance, in the piers of the bridge over the Midland Railway Station, at St. Alban's, which are already (in two or three years) honey-combed on their surfaces;—it is doubtful whether any average building-bricks of to-day would acquire the kind of surface, almost with a polish if ground against a stone with water,—that may be seen on these well-burnt bricks of well-tempered clay, whose fragments have strewn for hundreds of years the cornfields on the site of Verulam. The mortar-joints of the older work (the church of Abbot Paul, 1097—1100) average about 1½ in. in thickness, and so are not unlike those in the tile courses of the wall of the Roman city. In the work built with similar tiles at a later period in the choir, the joints are much smaller, though not so fine as our present favourite jointing. The later work was not intended to be covered with cement, as the earlier. The maxim, "the joint is too thick if you can see it,"—had not been acquired, however, by any of the constructors at St. Alban's.

The central tower of St. Alban's Abbey has escaped all this hitherto: its good original constitution having permitted it to live on,—showing no signs of weakness,—there has been no call for the remedies that would otherwise have been needed. After minute study of the whole fabric, spread over several years, it was stated not so long ago,*—"It is very remarkable that whilst so many of our grandest churches should have been partially rebuilt in consequence of the falling of their towers, or required strengthening to secure them from impending danger, this of St. Alban's should not, even at this distant day, betray a defect either from an inequality in the settlement of the larger piers, or from any imperfection in the construction or workmanship. The industry of eleven years was expended in its erection, a longer time than was allowed to others of perhaps rival magnitude" (p. 34); and again (p. 80), with a special interest, as applying to the account we have now to give,—"The pressure of the weight of the tower has not occasioned a flaw in any direction, excessively as its eastern abutments were lacerated at the period of the alteration of the sanctuary."† It is a truism, that in every arched building, without speaking of special calamities to which may be due the hastening of final failure, some time or other the equalisation of the opposing forces must be brought about: the abutments are weakened by their own decay, by the smallest damage, by many causes in fact, and the arches, on the contrary, retain their full destructive energy to the end. Let us hope we shall carry the reader with us in attempting, in very few words, to describe an actual instance.

The tower is at the junction of the choir and transepts, supported on four great arches. The transepts and some portions of the church westward and eastward of the cross remain as originally built; but with sundry alterations, structural and decorative, in the part eastward of the tower. About one-half of the original length of the Norman sanctuary,—(or choir, as we will call it, distinguishing the part westward of the tower up to St. Cuthbert's screen as the *ante-choir*),—seems to have been left standing when the remainder further eastward was demolished on the commencement of the reconstruction, in the thirteenth century, of the whole eastern portion of the church. The Norman nave of the choir had an apsidal end, and probably continuous side walls. Communication, with the north and south aisles and the apsidal chapels on the east sides of the transepts, was secured by openings in the walls in the *first bay* eastward of the tower. This opening on the north, (to which side only we need refer at present), has been closed up; a stone segmental arch being formed on the aisle side, the recess about 4 ft. deep, and the filling in on the choir side about 16 in. thick. At some period an arched opening was formed in the *second bay* eastward of the tower. This was, till the works now being carried on were begun, framed in with the modern panelling that lined the walls of the choir to a good height; and so the aisle was screened from the choir. In this panelling was the doorway leading into the choir from the aisle. The *third bay* eastward contains the sepulchral chapel of Abbot Thomas de Ramryge (near Kimpton, not far from St. Alban's; abbot from 1492 to 1524). The lines of the blank arcade, which had previously been treated here similarly to the blank bays—(with arched recesses only)—to the west of it, are stated to have cut through the wall and the portion below removed, so as to give the varied outline of the canopy of the monument the advantage of being seen

against an open arch. This Ramryge chantry is one of the four very noticeable constructions that occupy the spaces under arches at the sides of the choir, and the Saint's Chapel, or Foretory, further to the east; the others being the Chapel of Abbot Wheat-hampstead (died 1460), exactly opposite to that of Abbot Ramryge, on the south side of the choir; the monument* of Humphrey, Duke of Gloucester (died 1447), in the south-east bay of the Saint's Chapel; and the well-known oak watching chamber of such exquisite design in the corresponding north-east bay. The Ramryge chantry is remarkable for its elegant decoration and the homogeneous character of its design. It is internally about 6 ft. 6 in. by 12 ft., and divided into four bays. The fan-vaulting almost necessarily omits to suggest its construction in its design; but its four-centred cross-arches and diagonals, the flat upper curves being continued to small central pendants, give it a completeness of form that, if imagined to be wrought out of a single stone, is all that could be wished for in such a bison. The brightness (so to speak), of the aspect of the vaulting, results from the variety of form, as well as multiplicity of details. A treatment such as that of the vault of King's College Chapel, with extended conoids, would have been comparatively monotonous among the tiny sparkling shapes here, especially as the proportion of the bay is about 2½ to 1, instead of 1½ to 1, as at Cambridge. In order to guard against the possible disturbance of the ceiling, (the pseudo-vault, as it might be termed),—whose gem-like character has led us a little out of our way into the above criticism;—upright posts, capped with haybands, have recently been placed under the central stones.

In the western jamb of the arch in the *second bay* from the tower,—in which was the doorway leading from the north aisle,—cracks began to show themselves some time since, and increased as they were subjected to careful examination. The internal disorganisation was showing itself on the surface. The great lateral thrust of the tower arches,—they have spans of about 25 ft. by heights of about 60 ft.,—had found out the weakest point in their abutments. The wall had been lacerated in the course of the obliteration of old openings, and the formation of new—with what prove to be imperfect and insufficient piers. The destruction of some considerable thickness—19 in. Messrs. Backler say (p. 57)—of the wall in order to increase the width of the choir by forming the arched recesses at the time of the thirteenth-century alterations had removed the strong and regularly built tile-work forming the face of the wall. The results had, no doubt, been slowly operating within the bulk of the piers,—until the process, hitherto hidden from view, had been carried so far that the outside of the piers were reached. The unsleeping activity of the arch, the struggle between the buttress and the mass to be sustained, receive here only another illustration; as does also the very obvious maxim,—always, however, so much more vividly apprehended when demonstrated afresh by "the inexorable logic of facts"—that preventive measures should be taken in any doubtful case long before obvious failure compels attention.

It has now become necessary to restore, and considerably more than restore, the preponderance of the forces of resistance; and, perhaps, also to restrain to some extent by bands and ties the natural tendencies of the weighted arch to act laterally on its supports. The weak piers of

* In "A History of the Architecture of the Abbey Church of St. Alban." By I. O. & C. A. Backler. Longmans, 1847. A book to rejoice in! But with the sadly too-frequent defect,—the want of an index with plenty of cross references. Why is this often a desideratum in architectural books (as well as others)? Is it that the good servants of us all, that set themselves labours, take a sly pleasure in setting the lazy world a task?

* Hearne,—"Antiquities of Great Britain," London, 1807,—alluding to this monument, says,—"In the chancel is the vault discovered in 1703, at which time the body was entire and in strong pickle" ("embaïmed in fluid in which it lay,"—Dr. Nicholson's Guide, p. 10). Hearne's book, however, has descriptions in parallel columns, in English and French, after the manner of (rather too) many polyglot art-books. The translation, clearly to avoid any supposed want of stateliness in the last English phrase, says,—"Dans le chancel est la voûte découverte en 1703, alors le corps de l'écluse étoit tout entier, et même en bon état."

the second bay have been in great part rebuilt. The wall above was needed through the tympanum of what we have called the blank arcade, and supported at other points by timber framework and shoring. Brickwork in cement, with bonding layers of stone at intervals, was carried up slowly, and allowed to stand from time to time for settlement. This has been done both on the eastern and western sides of the lower arch (in which was the doorway), and the arch itself has been thoroughly reinstated, and raking shores put against the western intrados,—starting up from the foundation of the eastern pier. In the necessary course of investigation into the general condition of the tower, trenches have been dug out, and parts of the foundations laid bare. The south-east pier of the tower reaches down not quite 4 ft. under the choir floor; on the gravel soil there is a bed of flints, then a course of large flat tiles, and the structure is fairly started. This foundation is apparently not widely different from that found in some other portions of the church, as ascertained (p. 11, *et seq.*) by Messrs. Buckler. The south-west pier has large, level-bedded stone blocks, carried to a greater depth.

The removal of the wall panelling, &c., has brought prominently into notice the special mutilations that the piers of the great arches have suffered by the hacking away of the lower parts of their face pilasters; the upper parts are now "pendent 20 ft. from the pavement, rudely sloped off, because, no doubt, hidden by the canopies of the stalls, for the sake of which the alteration had been made" (Buckler, p. 69). Cracks now show themselves in several places in the lower portions. Here also the strong external lining which was intended to hold together the less perfectly-formed core, had been stripped off entirely. The uninjured upper portions of the piers, now projecting a distance of about 2 ft. 3 in. from the faces below, are sustained in their places by the more natural corbelling due to the bonding of the materials, and by the cohesive force of the mortar.

From the raw flayed surfaces of the north-east pier, a fine powder continues to fall down, covering all the ledges below with dust, and gradually forming quite a little heap on the floor.

Whole balks of timber have been lodged in holes in the piers at the springing of the arches, and in two positions below, so as to divide the height into three about equal quantities. The eastern arch has been centered; three sets of uprights (six in all), carried up under the horizontal timbers, afford bearing area for direct support in the middle, and by raking and other bearings to the ends of the beams at the springings of the arch. The other arches have also been shored somewhat similarly. These arches "consist partly of stone, are perfectly shapen, and exceed the semicircle, a figure which improves their appearance" (Buckler, p. 40); but of course with their dimensions the central portions are very nearly horizontal for about 3 ft. or 4 ft.; so that no precautions are wasted that may help them in case of local weakness. The restoration of the missing portions of the pilasters is now being made. With these ponderous struttings and centerings above, parts of the old work can be temporarily displaced without too strong a sense of risk—in order to insert the bonding bricks and blocks of stone that are to bind together the new and the old supports. The original foundations of the pilasters in question stand in the opened trenches, quite sound and sharp (for about 15 in. in height against south-east pier).

The arched recess which has been mentioned above, in the first bay to the east of the tower, has been blocked up solid with brickwork; the corresponding opening on the south being also filled up, the walls in this bay are, at any rate, *without vaults* at their bases. The work put into the recess on the north side must be seen to be thoroughly realised. From it may be obtained, on the most cursory examination, some impression with reference to the really terrible weights that are acting outside the limits of the areas of the detached piers. And yet these piers are of no trifling size: the detached ones, N.W. and S.W., are 15 ft. 9 in. long by 14 ft. N. to S., giving a net superficial area of over 150 ft. To the fine breadth of every part resulting from such dimensions is due much of the majestic air of the Norman interior.

Just by this now blocked-up recess is the internal angle, formed by the main pier and the wall; in this angle may be seen a considerable fissure—another indication on the surface of the tendency and some actual movement eastwards.

In many other portions of the building signs of dilapidation may be found; but those due to, or affecting, the central tower, have only been noted. The lines of the jointing, in the Ramryge chantry ceiling, are now marked far too vigorously by the drawing apart of the stones. In the south-west corner, the masonry of the walling is torn and split;—the tower pressing eastwards! The transept walls severed so thoroughly, both in the triforium and clearstory by passages, might be expected to lend themselves readily to minor dislocations. Very irregular stress on different areas of bearing piers,—ponderosity, and something like tenacity, side by side, are not favourable to the perfectly equable action that averts settlements. Each of the four sides of the transepts shows dislocation—not of yesterday. A more violent development in the north-east bay of the north transept, resulting in a bold fissure, from the ceiling to the string below the triforium, is, doubtless, however, an incident in the recent struggle of the great tower to derive aid outside its immediate supports. The north-east angle of the transept has displaced the pavement at its base, and separated itself from the wall over the large north window. This pier was probably not improved by being altered, and detached from its cross-wall, by the thirteenth—and again by the fifteenth—century alterations.

The reduction and partial and total obliteration of the Norman piers have been practised apparently with almost the same energy and delight in every succeeding age. The re-buildings necessarily involved much thorough destruction. But in the parts—nominally allowed to remain as they had been—there are cuts, gashes, parings, scoopings, lopings, and burrowings that indicate all the various virtues and vices between dulness and temerity. The destroyed face pilasters of the great tower of which we have spoken, had a superficial area of fully 10 superficial feet;—the eastern arch in two cuttings,—one at a man's height from the floor, the other higher. The pilasters of the other arches are cut away at a uniform level, about 20 ft. above the floor. By an odd chance, the front pilaster only is removed under the eastern side of the south arch,—a loss in this case of between 3 ft. and 4 ft. superficial. The pulpit, that stood till a month or two since at the west side of the north-east pier of the tower, has been removed, and the by no means insignificant orifice exposed, in which the timbers of the eighteenth-century sounding-board were lodged, in order that a fair type of dull and ponderous respectability might be provided with plenty of support. This hole has been of course filled up. After taking away the reading-desk from the west side of the south-east pier, on digging down, one of the strangest and least explicable pieces of work of the kind was hit upon. The internal angle of this pier has been scooped down to form a shallow cave, roughly semi-circular by the ragged material out of which it has been hewn. This splendid triumph of dulness bears no evidence as to its age or possible purpose. The cavity has a superficial area at its base of between 5 ft. and 6 ft.

In the transepts, parings have been carried out with considerable vigour and impartiality. The pilasters here no doubt interfered with the demand of wall-space for altars. In the north, five masses are cut off at heights of from 10 ft. to over 20 ft. from the floor. In the south, one pilaster just shows itself a few feet under the ceiling; the others are sliced off at the triforium string. The appearance of those in the south transept may be seen by reference to Buckler (Illustration to face p. 135). The aperture of the watch-chamber is also shown there. This remarkable little room is hollowed out of the thickness of the west wall of the south transept, in the pier immediately south of the arch of the aisle of the ante-choir. On the outside of the church, at the junction of the wall of the south transept and the south wall of the aisle, and at about 10 ft. from the ground, a little doorway (now blocked up) may be seen,—probably reached, when it was in use, by a passage on the roof of the cloisters: it led into the room, which is over 6 ft. deep from the inside face of the transept wall, by a greater dimension from north to south. The square-headed barred lights that look out into the transept, no doubt, command a very good view of a large section of the interior of the church,—obtained at the best point nearest to the monks' lodgings, and to be reached without entering the church. However, our fifteenth-century friends, in their anxiety to make the chamber of a reasonable size,—perhaps after

careful scrutiny of the bodily dimensions of some of their number,—left at the north-east corner a thickness of little more than a foot from the face of the aisle-pier. Although the room is rounded on plan like a letter γ , in order to avoid some reduction of area, the shell is, for the most part, not far different from that of an ordinary dwelling-house. An arrangement of this kind—beneath the springing of an arch, which, although relieved by the arrangement of the triforium, should carry down some considerable amount of pressure from the west arch of the tower,—seems to have been prepared with all the ceremony possible, in order to repeat, after some lapse of time, the effect of the weakening of the eastern abutments,—of which we have spoken at length above. The shaped piers on the north of the nave are very curious (apparently) early works. The side of the great pier in the southern aisle of the ante-choir was shaved down to allow a staircase to rise under it to a gallery, which was standing within the last few years. But to speak of these and all the other pieces of oddness or savagery that are to be found almost everywhere in the church would give opportunity for a series of little histories,—it is to be feared very yawn-provoking to those to whom the church is but imperfectly known.

Still let it not be supposed, however we may raise our eyebrows at some (minor) changes in the Norman work, that the judgment and skill of those to whom the building owes its present general form can in the main be impugned. It would be a pleasant task to draw on the facts and eke them out with fancy, and show that the efforts of the great building abbots were active only *after careful thought*. It might not be without interest to some who ask nowadays, What shall we do first, and why?

To many, by whom it has been often seen bare of furniture, and the scale and contrast that are given thereby, the present appearance of the nave will be a novelty. The orthodox cocoa-nut matting, hassocks, and prim rows of rush-bottomed chairs, a temporary pulpit, and a pleasing new lectern, indicate that the services are now being held here; and a couple of Gurney's stoves show that, for the first time probably in its history, artificial heat is endeavouring to subdue the chill of the long-unoccupied nave. The mass of water, constantly poured into the south wall by the earth heaped against it, seems likely, however, to supply chills and damps that sun and many stoves acting together would not soon make to flee away. But the very elegant Christmas decorations (now rapidly disappearing) recall to the mind that it is now mid-winter; and that the owners of the dainty wits and fingers that fashioned them probably placed them on the walls in a temperate room—not felt all the year round. On a dry sunshiny summer's afternoon this nave is a place to dream of!

No attempt has been made in the course of these remarks to sketch out either what should be done in the remoter future, or the immediate steps required for to-morrow's security. It is not the duty of an observer to do more than to observe attentively, and chronicle what he sees, leaving decisions and recommendations, and the responsibilities of them, to those who are in charge to direct and be responsible.

The illness of Mr. G. G. Scott has been heard of with regret in all places. His world-wide reputation,—nearly the only reputation of the kind among English architects,—and other now manifest reasons, lead many persons to regret that such great powers are not more closely concentrated on noticeable works of universal interest. However high a level may be attained by personal influence and a school of devoted followers, there is frequently little gained beyond the average standard, and this at what a cost! "*Nec Deus interit*." Here at St. Alban's, however, one can feel no question as to the worthy difficulty—for (speedily, let us hope) recovered health to face and to turn into honour.

It is no new thing to say, in speaking of the maintenance of notable buildings, that their loss will be an irretrievable injury to the *real wealth* of the country. It has been said so often, accompanied by the brandishing of subscription lists, that now it sometimes falls on ears that profess to understand such language no longer. The magic of a true enchanter is needed to reveal—among large sections of the most cultured people even, of our country—their latent hearty desire for the preservation of our national monuments. How rarely, then, do we expect an interest of this sort to have strong influence on ordinary habits of thinking and feeling! It

would be unfair, therefore, to withhold some tribute of respect to the inhabitants of the not-over-wealthy parish of St. Alban; who are upholding for themselves, and for their descendants, and for us, the parish church,—re-scaled by their forefathers from probable destruction, by its purchase a dozen generations since. In taking over the house of the royal-souled Benedictines, there would seem with part of the house to descend some portion of the spirit of its founders.

HOMES IN THE EAST OF LONDON.

JEWES AND GENTILES.

THERE is an angular piece of East London bounded by Bishopsgate-street and Norton Folgate, Commercial-street, Whitechapel-road (Aldgate), and Houndsditch. Irrespective of parish boundaries, and for brevity sake, we might call it all Houndsditch; for, indeed, a short distance behind it there exists something worse than a dead dog's ditch. Within the compass of the streets named representatives of nearly every European race may be found; and in juxtaposition perhaps the strangest element of all of power for good and ill, are the descendants of an Asiatic people. The boundary-line is marked almost by a long and uninterrupted succession of shops and warehouses, of a motley class, many of the owners wealthy, most of them thriving. Inwards, between Houndsditch and Commercial-street, there is a network of narrow intersecting streets and lanes; and these lanes are indented again, at right angles, by numerous blind courts, alleys, yards, cow-sheds, shambles, and foul waste spots. The passing traveller, who only walks adown from Aldgate to Bishopsgate, or through a few of the wide and open thoroughfares of the district we are describing, will see, perhaps, but little to find fault with. If he wish, however, to see the homes of the poor of this district, and the homes and surroundings of the small tradespeople who live by them, he must penetrate into the interior. Once through Gravel-lane, and standing in the middle of Meeting-house-yard, the nostrils will give him warning of evil. How often such a heap of ashes and abominable filth as we saw here on the day we last passed through it removed we cannot tell. Here beside us are several narrow courts, the inmates of which are breathing dangerous air. We enter Angel-court, and on each side are other courts, reeking with filth and rotteness. We stand to look around us for a few moments; and within 3 yards of us a group, of a hybrid class, breaks out in dispute, and Angel-court resounds with ribaldry and blasphemy, a meet accompaniment to the dirt and disorder that surround it. We passed from one end to the other of Petticoat-lane, and found portions of it in a very filthy condition, being strewn with heaps of refuse matter. It would be a rare thing to pass from one end to the other of Petticoat-lane (now New Middlesex-street) without either hearing foul language or witnessing a row or petty theft,—but to perpetrate a small theft in connexion with trade in that quarter is accounted "business." It matters not whether it be a poor widow or an indigent room-keeper, or the half-employed mechanic's wife, who goes out to market with her last shilling,—it is "business" to rob them in some way, either by giving them light weight or worthless articles. Christian and Jew, and Jew and Christian, are agreed in this respect, in the environs of Petticoat-lane. The miserable stone or half-stone of coal, the pound of potatoes, the dismal quarter of an ounce of tea, the halfpenny-worth of sugar, the half-loaf of bread,—in each and all of these the wretched famine-stricken poor are robbed wholesale, and systematically. Can no stop be put to this nefarious traffic? It is bad enough for the poor to live in such hovels as we have been visiting; but to be robbed of their scant earnings, as well as poisoned by foul air, and to have no redress against heartless extortioners, is hard indeed. We entered many of the narrow and dirty lanes and back-yards of the houses off New Middlesex-street; and, keeping well within the bounds of truth, we must say that their condition is an abomination. Indeed, the majority of the narrow courts on each side of this street, and branching therefrom, are in a bad state. In Love-lane, and leading thence, we found numerous heaps of dust and night-soil lying along the street, and the back-yards, where we could gain an entrance, were in a wretched state.

We penetrated the majority of the inner streets and courts of this district, only to meet with increased filth; and we saw hardly any apparent

effort made by the local authorities to keep them clean. A few leading streets were, indeed, in tolerable condition; but we had only to step aside, and a few yards brought us into the midst of dirt and wretchedness. To give a picture of the many impoverished homes we looked into would prove a sad recital. A mother and several small children were generally to be found. The mother had enough to do in keeping the house and children clean, and herself dirty. The husband was out at work, or in search of work, and the pawnshop was the only resource, or otherwise the workhouse, skum shed, or stone-yard, to make ends meet, "until something turns up." These were common pictures to be met with in our travels. Talk to many of these poor people about their health, and they are hardly conscious that there is anything the matter with them. Some of them will tell you that they have lived in the neighbourhood "a long time." They are very pale and drowsy, and have a touch of a headache. They do not know why. They were not able to eat anything with their cup of tea that morning, but they console themselves with the thought that they often felt that way before, and that "it will pass off." A mother complains that the child has not taken milk since the evening before; that it cried all the night, that it cried all the day, that she has lost her own rest, and that the father has not closed his eyes all the night either. Simple people, their infant is dying by inches, and they do not know it.

We found sickness and want, raggedness, and semi-starvation, in many a lane and court. Some were receiving out-door relief; others, who had seen better days, though in dire want, shrank from seeking it. With occasional assistance from relatives better off than themselves, and intermittent occupation, they struggle on. London, with all its mighty magnificence, wealth, and luxuries, is but a desert to them.

Let the naked and harrowing facts be known, that in all quarters of the east of London many of the poor are not only starving but they are dying of starvation,—dropping to the earth like rotting sheep, through disease and want of food and clothing. We could cite the sad particulars of such cases, east, south-east, and north-east of the City. We come across this utter want, this living death, in Wapping, Shadwell, Bethnal-green, Shoreditch, Spitalfields, and in the district we are now describing. We can speak of cases, to our own knowledge, where men and women have laid them down to die, and even with the death-rattle in their throats, have refused to be removed to the workhouse.

In Anne-street, Wentworth-street, Goulston-street, Bell-court, Fryingpan-alley, Petticoat-square, Coxson's-square (do we spell it rightly?), and many of the blind courts abutting and adjacent, the filth we encountered was intolerable,—not in hovels, but in barrowfuls, scattered about. The backyards of the houses were also in a foul condition. Coxson's-square was one dunghill, one inner arsement of abomination. It would seem that the backyards here, wherever there are any, were literally emptied out into the middle of the square. Were it a hot summer day instead of a cold wintry one, the absence of dire illness could only be accounted for by a miracle of Providence. Brothels are plentiful near to this unwholesome district. To what vestry the looking after of this locality belongs we do not stop to inquire; but it was in the condition we state on the days of our visit.*

To effect an improvement and prevent future outbreaks of contagious diseases, we fear it will be absolutely necessary to pull down a number of the wretched and closely-packed tenements behind and in the vicinity of Petticoat-lane. There is more open space required, and a greater facility of ingress and egress needed. Cleansing operations can only be performed with a difficulty, and perhaps it is owing to those reasons that the scavenging and the removal of the filth are here so long delayed. It would be a mercy

* Perhaps it may be interesting to many of our readers to see an enumeration of the class of persons who are located in the low dens and lodging-houses in the district under notice, and in the outlying neighbourhood, extending into the heart of Spitalfields. There are costermongers, crossing-sweepers, birdcatchers, street cadgers, scavengers, rat-catchers, dog stealers and sellers, tinkers, match-dealers, old-clothes men, sailors, vendors of baked potatoes, chickweed and bird-seed sellers, tailors, bone-pickers, vendors of pea soup, umbrellas and old hat brushes, house-wreckers, ballad-singers, cheap jacks of all kinds, mudlarks, dustmen, cat-skinners, pickpockets, sewer men, apple and orange dealers, fish-sellers, prostitutes, discharged soldiers, tramps, and cadgers of all kinds, artists of the flags in coloured chalks, and numerous other nondescript forms of beggars and impostors.

to the poor in some of the vile courts we have mentioned if they could at once be provided for elsewhere without over-crowding.

There is an important question that we would put to the authorities. How much longer are the shameful saturnalia enacted every Sunday morning in Petticoat-lane and its environs to continue? We asked the same question years ago. Every Sunday forenoon is disgraced by a demoralising exhibition, half market and half fair, to which congregate the riff-raff of London, and on that morning this notorious quarter is one elongated thieves' kitchen and pickpockets' hunting-ground. Surely, in the interest of law and order to say nothing of religious observance, this ruffianly Sunday morning's carnival ought to be suppressed.

How are the poor in these wretched localities, which it is a painful province so often to describe, to be lifted up,—saved for their own sake, and for the national credit? We may establish soup-kitchens by the hundred, and evangelise hourly, but until we improve their homes and ventilate them by draughts of pure air,—until we give them good water in abundance, and make it penal on all huxters and traders to fleece and poison them,—we shall not effect a permanent reform. What is the use of sanitary inspectorships if hundreds of back streets, courts, and lanes are left for days,—nay, weeks,—uncleaned? Of course, a sanitary officer or a medical officer of health cannot of himself make them clean, but he can report their existence, so that the ratepayers, the vestry, and their contractor may come to terms about the matter. A far more close surveillance and supervision are necessary to effect what is absolutely desirable. Cleanliness is a part of education, and if education is to be compulsory, so must be home and personal cleanliness as a component part of it.

Many of the Jewish homes in the district under notice are not in much better condition than those of the Gentiles, and accounts vary as to their general character. We are speaking now of the low class of Jews, not the well-to-do. The Gentiles put down the low class of Jews as an unclean lot, and the others retaliate. We must allow for antipathies on each side. As traders, to make what they can is their policy. To cheat an uncircumcised Christian, amongst a good many of them, is to do no wrong. They will ask an exorbitant price, and take it, if they can get it, without scruple; and the Christian huckster next door to them will play the same card. As a class, however, the good ones of them stand nobly by their own order; and of late years they have cabered and organised relief for the support of their own poor. Their footprints are deep in the City's soil, their history is written in our municipal records, and more than one legible tablet and stony fabric, uncrumbled by time, bear testimony to their struggle and their worth.

Before leaving the neighbourhood of Houndsditch, we would impress upon the local authorities concerned the absolute necessity that exists for giving careful inspection to the network of lanes and courts in this quarter. During the prevalence of contagious diseases, like fever and small-pox, daily inspection and cleansing are a necessity. And we cannot but think that those rag-fairs, old-clothes exchanges, and rag and bone shops are nurseries of disease. If we would raise a nation or its people, we must begin as we would in building a house,—at the foundation. Houses are not built downwards.

MOSAIC REREDOS FOR THE CATHEDRAL AT ST. DAVID'S.

A CRUCIFIXION, with figures typifying the Jewish and the Christian Church, one on each side, the whole occupying three large pointed-headed panels, has been executed in mosaic by Messrs. Salviati from cartoons prepared by Mr. Powell, of Birmingham, under the direction of Mr. G. G. Scott, and is at present to be seen at No. 9, Conduit-street. Mr. Powell's cartoons are also there, and it is obvious that the mosaicists have carefully and cleverly reproduced the forms. The general effect, however, is less satisfactory in the mosaic picture. Although in the cartoons the subjects show light upon light, the texture is different, and more contrast is obtained than is found in the mosaic transcript, which seems to us pale and spiritless. For the design itself we are not able to express any admiration: huge streams of blood pour from the hands, and from the feet two equally violent streams unite in one which is caught in a chalice. The whole thing is *outré*

and unsatisfying; we can get no pleasure or profit out of it, and cannot resist the impression that this is not the sort of work that the nineteenth century should be doing.

ON LIMES AND CEMENTS.

In Colonel Scott's first lecture on this subject, delivered before the Architectural Association, in their Rooms at 9, Conduit-street, the lecturer commenced, by directing attention to the comparative ignorance which exists on the subject of mortar-making. He said,—The process itself is generally relegated to the labourer, while those in charge of the building-works rarely pay much attention to this branch of them. There is at the present day an almost universal confusion, for instance, in the minds of builders between the quantity of sand which a lime will carry, for the convenience of the bricklayer, and that which will best conduce to its resistance to destructive influences. The poorest descriptions of limes are commonly spoken of in the building trade as of first-rate quality, if they "come cheap" to the contractor, and enable a large quantity of work to be done with a small quantity of the most expensive ingredient of the mortar. The mode of preparing the mortar is as slovenly and inefficient as could possibly be, the labourer having but two objects in view; the one to save himself as much trouble as possible, the other to satisfy the mason or bricklayer for whom he is working. The quantity of sand is thus to a great extent a matter of chance, and the proportions best suited to various kinds of lime are disregarded. Limes themselves vary greatly in their applicability to the purposes of the builder; white chalk limes being much less fitted for mortar-making than those burnt from the lower or grey chalk. Some beds of the latter, which would yield the best limes, are not even burnt at all, owing to the ignorance which prevails on this subject.

Knowing the want of information which exists, and feeling how difficult it is to take the first steps in the acquirement of practical knowledge in any branch of human industry, I have readily consented to bring under your notice certain facts connected with limes and cements, which I have made my special study, and for the acquirement of which I have had unusual opportunities. If in my examination of the action of these materials I have met with some matters which may be of use to you, it will give me the greatest possible pleasure to communicate them as far as I may be able, trusting that the aim of your society for mutual improvement may be my excuse for thus becoming, as it were, a teacher. It may not be uninteresting, before commencing the course of lectures, though at first sight it might seem egotistical, to describe the manner in which my own attention was first drawn to the subject, and in what way it has since been compelled to remain upon it.

In the early part of my career I found myself at Gibraltar in charge of works in which both lime and cement mortars were largely used. We had to remove a revetment or retaining wall of Spanish construction, which was filled in behind with fine sand to form the rampart. The foundations for the new wall had to be carried below low water-mark and some 10 ft. or 12 ft. below the old Spanish wall, which stood on a shaley substance of dark colour. On commencing work, after a damp and muggy Sunday, as soon as the men were in the foundations, that which had been a hard shaley rock on the Saturday suddenly gave way, and the sand which was behind the revetment poured in on the men and buried them, but fortunately not to such an extent as to cause a loss of life.

We were none of us chemists enough to understand, at that time, the cause of the deliquescence of the shale,—for no other term than deliquescence can be applied to the entire breaking up of the rock under the action of air and moisture. On my return, however, to England, I began to study chemistry, and then found that this peculiar action was due to the decomposition of the sulphide of iron present in the stone, with the formation of the soluble sulphate of iron or green copperas; and that the rock itself, when burned, gave a quick-setting cement, and would have answered very well instead of the Roman cement which was brought from England for these very foundations, at considerable expense. The captain with whom I was associated in these works had a good practical knowledge of cements; and I may quote, by way of illustra-

tion, a test he made use of to ascertain the quality of this particular material. When the barrel was opened, he would thrust in his hand; and if the cement felt warm, he assumed that it was good; but if cold, he concluded that it had been spoilt on the voyage. This test really only proved (if it was warm) that it had not been quite spoilt, and that was all. Several years later, while making some experiments with the Plymouth limes, in the course of which I found an excellent hydraulic lime among some beds generally rejected for burning, I discovered certain curious effects produced by burning the stone in a dull fire,—I found, in fact, that the lime burned in this way, in lieu of slaking and heating, as I should have anticipated, when reduced, mechanically, to a fine powder, and treated with water, set into a solid mass. I consulted Professor Faraday respecting this phenomenon, and we eventually came to the conclusion that this change in its behaviour was due to the formation of some form of "carbonate of lime." After many experiments, I ascertained that the action was really due to the presence of a small quantity of sulphate of lime, resulting from the oxidation of sulphurous acid, arising from the fuel, which had been mixed in along with the lime in burning. This singular effect, which sulphuric acid or any soluble sulphuric acid-compound has in impeding the slaking action of quick lime, I shall not enter upon at present. I may mention, that when I pointed out the fact to Dr. Miller (my master in chemistry), he could hardly believe it possible that lime had been used during 4,000 years without the discovery of such an apparently simple reaction. You will, perhaps, allow me to allude to another instance, and it is only one of many, in which I have found a knowledge, a chemical knowledge, of the nature of limes and cements useful to me and others. Many of you will, doubtless, have heard of Barrow lime. The Leicestershire Barrow lime is one of the best limes in this country, and it has, I hear, been specified by Mr. Street, for the foundations of the New Law Courts. The manufacturers, Messrs. Ellis & Sons, send out both lump lime and ground lime. The stone (of the lias formation) runs in beds of small thickness, and of irregular composition, separated by deep layers of clay. One thick bed of stone, I mean thick by comparison, for it is only about 11 in. deep, is a bed, richer in clay than its neighbours, locally called "Rummel" and this, when sent into the market, mixed with the other beds, not so rich in clay, shows itself sluggish in slaking. Now, builders, and I have no doubt engineers also, looked upon this as a defect, though, as you will learn by-and-by, it is not really so from the engineer's point of view, whatever it may be from the contractor's. Again, adhering to the outer surfaces of the stone at its junction with the clay, there are certain shaley layers called the "sculls," which are chipped off from the stone before it is burned, to avoid discolouration of the lime, and perhaps, also, its rejection, if sent into the market in this condition. Among the beds of irregular composition above alluded to were also some called locally "Good-for-nothings," and from the term you will understand how little they were appreciated as a source of profit to the manufacturer. Now, formerly, when ground lime was needed, it was usual to grind up the lump lime from the thick beds, whereby, no doubt, an excellent lime was obtained, but at the cost of the best lump lime. At my suggestion, after visiting their quarry, whenever ground lime was asked for, Messrs. Ellis ground together the "rummel," "good-for-nothings," and "sculls," and by this means produced a lime which, for concrete and water work, is far superior to the lump lime which the quarry yields. In fact, the good-for-nothing beds contain a mixture of cement and hydraulic lime in this layers; the rummel bed is a lime of intermediate character, which is almost a cement; the sculls actually yield a cement. One fact in connexion with this incident, and which greatly redounds to the credit of the Messrs. Ellis, is that shortly after my visit, and entirely unsolicited on my part, they wrote to say that my suggestion would turn out very much to their advantage, and that they proposed to pay me 1s. per ton for seven years on this ground lime.

This they have now done, upon a constantly increasing quantity, for six years, and I only regret that the term expires next Christmas. I must yet give you another instance in illustration of the prevalent ignorance of the chemistry of lime. I have within the last few years seen, on two occasions, large quantities of grey or (to

the best of my belief) lias lime thrown into the Serpentine, in Hyde Park, for the purposes of purification; and I am certain that during a hot summer, some six years ago, large quantities of grey lime were thrown into the Thames for a similar purpose. Indeed, a grey lime manufacturer told me that he was supplying the lime for the Thames very freely; and when I asked him why they did not get the white chalk lime from Gravesend, which contained about 15 per cent. more of the material they wanted, viz., the lime, and was 2s. per ton cheaper, he replied,—"That is their look out; my business is to sell lime, not to teach my employers chemistry."

I have occupied some time in these illustrations of the want of knowledge which prevails on the nature and properties of lime, in order that I may impress upon the younger members of this Association that there is really something still to learn on this subject.

I now proceed to the second head of my syllabus,—the substances concerned in the preparation of mortar; and I must refer you to the table which I have prepared, to keep before you their names. This table gives the names, chemical equivalents, and symbols of the materials most frequently to be found in limes and cements:—

Name.	Symbol.	Equivalent.
Quick Lime	CaO	28
Carbonic Acid	CO ₂	22
Water	H ₂ O	9
Oxygen	O	8
Magnesia	MgO	20
Silica (Silicic Acid)	SiO ₂	44
Alumina	Al ₂ O ₃	51
Potash	K ₂ O	47
Soda	NaO	31
Sulphuric Acid	SO ₃	40
Iron (Protioxide)	FeO	36
" (Ferrous)	Fe ₂ O ₃	80

The materials with which we have more especially to deal are nearly all of them represented by the substances shown on this table or by their action between themselves. Thus, if we take as primary substances CaO, CO₂, as carbonate of lime or chalk, CaO, SO₃, as sulphate of lime or gypsum (which when burnt forms plaster of Paris), or CaO, SiO₂, which results from the calcination of limestone containing silicic acid, we may have as secondary combinations:—

MgO, CO ₂ , and CaO, CO ₂	Combined to form Dolomite.
Al ₂ O ₃ , Fe ₂ O ₃ , KO, NaO, and SiO ₂	Combined to form various Clays.
And Borax or some equivalent as NaO, SO ₃ , added to CaO, SO ₃	Forming Parian and such-like Cements.

In speaking of the origin of these substances it is not my intention to enter into any geological theories as to the mode in which the crust of the earth was originally formed. It will be sufficient for my purpose to consider only the latter geological changes which are taking place before our eyes. In the one place older formations being broken up, as in the case with the decaying granite, the Cornish stone of Cornwall; in another, mechanical deposits taking place on an enormous scale, as, for instance, the deltas of many of our rivers; then the gradual building up of whole islands and continents by such minute organic beings as the coral; and lastly the stalagmitic and stalactitic formations which are to be seen in our limestone caverns.

The rocks, which are supposed to constitute the older formation of the globe, consisted of silicates of lime, alumina, magnesia, protioxides of iron, manganese, &c. Such is the constitution of the decomposing rocks or granite to which I have alluded, in illustration of what I am about to say. Such silicates are decomposable by acids. The rains, which descend from heaven, absorb the carbonic acid resulting from volcanic action, and from every description of decay or combustion of organic carbonaceous matter; and this acid, minute as is its quantity in respect of the whole atmosphere, when acting over long periods, is enabled to bring about wonderful changes in the appearance of the earth's surface.

We will take, for instance, the silicate of lime, and see what may become of it. The first step is, that the carbonic acid of rain-water decomposes the silicate with the formation of carbo-

nate of lime which is deposited, while the silica is set free in a very soluble condition. The two are, by means of some river, washed down into the sea, and are there in part deposited at the sea bottom, and in part remain in solution. The part which is deposited may harden into beds, and these beds at a future time, after they have been elevated by volcanic action above the surface of the water, may be quarried by a future generation of lime-burners as a hydraulic lime. If previously to its upheaval the deposit is subjected under pressure at the sea bottom to the action of volcanic heat, the stone will take a crystalline appearance; if not, it will remain earthy in fracture. Should silicate of alumina and iron be washed down at the same time and deposited with the carbonate of lime and silica, instead of a white lime, as in the first instance, we may have from burning the mineral, a buff-coloured substance like *lilas* lime, or a brown one (the colour depending on the quantities of iron and manganese present) like Roman cement. Or if we turn our attention to that portion of the decomposed silicate of lime rock which remains dissolved in the sea water, we shall find our limestone rocks made for us in a very different and very surprising manner. Did you ever consider where oyster-shells came from? They are undoubtedly derived from the minute quantity of lime which is dissolved in sea-water, which amounts to only $\frac{1}{1000}$ part of its weight. But the oyster is a wonderful pumping machine. We speak of "drinking like a fish,"—drinking like an oyster would be a more expressive phrase. It is now well known that in *testacea* there is a continual current passing forward from behind within the mantle. Supposing, now, that the oyster abstracts the whole of the carbonate of lime from the water passing through it, which is highly improbable, the quantity of water required to furnish an oyster-shell would be something like 50,000 times the weight of the shell. The quantity is very interesting when we compare it with what a man imbibes. In a life-time of seventy-five years it has been computed that a man would not pass through his body more than 1,000 times its weight of water. An oyster in the same time would have got through many thousand times the quantity required by the most thrifty mortal, notwithstanding the difference of their bulk; and yet it has been calculated that 332,539,000,000 oysters could obtain their shells from the soluble carbonate of lime carried into the sea by the Rhine alone in one year.*

COTTAGE HOSPITALS.

Shaftesbury.—The premium offered for the best design for a Cottage Hospital as a memorial of the late Marquis of Westminster, was twenty guineas. The cost of the hospital to be 800*l*. The general arrangement of the ground plan of Mr. Corby's design, selected, consists of central porch and vestibule, double and single wards, convalescent-room, bath-room, kitchen, and necessary offices. On the first floor there are two double and one single

wards, with nurse's room, and the requisite conveniences. The style adopted is Domestic Gothic, of the sixteenth century. The elevations have local green stone walling, with Box-ground dressings, the entrance doorway, with oriel window in gable, forming a central feature, and the side walls pierced with square-headed mullioned windows. The roofs are covered with plain brown tiles. The site selected has a southern aspect, is near the public walk, and overlooks the park and valley of Blackmoor. This site is the gift of the Dowager Marchioness of Westminster.

Walsall.—The annual meeting of the subscribers to the Walsall Cottage Hospital took place at the hospital. The secretary (Mr. S. Welsh) read the report, which set forth that last year there were 139 in-patients and 2,318 out-patients. Of the former 99 were cured, 16 relieved, and 10 of whom were in a dying state when admitted, died. All the out-patients were either cured or relieved. During the seven years upwards of 11,000 individuals had derived direct benefit from the hospital. As a proof of the superiority of the principle upon which the institution is conducted, it was mentioned that while, in the hospitals conducted on the old principle, the deaths after amputation are as high as 15 per cent.; yet in this hospital there has been only one death from pyæmia, and although upwards of 100 amputations have been performed, not one has terminated fatally, and no contagious surgical malady has ever existed in the hospital. The committee also expressed regret that they had not been able to open a dispensary in connexion with the hospital. The chairman stated that the receipts had reached a total of 650*l*., or about 70*l*. in advance of last year, and the disbursements to 652*l*. 3*s*. 9*d*.

DWELLINGS FOR THE POOR, CHEQUER-ALLEY, ST. LUKE'S, MIDDLESEX.

The mass of wretched, though profitable, property which lies between Bunhill-row on the east and Whitecross-street on the west is perforated by numerous narrow alleys teeming with struggling life; the houses are mostly dilapidated hovels without ventilation, and ill calculated to produce a healthy, vigorous, and virtuous population. One of these lanes, entered by a passage-way not the height of a man, in Bunhill-row (where Milton died), just opposite Bunhill-fields Burial-ground (the great plague-pit, and the resting-place of John Bunyan, Daniel Defoe, and the painters Blake and Stothard), runs the whole length between the two main thoroughfares we have named, and has long been known as Chequer-alley. Towards the Whitecross-street end of this alley some houses have been cleared away under Mr. Torrens's Act as unfit for habitation (it is to be hoped that others will soon meet the same fate), and here on a much too confined plot of ground the owners have been induced to build, under the direction of Mr. Joseph Niblett, surveyor to St. Luke's vestry, a block of houses for the poor. Some power seems needed to enable authorities, when various small plots are

cleared, to make one general arrangement so that proper approaches and openings may be formed. If each small site as it is cleared is to be again covered with houses, present evils will be perpetuated and little lasting good be done.

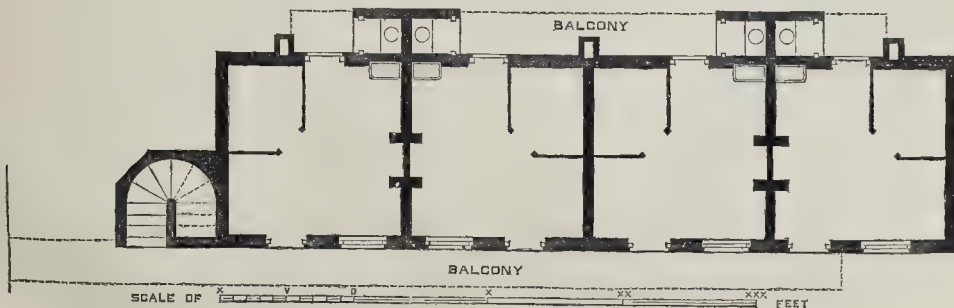
The object of the designer of the block of new dwellings, to which we are now referring, was to provide accommodation for the very poor. The block is three stories in height, with four tenements on each floor, as shown by the plan we give of one floor. Access is obtained to the two upper floors and to the roof by a staircase at one end leading to a balcony that runs along the whole front. In addition to the twelve tenements thus provided, there are three more tenements, one above another, close to the staircase end of the main block, and which are reached by the same balcony. The buildings have been erected by Mr. Allen, some of whose patent materials and appliances (concrete stone for lintels and steps, &c.), are being used.

Each tenement consists of one room, 13 ft. by 13 ft., and about 8 ft. 3 in. high, provided with a cottage range, patent sink, and water supply. The back door opens on to a balcony, to which no one but the tenant has access, where there is a W.C. and dust-shaft for that tenant only. Within the room is a bed space, enclosed with a low partition.

On the roof, which is flat, formed with concrete and iron, a washhouse is provided, having coppers, washing-troughs, and water supply, giving accommodation for the tenants, while the flat roof is available for drying. This of course is an advantage, as there will be no necessity to lumber the rooms with washing-pans, nor to render them unbearable with the fumes arising from washing and drying in them, now common on the poor woman's "washing-day."

Each room has light and air admitted at back and front, and thorough ventilation. A narrow piece of perforated metal, at the top of each window opening, admits of the window being opened a few inches without any draught. The closets are ventilated, and all the water from the sinks, roof, and washhouse is made to go through the soil-pipes, and these are left open above the roofs.

The cost of the fifteen tenements (irrespective of land), is stated to be 1,237*l*.; the rent asked is 3*s*. 6*d*. per week for each dwelling: so a fair percentage on the outlay may be expected. Externally the buildings are of brick, with red bands, cornices, &c., and are sufficiently sightly. It will be obvious that the cost of enclosing one room with brick walls is greater proportionably than would be the case if there were two or more rooms on each floor separated by partitions. It is not agreeable to contemplate the confinement of a man and his wife, with any grown-up children, to a single room, but the fact remains that there is a large class of persons unable to pay the cost of more, even if for that, and in these new rooms they can at any rate command ventilation, the ready removal of dust and dirt, the means of washing without annoyance, a handy supply of water, and private closet accommodation, the last an item of great importance; so that the advantages afforded by them, as contrasted with the evils of the dens at present in use, are undeniable.



LODGINGS FOR THE POOR, CHEQUER ALLEY, ST. LUKE'S, MIDDLESEX.—PLAN.

* The remainder hereafter.

THE WORKS OF THE LATE MR. LEWIS VULLIAMY, ARCHITECT.

We have already briefly mentioned the death of Mr. Lewis Vulliamy, which took place at Clapham-common, on the 4th of January, and we are glad now to be able to place on record a list of his works which was prepared by himself not very long before his death, at which time he was eighty years of age. Mr. Lewis Vulliamy was a son of the celebrated clockmaker of that name in Pall-mall, and was an articled pupil of the late Sir Robert Smirke, then Mr. Smirke, of Stratford-place. He was a life student of the Royal Academy, having attained all the honours, concluding with the travelling studentship, and studied his profession for some time amongst the ruins of antiquity abroad.

He was in practice about half a century, and the day before his death had drawings placed before him for approval. His professional career may fairly be considered very successful, due equally to his ability and his industry. He set the example in that respect, and took care that every one in his office followed it. He was well known to be peculiar in his notions, and many odd anecdotes are related of him.

Several of his works show great architectural skill and peculiar knowledge of construction: he possessed remarkable ingenuity both mechanical and mental. It is important to observe that in consequence of the particular attention which he personally contributed to all the details and the cost of every item, it happened but very seldom that any of his works exceeded the amount of his estimate.

Amongst his pupils may be named Mr. Owen Jones, Mr. W. Wright, and Mr. F. Porter. Mr. C. F. Maltby, who was associated with him more or less during a period of forty-three years, is one of his executors. Dorchester House, Park-lane, and Westonbirt House, Tetbury, Gloucestershire, both belonging to Mr. R. S. Holford, were Mr. Vulliamy's last and most important works; the latter is not completed. We may add that somewhat early in his career Mr. Vulliamy published a work entitled "Examples of Ornamental Sculpture in Architecture, drawn from the originals in Greece, Asia Minor, and Italy, in the years 1818, 1819, and 1820."

We print the list precisely as left by Mr. Vulliamy, and have only to note that the letter A indicates alterations and additions, and the letter N a new building:—

- 1823. House at Limehouse: T. Thornwate, esq., London. A.
- 1824. Syson Hall: Sir J. Thorold, bart., Lincolnshire. A.
- 1825. New Library, ditto, ditto.
- 1826. Boobydy duto: J. Litchford, esq., ditto. N.
- 1827. Houses in Tavistock-square: G. Anstey, esq., London. N.
- 1827. Ditto in Gordon-place: — Humphries, esq., ditto. N.
- 1827. Ditto in Tavistock-square: J. Frampton, esq., ditto. N.
- 1828. Burslem Church, Staffordshire. N.
- 1828. St. Barnabas Church, Kensington, London. N.
- 1828. Race Stand, Whitechapel, N.
- 1828. Corn Exchange, Bishop Street, Hert. N.
- 1829. Leadenhall House: Colonel Reeve, Lincolnshire. A.
- 1829. Assembly Rooms, Wolverhampton. A.
- 1829. Ashburnham-park, Earl of Ashburnham, Sussex. A.
- 1830 to 1836. Bloxham Hall: G. Manners, esq., Lincolnshire. A.
- 1830. Chapel at Brierly-hill, Staffordshire. A.
- 1830. Norton Hall: Sir Moutage Cholmondeley, Lincolnshire. A.
- 1830. Edith Weston House: Reverend R. Lucas, Rutlandshire. N.
- 1830 to 1836. Law Institution, London. N.
- 1831. Trinity Church, Burnley, Lancashire. N.
- 1831. Habersham Eaves Church, ditto. N.
- 1831. Woburn-square, ditto, London. N.
- 1831. Richmond Rectory, Surrey. N.
- 1831. Highgate ditto, Middlesex. N.
- 1831. Sydenham ditto, Surrey. N.
- 1832. Wordley ditto, near St. Urbridge, Staffordshire. N.
- 1832. Rockhill House: — Nix, esq., Sydenham. A.
- 1832. Waverley Church, near Rochdale, Lancashire. N.
- 1832. St. James's ditto, Park-hill, Clapham. N.
- 1832. Leigh Park: Sir J. T. Staunton, bart., Hampshire. A.
- 1832. Ditto Lodge and Library, &c., ditto, ditto. N.
- 1833. Spotland Church, near Roedale, Lancashire. N.
- 1834. Tolmorden Church, ditto. N.
- 1834. House at Richmond: S. Pantor, esq., Surrey. A.
- 1834. Allshouses at Richmond, ditto. N.
- 1835. St. Catherine's Chapel, Lancashire. N.
- 1835. Wordsboro House: — Bevan, esq., Twickenham. A.
- 1835. Queensbury Villa: Sir W. Dundas, bart., Surrey. A.
- 1835. Tayfords House and Stables: G. Frere, esq., Hertfordshire. A.
- 1835. High Beech Clappe, Essex. N.
- 1836. Burnley Church, Lancashire. N.
- 1836. Fno Park, Earl of P. Harrington, Ireland. A.
- 1836. Whilgh House, G. Curthope, esq., Sussex. A.
- 1836. Villa at Twickenham: J. Weld, esq., Surrey. A.
- 1836. House at Richmond: J. Ward, esq., ditto. A.

- 1836. Downham Hall: Lord W. Powlett, Norfolk. A.
- 1836. Mereworth Castle: Lady le de Spencer, Kent. A.
- 1838. No. 51, Grosvenor-street: Mansfield, esq., London. A.
- 1836. Glashury Church, Brecknockshire. N.
- 1836 to 1837. Mucros Estate at Killybegs: H. Herbert, esq., Ireland. A.
- 1836. Carlton Lodge: S. Forster, esq., Lincolnshire. N.
- 1838. Kotharbithe Church, Surrey. N.
- 1847. Wordley Rectory House: Rev. Dr. Penfold, Staffordshire. N.
- 1837. Knowle Church, N.
- 1837. Colridge Church, Staffordshire. N.
- 1838. Sturminster Union Workhouse, Dorsetshire. N.
- 1838. Epping, ditto ditto, Essex. N.
- 1838. House at Highgate: — Snow, esq., Middlesex. A.
- 1838. Kotharbithe Church, Surrey. N.
- 1838. Stonegate Chapel, Wadhurst, Sussex. N.
- 1818. Royal Institution, London. A.
- 1838. Brentford Union Workhouse, Middlesex. N.
- 1838. House at Lewisham: S. Forster, esq., Kent. A.
- 1839. Windhill House: J. Fairman, esq., Hert. N.
- The late Westonbirt House:—
- Various additions to the building, and alterations in the interior.
- A new wing, with nurseries, &c., and new offices.
- A new billiard-room and conservatory in another new wing.
- New stables.
- Conservatories in flower garden.
- Buildings in Italian garden, viz., two pavilions.
- Two arcades, at the house, with water, stone seats, terraces, &c.
- Orchard-arcades and forcing houses.
- Lodges at principal entrance to the park.
- Hest grove's to go at second entrance.
- Gardener's house.
- Keeper's house.
- Barl's house.
- And buildings of home farm.
- New Westonbirt, Tetbury, Gloucestershire: R. S. Holford, esq., M.P.—The above was Mr. Vulliamy's last and most important work, but not completed.
- 1839. Hill Park: — Bailey, esq., Kent. A.
- Ditto cottage, ditto, ditto.
- 1840. Burton Vicarage House: Rev. Temple Freere, Norfolk. N.
- 1840. St. Peter's Church, Bethnal-green, London. N.
- 1840. Rayne ditto, Essex. N.
- 1840. School House, Staffordshire. N.
- 1840. Friday-hill, ditto: Rev. R. B. Heathcote, ditto. N.
- 1840. St. Peter's Rectory House, Bethnal-green, London. N.
- 1840. Clenton Church, Dorsetshire. N.
- 1840. Porch to Royden ditto: Rev. T. Freere, Norfolk. A.
- 1840. Rosedale Church, Yorkshire. N.
- 1841. Dullingham Estate Farm building, Cambridge-shire. N.
- 1841. Small-Pox Hospital and Asylum, London. A.
- 1842. Cottenham Rectory House: Rev. T. Freere, Cambridge-shire. A.
- 1842. St. James's Rectory ditto, Bethnal-green, London. N.
- 1843. St. James's Church, Bethnal-green, London. N.
- 1842. St. James's School, Gloucestershire. N.
- 1842. Lock Hospital, Middlesex. N.
- 1842. Ditto Asylum, ditto. N.
- 1843. House, No. 28, St. James-place: Lady Arden, London. A.
- 1843. No. 15, Charles-street: Genl. J. Humphry, ditto. A.
- 1843. House: J. Montgomery, esq., ditto. A.
- 1843. Ditto, at St. Leonard's, ditto, Hastings. A.
- 1843. Monumental Tower: Gloucestershire. N.
- 1844. Chingford Church: Rev. G. Heathcote, Essex. N.
- 1844. North House: Lady Arden, Surrey. A.
- 1844. Canonical House: Rev. Dr. Griffith, Rochester. N.
- 1844. Nestly Farm: R. S. Holford, esq., Gloucestershire. A.
- 1844. St. James's Church, Norland, Middlesex. N.
- 1844. Beverton ditto: R. S. Holford, esq., Gloucestershire. A.
- 1844. London and Westminster Bank, London. N.
- 1844. Ditto ditto ditto ditto A.
- 1844. Ditto ditto ditto ditto A.
- 1844. Ditto ditto ditto ditto A.
- 1845. Tregothan House: Earl of Falmouth, Cornwall. A.
- 1845. Monumental Room ditto ditto N.
- 1845. Nansau Lodge ditto ditto N.
- 1845. High Beech House: Admiral Sotheby, Essex. A.
- 1845. Dingestow Court: S. Bosanquet, esq., Monmouthshire. N.
- 1845. Church in Curtain-road, Shore-ditch, London. N.
- 1845. Rochester Cathedral: Dean and Chapter, Kent. A.
- 1846. Newton House: Duchess Dowager of Cleveland, Yorkshire. A.
- 1846. Dalbourn Park-house: R. S. Holford, esq., Gloucestershire. N.
- 1846. Great Briddleford Farm: ditto, Isle of Wight. A.
- 1846. Lock Chapel, Middlesex. N.
- 1846. Chestall House: — Phelps, esq., Gloucestershire. N.
- 1846. Woolhampton House: Earl of Falmouth, Berks. A.
- 1846. Lamorran Parsonage: ditto, Cornwall. N.
- 1846. Down Farm: R. S. Holford, esq., Gloucestershire. N.
- 1846. Elmstree Farm: ditto, ditto. N.
- 1846. Wanslip Hall: Sir G. Palmer, bart., Leicestershire. A.
- 1846. Wanslip Hall, New Conservatory: ditto, ditto. A.
- 1846. St. Martin's Church, Bethnal-green, London. A.
- 1846. White Hart Inn: R. S. Holford, esq., Gloucestershire. A.
- 1846. Palmer's Farm: ditto, Isle of Wight. N.
- 1851. St. Mary's Chapel, Rochester Cathedral: Rev. Dr. Griffith, Kent. A.
- 1851. St. Thomas's Church, Nova Scotia Gardens, London. N.
- 1853. St. Margaret's House: Lord Kilmurray, Ireland. N.
- 1853. Sherford Park: Hon. P. Ashburnham, Sussex. A.
- 1855. Bramshot House: Sir W. Earle, Hampshire. N.
- 1856. Nos. 29 & 31, Berkeley-square: Lord Lindsay, London. A.

- 1857. Dorchester House: R. S. Holford, esq., ditto. N.
- Stone terraces and stone seats and ornamental gates and enclosures, and architectural screen of offices with porter's lodge.
- Domestic Offices. — Stable-yard with stable and coach-houses.

NUMBERING THE PEOPLE, AND NAMING THE STREETS.

It is evidence of the lusty vigour of our Transatlantic cousins of the United States that they have already completed their ninth census, whereas the eighth of the United Kingdom is only as yet in its first preliminary stage. Many months will elapse before the results of the census of 1871 are made known, and the first disclosures concerning it will probably be in imperfectly-digested unofficial returns. We learn from Washington, U.S., that a preliminary report on the American census of 1870 is in the press, and nearly ready for publication. The term "preliminary" is likely to convey an erroneous impression, inasmuch as the forthcoming report will be an instalment of the whole returns, and complete in itself, in so far as it goes. It will be embraced in a quarto volume of about 800 pages, printed in double columns, without "leads." The three tables it will comprise will give (1) the classes of population by States, according to each of the nine censuses, from 1790 to 1870 inclusive; (2) classes of population by counties, from the nine censuses; and (3) the population of all civil divisions smaller than counties, and the proportion of white and coloured, and of foreign-born, population for the three censuses of 1850, 1860, and 1870. The volumes to follow will embrace statistics of agriculture, manufactures, mortality, and miscellanea. The classes of population are divided into white, free-coloured, slave (so it is reported), Indian, and Chinese. This first volume, if not already issued, is expected to appear immediately. It will be followed in rapid succession by the several volumes devoted to statistics of mortality; population by age and sex; and such particulars as relate to the moral and intellectual condition of the people, as churches, schools, paupers, crime, libraries, &c.; and a concluding volume relating to wealth and industry. The complete work is promised before December next. We hope that the details of the census of the United Kingdom may be published with at least equal promptitude.

The instructions to registrars of births and deaths, as to their duties in taking the census, have been issued, as we said last week, by the Registrar-General, and the instructions to enumerators, incorporated with them, and a copy of the Census Act of 38 and 34 Vic., cap. 107, are ready for delivery as soon as the enumerators have been appointed. As regards the machinery for taking the census, the command-in-chief, of course, devolves upon the Registrar-General, assisted by a staff augmented for the special work. His divisional officers, so to speak, are the superintendent registrars in charge of registration districts; their subalterns, in turn, are the registrars of births and deaths, who have charge of sub-districts; the enumerators will constitute the "rank and file" of the force. The authority and duty of supervision of the several classes of officers is indicated by their designations. The Registrar-General's control extends over all England and Wales; the superintendent registrar's over his district, the registrar's over his sub-district. The Registrar-General's powers reach downwards to the enumerator, through the other two classes, and the enumerator's nomination and work pass upwards through the same channel.

The country was divided into enumeration districts for the census of 1861, and it is recommended to retain as far as possible, especially in the country and in the denser parts of towns, the plan of division then adopted. For such localities the plan may need but slight modifications, but numerous and important alterations will be necessary in relation to the metropolis, and to many large cities and towns. In the suburbs of London, north, west, south, and south-east, residential districts have come into existence, with paved roads and streets in scores, and inhabited houses in hundreds, that were fields and gardens, or waste land waiting for the builder, in 1861. It is not too much to say that the revised plan of division for the metropolis will require the addition of hundreds of new enumeration districts. The metropolis will require, allowing an average of 1,000 persons to each enumerator, an army of above 3,000 men, whose fees, according to the table of allow-

ances sanctioned by the Treasury, will amount to about 5,500*l.*, which is, of course, exclusive of the extra allowances to registrars and their superintendents for their special work.

An important circular has been issued by the Registrar-General urging mayors and other local authorities to carry out the provisions of the Local Government Act, which enjoin that all streets should be named and all houses numbered that are under their respective jurisdictions. The circular has some interesting notes appended, particularly respecting London streets. It appears that the metropolis has 30,000 streets, of an average length of a furlong, or an eighth of a mile. The longest runs to a mile, and a few to even more. The numbers sometimes reach to 929, but never to a higher figure. The name of a new street in London is restricted to one word, with the addition of "street" or "road," or other analogous term. The latter term is applied to leading thoroughfares of considerable length. Lists of streets, and of all changes in street names, are published in London, the list showing also the parish in which each is situate; an example worthy of imitation by the authorities of all large towns. Experience has decided in favour of numbering the houses of a street so that all the numbers upon one side of the street shall be odd, and on the other side even. The rule is to make the left-hand house at the end of the street nearest one central point (in London it is St. Paul's Cathedral), No. 1. Thus, with the back towards the central point, the odd numbers are on the left hand side. In some English villages all the houses are numbered consecutively; and that system is also in use in Vienna, where every house has its number. For the purposes of the census a system of designating every house distinctly would prove of immediate utility. It would be also of permanent value for the registration of births and deaths, in the direction of letters, in registering electors, and, in short, in all administrative arrangements. It is to be hoped that mayors, corporations, and other local authorities may cheerfully co-operate in carrying out the Registrar-General's valuable practical suggestions.

THE DESIGN FOR THE NEW POST-OFFICE, ST. MARTIN'S-LE-GRAND.

A few evenings ago, in reply to Mr. Eky, Mr. Ayrton made the following statement:—He said, a member of the council of the Institute of Architects had described the design of the new Post-office as the ugliest ever conceived, as devoid of all architectural knowledge and treatment, and as the result of the want of skill in the Department of Works consequent upon the arrangements recently made for carrying on the business of that department. Perhaps the best answer to that was to state exactly what had occurred. The design for the new Post-office was originally prepared by an officer of the Department of Works, under the direction of Lord J. Mansergh, when First Commissioner; but on Mr. Layard taking charge of that office, he had to deal with the design, and did not approve it, but in conjunction with Mr. Fergusson, in the Office of Works, he prepared what they deemed an improved design, which was sent to the Postmaster-General and the Treasury. Being approved by both those departments, tenders were invited for carrying out the design before he himself became First Commissioner. To show the value of that architectural criticism, he might add that the Council of the Institute of Architects themselves recommended that Mr. Fergusson should receive her Majesty's gold medal for his great knowledge—of which every one was aware, in matters connected with architecture, and for his instructive writing on the subject, Mr. Fergusson being the gentleman who approved and settled the design for that new building.

With reference to this statement, we have received the following from Mr. Fergusson:—

When answering Mr. Eky's inquiry in Parliament on Thursday evening in last week, Mr. Ayrton used the word "approved" in a manner which seems likely to convey an erroneous impression of the part I was called on to play with reference to the design of the new Post-office, in St. Martin's-le-Grand.

Mr. Ayrton's account of the early history of the design is perfectly correct. Before I joined the office, a design had been prepared by Mr. Williams, an officer of the Board who for many

years previously had the sole charge and responsibility—subject only to the nominal control of the First Commissioner—of designing and erecting all the buildings required for post-office purposes in England.

This design had been sanctioned by the late First Commissioner, and was countersigned by the Post-office authorities, and any one who knows anything of official etiquette in these matters will know how delicate a matter it is for a new First Commissioner to interfere with a matter so settled and passed. Had that design been carried out, it might have justified all that has been said about the present one. I therefore considered it very fortunate that I was able to procure the assent of Mr. Layard to the substitution for it of Mr. Williams's original design, which he himself preferred to this one. Having done this, I suggested to him various modifications, which he admitted were improvements, and so soon as I had satisfied myself that I had got the best design which under all the complex circumstances of the case it was possible to procure, I took the steps requisite for obtaining the approval of it by the proper authorities, and got it passed for execution. I did not then think it part of my duty to express any opinion as to Mr. Williams's position as an architect or as to the merits of his design, nor do I wish to do so now. All I had to do was what I considered the best thing practicable for the public service in the situation in which I was placed, though whether I personally approved or disapproved of Mr. Williams's design is known only to,

Your obedient servant,
JAS. FERGUSSON.

ACCIDENTS.

The Imperial Gasworks Accident.—The coroner's inquest has been concluded. The evidence of Richard Roach and Edward Grady, two injured workmen employed with the deceased at the time of the occurrence, in removing the arches and division-walls of the retort-ovens, showed that there was no shoring up of the arches as there ought to have been; and the men believed the vibration caused by coal-laden trucks running into the building close by caused the overlapping iron bands to shake the division-wall, and throw it down. Henry Skeenes, the foreman of the bricklayers, said the wall that fell was 7 ft. 3 in. long. He did not think it at all necessary that it should have been shored up, as it was one solid mass, and of sufficient strength to carry a railway-train over it. It was certain now, however, that had the wall been shored up, the accident would not have happened. Mr. John Clarke, engineer of the Imperial Gas Company's works at King's Cross, said these retort-ovens were generally pulled down and rebuilt once in ten or twelve years. These had been up about ten years. He never apprehended any danger, and could not account for the accident except that there might be a cracking or contraction of the wall by the action of the fire. On the arch left standing he had placed 4½ tons of sand, and he believed it would bear 20 tons. After some further evidence, the jury, after half an hour's deliberation, returned the following verdict:—

"That the deceased, W. Martin Childs, Joseph Adams, and Jacob Buckland, were accidentally killed by the falling of a wall at the Imperial Gasworks, on the 6th of February last; and the jury empanelled on the said bodies are of opinion that the division wall of the retort-ovens which, by falling, killed the deceased, ought to have been properly kept up by strutting, and that by the omission of this act the work the men were engaged in was hazardous, and they recommend that in future the proper strutting of such walls be adopted."

Fatal Accident at Mile-end.—About six weeks ago a contract was entered into with Mr. Abbott to construct a sewer from the main sewer in St. Paul's-road, Bardett-road, through Robert-street. Since that time he has employed several men in digging in the middle of the road, and there was an excavation 30 ft. in depth there. The excavation was narrow at the top; and as it was intended to have the sewer bulging out at the bottom, six men and a lad were ordered to dig away the earth that was at the sides of the bottom of the sewer, and they accordingly did so for a distance of about 13 yards along the bottom part. The top part was shored up by beams and struts in the usual manner; but the undermining of the lower earth caused the upper crust to become loosened. The ganger, or foreman of the works, felt the ground tremble underneath, and he shouted out to the men at work, "It's going to fall in,—look out!" Before

the workmen could escape the whole side of the sewer gave way, and three of the men were instantly buried and killed, underneath a weight of about sixty tons of earth. Two other men and a lad had two-thirds of their bodies buried. A number of men were at once set to work, and they succeeded, after two hours, in extricating the injured persons. The three men who were completely buried were taken out dead. At the inquest evidence was given to the effect that the sides of the sewer—which was cut through sand and clay—were at an early period of the work rendered unsafe by a stream of water, apparently connected with an old sewer cutting, and which the workmen had been unable to check. The point involved was whether the contractor had taken reasonable precautions to avert danger after this flow of water was discovered. The coroner adjourned the inquiry in order that scientific witnesses might be examined on the question.

Fall of Scaffolding.—At Messrs. Traeman & Hanbury's brewery, Brick-lane, Spitalfields, a scaffolding, upon which a number of workmen were employed, gave way, and two men were thrown to the ground beneath, the result being that their skulls were fractured. They were instantly carried to the hospital, where they died.

Fall of Shop-fronts.—The upper portion of the brick front of two of the Hall End shops, Halifax, recently fell down upon the footpath and street; no one was hurt. The shops are built of brick, and at the top an ornamental character has been given them by a slight brick parapet, hiding the roof. The snow and thaws and frosts of winter have been so many battering-rams to drive the parapet forward. There was a heavy and rapid fall of snow, followed by a rapid thaw; so that as each little avalanche slipped down the roof, at last the whole gave way, and was sent into the street below.

Fatal Fall from a Chimney.—A fatal accident has occurred to Mr. Joshua Medwood, ornamental wood-cutter, &c., Pontefract-road, Barnsley. It appeared that the deceased was erecting a building for the purpose of cutting and polishing gravestones, &c., by steam-power. He was engaged pointing the top of a chimney, about 40 ft. in height, on a scaffold composed of three narrow planks and upright poles. It is supposed that as he was in a stooping position he displaced a portion of the cornice, which fell against him, and caused him to overbalance himself. Finding he was going he attempted to jump, and alighted on his hands and feet, dislocating both his wrist and ankle joints, and otherwise injuring himself. Mr. Wainwright, surgeon, was called in, but he died in about half an hour.

WEST HOATHLY, SUSSEX.

On Sunday last, the inhabitants of West Hoathly re-assembled in their parish church for the first time, after an absence of nine months, during which period extensive restorations and repairs have been carried on, under the direction of Messrs. Slater & Carpenter, of London, architects. Mr. Anson, of Lindfield, was the contractor.

The roof of the church has been stripped off and rebuilt, and is now covered with tiles; some few of the original timbers* having been found sufficiently sound, have been re-inserted, and four or five courses of the old heavy "Horsham slates"—stone, that is,—have been relaid above the walls, to preserve, as it were, the memory of the old work. This is outside; but within, an entire change has been effected. The unsightly flat whitewashed ceiling has given place to a handsome open roof, the woodwork of which is in good taste, and admirably executed. The mean little west gallery has disappeared, and also the former poor contrivance for a vestry; the latter has been constructed in the tower, and the space it used to occupy has been filled with seats for the school-children.

By a judicious re-arrangement of the chancel, a peculiar apparent increase of size, of largeness, has been obtained, which is likewise aided

* One of these timbers—a tie-beam, was found to measure 40 ft. in length; it ran through the roof of both nave and south aisle. It must have formed part of the primeval forest of the locality,—the "Forest of Anderida," or "Andras's Wood," for when the church was built, there were no roads in this part of Sussex that would admit of so ponderous a mass being brought from a distance. Another interesting "find" was a huge coffin, or trunk of a tree, and filled with roughly at the ends with pieces of wood. This latter has been preserved, but the beam was too decayed for using again.

by the solid appearance of the open pews, gained by the addition of book-decks at the back of the seats. The position of the pulpit has been slightly altered, and a new reading-desk and a small wooden lectern have been substituted for the hideous erection of a former generation of West Hothlyties.

The stone arches and columns, and the mullions of the windows, most of them of excellent form and workmanship, have been freed from all remains of whitewash, and thoroughly repaired where necessary; and the windows have been glazed with green cathedral glass of small size, and set in varied pattern. Two of the windows have been filled in with stained glass by a member of the congregation,—an additional donation to his already handsome subscription to the restoration fund. In a small village like West Hothly contributions naturally fall somewhat heavily on the sparse residents. The sum required for the repairs of the church was estimated at 1,441l., but of course unforeseen expenses have occurred to increase the outlay; of this sum it was thought about 100l. would be covered by the sale of the old materials. Very nearly the whole of the amount is already paid off, and I believe it is in contemplation to hold a ceremonial opening later in the season, when some little matters not yet finished shall have been completed, and when more settled weather shall encourage visitors from a distance; and then, doubtless, a collection will be made to clear off any casualties that may arise in winding up the accounts. We have as yet no redos, but we live in hope of getting one some day. The spire of our church is of beautiful proportions: it is lofty, and being also perched on a high ridge of hills, it serves as a landmark for many miles round. This spire and the tower below have been merely repaired and made weather-tight, the shingling renewed where needed, the weathercock regilt, and a lightning-conductor added. The foundations of the walls have been everywhere cleared of the accumulated earth, a stone paving has been laid all round, and a series of water-pipes and stone gutters provided.

While the works were in progress it was discovered that the east wall was 8 in. out of the upright, so that it had to be taken down and rebuilt. A partly new east window has been inserted, the original one having been cut down and left with a square head long before our time. All old string-courses have been repaired where possible, great care having been taken to preserve every inch of the original work that could be saved,—so that while it is now perfectly sound, our old church has lost very little of its familiar character to our eyes. A mean little creasing, however, now runs along the ridge of the roof, which no one amongst us seems to like, but which we all tolerate, partly because we think it may be correct, but mostly in deference to our architect, with whose work we feel we have, on the whole, good cause to be well satisfied. Of course there are always little differences of opinion as to minor matters of detail, and some of us think that a few of the forms introduced might have been more elegant, and that others might have been differently arranged so as to produce more play of outline, more life, and a better general effect; but any one who remembers the church as it was will agree with us that we may well be greatly gratified to see it as it is.

A handsome wooden porch replaces the unsightly hovel of brick and mortar that was attached to the south wall. The sides are pierced with a range of suitable windows, glazed with the old weather-stained quarries out of the church; and below, on each side, is a comfortable bench. The old oak door, studded with iron nails, and bearing the date 1526, has been repaired, cleaned, and varnished.

The mortuary-tablets have been taken down from the walls of the nave, and fixed again at the west end of the south aisle, around a quatrefoil coloured-glass window, and above the seats of the school children.

According to the architect's report, a large portion of the original Norman structure still remains; but those parts of the church visible inside date mostly from the thirteenth century. During the restorations, several of the earlier features were disclosed. Also, in scraping the plaster from the walls, some remains of mural paintings came to sight; but most of them were in too fragmentary and decayed a state to allow of preservation. Some early windows in the north wall of the chancel, however, have a very handsome flowing ornamentation of scroll-work, in deep crimson colour, covering the entire splay

of the opening; and immediately opposite, on the south wall, and above the line of the elegant sedilia and piscina, half of a corresponding window-arch was found bricked up, the splay being similarly decorated. The remainder of the window must have been destroyed when the chantry chapel was lengthened, one of the main arches of the church now occupying its place.

A massive pier between the south aisle and nave was found to be pierced by a passage-way, high up, evidently the opening to the rood-loft. The marks of the stairway were to be seen below in the plaster. This opening has now been judiciously left clear all through, and forms an interesting feature in the former history of our old church.

R. F. H.

THE NEW TRADE-UNION BILL.

The Home Secretary, Mr. Bruce, has brought in his Bill on Trade-unions.

The bill repeals the existing statutes which expressly deal with the subject of trade-unions, namely,—1. The Trade Combination Act of 1825 (6 George IV. c. 129), with its amending Act (22 Victoria, c. 34). 2. The penal clause of the Offences against the Person Act, under which two years' imprisonment may be awarded as the punishment for an assault committed in pursuance of an unlawful combination; and 3. The Trade-union Protection Fund Act of 1869.

The bill may be considered under three heads:—1. Criminal provisions; 2. Civil provisions; 3. Registration.

With regard to criminal provisions, the bill commences by abrogating the rule that every trade-union (except one which has for its sole object the modification of hours and wages), from the mere fact that its purpose is to restrain trade, and quite irrespective of any means by which that purpose is to be effected, is, in the eyes of the law, an unlawful conspiracy, rendering every member of it liable to indictment. The bill so defines the term "trade-union" as to include casual or temporary combinations, and consequently this clause will serve to protect, not only trade-unionists, but also non-unionists, who may join in a strike or other trade combination; also masters as well as workmen. The third section strikes at the use of improper means for effecting the purposes of a trade-union; in other words, at the offence of coercion. In effect, it re-enacts the penal provisions in the repealed statute of 6 George IV. against "violence," "threats," "intimidation," "molestation," and "obstruction," except that the acts constituting the offence are not left vague, but are strictly defined. Violence, indeed, means any violence, either to person or property; but "threats" and "intimidation" are confined to such threats as in other cases justify a justice in demanding sureties of the peace,—i. e. to threats of personal violence to a man, his wife, or child, or threats to burn a man's house down, such threats being made in earnest so as to cause terror. In like manner the Acts which constitute "molestation" or "obstruction" are limited to the following:—1. The persistently following about a person from place to place; 2. The hiding of tools or depriving a workman of his tools; 3. The watching or besetting by two or more other persons of the house or place where a master or workman resides or works or happens to be, or the following him tumultuously through the streets. These acts, however, are not made criminal in themselves. They are only declared to be criminal when done with a view to coerce any employer or workman in his trade or employment. The clause, as a whole, is special in so far as it makes acts criminal when done with a view to coerce in trade which are not criminal when done with any other object, but in form it is perfectly general, affecting both the employer and the employed alike; the offence, however, is in its nature one which is not likely to be committed by employers. The provision of the bill is, of course, in addition to the general provisions of the law for the punishment of assault, libel, riot, &c., but is in substitution for the provision which some judicial authorities hold to be in force by the common law against the offence of obstruction to the free course of trade. As under the 6 George IV., the offence is made the subject of summary jurisdiction by two justices in petty sessions, with an appeal to quarter sessions, and the extreme punishment which may be awarded is three months' imprisonment with hard labour.

As to the civil provisions of the bill, the rule now in force, as to restraint of trade, declares any

court of justice from enforcing any agreement or trust whatsoever relative to trade-unions, for such agreements as aim at restraint of trade are in themselves illegal, and such as have no aim of the kind are, nevertheless, by their connexion with trade-unions "tainted with illegality," and equally unenforceable. The fourth section of the bill abrogates the rule by declaring that the purposes of a trade-union shall not, by reason merely that they are in restraint of trade, be unlawful so as to render void or voidable any agreement of trust. The next section, however, makes some necessary exceptions. Certain contracts which are therein specified and which may be called the primary contracts of trade-unions, are declared unenforceable; for instance, no person is to be compelled to carry out his contract not to work or not to employ, and no person is to be entitled to sue for benefits to which he is entitled under a contract with a trade union. This might seem to restore the *status quo*, but the effect of the provisions as a whole will be that all collateral and subsidiary agreements connected with trade-unions will become enforceable. For example, a trade-union secretary will henceforward be competent to sue for his salary, and an action for a breach of the covenants of a lease of a building used for the purposes of a trade-union will no longer be liable to be barred by the plea that the premises were let for an unlawful purpose. The sixth section exempts trade-unions from the Companies Acts. The same section withdraws trade-unions also from the operations of the Friendly Societies Acts. The remainder of the bill deals with the subject of registration, which is made voluntary, not compulsory. The only conditions attached to it are such as to secure publicity. The Board of Trade is the registrar. Trade-unions which fail to register will remain under the disabilities entailed by non-incorporation.

PRACTICAL HINTS BY PRACTICAL MEN FOR YOUNG ARCHITECTS.

STR.—It might prove of great advantage to the rising generation of young architects for their facility and knowledge in passing a desirable examination (and even for others) if there were a series of papers drawn up from time to time by good practical and experienced workmen, if they were to put forth their experience in such papers as above stated, as relating to every branch of building which might refer to public or private buildings. This might be followed by clear and practical instructions and observations in the form of specification. Matters of taste and decorations might succeed this by a different class of artificers. All this would be a sure footing to go upon, divested of all theory. In such firms as Cubitt's, &c., such men are to be found capable of the task, and papers might be submitted to the editor of the *Builder*. W.

THE PAST CENTURY AND THE PRESENT

A PRESIDENTIAL ADDRESS.

At a meeting of the Northern Architectural Association, on the 14th instant, the new president, Mr. F. R. Wilson, after thanking the members for placing him in that position, and assuring them he would do all in his power to prove himself worthy of the compliment, said,—

But it appears to me that the president of an institution of this kind is subject to the same reign of circumstances that affects the Lord Mayors of London. Should any important event occur in a mayoralty, the mayor becomes, by virtue of it, an important personage; but should his year of office be unmarked by any public benefit, he scarcely emerges from the shade in which private individuals are, figuratively, supposed to dwell. Should an architectural or archaeological congress take place in Newcastle, the president of this association would naturally take a prominent place in our associated welcome of it; but in the absence of this, or similar jubilee, there are but few ways of showing extra zeal beyond those that are open to us all in our private capacities. I have come to this conclusion after thinking of the completeness of the reports prepared by the secretaries, which have recorded all the transactions of the past years, and of the trouble that has been taken in the matter of the alliance, all perfected, mainly, without presidential aid. And, in looking over the remarks I am about to make, the conviction comes home to me—with quite a concussion. We must all feel there is a marked stride in the public appreciation of architecture of late

years; and although we cannot credit our association with the whole praise of it, yet, I think, it has done its part in the very desirable work. A hundred years ago, in the days when every nobleman and gentleman who could afford it made what was called the "grand tour," our own architecture was considered positively beneath notice. Looking at Dr. Goldsmith as a representative man, it is curious to note how little he makes of English architecture. When his Citizen of the World arrived in London from China, *via* Amsterdam, he makes him tell his impressions of London in these terms:—

"Judge, then, how great is my disappointment, on entering London, to see no signs of that opulence so much talked of abroad! Wherever I turn, I am presented with a gloomy solemnity in the houses, the streets, and the inhabitants; none of the beautiful gliding which makes a principal ornament in Chinese architecture. The streets of Nankin are sometimes strewn with gold leaf: very different are those of London. In the midst of their pavements a great lazy riddle moves noddily along; heavily-laden machines, with wheels of unwieldy thickness, crowd up every passage; so that a stranger, instead of finding time for observation, is often happy if he can find time to escape being crushed to pieces. The houses borrow very few ornaments from architecture; their chief decoration seems to be a paltry piece of painting, hung out at their doors or windows, at once a proof of their indigence and vanity; their vanity in each having one of those pictures exposed to public view; and their indigence in being unable to get them better painted."

When he visits Westminster Abbey, its architecture is dismissed in three lines in favour of a long meditation among the tombs upon the vanity of the English method of rewarding or recording the merits of the dead. These three lines, making due allowance for the fact that they are Chinese eyes that are supposed to have received the impressions, must be allowed to be short measure for Westminster Abbey. The Chinese philosopher exclaims, "Imagine a temple marked with the hand of antiquity, solemn as religious awe, adorned with all the magnificence of barbarous profusion, dim windows, fretted pillars, long colonnades, and dark ceilings." And then he commences his reflections upon the "puny child of the dust."

At St. Paul's it was just the same. Goldsmith made him see and describe, not the building, but the congregation, ogling, whispering, taking snuff, and one worshipper asleep because he had eaten too clearly a dinner, and another dozing because she had sat up all night at a brag party. The general appreciation of Classic in preference to Gothic architecture crops out, however, in one sentence, where, before mention of what he calls the rags that have been taken from an enemy and hung round the walls, he says, "This temple is far superior in beauty and magnificence to the Abbey."

In Dr. Johnson's works there is but the rarest and most casual mention of any specimens of our national architecture. And so on, through all the last-century wits. Men and manners were their themes. Not one of them but sincerely believed in his heart that architecture meant only the Greek mode of building; and they felt that allusions to it would fall but tamely upon the ear of the general public for whom they wrote.

Yet it was not always so; for Milton was particular to mention that there was an architect thrust out of Heaven with the rebellious angels at the fall. He mentions the sapphire towers he built in Heaven:—

"His hand was known
In Heaven by many a tower'd structure high
Where scepter'd angels held their residence,
And sat as princes."

At least fifty beautiful lines are given to this pre-historic architect. The poet tells us,—

"In Assyrian land
Men call'd him Mulcher; and how he fell
From Heaven, they fabled, thrown by angry Jove
Sheer o'er the crystal battlements: from morn
To noon he fell, from noon to dewy eve,
A summer's day; and with the setting sun
Dropp'd from the zenith like a falling star,
On Lemnos th'Ægean isle: thus they relate,
Erring; for he with this rebellious rout
Fell long before."

And although Milton gives Doric pillars with a golden architrave to the palace Mulciber built for Lucifer, we may see by the oft-quoted passage in "Il Penseroso" that he had a deep and solemn sympathy with English or Gothic architecture. I allude to that passage where he says his feet will never fail

"To walk the studios cloister's pale,
And love the high-embowed roof,
With antique pillars massy proof,
And storied windows richly light,
Casting a dim religious light."

But Sir Christopher Wren, Lord Burlington, Kent, Nash, and the rest of their school came after Milton, and created that indifference for

English architecture which the silence of contemporary literature indicates.

All this, however, is now changed. The building of an English cathedral was, we know, one of the distractions with which our ex-Prime Minister perplexed Lothair in the early part of his history; and the architectural effects thrown in here and there in that book are very enjoyable. Mr. Dickens put out his very best strength in delineating ancient English buildings, and their impressions on our minds, beginning with his charming legends of the stained glass window called "The Five Sisters," in York Cathedral, and his account of the thespian the famous "Chimes," down to his beautiful descriptions of Rochester Cathedral in "Edwin Drood." I think it was Sir Walter Scott who first showed that English and Scottish architecture would adorn English and Scottish literature; and it must be owned his descriptions of Melrose Abbey and of Bradwardine Hall are as absolutely fascinating as his love scenes, and more popular.

I was struck, in reading the architectural experiences lately given to the world by an octogenarian architect, Mr. Taylor, how completely our own profession endorsed the opinion of the literati as to the valuelessness of English architecture, despite the attempts of Horace Walpole and Mr. Beckford to arrest the flow of taste in the direction of the South of Europe. As soon as an architectural pupil had finished his articles, away he went to Greece. Mr. Taylor did the same. Sir Robert Smirke had preceded him by a few years. Professor Cockerell's traces were still fresh. Sir Charles Barry, Professor Donaldson, Messrs. Hardwick, Vulliamy, Basevi, were all at work in the Eternal City when he arrived there, besides Gibson, Eastlake, and other English painters. To be a man of letters even at that date was to be a good classic scholar; and to be an architect was to have studied Greek and Roman buildings. If any of these travelled students published their sketches, they were either Greek or Roman. The Mediæval monuments of France and Italy, like those of England, were regarded, not so much with admiration as with sorrow, that they were not classic. Even the stones of Venice were counted second to a few overthrown columns on classic soil. In December, 1844, one celebrated architect, too early cut off, wrote to another,—
"Architecture, as a noble science and beautiful art, in the highest sense of those terms, exists unfortunately, at present only in ruins, or in history and imagination." He was thinking only of the city of the Cæsars and the works of the ancient Greeks.

As in literature, all this is changed too. The bewitching old French towns, with their gabled houses, with their half-dozen stories of dormers lighting up their steep roofs, and clever oriel, wonderful niches, shadowy balconies, overhanging eaves, carved timber-work; the ancient free and art-loving cities of Germany, Bavaria, Belgium, Spain, and North Italy, have more attractions now for the sketching students than Greece, because their architecture is more akin to our own. Berne and Basle, Friburg and Frankfurt, Munich and Milan, Venice and Verona are as familiar in our sketch-books as Lanercost or Lindisfarne. Within this century English architecture has set up a literature of its own. Rickman, perhaps, laid the foundation stone in his "Attempt to Discriminate." Then arose Pugin, with his "True Principles of Gothic Architecture." The brothers Brandon made a valuable contribution to it when they published their "Parish Churches." The *Builder* newspaper was started to represent the profession and its works, and conducted with so much success as to bring competitors into the field. An Institute of British Architects has been organised, comprising the periodical reading of professional papers, and their subsequent distribution to members. Publishers have arisen who, like Mr. Weale, have devoted their undertakings to architectural works. Countless hand-books, manuals, and books of details have been issued. Messrs. Gwilt, Ferguson, Godwin, Scott, Burges, and Street have made large additions to this literature. Architectural associations have been formed in various parts of the country. And Mr. Ruskin's "Seven Lamps of Architecture" shone upon thousands of minds prepared to receive every ray with rapture.

It appears to me, if we could only augment this newly-awakened interest in architecture generally, and draw it towards a proper national pride in our English architecture, we should be doing a very profitable work. The grand question is, of course, how is this to be done? And

I reply, not by making a secret mystery of our craft, as the Freemasons did of old, but by pursuing and widening out the same course that has already proved successful,—explaining, expounding, dilating, detailing, publishing, and proclaiming on all sides, at every turn, the charm, the meaning, and the manner of English architecture.

The preservation of every fragment of existing examples of it is an important assistance to us; and we must be down, with all the stringency of a Prussian requisition, upon any attempt to deprive us of one of them.

Popular lectures, given in connexion with mechanics' institutions, schools of art, or otherwise, will also help to spread this desirable taste. Gratis exhibitions of architectural drawings are also means to the same end. We have Penny Readings now, as regular institutions, why not Penny Art and Architectural Exhibitions? Accounts of ancient buildings, like that of Breckburn Priory, by Mr. Johnson, cannot fail, too, to increase this general appreciation.

I say general appreciation, because I think we may congratulate the profession upon the fact, that a deep consideration for the beauties of our national architecture has already taken root in high places. The volume on the feudal antiquities of this county, printed for private distribution by the late Algernon, fourth Duke of Northumberland, bears me out in this statement. Dean Milman's book, on St. Paul's Cathedral, and that of Dean Stanley, on Westminster Abbey, will occur to you as further instances of amateur interest in professional subjects; and now we have the Duke of Argyll's little book upon Iona, as a more recent example of it.

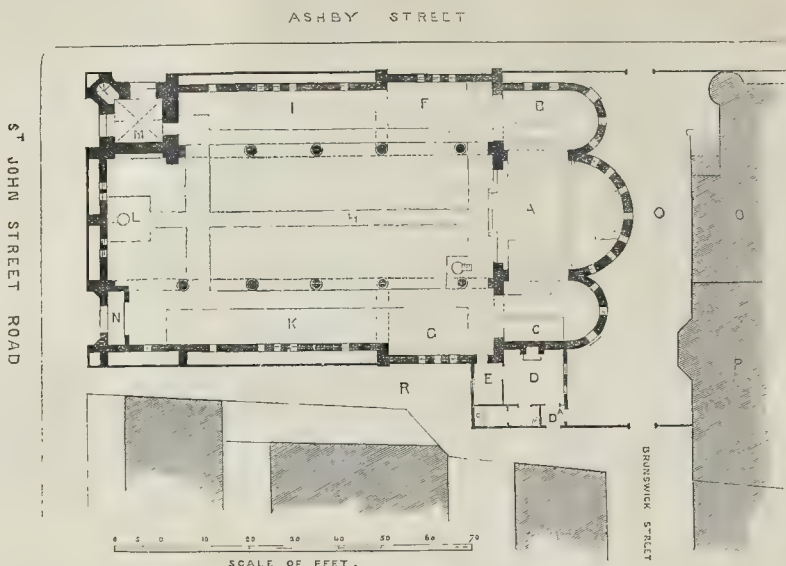
I will not detain you longer, but content myself with asking you, as a further contribution from this Association towards the good work, for more papers, more drawings, and more visitors for our meetings, and greater efforts to bring architecture into the notice of the general public.

CHURCH OF ST. PETER, CLERKENWELL.

THE SMITHFIELD MARTYRS' MEMORIAL.

This church, of which we give illustrations in our present number, is now closely approaching completion, and will be consecrated as soon as the remaining funds necessary to relieve the building from debt have been received. It occupies a commanding position, on the east side of St. John-street-road, leading from Smithfield to Islington, its site having formed, until comparatively lately, a garden, attached to what is reputed to have been a manor-house of the Lords Northampton, still existing, in a modernised shape, and converted into district mission schools. The last feature of its earlier appropriation was a large and ancient plane-tree, which stood at the corner of Ashby-street, nearly on the spot occupied by the present church-tower, to which it gave place.

In the erection of this church, a double or two-fold purpose has been sought. Some few years since a movement was originated having for its object the erection, as nearly as possible to the scene of their death, of some tangible and permanent memorial of the Protestant and other earlier Reformers who suffered at Smithfield. The idea was so far successfully carried out that, under the auspices of a committee formed for the purpose, subscriptions to some extent were obtained, and a sum of money collected. This sum was placed in the hands of bankers, who, unfortunately, subsequently failed; and the scheme, in consequence of the attendant loss, remained for a time in abeyance. On the separation, however, of the mission district of St. Peter, Clerkenwell, from the large parish of St. James, and on the formation of a committee for the building of the permanent church in connexion with such mission, the thought suggested itself that, as the site procured for this latter purpose was in a great thoroughfare to and from Smithfield, and, at the same time, the nearest that probably could be obtained to that spot, the contemplated building might be devoted to the realisation of the originally entertained intention of a "Martyrs' Memorial Church," in connexion or association with the purposes of the "District Church." Through the medium of the vicar, and the instrumentality of others interested in both undertakings, the "District Church" building committee, and the "Martyrs' Memorial" committee, were there-



ST. PETER'S, CLERKENWELL.—PLAN.

REFERENCES.

A. Chancel.
B & C. North and South Chapels.
D. Vestry.
D's. Porch thereto from Q & R.
E. Lobby from ditto to Church.

F & G. North and South Transepts.
H. Nave.
I & K. North and South Aisles.
L. Baptistry.
M. Tower.

N. South-west Porch.
O & P. Site for proposed Parsonage and Schools.
Q. Proposed Courtyard between Parsonage and Church.
R. Passage from St. John's street-road to Brunswick-street and Schools.

upon united, the ultimate result being the edifice we have illustrated.

In its architectural treatment, the church exhibits an early phase of Gothic, partaking slightly of the foreign or French element. Its plan in its completed form, as shown in our engraving, comprehends an apsidal chancel, with lateral chapels, also apsidal, north and south. A nave, with aisles; transept, with vestry, &c., attached on the south-east; a tower, reaching to a height of over 125 ft., terminating the north aisle at its western end, the lower story being an open porch of access from the north and west; and a south-west porch finishing, in like manner, the south aisle.

The material employed in the construction is stock brick, picked for the facings, both exterior and interior, and Bath stone; the former being used for the walling, relieved by occasional narrow banding courses of red brick, and the latter, with introductions of red Mansfield in the shafts of columns, and Anaster stone for weatherings, &c., for doorways, windows, string and cornice mouldings, and other general dressings and enrichment. The nave and other internal arcades are also of Bath stone; the columns of the former, and to the chancel arch, being of polished granite. In the chancel a range of arcaded windows, continued round the apse above a richly-carved cornice, rise from shafts of marble. The arches opening into the lateral chapels have respond shafts, also of the same material; the whole, together with those of the nave and elsewhere, having richly-carved capitals, bases, and supporting corbels. From similar corbels, red Mansfield stone shafts finished in like manner, are continued upwards from the spandrels of the nave arcade, and carry the roof principals; the neckings of the same intersecting with the clearstory string.

This roof, together with that of the transept, is of wrought deal, open to the rafters in the upper part, plaster-ceiled to the second parlin, divided into bays by cusped and pierced arch-

braces dependent from the principals, and enriched with colour, all the timbering exposed to view being lightly stained.

The chancel and lateral chapel-roofs are plaster-ceiled, hemispherically, and enriched with painting, a similar treatment as respects plaster and painted decoration being applied to the walls of the church throughout, up to the level of the springing of the aisle-windows, above which the finished brickwork of the general construction shows itself.

The seating is of the best deal, stained and varnished; and the pavement is of coloured tile, with encaustic patterns, as additional enrichment, in the chancel. The pulpit is of Caen stone, with red and green serpentine for base and supporting columns. The font, with the lectern and prayer-desk, are of Bath stone, with marble columns, and carved caps and bases, &c.

The windows, with the exception of those of the clearstory and the upper lights of the north chapel, which are simply geometric patterns, enriched by lines of colour, are of stained and painted glass, bearing appropriate inscriptive texts. The seven chancel windows have the seven "last sentences of our Lord;" those of the north aisle and transept, "the Beatitudes;" those of the north chapel and the south transept, other similar texts. These windows are all gifts, and bear a memorial reference as relates to the donor of each. The great west window has four sentences from the "Te Deum," and is a special memorial to John Rogers, M.A., Pro-bendary of St. Paul's, burnt 1555, given by his descendant, Dr. Nathaniel Rogers, of Exeter.

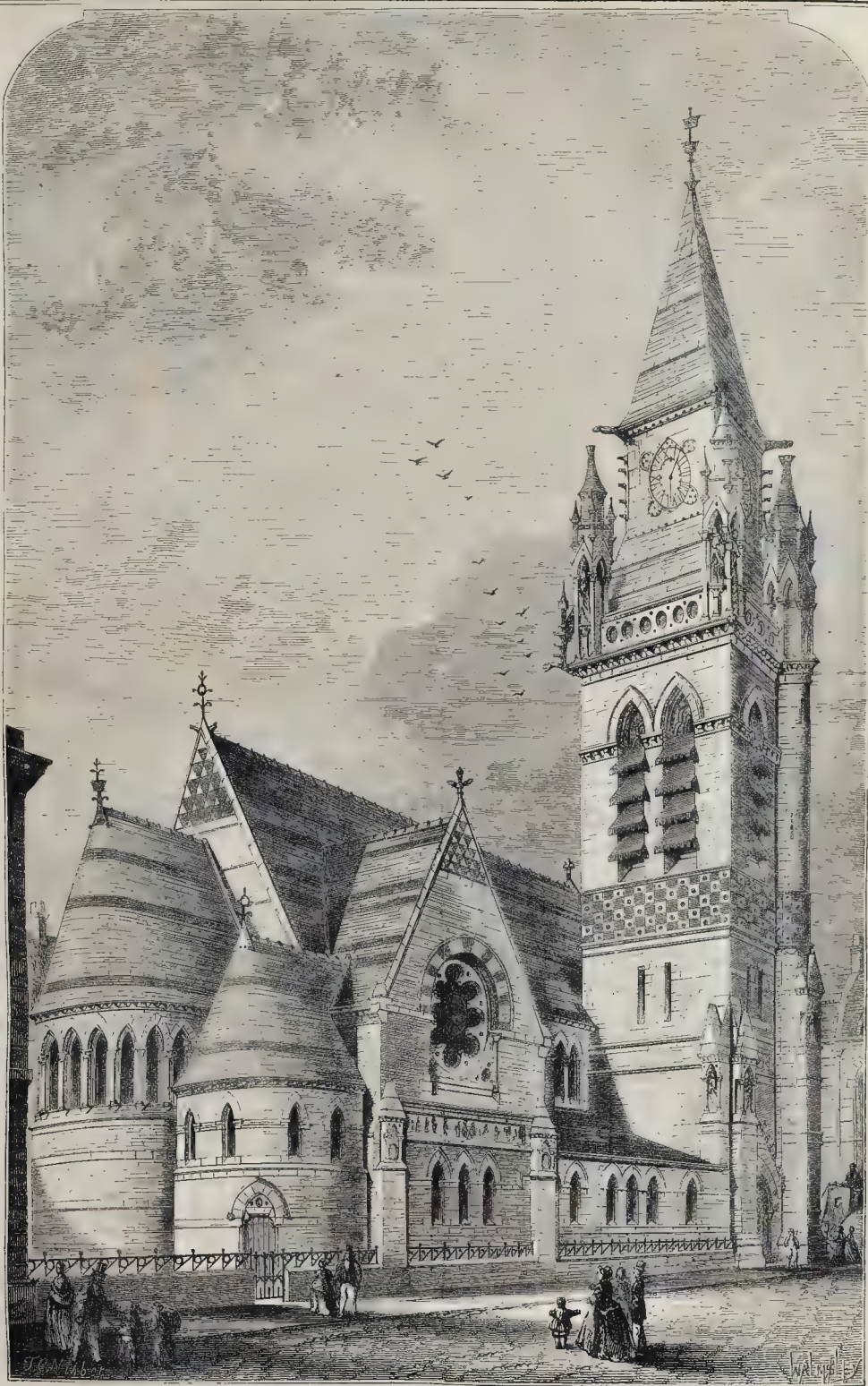
As respects the more particular memorial character sought to be given to the church, this is conveyed, or exhibited, externally, by means of statues and bas-reliefs, which respectively fill the niches of the tower pinnacles, the terminations of the several buttresses, and the wall spaces beneath the large window in the west front, the rose-window of the transept, and the two others over the north and south doorways

of the tower. Among the former, as already executed are statues of William Sautre, priest, of St. Oyst, Essex, A.D. 1400 (the first Smithfield martyr); John Badby and John Claydon, respectively, tailor and currier, of London, temp. Henry IV. and V.; William Taylor, priest; Thomas Bagley, vicar of Monenden, Essex; Joan Boughton, widow; and Richard Bayfield, sometime monk of Barry; and among the latter, representations of the burning of John Bradford and John Leaf; the progress of John Rogers to execution, and the martyrdom of Anne Askew, Nicholas Belesman, and the others who suffered at the same time with her.

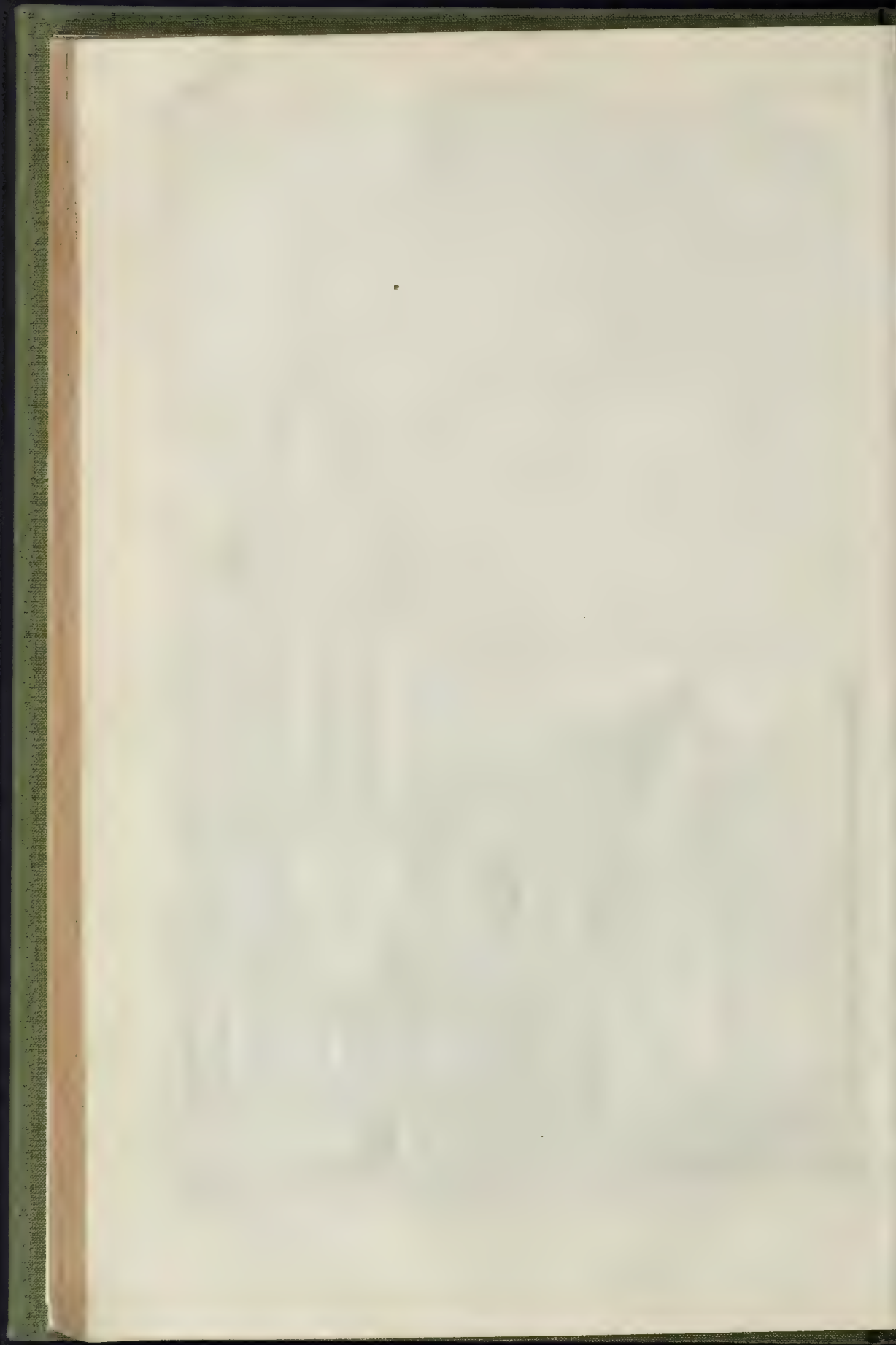
Internally the memorials take the shape of rubricated inscriptions (painted on imitative hangings, disposed round the walls of the church below a stone band, ornamented with Scriptural texts, written in Gothic letters), recording the names, dates of death, articles of accusation, &c., of the several martyrs, commencing with, as before said, the first Smithfield martyr, William Sautre, and ending with Roger Holland, as the last, and the six companions, all of Ilalington, who suffered with him, June 27, 1558.

The accommodation provided in the church, as at present executed, is for about 700 adults. With the addition of the south aisle and corresponding increase of transept on this side, it will be about 900.

The design is by Mr. E. L. Blackburne, F.S.A., architect, of Bernard-street. The contractors are Messrs. Dove, Brothers, of Ilalington. The stained glass of the west window is from the hands of Messrs. Lavers, Barraud, & Westlake; that of the chancel, and the small windows of the west front and south transept, by Messrs. Baillie & Meyer. The windows of the north aisle and transept are by Messrs. Gibbs & Moore; and the small lower windows of the north chapel, by Messrs. Heaton, Butler, & Bayne. The painted decorations are the work of Mr. Homann.



CHURCH OF ST. PETER, CLERKENWELL: THE SMITHFIELD MARTYRS' MEMORIAL.
MR. E. L. BLACKBURN, ARCHITECT.



GIVE THE LITTLE ONES A CHANCE.

Str.—Some years ago, I remember the sale of a cellar of valuable wines, in one of the Midland Counties, which was largely attended by the neighbourhood. The big lots went off at high prices, to the wealthy bidders; but towards the close of the auction, when broken lots were put up, one of the company appealed to the large buyers to let the little ones have a chance. This was good-naturedly acceded to, and the consequence was that everybody was satisfied, a carcase even carrying off eleven bottles of '84 port for four guineas.

Now, could not something of the kind be done by architects? and if so, might not the consequence be that that which is now a *profession*, and fast becoming a *trade*, may be restored to an art? As matters now stand, there is scarcely an architect, however extensive his practice, who would refuse the smallest undertaking; and the result is that, what with excursions about the country, and numberless demands on his time at home, he literally has no rest for study and thought. He is obliged to repeat himself over and over again, and to delegate to clerks that which should emanate from himself; and in support of this assertion, I will state a few facts of my own knowledge.

I was interested, some years ago, in the erection of a church; and the architect employed was, perhaps, the most promising man of the day, though the promise has never, in my opinion, been fulfilled. In the course of the work, of which I have anything but a satisfactory recollection, he referred to a church that he was building in another county; and being in that neighbourhood last summer, I found that the two works were identical, with the exception of some minor details and alterations made during the process of construction in the church with which I was concerned. The same architect has since built a second church in my locality, intended for a population of some thousands, but which is deficient in every characteristic of a town church, and suitable only for a country parish or small market town. I do not think that he ever saw the site until the work was commenced. In short, it is my belief that the plans were taken out of a pigeon-hole, after having done duty somewhere else, and forwarded to supply a demand for so many sittings (and precious small ones, too) for so many pounds.

Here is another and more recent case. Thequire of a parish was having his house rebuilt, at a heavy cost, by that leading architect, whom I will designate as Mr. Boss. Schools had been erected in the parish a year or two before, and required something to be done to them: so the vicar on one occasion waylaid Mr. B., and asked him to look at the buildings. On getting sight of it, Mr. B. exclaimed, "Ah, neat little work; who was the architect?" To which the astonished vicar replied, "Yourself." Now, I do not think that the question was put from affectation, the architect being a very plain, straightforward man; but I feel sure that he had never had a fair view of the building before. In other words, it was designed by one of his clerks, approved of by his manager, and countersigned by himself without a second glance.

But it may be asked, Why is all this to be avoided? To which I reply, would a Raffaello undertake fifty orders simultaneously, and hand over forty-five to his pupils, contenting himself with putting in a finishing touch to some of the chief works, and none at all, perhaps, to the little ones? Would any purchaser be content with such a return for his money as a painting by Mr. Stipple or Pinto, with only Raffaello's reputation and name attached to it? Would any great painter stoop to such doings? Certainly not; but, then, painting is still an art, and architecture is only a profession with most of its followers. For my own part, I can say that were I about to build, I would not employ a leading architect with his hands full of work, and his brain and heart unpoised. I believe heart is as much, if not more, necessary to a good work as head, and I should try and find an artist and gentleman who would thoroughly enter into the matter as a work of love as well as money. This was done by the owner of perhaps the most beautiful modern mansion in England. The employer was a fair amateur, and the architect a young man, then comparatively little known, and the two went to work with a will. There is, however, a comical sequel to the story. The amateur was so satisfied with what "we" had

done that he determined to dispense with professional aid in the restoration of the adjoining church, and in the opinion of everybody, save perhaps himself, made a regular mess of the undertaking.

The question then that I would now put to the great architects is much the same as that put to the great wine-buyers—"You have got all the large prizes, will you then stand aloof and let the small fry contend for the lesser ones?" This might be easily done to a great extent by their charging 10 per cent. instead of 5 per cent. upon an expenditure below a given amount, say 2,000l. or 3,000l. In nearly every profession the leaders receive higher fees than the juniors, and if wealthy clients require the services of a leading architect, why should they not pay for them? As it is, Mr. A., with a practice of thousands a year, is one week going north to spend 500l. in restoring a church, or east to build a parsonage or school for 1,000l.

It is true that the aggregate of the small sums amounts to a good figure in the course of a year, but what becomes of the art when the artist is spending more than half his time in flying about the country? The mere act of excessive railway travelling is injurious to both brain and heart, physically as well as artistically. I recollect once wishing to meet a celebrated architect on a small business matter. I was staying in London at the time, and as often as I called at his office he was out of town, even on the very occasions when his clerk told me he would return. Finding that he was to be back by a given day, I called early in the morning, and found him not only back but about to be off again, and hastily taking an indigestibly cooked office chop, during which process he equally hastily, but more satisfactorily, discussed my question, which had been in limbo for six weeks, and would probably have remained there as many more but for my chance intrusion.

One word more. When I named a given sum as the minimum of charge, I merely threw it out suggestively, and would like to see it raised, making an exception in favour of works of detail, as a font, monument, organ-case, &c., which undertaking would not be beneath the notice of the most accomplished artist. If my idea can be carried into effect, I do not think that the incomes of the Tritons will be at all injured, whilst those of the Minnows will be benefited.

AN AMATEUR.

THE SEWAGE QUESTION.

Pollution of Rivers by Sewage.—In the House of Commons Mr. Dimdale asked the Secretary of State for the Home Department whether he intended to introduce any general measure during the present session for the prevention of the pollution of rivers by sewage. Mr. Bruce, in reply, said, he regretted to have to state it would not be in his power to do so.

Utilisation of London Sewage.—Some of the sewage of London is to be experimented with on the A B C process, which was condemned by the Sewage Commission. After much deliberation, however, the Metropolitan Board of Works have decided to permit the "Native Guano Company" to erect works at the Southern Outfall, where, 500,000 gallons of sewage will be acted upon daily. Recent alterations, or improvements, it is now said, have added to the value of the manure; but whether the process is still entitled to be called "the A B C" (alum, blood, and clay, or charcoal, or whatever it was) we do not know, but rather think not.

Richmond and its Sewage.—The Government inquiry respecting the Richmond sewage scheme has been concluded, having lasted seven days. Over thirty witnesses were examined, including Mr. Bazalgette, C.E., Mr. Bailey Denton, C.E., Mr. Quick, C.E., Mr. Shields, C.E. Twenty-five of the witnesses were called by the opponents of the scheme. Mr. Garth, Q.C., who opposed on his own behalf, stated that he had property worth 40,000l. in the neighbourhood, and if the sewage farm were established there, as proposed, he estimated that his property would be reduced in value nearly one-half, in which case he should sell it for the best price he could get, and apply to the Richmond vestry to compensate him for the difference. Mr. Holl, barrister, opposed on behalf of Mr. Blake, a large landowner in the neighbourhood. The representatives of the New Malden Local Board, the corporation of Kingston, the parish of Merton, the Thames Purification Company, and the trustees of the Gower Estate also brought a powerful opposition to bear. The scheme was not opposed by the Duke of Cam-

bridge, who has an estate of 2,000 acres in the neighbourhood. The commissioner (Mr. Harrison) having been requested by the promoters of the scheme to express his opinion on its merits, replied that he should without doubt report to the Home Secretary against the scheme.

Proposed Irrigation Scheme for West Derby, Liverpool.—Mr. Arnold Taylor, one of her Majesty's inspectors from the Home Office, has held an official inquiry, at the offices of the West Derby Local Board, as to the proposal of the Local Board to acquire certain lands for the purposes of sewage irrigation. Mr. Layton, clerk to the Board, was present, and there were also present several of the members. Mr. Simpson, of Messrs. Simpson & North, solicitors, attended on behalf of the owners of the Walton Hall Estate; Mr. Atherton, occupier of a farm on the same estate, also attended. At the close of the inquiry, Mr. Layton said he trusted as little time as possible would be lost in getting the provisional order, especially as a perpetual injunction had been obtained against the Board, restraining them from executing any further sewerage works which would increase the flow of sewage with the Tuebrook, and after the 15th of April next preventing them from emptying any sewage whatever from the main sewer into that brook. The Board intended applying for an extension of that time; but if the application were granted, it would probably be only for a short period. Mr. Taylor said that was the strongest argument they could have for having the order granted as soon as possible. Mr. Taylor said he hoped the land would be got without serious opposition. Mr. Layton: I think there will be no difficulty. Mr. Taylor: The best way to avoid that is to meet everybody fairly and fully, and do no harm to private individuals.

METROPOLITAN STREET TRAFFIC.

THERE are at the present time few questions of more importance in this great metropolis, and few more difficult to deal with, than that of the street traffic. Vast sums have been spent, and are being spent, on this account, the effected improvements barely keeping pace with the increase of the traffic itself. Circumstances have led me to pay much attention lately to the working of the present system, and to observe the causes of impediments in the streets. Considerable inconvenience unquestionably arises from the loading and unloading of carts and vans by the side of the road. Attention is now being given to this point, and no doubt the best regulations the circumstances admit of will be made. Nevertheless, a few days' careful observation of the street traffic would satisfy any one that the great obstruction arises from inattention to the "rule of the road." If vehicles generally could be compelled to keep their own side of the road,—that is, to keep as close to the "near side" as possible,—those wanting to pass could do so freely, and, in many cases, I am satisfied that the same amount of slow traffic, and double the amount of fast, could traverse with greater facility and less danger than at present.

Take the case of a road wide enough for three lines of traffic. You will find a heavy van travelling slowly about half a width clear of one side, and other vehicles coming in the contrary direction in the same position. These block the whole street. Nothing can pass the slow van till an opportunity is found when the off side is clear; and this leads to the most dangerous position possible,—namely, trying to pass one vehicle when others are advancing to meet you. It is the same with streets wide enough for four lines of traffic. The slow and heavy vans keep some considerable distance from their proper side. The four-line road is thus reduced to two; and opportunities for passing must be waited for.

The remedy for this evil in some countries would be for the police to chastise any driver they might see transgressing, or fine him on the spot there and then. In England, however, it is to be supposed that there might be objections raised against such power being given to police; and we must make up our minds to take the consequence which undoubtedly is and ever will be to give up the best part of the road to the greater power; that is, to the slow and heavy vans, whose very weight and slowness give them the power of choice of position. If the mind be fairly made up and reconciled to the fact that the heavy traffic must have the pick of the road,

* They have done so.—ED.

tions appear. Builders will often inquire whether the "quantities" are taken out "full," some, it is possible, who have erected similar buildings to that now before them for consideration, will censure the whole mass, and many of these courses of procedure are just as likely to yield a correct result as an attention to every little detail prepared by that student of elaboration, the "quantity surveyor."

I respectfully suggest to the Council of the Institute that instead of allowing the preparation of "quantities" to be considered a "bar sinister" to members of their body, they should rather encourage the practice. The aesthetic and artistic parts of our profession are of high importance; but not less so, that sound practical knowledge, without which we can scarcely be considered architects, in the wide application and general acceptance of the form, as applied in this utilitarian age.

I treat, as an unwarrantable reflection, the insinuation that architects cannot have pecuniary transactions with builders without the implication of collusion; but if the practice of taking out quantities by them were the rule and not the exception, I believe it would tend to the correction of many abuses now associated with the contract system.

N. B. B.

LAYING ASPHALTE.

SIR.—In the face of ill prognostication and ominous forebodings, I have most perfect confidence that asphalt is in every respect a far superior article to stone for paving purposes, but at the same time it appears to me that much unnecessary and mischievous labour is expended in the manner in which the Val de Travers asphalt is applied, and it is as I feel to commend, while watching the process in Cheshire, why so great a depth of road should be taken up to make a surface on which to lay the asphalt, whereby a good substantial and well-beaten road is converted into a traffic as Cheshire shows, an exceedingly false one. I therefore venture to suggest that, as it is probable this comparatively new material, at least in this country, will soon be more generally adopted, it would be as well if the labour objection to its application could be obviated; for although the indentations, consequent on the present method of laying it down, can be filled in, it is certainly no argument why a thoroughfare enjoying so enormous a traffic as Cheshire side should, every time it requires repaving, be torn up by the roots in the ruthless fashion we witnessed last year.

WM. BOWFIELD.

ACTION ARISING OUT OF THE RESTORATION OF BARROW CHURCH.

In the Derby County Court, before Mr. G. Russell, Judge, the case of Higgins and Another v. Roberts has been heard.—Mr. Briggs appeared for the plaintiffs, Matthew Higgins and Joseph Hill; and Mr. Barker (of Nottingham) for the defendant, Edward Roberts, builder, Weoston. The action was to recover 20l. 3s. 6d., the balance of an account for work done. The defendant had the contract for the re-building of Barrow Church, in this neighbourhood. The plaintiffs are plasterers living in Derby. In August last Mr. William Miller, in the employ of Mr. Stevens, clerk of the works, received a letter from the defendant asking him to obtain a plasterer for this neighbourhood. At the request of the plaintiffs he afterwards wrote to the defendant stating that they would do the work at 9d. per yard. The defendant then wrote to Mr. Miller stating that he thought 7d. per yard was sufficient. This, however, was not communicated to the plaintiffs, and the work was entered upon, they being under the impression that they were to be paid the price they had named, and the defendant of opinion that their charge would be 7d. per yard. There were 918 yards of work, which at 9d. came to 84l. 8s. 6d., and also 500 ft. of angles at 3d. The latter price was also disputed, the defendant affirming that it ought to be 2d. The claim amounted to 11l. 15s. for seven bags of plaster, the defendants having understood that the contract was for labour only. The defence was that the defendant not having ordered the plaintiffs to commence the work was not liable; and that he claimed that they had been paid into Court, and the order was thus admitted. His Honour decided that 7d. per yard for the general plastering, and 2d. per foot for the angles, were sufficient, and that the evidence showed that 9d. and 3d. respectively were unusual and unreasonable charges. He therefore ruled that the amount paid into Court was sufficient to cover plaintiffs' claim. If the defendant was satisfied that the plaster (for which 1l. 15s. was charged) had been used and that that amount had been paid for it, which he appeared to admit, he should suggest that, to avoid further litigation the sum should be paid.

'SATURDAY HALF-HOLIDAY.

SIR.—Allow me to thank you for inserting my letter on the above question in your impression of the 11th instant. Of ninety-four communications sent me on the subject, I find the result to be that eighty-three of the offices close on Saturday earlier than on the other five working days of the week, the remaining eleven slaving on as usual. I presume I may be allowed to take this result as a fair representation of the extent to which the half-holiday is recognised by the architectural profession. If so, the proportion will be seen to be nearly eight to one. The question then comes to be, what is to be done with this ninth man who refuses to do as the majority of his brother architects do? Suggestions rise in one's mind with regard to him, which have more direct reference to tailors than architects. At the same time it would be a great matter to impress him with the fact that he is doing himself and his assistants a great injustice; for the advantages of the half-holiday are as much on the side of the principal as the assistant.

To speak of the advantages generally, they are

summed up in recreation and study. Now, I maintain that the man who has a few hours of every week to give to either of those purposes benefits not only himself, but his employer. If he gives the time to recreation, he is certainly physically able to do more work than if he had no time during the week to devote to such a purpose. If, on the other hand, he gives his time to study, his employer, of course, receives the benefit of it, in having his work more carefully and skilfully done. I contend, therefore, that architects who deny their assistants this boon stand much in their own light, and deprive their assistants of the opportunity of keeping pace with the other young men in the profession.

May I be allowed to suggest that the Institute would be doing good service to the profession were it to strongly recommend to all architects the giving of the Saturday half-holiday?

I beg to thank those gentlemen who have so kindly assisted me in making public the above figures.

A. Y. Z.

SMALL-POX HOSPITALS.

At the vestry of St. James's, it has been resolved, in view of the increasing demands for hospital accommodation for small-pox patients, to give the Sanitary Committee power to make temporary provision by erecting an iron hospital at Battersea, or making any other arrangements in accordance with the requirements.

Memorials have been presented to the Metropolitan Board of Works by the inhabitants of Richmond-terrace and Parliament-street, Westminster, and also by the Whitehall Club, against the proposed erection of a temporary small-pox hospital on a piece of land between Cannon-row and the Thames Embankment. It is urged that the building would be in the highest degree dangerous and objectionable to the residents in the locality.

In reply to a question in the Commons, the president of the Poor-Law Board, Mr. Goschen, said the last returns showed that the total number of the small-pox cases in the Metropolis under treatment was 1,228. The accommodation for them consisted of 520 beds in the Metropolitan hospitals, and the Boards of Guardians had accommodation for some 300 more, making a total of 820 beds, or about 400 short. In the course of a fortnight, however, the number of beds would be increased by upwards of 500, so that the provision would exceed the cases known to be in existence. Some of the accommodation furnished by the guardians was, however, of an insufficient and temporary character; and it might be requisite to have 200 or 300 additional beds. Of the 400 cases unprovided for, the majority were at Bethnal-green, Shoreditch, and Whitechapel. A report had gone abroad that at Shoreditch there were 420 cases unprovided for; but that number was made up by an erroneous calculation. The real number of cases unprovided for at Shoreditch was about 150—certainly, far too many.

BIRMINGHAM CORPORATE BUILDINGS COMPETITION.

THE Town Council, at their last meeting, decided that the building committee shall engage a consulting architect to assist them in reporting on the designs which are to be sent in on March 1st; and further, that the designs are to be exhibited to the public. More than 200 copies of the Instructions to Architects were applied for.

CHURCH-BUILDING NEWS.

Hull.—The new church of St. Silas, situate in Barmston-street, has been consecrated by the Archbishop of York. The movement for the erection of a new church commenced not quite three years ago, when a committee was appointed. Subscriptions were at once promised to the extent of about 1,500l., an amount sufficiently large to justify the proceeding with the erection of the church. Land was bought on the north-west side of Barmston-street, and plans and tenders accepted for the erection of a church, to cost about 3,500l. The expenditure to the present time, inclusive of the cost of the land, has been near upon 4,400l., whereas the funds collected fall short of that amount by about 200l. The whole of the seats in the new building are to be free. The building contains sitting accommodation for 660 persons in open

benches, and consists of nave, with north and south aisles, chancel, organ-chamber, and vestry, and is built in the Gothic style of architecture, of the twelfth century, from the designs and under the superintendence of Mr. Samuel Musgrave, architect, Hull. The church is constructed of bricks, and faced with red stocks, with bands of blue Staffordshire bricks, tracery, and other dressings. Hare-hill stone has been used. Entrance to the church is by the tower porch in the south aisle, and by a door in the west end. The church is not yet completed, so much of the tower only having been erected as was necessary to form a porch; but when funds will allow, the tower will be carried to the height of 70 ft., and finished with a slated spire, 52 ft., making the total height of the tower and spire, 122 ft. The interior of the church has Bath stone columns, with moulded caps and bases, and parti-coloured brick arches and stone labels to the nave arcade. The chancel has an apsidal termination, and has moulded brick arch and stone sub-arch resting on bold moulded corbels and shafts of Bath stone, with carved capitals and moulded annulets and bases. The whole of the building is lighted by windows with traceried heads, and large rose-window over the west entrance, and to the clearstory, the windows being glazed with tinted cathedral glass in geometrical patterns. The nave and aisle roofs are open timbered, framed in trusses, with moulded and wrought ribs on corbels. The ceiling is plastered between the rafters. The other roofs throughout are trussed rafter roofs and boarded. The whole of the interior woodwork is stained and varnished. The pulpit is of oak, and placed on a moulded Bath stone base. The font is of Bath stone. The floors of the passages and porch, as well as the porch walls, are laid with Staffordshire tiles, and the chancel and communion with glazed and encaustic tiles, and all are laid to patterns. The gas-lighting is by means of coronas suspended from the nave roof and brackets in the aisles; these, which are very simple in design, were supplied by Mr. J. W. Dovey, of Manchester. The contractor for the whole of the works was Mr. Musgrave, of Hull, his sub-contractors being Mr. Sweeting, mason; Mr. Thomas Sissons, joiner; Messrs. King & Co., ironmongers; Messrs. Gouldsborough & Son, plumbers; Messrs. Wilde & Sons, slaters; and Mr. A. Wright, painter.

Cuckfield.—The work of re-shingling the spire of Cuckfield Church has been completed, under the superintendence of Mr. Holland, of Hayward's Heath, architect; Mr. Dawson, of Norwood, being the contractor. The decayed timber in the interior has been replaced by heart-of-oak beams, and the brick buttresses of the tower have given way to stone ones. The weathercock has been reinstated in its old position, after its fall, a year or two ago, regilt, with a new king-post for a roosting-place. A winding stone staircase has been added at the south of the tower. The stone-work of the tower has been repaired and pointed throughout, and the growth of the ivy that was overrunning and injuring the stone-work of the battlement checked.

Gorefield.—The new church here has been consecrated. The late rector of Leverington, the Rev. Canon Sparke, a short time before his death, expressed his intention to erect a church at the Gorefield end of his parish, at his own cost. The plans were in course of preparation, under the rector's personal supervision, when he was removed by death; and, for a time, the execution of his design was postponed. His wishes have been, however, carried out by his eldest son, Mr. Edward Bowyer Sparke, and the edifice is erected to the memory of the late rector. A parsonage is about to be built on the north side of the church, and it is also proposed to erect schools in the parish. The church consists of a nave, 64 ft. by 22 ft. 6 in., with porch at south-west corner; and of chancel, 28 ft. by 18 ft., with vestry and organ-chamber on the north side. The walls are of brick, faced with flint, and have stone dressings throughout, externally and internally. A bell-gablet, of stone, is built over the chancel-arch. The roofs are open-timbered, stained, boarded, and covered with slates. The nave is seated with low deal benches, stained and varnished; the chancel with oak seats; giving a total sitting accommodation for 260 persons. The altar-table and rail are also of oak. A stone pulpit is placed at the north-east corner of the nave, and contains, in a central canopied niche, a figure of our Lord. The font is at the west end. The passages are paved with Godwin's tiles, the chancel floor increasing in richness towards the east end. All

the windows, except the east window, are filled with tinted plain glass in quarries, the latter with stained glass inserted, in the following subjects, designed and executed by the architect, viz.,—north light, the Agony in the Garden, and the Betrayal of our Lord; centre light, the Crucifixion, Resurrection, and Ascension of our Lord; south light, Supper at Emmaus and Pentecost. The building has been erected by Messrs. S. & W. Pattinson, of Ruskington, near Sleaford, from designs by and under the superintendence of Mr. Frederick Preedy, of London, architect.

Books Received.

The Schools of the People. By GEORGE C. T. BARTLEY, Examiner, Science and Art Department. London: Bell & Daldy. 1871.

THE history, development, and present working of each description of English school for the industrial and poorer classes, is a highly important and instructive subject, to which Mr. Bartley has seemingly done great justice in this portly volume. The work is replete with details as to all kinds of schools; elementary in connexion with the Committee of Council on education; in connexion with the Science and Art Department; with the Admiralty; the War Secretary; the Home Secretary; the Poor-law Board; the Commissioners of Lunacy; and Schools not aided by public grants. Accounts are also given of the training colleges in connexion with the Committee of Council on Education; and separately of educational arrangements and institutions specially interesting. The work is illustrated with sketches of various kinds of schools; and in the introduction is an interesting history of schools from the Reformation, including the Grammar School period; the Parochial Charity School period, from about 1700 to 1800; the Educational Society period extending from 1808 until 1833; the period during which public grants were made, to encourage education, but limited to the erection of buildings and partial aid to training colleges, from 1834 to 1846; and the period during which public grants have been made in aid of the annual expenses of schools, from 1846 till the present time.

Schools are shown to be in existence for almost every class of child, but the accommodation which they provide is far below the requirements. The estimated population receiving weekly wages or falling within the classes for whose benefit the Parliamentary grants were voted in 1869, was 18,745,378. Of these there must be, aged from 3 to 12, all of whom should be either at Day or Infant School, 3,936,513. But the numbers known to be in average attendance at schools of all sorts for the people, is only 1,384,203. Of these only 205,245 receive no State aid.

The worst feature in the case is, that so great are the apathy and indifference of parents, caused, it is true, by long neglect, that the provision already made in existing schools is not taken advantage of to nearly its full extent, in spite of the hundreds of thousands who are growing up in absolute ignorance,—a strong argument, we may observe, in favour of some sort of compulsion to promote the education of children.

The year 1870 must be looked upon as the commencement of another epoch in the history of English education. Hitherto, the assistance of Government towards the work of teaching the poorer classes has been confined to those places eligible to receive grants on account of their fulfilling the necessary conditions, by producing a certain amount of voluntary local effort. Where nothing has been done by private energy, the State has not interfered, but allowed the children to go without the opportunities for improvement. The change now about to commence will be more important than any which has yet taken place. Voluntary effort, largely aided by the State, has led to the present condition of affairs, but has been manifestly unable to reach the lowest and most numerous class of society. Every feasible plan has been suggested, by which these thousands might be included amongst those receiving the benefits of education, and it has been decided that nothing will avail but the power of a compulsory measure, even though it be unnecessary to enforce it except in rare instances. Such is the main object of the Act passed last session, by which it is hoped that those hitherto neglected may be duly cared for, even in places where local philanthropy and voluntary assistance are unknown.

The inauguration of such a scheme has raked up all the discussions which have taken place from time to time even as far back as 1820, when Lord Brougham first introduced an Educational Bill into Parliament; and religious zeal has again been too frequently perverted into bigotry, and allowed to become the cause of ill-feeling and paper warfare. Nothing but the public determination to throw over all other considerations except that of requiring that children should be taught, enabled the present measure to be settled at the end of last session. Mr. Bartley is of opinion, that—

"Many of the details of this new Bill will no doubt undergo changes before, in practical working, it is found to accomplish all that is desired. In spite of this, however, the operation of the enactments cannot fall very shortly to be felt, and this sixth period now dawning upon us bids fair to make such a change in the condition of all, that its operation in a few years must influence for good a larger number than that affected by the efforts of former epochs. If the one principle on which it was framed is maintained and carried out, namely, that in some way or other every child in the kingdom shall be taught, and the rudiments of knowledge, the year 1870 will have to be looked back upon as not only inaugurating a new system of education, but as commencing a reformation in society in no way second in importance to the great religious event of the sixteenth century."

Whenever the enactment is carried out, which requires that all children from three to twelve years of age shall be at school, an increase in the number to be taught, to the extent of about 2,150,000, is anticipated. Judging from the past, the great difficulty will be to obtain an adequate supply of teachers for the large number of new schools which will have to be brought into existence. No plan seems to have been so effective for creating efficient teachers as the pupil-teacher system. With the multiplication of schools, a corresponding increase in the number of pupil teachers may be fairly anticipated, and thus in the course of a few years, when those have served their apprenticeship, a considerable addition to the number of candidates for admission to the Training Colleges may be looked for. It is to be feared, however, that this will be insufficient. The Training Colleges are not now full, though the present complement of pupil teachers, even not taking into account those who enter to be trained without having been apprenticed, would be ample to supply the 1,250 annual vacancies, were they all, or a fair proportion of them, to continue the vocation of teaching. Taking the number of scholars to each certificated teacher as eighty-five, the training system of the country must furnish about 2,000 new teachers a-year, in order to keep up the number necessary for all the schools now at work, and for those which will have to be formed. Besides this, a staff of 27,000 instructors, in addition to those already at work, must be provided, to start with.

Besides an increase of salary, the prospect of advancement for extra ability might be urged as an inducement to eligible persons to come forward and qualify as teachers. The recognised necessity of combining scientific instruction with the ordinary training of the artisan class, suggests a means of carrying out this idea, which Mr. Bartley thus gives:—

"A superior Training College might be established, to which a certain number of the most efficient elementary school teachers might, by competition or otherwise, be admitted, to pursue their education in advanced science subjects. Superior appointments, fairly remunerated, such as science teachers in provincial towns or districts, might be open to those who had passed through this higher course of training. This would induce many to enter the profession who are now discouraged from a knowledge that, even with the utmost skill and perseverance in their duties, their position, in a pecuniary point of view, can never rise beyond that of a first-class mechanic."

The motive power for great improvement and much good has been created, and the determination of the country is taken: nothing remains but to design the necessary machinery whereby to carry out the work. It is not likely that this country, so advanced in enterprise and intelligence, will be wanting to this end, now that it is fully alive to its importance. The schools of the people will then afford instruction not only to the poorest class, but to every individual member of the poorest class; and not only to those whose parents desire to see them improved, but to those who are so unfortunate as to be the offspring of persons too ignorant to know the value of education, or utterly callous and apathetic as to their welfare. They will also give an opportunity to all to develop any talents they may possess to the greatest extent, and at the same time guide them in using such advantages not only for their own benefit, but for their country's welfare and advancement.

At this particular juncture in the history of

education, no more fitting production than the one before us, as a standard work of special importance, and, indeed, indispensable, to all interested in the education of the people, could have issued from the press.

The City of London Directory for 1871: Collingridge, "City Press" Office.

THIS, say the proprietors, is the first directory ever specially devoted to the City, and its map is the only one published giving the parish and ward boundaries (for nearly 200 years). The "City of London Directory" is said to contain every street, court, alley, or place in the City, numbering 1,039; and in this section 28,509 firms and their trades appear. These, again, are rearranged in the alphabetical divisions, but with the addition of the individual members of firms, as well as the names and addresses of every church, chapel, charity society, &c., and number 33,998. The "Trades Guide" contains 31,655 names of firms, classified under 909 trades or professions.

The "Street Guide" is so arranged that the position of each house in the street can be seen at a glance, and the ward and parish determined even to the half of a building. The nearest post-office, pillar-box, and telegraph are given, as well as the floor on which business is conducted, thus saving much time. The "Livery Companies' Guide" is a valuable addition. It is added that the particulars respecting charities, schools, almshouses, and exhibitions have been mainly drawn from the "Charity Reports" furnished to Government; other matters from old records and ancient documents. The information is said to be all corrected to January 31st, 1871; and although we cannot commit ourselves to all that is said of it, we willingly state that this seems to be a very valuable Directory, and by far the best one of the City of London extant.

VARIORUM.

"Metallography, as a separate Science. By T. Allen Blyth. London: Longmans & Co. 1871." This is a reprint from magazines, issued as a student's handbook. It is based on notes taken originally for the writer's own private use; but the book is all the more valuable on that account, as it is not a mere made-up compilation from other books; and though defective in some respects, even as a mere elementary treatise, it contains much that other elementary treatises want. A little more care might have been taken in condensation and correction of the press. "Iodine of antimony" for example, is not a very chemical expression; and phosphorus for phosphorus should not be used repeatedly. The meaning of the following passage is not very clearly put. Protoxide of Strontium "is a grey, poisonous, alkaline earth, resembling baryta (but is not poisonous), and has a violent affinity for water."—"Iron Arches. By Wilfrid Airy, C.E. Office of Engineering." This small treatise on the practical theory of the continuous arch has been reprinted from *Engineering*.—"A Handy Book on Health. By C. A. Cameron, M.D." is a second and revised edition of one of Cassell, Petter, & Galpin's useful publications.—"The Ashmolean Museum, by J. H. Parker, Oxford," is a lecture by the keeper of the Ashmolean Museum delivered to the Oxford Architectural and Historical Society, in November last, on the History, Present State, and Prospects, of the Ashmolean Museum.—"A Supplement to Haydon's Dictionary of Dates" (Moxon, London), contains a chronicle of the Franco-Prussian war, and a summary of the history of the world, 1868-1870.—"Arithmetic. By W. H. Girdlestone, M.A. Rivingtons, London." This is a second edition, revised and enlarged, of Girdlestone's "Arithmetic, Theoretical and Practical." Its special object is to give reasons and explanations of the fundamental principles of arithmetic.

Miscellaneous.

Henley-on-Thames is to have some public baths. It has been decided to erect them in time for the next season, so that the visitors to the regatta shall not have such good cause for complaint as to bathing accommodation as we heard of last year. Mr. Haslam has prepared plans, and they have been approved by the Thames Conservancy Board, and the owner of the adjacent estate.

New Process in Iron Manufacture.—A description of a blast furnace, the invention of Mr. Wm. Ferrie, which, four months ago, was lighted at the Monkland Ironworks, Calderbank, near Glasgow, is given by the *Scotsman*. The furnace, he says, is constructed on the bell and cone principle, neither flame nor smoke being allowed to escape at the top of the furnace. The coal is self-sucked in four descending compartments or retorts, and the heat necessary for this purpose is created by the burning of the waste gases in a series of flues arranged around the retorts. In addition to an ample supply of gas obtained by the destruction of coal during the process of reduction, and employed for the self-sucking of the coal, an enormous surplus is given off, and is utilised in other departments of the work. The saving proved to be effected in one furnace constructed on this principle amounts in coal to 4s. 6d., in ores to 2s. 5d., in dross to 3s. 3d., or equal to 10s. 2d. on every ton of iron this furnace makes, being equal in one year on a production of 10,000 tons to a sum of not less than 5,083l. 6s. 8d. In Scotland alone, where the annual make of pig-iron exceeds a million tons, the saving effected in coal by this process amounts to 850,000 tons, representing in value 233,750l., and in dross 400,000 tons, or equal in value to 40,000l., exclusive of the estimated saving in ores also.

Church Enlargement and Extension.—At the last meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, grants of money were made in aid of the following objects, viz.:—Building a new church at Caldmore, in the parish of Walsall; rebuilding the churches at Church Lawford, near Rugby; Linkenholt, near Hungerford; and Martindale, near Penrith. Enlarging or otherwise increasing the accommodation in the churches at Bebbington, near Birkenhead; Britford, near Salisbury; Bywell St. Andrew's, near Newcastle; Crawley Down, near Worth, Sussex; Germansweek, near Launceston, Devon; St. Mary-le-Strand, London; and Thorp Arch, near Tadcaster, York. Under urgent circumstances the grant formerly made towards rebuilding the church at Burton-Pedwardine, near Sleaford, Lincoln, was increased. A grant was also made from the School-Church and Mission House Fund towards enlarging the school-church at Sewer's-end, in the parish of Saffron Walden, Essex. The society likewise accepted the trust of a sum of money as a repair fund for the church at Cantley, in the parish of Sedburgh, York. The grants have been fewer than usual during the past three months, owing partly to the erection of schools, and partly to the small amounts the society is able to award, in consequence of the limited funds placed at its disposal.

Proposed Purchase of Leicester-square. Great alarm has been excited by the statement that the Metropolitan Board of Works were about to pay 50,000l. for the open area of Leicester-square, as well it might be. It has been explained, however, that this sum was inserted in the Bill promoted for the acquisition of the enclosure in order to cover any contingency that might arise. 5,000l., it was hoped, would more accurately represent the purchase money required. If it were determined that the ground was available for building purposes, of course a much larger sum would be requisite. According to Mr. Justice Blackburn and other justices, 5,000l. was as much as the square was worth. It is to be hoped the Board will do all it can to prevent the public from being swindled in this matter. The area is utterly worthless to those who claim the ownership of it, and they have shown such an utter disregard of the credit of the metropolis that they do not deserve the least consideration.

Cost of Roads.—The following is the average cost of the roads in the township of Chester-le-Street, under the Highway Board:—1864, 344l. 10s. 6d.; average per mile, 28l. 14s. 2d.; 1865, 308l. 14s. 11d.; average, 25l. 14s. 6d.; 1866, 308l. 18s. 5d.; average, 25l. 14s. 6d.; 1867, 317l. 9s. 6d.; average, 26l. 9s. 1d.; 1868, 325l. 7s. 1d.; average, 27l. 2s. 3d. Gross cost for five years, 1,602l. 15s. 5d. Average cost per mile for five years, 26l. 14s. 11d.; 1869, 303l. 1s. 9d. less shares, 40l.; total, 263l. 1s. 9d.; average per mile, 21l. 18s. 5d.; 1870, 248l. 7s. 8d.; less taking off hill at Hett Hill, 17l.; total, 231l. 7s. 3d.; average per mile, 19l. 5s. 7d.; 1871, estimated cost, 228l. 13s. 10d.; average per mile, 19l. 1s. 2d.

Opening of New Library and Lecture Theatre at Halifax.—On the occasion of the annual *conversations* of the Halifax Literary and Philosophical Society, the new rooms which have just been added to the society's premises were formally opened. There was a crowded gathering of the *diletti* of the town. The erection of library and lecture theatre at the rear of the old building forms considerable additions, and the premises have undergone a great change in appearance. The old staircase leading to the museum has been removed, and a new one, of good width, erected further back. The new lecture theatre is about 44 ft. square, and has a height of 20 ft. The seats are ranged in a semi-circular form, one above the other, and ample space is left at the foot of these for the convenience of lecturers and others who illustrate their subjects by scientific apparatus. The acoustic qualities of the room are said to be good, and it will afford accommodation for about 300 persons. The new library is about 72 ft. long by 30 ft. wide. It is scarcely finished yet. In addition to these are lavatories and other conveniences.

St. Mary's R.C. Cathedral, Newcastle.—At the annual general meeting of the Northern Architectural Association, Mr. A. M. Dunn read a paper on the "Reparation of the Roof of St. Mary's Cathedral, Newcastle, which was affected by dry rot." In doing so, he observed that the church was designed by the late E. W. Pugin, and is one of his best works. On the roof there was a gutter about 140 ft. long; but there were no snow-boards put into it. Damp was observed to come through, and the eads at both ends of the church having been removed, the roof was found to be one mass of rottenness, the whole foot of the spar and the principal part of the gable end resting only upon a space of 2½ in. He had no hesitation in saying that if this state of the roof had not been discovered at the time it was, it would have fallen into the cathedral during the present winter. He explained that the defect was repaired by iron work, and at the present time the appearance was such that few could see it had undergone renovation. Mr. Dunn also submitted a design for the steeple, over 200 ft. high, proposed to be added to the cathedral.

Photographic Enterprise at Margate.—New studios are being erected by Mr. Goodman and Mr. Stodart, jun., on the Fort, at an outlay upon each of 1,000l. These studios will each comprise a large shop, waiting and dressing rooms, glass-house, dark rooms, printing, stove, and negative rooms, lavatory, w.c., and other conveniences, all upon the ground floor, and both will be of strong and permanent description. The builders who hold the general contracts are Messrs. Bushell & Son, and Messrs. Brown & Son, both of Margate. The roofs will be by Messrs. Taylor & Co.; the patent shutters, by Messrs. Clark & Co.; the ornamental tiling, by Messrs. Maw & Co.; the ornamental bricks, by Messrs. Beart & Co.; the white plate-glass will be manufactured specially at the works of the St. Gobain Company; while Messrs. Hobbs & Hart will supply the safes and locks; and Mr. Underbray, of Clerkenwell, the w.c. and lavatory fittings. The architect of both these studios is Mr. W. Lane Sear, under whose direction the various works are being carried out.

The Post-card System and a Substitute. The disadvantages of the open card have induced the Society of Arts to issue a specimen envelope weighing about two grains less than the post-card. It is simply shaped out and folded so as to be secured at once like the ordinary envelope, but to lie open before that, like a sheet of paper, and be written upon only inside, with the address outside. This envelope is proposed to be found by free trade and stamped by the authorities, or sent with a halfpenny stamp, fixed on a special place for it, which would be requisite for the perforations by the Post-office authorities, as would uniform size in the folds. Considering that no enveloped letter at all bears any evidence of having passed through the post, would not such an envelope be an improvement on the present system? If folded of uniform size there would be an immense saving of labour with it at the post-offices, in the obliteration of the stamps by perforation.

Architecture at Royal Academy.—Lectures on Architecture will be delivered at the Royal Academy, by Mr. E. M. Barry, on the 3rd and 10th of March, and by Mr. G. E. Street, on the 9th and 23rd.

Labourers' Dwellings in Ireland.—In reply to Mr. W. H. Gregory in the Commons, the Marquis of Hartington said that Sir William Somerville's Act, passed in 1860, under which certain loans might be made to facilitate the erection of labourers' dwellings in Ireland, would expire next year, and it might be necessary in the course of this session that it should be renewed. There were certain alterations and improvements which, he believed, would make that Act more useful than it had been; though its operation had been deemed of considerable benefit. In the meantime he was endeavouring to obtain some information on the question partially discussed in the Land Bill last year, and, without pledging himself, he would endeavour to deal with the subject in a wider manner.

The Royal Scottish Academy's Exhibition. The forty-fifth exhibition of the Royal Scottish Academy was opened on Wednesday, 15th inst. There are not very many striking pictures, a result very probably of the circumstance that some of the leading artists have been working for the International Exhibition which is to open in London in March. There is a smaller number of English or foreign pictures of merit than we have seen in many former exhibitions; but the Scotch artists of the younger generation are represented to great advantage, and there is evidence of improvement and advance in the works exhibited by some of them. The whole number of works of painting and sculpture together exhibited is 1,094.

Report on the Railway and Tramway Projects through the City.—A report to a committee of the City Sewers Commission, by their engineer and surveyor, Mr. Haywood, has been printed. The report states that about 4½ miles of street are scheduled for new tramway projects in the City, in certain cases the public ways being scheduled by two or three, and even in one instance, by four companies. The railway projects will interfere more with the sewers than the streets, though some of the chief public ways will also be interfered with, but not permanently in most instances. Mr. Haywood recommends the Commission to dissent from the whole of the projects.

Royal Society.—The President of the Royal Society, Sir Edward Sabine, has sent out cards for two evening receptions, which are to be held at Burlington House on March 11 and April 22. This is the last year of Sir Edward's presidency. We have received editorially, as well as in a private capacity, a pamphlet and two printed letters which serve to show there are some little differences just now amongst the governing body of the society. We do not know that it is necessary to discuss these matters publicly, but if they are to be talked of, we have opinions on the subject we may feel bound to express. Too small a section of the Fellows are allowed to rule at Burlington House.

Cattle Trough, Knightsbridge.—The parish authorities, St. George's, Hanover-square, have granted permission to the Metropolitan Free Drinking Fountain Association to erect a cattle-trough on the south side of Knightsbridge or Piccadilly, and recommend its erection opposite the drinking-fountain at St. George's Hospital. The trough on the north side of the road, at Hyde Park-corner, has proved to be a great boon; half a dozen vehicles at a time may often be seen around it. Although the road is wide, it is not desirable to have the troughs opposite each other, as obstruction might thus be produced.

A Minister of Health and of the Poor. The report of the Sanitary Commission recommends the detachment of the Health Department from the Home Office, and its association with the Poor-law Board, the two to be under the control of a minister of health and the poor. Another recommendation, we believe, will be the establishment in every district of a local sanitary authority; the formation of a local Board being compulsory in places having more than 2,000 population. A consolidation of the Sanitary Acts is also one of the recommendations of the Commissioners.

The Oxford Surveyorship.—Out of sixty-nine candidates for the surveyorship of the Oxford Local Board, four were selected by the committee, namely, Mr. Cotterill, of Portsmouth; Mr. Foot, of Oldham; Mr. Southam, of Brighton; and Mr. White, of Norwich. The Board ultimately elected Mr. White, by a majority of 19 to 17 for Mr. Southam, and 1 for Mr. Foot.

OFFICES AND SHOW ROOMS,
FARRINGTON-ROAD, LONDON, E
ONE DOOR FROM RAY-STREET.
Publishers of a Pamphlet on "Hot-Water Heating."

The Builder.

VOL. XXIX.—No. 1465.

Progress at Wells and Salisbury.



It is curious to note the change in the relative importance of some of our most celebrated cathedral and monastery towns in the present day, compared with that which they doubtless possessed in Mediaeval times. To the modern architect, Wells is always in idea what some centuries ago it doubtless was in fact, one of the chief centres of interest in the south-west of England; but, on alighting at the small and unpretending railway-station which bears the name connected in his mind with one of the greatest marvels of architectural art, the impression conveyed is that Wells is simply a cathedral and a collection of subsidiary buildings of the Mediaeval period, round which a few rows of small and mean-looking modern houses have clustered,—so disproportioned in the aspect and size of the former to that of the town which partially surrounds them. So capricious, indeed, are the influences regulating the growth and progress of towns, that while Bath, which formerly found it necessary to enter a doubtful claim to episcopal honours in opposition to its then superior rival, has grown into a large and important place, Wells seems to have remained positively almost stationary,—relatively to have far retrograded. The streets themselves offer little to detain the architectural visitor eager to reach the cathedral, the west front of which can at present be studied with a minuteness not generally possible, by the aid of the scaffolding erected for the repairs, which, while of course marring for the present the general effect to the eye, furnishes as a compensation the means of gaining close access to the wonderful and almost inexhaustible sculpture and decoration with which it is covered.* After the interesting account of the front lately brought before the Institute by Mr. Ferrey, the greater part of which, at different times, appeared in these columns, it is unnecessary just now to draw attention to, or describe anew, the general design which runs through this great assemblage of architectural sculptures; but a word or two as to the impressions produced by the close inspection which is rendered possible at present, may not be uninteresting to those who have not the immediate opportunity of visiting the cathedral in person. In regard to the general skyline of the centre portion, it has been before said, and on the whole correctly, that it is somewhat unsatisfactory, and even inelegant. In regard to the details of the structure and design,

the feeling left on a close examination is, that the whole achievement is more remarkable even than has been hitherto recognised. In regard to quantity of work alone, perhaps only the inspection of the several stages of the design at close quarters, from one scaffold to another, can enable any one fully to realise the intricacy and richness of the work undertaken, and the admirable and precise manner in which all its details have evidently been worked out, notwithstanding the present dilapidation of many portions. These dilapidations are most conspicuous in the caps and shafts of blue lias, of which the former are, in many places, reduced to mere shapeless rags of stone, while the few of the latter which are left, are not only disintegrated on the surface, but, in one or two cases, actually bent, like a wrought-iron bar under a heavy blow. Of the statues, those on the south sides of the buttresses seem to have stood best. The last of the row of angels in particular, in one of the upper tiers, which is so placed, is in comparatively good preservation, while all the rest in the same tier are woefully defaced by weather. The statues of saints, kings, and bishops, &c. in the lower tiers, while presenting much that is dignified in expression and pose, belong to the comparatively stiff conventional type usual in ecclesiastical work of the period, and may be regarded rather in the light of architectural embellishment, not without some degree of archaeological interest also. The main interest of the artist will always be centred in the remarkable tier of alto-reliefs, about half life size, which runs right across the front and returns round the towers, near the top of the composition, and represents the dead starting, naked and astonished, from their tombs, at the sound of the last trumpet. Here we have no conventionality, no ecclesiastical rigidity of type: here we have before us the genuine attempt of some gifted Mediaeval artist to do all that he could with the human figure as a medium for the expression of passion, despair, and exultation. In regard merely to mechanical execution, the spectator accustomed only to the more usual Mediaeval developments of the art of sculpture cannot but be astonished at the freedom of treatment, the energetic action of the figures, and even the degree of anatomical correctness in many points; speaking comparatively, of course. But more remarkable than this is the variety of conception and the intensity of feeling evident as underlying the whole work. Whoever was the sculptor, he had felt in his inmost soul the influence of that belief in a *Dies Ira* which formed such an awful background to the Mediaeval theology; and as we contemplate this array of figures, one looking joyfully up from the tomb from which he has thrust away the covering, another with an expression of simple wonder at the vision which has roused him from his long sleep, a third leaning his head on his hand in the deepest dejection, another tearing his hair, another with arms folded in the doggedness of despair, we involuntarily recall the lines from the great hymn of Thomas of Celano:—

*"Mors stupebit, et Natura,
Quam resurgit creatura
Judicantis reponetur."*

*"Quid sum, miser, tunc dicturus,
Quem patronum rogaturus,
Quia vix peccatis sit securus?"*

Passing from these greater considerations to more strictly architectural details, we may notice the remarkable vigour and largeness of manner in the carved foliage of the caps throughout the work, which overhang the bell more boldly than any we remember to have studied; and the freedom and beauty of the carving which fills the spandrels between the arches. We hear much now-a-days, and rightly, about combining Classic purity of form with Gothic vigour in the treatment of detail. If any one wishes to see

how this can be accomplished, let him examine minutely the foliated ornament on the west front of Wells. The student of masonic design will not omit either to take the opportunity of noting the construction and jointing of the masonry from which all this elaborate decoration is worked, and the depth and boldness of the mouldings; the whole of the foliated arches, for instance, over the figures we have been mentioning, being drop arches, undercut, and moulded behind with a deep hollow, where no one can possibly see the result of all this labour.

The work on the front, up to the date of our visit, had proceeded only as far as the fitting up of some portions of the masonry of the arcades and strings with new stone, and the renewing of a considerable part of the work, including a complete statue and niche, on the upper (later) portion of one of the towers. The earlier statues, we understand, are not to be touched, at present at least. The new stonework we found mostly not set permanently, but wedged up into its place, waiting for a sufficient supply of the shafts of Kilkenny marble, which is to supply the place of the perishable blue lias, being much of the same tint and appearance when used (as it is) simply sanded, and not polished. We do not see grounds for Mr. Ferrey's remark, that the lias had "stood remarkably well in sheltered corners." It shows extraordinary decay in some interior portions of the building, where it really looks more like cracked and rotten wood than stone. On the other attractions of the cathedral we need not now dilate, but may mention *en passant* the new and very beautiful organ, by Willis, not too large or noisy, recently erected. The bishop's palace, with its moat and drawbridge and picturesque irregular outline, is, of course, not to be passed over, as one of the finest pieces of ancient domestic architecture in the country. Of what has been recently done there we gave some account a few weeks since. The Church of St. Othbert is worth attention for its tower,—a good specimen of one of the characteristic types of late Somersetshire tower; and on the rising ground behind the Cathedral the new church of St. Thomas, with its adjoining rectory, may claim a word as a pretty and picturesque, if not very powerful, design. A walk up the hill rewarded us with a view of the outline of the cathedral and churches dark against a perfect flood of western sunlight, filling the sky and illuminating with a misty glory the successive reaches of hills beyond—a truly English scene. A parting glance at the cathedral as we descend suggests the reflection that, whatever some theorists may say, this west front was the design of one independent and original mind; that it did not grow "of itself" under the hands of a masonic clique; that it is as truly and distinctly an individual artistic conception as a symphony of Beethoven's or a poem of Tennyson's.

Perhaps this feeling as to the individual character of Gothic architecture is not diminished by a comparison of the front of Salisbury with that of Wells; so near in date, similar to some extent also in the general arrangement of the sculptured decoration, yet so weak and mannered in comparison, both as to general composition and details. Let the student who wishes for a lesson on the value of breadth and largeness of execution in architectural ornament, contrast the capitals in the front of Salisbury with those before mentioned at Wells, and "make a note" of the distinction. Very elegant and delicate, certainly, are the former, but very weak when by comparison. The strong point of Salisbury is its completeness and unity as an architectural composition externally; fortunately emphasised and shown to advantage by the large expanse of lawn which surrounds the building. No one visiting Salisbury Cathedral for the first time could make a better approach to it than by entering the green from the north-east angle, whence the

* It may be as well to mention, to prevent disappointment on the part of any of our readers who may visit the cathedral, that strict orders have been issued against the admission on the scaffold of any strangers, without a written permission from the architect for the restoration. This permission, we have no doubt, would be accorded to any one wishing to visit the building for purposes of study.

whole pyramidal composition groups itself to perfection. Should he come to this point, too, at the moment when an early sun is throwing the long shadows of trees right across the green from side to side, let him appreciate the value of level lines in the foreground of a picture in giving emphasis to a vertical composition in the rear. The modern statues in the niches of the west front, by Mr. Redfern, will repay attention: that of St. Sebastian, among others, is a very successful and pleasing design. The architectural restorations here have been executed in Chilmark stone, the shafts being replaced in grey Devonshire marble.

The work of restoration at present is concentrated on the interior of the Lady Chapel, an important part of the work being the repairing of the red Purbeck shafts, which have decayed in many places to almost a spongy softness and brittleness, chiefly owing, in all probability, to the action of condensed moisture in the colder seasons. Where these shafts are but partially decayed, the bad portions have been cut away, and their place refilled with a new piece. This has been carefully done, so that the patching is only perceptible on a close inspection, and even then might be missed by any one who was not aware of it. The brass rings, formerly gilt, which bind the joining of the shafts half-way up, it is proposed, we understand, not to regild; if so, they will have rather a shabby appearance, and it seems better, as they are there, to recognise them as a source of decoration; the gilding will tell well on the brownish red surface of the marble. The vault, with its "tufa" filling, has been re-pointed and re-cemented where decayed. Is it known where this light, porous, volcanic-looking material (for so it appears when uncovered by cement) was brought from? It seems to have answered its purpose as a filling material for the vault admirably, both as to lightness and durability. An ascent of the tower reveals the amount of solid labour which it has been necessary to expend in strengthening and replacing the masonry, especially at the angles, visible in ascending the stair turrets, where much of the old and not very well bonded work has been cut away and replaced with masonry in larger stone well bonded and wedged up, and having all the appearance of a solid piece of work. In the upper stage of the tower a number of wrought-iron diagonal ties, from corner to corner, have been inserted; and in the centre of each of the two internal arches on every face a massive supplementary stone centre mullion, concealed from outside view by the louvres, has been built up to the crown of the arch, which, together with the iron ties inserted across the springing, will probably be sufficient to prevent for the present any more of the threatened settlement from the weight of the spire. That so lofty a stone spire was not contemplated in the original design seems almost evident on examining this stage of the tower; if it were, very insufficient provision was made for so great a superincumbent weight. We spoke not long ago of the interior effect of the chapter-house, the windows of which have been filled with stained glass of a very admirable style both as to design and colour; the design consisting mainly of geometric diaper, with a few small figures in medallions, and the colour for the most part very subdued and delicate. The key-note of this glass design would almost seem to have been given by a window put up a generation back by a local artist, in the south transept; a window which is bad in colour, certainly, but which in general design shows a very clear perception as to treatment of stained-glass design. It is a pity that the lower portion of the chapter-house cannot be said to afford the same satisfaction as the tier of windows above; here, as our readers know, the quaint frieze of Old Testament subjects, in the spandrels of the ground-story arcade, has been painted in heavy colours, and the capitals below are overdone with gilding and masses of colour.

Those who like to note the architectural or the building peculiarities, however slight, of different localities, may observe the *pennant* in Salisbury for hanging out from the first-floor stories of houses, bay-windows with a flat boarded soffit, without the slightest indication of bracket or corbel to carry them; an omission which converts what would otherwise be a picturesque feature into a very ugly one. Still less pleasant reflections are suggested by the dirty and ill-kept state of some of the streets; foot-walks, outside the gates of respectable houses, consisting of nothing but a bank of clay, and

such other phenomena; things which are a reproach to any people. The Church of St. Edmund, though very late in style, is worth a glance for its rather unusual proportions: low but with very broad aisles, and a general open and unencumbered appearance in its nearly square area, very suitable for a place of congregational worship: the church only requires a new roof to the nave (the present being a very poor one) to present rather a striking and characteristic interior. A good east window, by Clayton & Bell, and some mosaic decorations in the reredos by Salviati, are among the adornments of the chancel. Those who love the scenes where good men have lived and laboured, never omit the pilgrimage of a mile and a half or thereabouts, out to the little church at Bemerton, associated as it is with the name of one of the most refined and truly "gentle" men of whom England keeps record. Adjoining the little flint-built church, scarcely larger than an average drawing-room, is the paragon in which "George Herbert's study" is still shown. A stone-throw off is Mr. Wyatt's new church, which has been before mentioned and illustrated in these columns, and of which therefore we will but observe that the good taste and effectiveness displayed in such decorations as the incised figures on the aisle walls and the pleasing style of grisaille glass with which many of the windows are filled, render it the more difficult to imagine how the east window came to be filled with such unmentionable stained glass: a chromatic fantasia in claret-colour and other abominations, by which the designer, whoever he be, has imperilled his soul, and to which no sort of pardon shall on any terms be extended.

COLONEL SCOTT ON LIMES AND CEMENTS.*

THE quantity of carbonate of lime extracted from sea-water by the oyster is nothing compared with what is done by the coral. It is an undoubted fact that the low islands in the ocean consist of nothing else than the works of the coral animal. Although only a feature of the Indian and Pacific oceans, the area which coral islands occupy is scarcely to be credited. The coral reef west of New Caledonia extends for a distance of 400 miles; the great Australian reef has a length of 1,000 miles. Millions of men dwell upon the decayed calcareous shells of these animals, and Darwin speaks of annular reefs of coral islands, with perpendicular walls of 300 ft. Coral limestone, indeed, is the material employed for the mortar of the Bermuda Islands and Malta among our own possessions.

But the oyster and the coral are not the only animals employed in building new continents. Ehrenberg has made it clear that the presence of visible petrifications in some, but not in all, limestones, is by no means a proof that other limestones without such visible signs of life have not been constructed in the same manner by creatures too small to be seen by the naked eye. In fact, all European chalks consist of microscopic animals with calcareous shells, and others with silicious shells; and this brings me to the question of what becomes of the silicic acid which we left suspended in the sea-water.

The organic agency which in such a wonderful manner brings about the abstraction of the carbonate of lime it contains, likewise removes the silicic acid. Most of the microscopic marine forms hitherto observed are silicious. Silicious organisms have in bygone days existed in such quantities that beds of earth, many fathoms in thickness and miles in extent, are made up of them. The so-called mountain-meal of recent formations, the Bilin polishing slate of the tertiary period, and a considerable proportion of the bulk of the chalk formation, are all due to their agency. It is to their presence in chalk marls that the limes made from the lower chalk owe their hydraulic properties. Ehrenberg, who made these animalcules his special study, calculates that in a pound of chalk there are upwards of ten millions of nautile, being upwards of one million in each cubic inch. There are placed round the mouths of these animalcules, hairs so disposed that a whirl can be produced which brings the food which the water contains within the reach of the creature, and at the same time assists its progression. Their bladder-like stomachs also present a large surface for the absorption of water, and separation of its con-

stituents. By this means an enormous quantity of water, far exceeding that which the oyster swallows, is enabled to pass through these infusoria. The nautile must consume—supposing it to extract the whole of the silica contained in the water—33,333 times as much water as it weighs, and this, remember, when the duration of its development does not continue beyond twenty-four hours. This is much as if a man weighing 150 lb. passed through his body in twenty-four hours five million pounds of water, i.e., 1 cubic foot per second,—a quantity sufficient to drive an overshot wheel.

But the power of increase of these creatures is more astonishing than their powers of imbibition and secretion. Ehrenberg observed the *Hydratina senta* for eighteen days, and found that such an individual can multiply itself fourfold in twenty-four hours. It can during this time develop four eggs, or in ten days forty eggs; and if no obstacles intervene, and all its descendants are equally fertile, on the tenth day there would be a million of individuals from one parent; on the twentieth, a billion, and in a month a trillion, and so on. But something more surprising than this remains to be told. The same observer found that another animalcule, the *Paramacium aurelia*, during its life of several days, could, in the course of one day, divide itself into eight individuals by simple transverse partition; and as these individuals increase by eggs as well as by partition, and these eggs are deposited, not singly, but in masses, it follows that the possible increase of a single individual in two days' time must be so enormous as to be incapable of being expressed in numbers. "Dr. Carpenter," says Sir John Herschel, "computes the progeny of a pair of aphides, if allowed to accumulate, at the end of one year, a trillion. Granting the reproduction of marine animalcules to be a thousand billion times less rapid than that of aphides,—granting that each of them during its life time (supposed not interfered with, and food supplied) secreted only a ten-millionth part of a cubic inch of indestructible calcareous matter, we should find accumulated, in less than a quarter of a century, a globe of such material, whose diameter would exceed the distance travelled by light since the ordinarily received epoch of the Creation (4004 B.C.), and the surface of the globe supposed to continue increasing, at the same rate, would then be swelling out into space a great many thousand times faster than the speed of light."

Nature doubtless bestowed upon them this marvellous fecundity to provide against their extinction, forming as they do in countless numbers the food for larger animals. If they were not exposed to many casualties, a single animalcule of the Rotifer kind could in one month, by means of its descendants, form a bed of silica twenty-five square miles in extent, and about three-quarters of a foot thick.*

Here, indeed, is a minimum form of existence, and a maximum effect resulting,—the greatest results produced with the smallest expenditure of means. Archimedes declared that, give him a lever long enough, he would move the earth; we can say that, give us a mailed animalcule and an ocean large enough, we will in a short time separate from it the whole of its lime and silica and build one.

In no case can the insignificance of the means by which the Creator works, and the immensity of the effects produced, be greater than in that of the infusoria, which form the material from which we derive so common a substance as that which I have undertaken to treat of in the present lectures.

As it is to the calcareous silicates that we must trace the origin of all the carbonate of lime upon the earth, so it is the magnesian silicates to which we owe all the carbonate of magnesia, a substance sometimes found in connexion with carbonate of lime, as in dolomite (in some parts of the country largely used for lime-burning), and sometimes occurring alone, as at Madras, where it has been extensively used for water-works. But silicate of magnesia is much less destructible than silicate of lime, and it exists only in small proportions in the skeletons of infusoria; on the other hand, it exceeds the quantity of lime in marine plants, and I must not omit to point out that vegetable as well as animal life is conspiring to the re-arrange-

* Such a stratum is actually now in course of formation at the bottom of the Atlantic Ocean, recent soundings clearly proving to us that a vast bed, of what may in time be consolidated into a soil, is now being deposited over a surface many thousands of square miles in area.

* See p. 140, ante.

ment of the solid constituents of the globe in its rocks and deposits. While, however, they both concur in removing from the ocean its mineral substances, these two agencies separate the two minerals, lime and magnesia, from one another. The carbonate of lime, as well as the carbonate of magnesia, is thus subjected to a wonderful circulation. The marine animals and plants separate them from the sea-water, and protect them from its dissolving influences. In this way calcareous sediments are formed, and perhaps after a time elevated above the surface of the sea. Then the organic matter is gradually destroyed, the carbonate of lime is again exposed to the solvent action of the acid-laden rain-water, and is thus removed and carried back to the ocean to renew the same cycle of changes.

I have now dwelt at considerable length on the mode of formation of the minerals which, when calcined, furnish us with our various limes and cements, and I may now pass on to the chemical processes which the preparation of these substances involve. Limestones consist mainly of carbonic acid and oxide of calcium or lime. If we look at the table (see p. 140), we find that carbonic acid is represented by the symbol C O_2 , or two parts of oxygen = 16 combined with one part of carbon = 6, total 22. Oxide of calcium, symbol C O , consists of one part of calcium = 20, combined with one part of oxygen = 8, total 28. If we put carbonate of lime into the fire, and expose it to a red heat, the carbonic acid is expelled in a gaseous form, and we have a residue of pure lime. If I take the same carbonate of lime and expose it in a vessel to the action of acid, the carbonic acid is also expelled as carbonic acid gas. The oxide of calcium, or lime resulting from the calcination, is a white substance, highly phosphorescent under heat, and possessing a great avidity for chemical combination with water. When water is added to the quick lime, a union of these substances takes place with the evolution of heat and a more or less considerable change of form and bulk in the lime. We have, in fact, a new substance produced, called hydrate of lime, which is a bulky powder which may occupy from two to four times the space of the original lime. The oxide of calcium, Ca O , takes up one equivalent of water, H O , and becomes $\text{Ca O, H O} = 37$. When this hydrate of lime-powder is mixed with water and made into a paste, with or without the addition of sand, Si O_2 , the resulting mortar gradually dries and hardens, and in the course of ages the carbonic acid gas of the atmosphere expels the water from the hydrate, and replaces it, forming a carbonate of lime. This is what takes place in the case of what are known as pure or fat limes; but, as the quantity of carbonic acid in the atmosphere is very minute, and does not, except after very long continued exposure, penetrate to any great depth below the surface, it follows that mortars made from such limes never properly harden and give good results. It is often thought that hard and dense limestones, such as the mountain limestone, give the strongest and best limes. This is not true as regards the builder, though the resulting material may be good for the smelter, the soap-boiler, and the candle-maker. Alberti, who devoted much attention to the subject of limes, asserted that some lime, more than 500 years old, which had been found in a pit, was, on its discovery, "still so moist, well-tempered, and ripe, that not honey or the marrow of animals could be more so!" It is stated by Jahn, that in the ruins of the Castle of Landsberg a considerable quantity of lime was discovered in a cellar, where it had been more than 300 years, which was apparently in the condition of freshly-slaked lime, only a little more dry. From these facts it must be evident that, if lime protected from the atmosphere remained so long without becoming consolidated, it is useless to expect good results from pure lime such as these clearly were. General Treussart sums up his opinions on this subject in the following pithy way:—"Thus chalk-lime mortar, when wet, is a pulp or paste, and when dry it is little better than dust."

Breweries.—In connexion with our remarks on breweries, we mention that at the next ordinary meeting of the Society of Engineers, to be held on Monday evening, 6th March, in the Society's Hall, Westminster Palace Hotel, a paper will be read on "The Machinery and Utensils of a Brewery," by Mr. Thomas Wilkins.

A REVIEW OF THE ARCHITECTURAL MUSEUM.

ON Saturday last, the Architectural Association paid a visit to the Architectural Museum, Tufton-street, Westminster, and Mr. J. P. Seddon lectured on the collection of casts.

Mr. Seddon said that his object was to bring before architectural students the varied treasures of the Museum, and to render them more generally known than, he was sorry to say, was the case at present, and the goodly gathering before him gave him hopes that, to a certain extent at any rate, that object would be achieved. He regretted that it was necessary he should have to assert that the collection he was about to describe did possess varied and valuable treasures; yet remarks that he had lately heard made by architects, of whose opinions he had the highest regard, to the effect that the Museum contained a heap of rubbish, warned him that he could not take the position he desired as proven. He felt, however, that he should have little difficulty in showing his audience that the general character of the casts which the Museum contained was anything but rubbish. It was fortunate that nowadays men were not given to mine their words, and vigour was to be admired, even if it sometimes overshot the strict bounds of propriety and verged upon those of exaggeration. He did not suppose the remarks referred to were literally meant; still, their purport was that the speakers' particular views were not sufficiently catered for, and therefore, on behalf of the authorities of the Museum, he felt bound to point out the fallacy they involved. The Architectural Museum and its contents, as it stood, had cost not less, in one way and another, than 5,000*l.*, and it had only been established after years of unremitting and painstaking labour on the part of its secretary, Mr. Clarke, and the council generally, and yet now he often heard it alleged that one error or another marred its efficiency. First, that the locality was undesirable. Now it had been chosen partly with the view of accommodating the class it was designed to benefit,—carvers and art-artisans. Unfortunately, that class did not yet seem to avail themselves of its advantages. But it was early days yet, and the existence of the Museum not sufficiently known to them. Then, no one probably was aware as well as the council how difficult it was to find sites in the centre of London, within such means as they had had at their command. At any rate, here was the Museum, and the cost of merely fixing the casts upon the walls had amounted to hundreds of pounds, and therefore it seemed foolish to talk wildly of removing it, and far preferable to try and make the best of it where it was. Another reason he had heard given for it not being used as it might be by students, was, that they thought it far better to study carvings in the actual positions for which they had been designed, and not from casts which were imperfect. This certainly could not be denied; yet there was one great benefit conferred by the Museum which could not be got elsewhere, and that was the readiness with which the work of various localities and styles could be compared. And if some of the casts were not so good as they might be, they still had value as parts of such a sequence, and might, and no doubt would, be gradually supplanted by better ones in time. On the whole, he thought that such complaints as these might be dismissed, as those of bad workmen who grumbled at their tools; and as he trusted his audience was composed of better stuff, he would proceed without further preamble to a description of what was before them. It would be found on examination that the distinct types of architectural ornament were but few, and had been handed down from remote ages with less variety of treatment than at first might be supposed. Thus the refined Greek had clearly its parentage in the ancient Egyptian and Assyrian, and in its turn was copied by the Roman. And after the convulsions which caused the overthrow of the empire of Rome had subsided, the same elements were re-used by the founders of the various Romanesque styles and the artists who in Byzantium still worked after Oriental traditions. The Museum had some fine examples of Classic work belonging to the Institute of Architects, but its collection was mainly composed of the later Mediæval styles. Some fine Romanesque capitals, however, showed by their interlaced ornaments carved on their surfaces, and not growing out of them, the character of work which had spread into the various countries from the Byzantine influence. The Gothic

of France never freed itself so thoroughly from these traditions as did the English, and with the square abacus carried quite late into the style, the conventional horns reminding one of the Corinthian scrolls, and even the Ionic volute and the acanthus remained almost throughout the principal type of the foliage employed in it. Whereas in England, as the Early English style became a distinct and complete one full of admirable and quite local characteristics, so was the Early English foliage developed into a perfect style of its own. The museum was remarkably rich in the carved work of this date; and some recent additions, in the shape of some casts of capitals from St. David's Cathedral, were most valuable, as showing whence and how this class of work arose. This was not from the Byzantine class of Norman ornament, but from the cushioned Norman capitals, on the face of which at first trefoil-shaped leaves were out, and at last they budded into foliage of the freest character, although the cushion element still mingled among the leaves in a curious fashion. A magnificent series of capitals and corbels from Llandaff Cathedral were next pointed out, as being perhaps the finest examples of Early Gothic foliage in existence, so free and perfect, and with so little reminiscence of their Norman origin, that it was only by reference to the earlier transitional St. David's work that it could be seen whence this was derived. This Llandaff work seemed the perfection of stone foliage, with the idea of strong vegetable growth, bold and free lines, perfect modelling of leaves and stems, full of gradation and lovely lines in every part. The next series of Early English capitals, though beautiful in their way, were more conventional, and far inferior in the above-named characters. These were from the East Anglian churches, such as Ely and St. Albans. Another group from Westminster Abbey and Stone Church might be considered as intermediate. The freedom of design and arrangement of their stems in spandrels were admirable and decorative, and the leaves broad in treatment and playful in detail, the trefoil not so rigidly adhered to, but three-lobed, irregular-shaped leaves, some with trefoiled ends, abundant. A fine cast of the capital of the central column of the Chapter House found at Westminster, was pointed out as a curious example, the detail being very quaint if closely examined, but the effect poor from the height at which the original is fixed, though piquant, being executed in Purbeck marble. Here, it was remarked, was an example of the value of this museum, in that its galleries permitted of a close examination, impossible hereafter to be attained in the Chapter-house itself. One bracket from Wells Cathedral was described as fine in general design, but inferior in treatment of the leaves and stems to those of Llandaff, which it generally resembled. Some very fine and boldly-treated Early English foliage of another type was pointed out as coming from and characteristic of Lincoln Cathedral. In leaving this class, Mr. Seddon insisted on the necessity that whatever leaves were adopted, they should bear examination, and look as if, gathered and pressed, they would be symmetrical and perfectly formed throughout; and with regard to the stems, that great care should be taken to secure a good contour of moulding in every direction, and continued and delicate gradation in their projection, a point which is often lost sight of in French work, where effect at a distance is sometimes coarsely sought. Among the Decorated work in which the conventional character is superseded by a naturalistic one, and the foliage no longer seems to grow out of the stone columns, but to be rather bound round and attached to them, some beautiful examples from Southwell Minster were pointed out and compared with examples from St. Etheldred's Chapel, in Ely-place, Holborn, which are, though vigorously, coarsely sketched, like some of those figured in M. Viollet le Duc's book, and which consequently Mr. Seddon thought might have a French origin. Quite another class is that from the lady-chapel at Ely Cathedral. This looks as if it had been elaborately conventionalised from crinkled cabbages; yet even with all its elaboration truly drawn, each leaflet is traceable, with its fibre to the stalk, and not a mere nobbled pretence, such as a modern carver would make of it.

Passing to still later or Perpendicular and Flamboyant work, Mr. Seddon said he could hardly follow Mr. Ruskin in what he thought his rather over-strained and sentimental notion as to its having taken dead and shrivelled leafage as a type. Certainly it was clear that Early Gothic carvers affected and copied the bud rather than

patent mitreing machine. It is quite a novelty, and is strong, simple in action, and effective. The sole of the machine is of planed iron, and the two sides are open cast-iron triangular plates, bound to each other at the top, and bolted to the sole at the bottom. The front of the machine, which is on the mitre angle of 45, has accurately-adjusted grooves, in which a strong outer, with a central angular point, works. The outer is operated by a hinged lever attached to the top of the machine, and having a jointed arm between it and the moulding. There are no fixings necessary; the moulding, from 4 in. downwards, is held firmly to the sole and the back-rest by one hand, and with the other the lever is brought down, and a clean-cut mitre is made by a single slice, a much more summary process than cutting in the mitre-box and dressing with the plane upon the mitre-block. It is claimed for it that it will mitre Beolotion or return mouldings without splintering them. That will depend very much upon the depth of the return; but whether the machine is capable of doing this or not, it commands such unquestionable capabilities for ordinary mitre-work as cannot fail to bring it into favour.

THE "NORTH WESTERN" HOTEL, LIVERPOOL.

SOME little time since we noticed briefly the architectural design of the large hotel built by the London and North-Western Railway Company as an adjunct to their Liverpool Terminus. The building, which, as our readers may remember, is planned and designed by Mr. Waterhouse, is this week completed internally and ready for occupation, so that visitors to Liverpool will be able to judge for themselves of the practical as well as the architectural merits of this large establishment. The principal rooms, which are furnished in a costly manner and with every attention to the comfort and convenience of inmates, have been decorated in colour by Messrs. White & Son, of Liverpool, from the designs and under the direction of Mr. Allen, of London. The front suite of rooms on the ground floor comprises coffee-room, reading-room, drawing-room and dining-room, billiard and smoking rooms. In all but the two last-named apartments, the large iron columns necessary to carry some of the partition walls of the chamber story above, have been made a feature both in the architectural and decorative design. The columns, which are fluted for one-third their height, and plain above, are treated mostly with gilding on a dark chocolate ground, the fluting has gilding on the fillets, the upper plain portion of the shaft decorated with a continuous design of stem and leafage in gold, as if wreathed up the column. The character of this design has been skilfully and suitably varied in accordance with the uses and associations of the different apartments, and the general effect of it is pretty, but not sufficiently rigid and architectural in character for its position; and unfortunately the strong contrast of the chocolate and gold forms too violent an opposition to the much quieter colouring of the ceilings. In the coffee-room this is so much the case, as to give the impression that the ceiling is unfinished: it would certainly require much stronger tints, and more elaborate decorative detail, to bring it into harmony with its supports. Beneath the cornice of each room runs a kind of frieze of conventional ornament, interspersed with medallions, containing allegorical heads or figure subjects; those in the coffee-room having reference to commerce and enterprise, the dining-room frieze being decorated with representations of sundry delicacies of the shooting season (making "game," in fact, of the whole thing), while in the drawing-room, the eyes of lady visitors may be suitably entertained by representations of "Faith," "Hope," "Charity," "Love," and we know not what other graces and virtues—are not their names inscribed beneath each? The frieze of the billiard-room gives us, humorously enough told, the old fable of the two men with their ass, who tried to please all parties; and the smoking-room holds forth certain allegorical warnings against, or encouragements to, vice; they may be read either way. The soffit of the large arch carrying the principal staircase, shows the signs of the zodiac (a never-failing resource, it should seem, of decorative artists) and the staircase is to be adorned eventually with larger figure subjects life size, of which one panel is partially executed as a specimen, and may be accepted as sufficiently good for a

position where it is not likely to receive very critical inspection. The staircase is lighted from above with some very poor stained glass supplied by a Liverpool firm, in which the principal ingredients in the way of colour are "mauve" and strong yellow. The general impression left by the decoration is that more has been attempted than was necessary in certain portions, and less than might be desirable in other places, and that there is a want of architectural feeling about it. The execution is very good throughout.

A considerable part of the first floor of the hotel is laid out in suites of rooms, two, three, or more, for families;—the rest of the floors apportioned into bedrooms and separate sitting-rooms, as usual. The lower mezzanine contains a complete set of sleeping-rooms for visitors' servants; the house servants being accommodated at the top of the building. The kitchen accommodation is ample and well arranged for easy working, with dinner-lift into the serving-room adjoining the coffee-room over. There is an ascending room for visitors, worked by a hydraulic lift supplied with water by a donkey-engine, and a luggage-lift worked by steam alone. A separate boiler is provided, apart from the usual kitchen boiler, to furnish the hot-water supply for the whole house. The basement contains, besides the kitchen and other offices, ample cellarage accommodation, and is very well lighted. The greater portion of the ground-floor on the railway-station side is occupied by first and second-class refreshment-rooms, in immediate connexion with the hotel. The centre hall and staircase are to be heated by hot air discharged through a grating under the first flight of stairs; but this has been the source of some little trouble, as the current of heated air has brought with it already no small amount of dust and dirt, which has in some degree disfigured the work at this part, and the mechanical adjustment of the outlet is under re-consideration. The general fittings and furnishing have been carried out on a most liberal scale; the sum of 20,000*l.* has been named as the entire cost of this part of the work, which seems more likely to be under than over the truth. It should be added that whatever difference of opinion may exist as to the architectural aspect of the hotel externally (and Liverpool people at least do not seem satisfied with it on this score), there can be no question that the general plan and arrangement exhibit in a high degree that talent for simple and convenient planning and concentration for which its architect has gained so high a reputation with all who can appreciate the difficulty and importance of this portion of an architect's duties, in connexion with any large building where what may be termed internal traffic on a large scale is to be provided for.

SMITHFIELD DRINKING FOUNTAIN COMPETITION.

AT the end of last year the Markets Improvement Committee of the Corporation of the City of London invited designs and estimates for the erection of a drinking-fountain in the centre of the circular space in Smithfield, between the Metropolitan Meat and Poultry Market and St. Bartholomew's Hospital. Each competitor was required to submit "at least a plan, elevation, and section, drawn to a scale of $\frac{1}{4}$ in. to 1 ft.," and to state the sum of money for which he would undertake to erect completely the fountain as shown by his design; such sum was to include all expenses whatsoever, water service, drainage, and drinking-cups, and the total expense was not under any circumstances to exceed the sum of 1,200*l.* The committee did not bind themselves to accept any one of the designs submitted to them, nor did they offer any premiums.

In reply, some forty designs have been sent in, and are now hung on screens in the crypt of the Guildhall, for want of room elsewhere, where they can be well seen by gaslight. With very few exceptions, the names of the designers are attached, very properly; indeed, where sculpture is concerned, the selection of a design without knowing who was to carry it into execution would be futile. The first hung design marked only with initials, A. Z., sets forth a lofty Gothic column in the centre of a large basin; the top of the column consisting of canopied niches for figures of martyrs surmounted by an equestrian statue of Walworth;—a monument rather than a fountain. Mr. Butler sends a temple-like structure owing something to those put up for Miss Countess; but not without merit though poorly set forth

in the perspective drawing. Messrs. Boehm (sculptor) and Jeckyll (architect) propose a bull on a basement, with his driver, the bull very well modelled, as might be expected from Mr. Boehm. Messrs. Cox & Son exhibit a very agreeable arrangement of marble and granite basins and columns in two stories, though the chimney-pot aspect of the topmost jet might be improved. Messrs. Farmer & Brindley show a Gothic base carrying a column, with a figure on the top; the figure, like the majority here, very badly drawn. Mr. E. A. Heffer is less successful on this than on some similar occasions. His design takes the shape of the upper part of a Perpendicular-Gothic tower, partly sunk in the ground. Mr. Kelsey suggests a statue of St. George on a pedestal, the details of which are unsatisfactory. His hirsute figure of St. George, too, though drawn with spirit, is a mistake. Mr. Rolfe gives two stories of arcades, not inelegant, but overslight in construction. Messrs. Sim & Smith send a design for a structure of some elegance on four arches, with figures of Victory surmounting the angles. The *projet* forwarded by Mr. E. W. Wyon, sculptor, and Mr. E. A. Wyon, architect, includes a figure of London, in Siolian marble, a model of which accompanies the drawing. Mr. W. Young's design (Gothic basin, figure at top) is good of its kind. The Gothic column carrying a figure under a canopy, marked "Aquarius," deserves attention. Mr. A. T. Jackson proposes a somewhat expensive Gothic building, inclosing a space within which would stand the fountain, a somewhat risky resort, especially at night. Perhaps the most original suggestion is that marked—"But here's my comfort," wherein eight Mediaeval columns, dispersed octagonally, carry an entablature, from which rises a belfry-like structure, with tiled roofs, and central spire leaded. Mr. H. H. Vale sends a design for a Gothic spire, with sculptured figures around the basement, which alone would cost nearly all the money available.

If we were called on to name half a dozen of the designs most likely to include the one to be selected, we should probably name those sent by A. Z., Mr. Butler, Messrs. Boehm & Jeckyll, Messrs. Cox & Son, Messrs. Sim & Smith, and Messrs. Wyon.

The site for the fountain is in the centre of the area formed by the circular road down to the Great Western Railway Depot, a plot 140 ft. in diameter, so that the fountain will need to have some mass and height, if it is to produce any effect. The space around it will probably be planted.

THE SUPPLY OF WATER TO EDINBURGH.

THE capital of Scotland is at this moment plunged into a serious controversy on the question of its increased water supply,—a controversy which has at length culminated (as we regret to observe) in a Parliamentary contest. Briefly stated, the case is something like this. The water trustees, who are chiefly composed of members of the town council of Edinburgh, and who act, it must always be presumed, in the interests of the community, are promoting a gigantic scheme for supplying the district with the water of St. Mary's Loch in Selkirkshire. To this scheme there has sprung up a highly-influential opposition on the part of the rate-payers, composed of such men as Mr. Adam Black and Mr. Charles Cowan (both formerly members for the city), together with a whole phalanx of other eminent citizens, who hold the opinion, and have resolved at a public meeting, that the St. Mary's Loch scheme is not only too costly, but is wholly unnecessary; and, moreover, that the quality of the water is bad. Both sides, it is proper to explain, admit the scarcity of water, and both insist on the urgent necessity of an increased supply. But while the promoters insist upon St. Mary's Loch, the objectors assert that Edinburgh can be supplied more economically from the springs and rainfall of the neighbouring hills.

The present water-supply of Edinburgh is derived, as we have often mentioned, from the springs and rivulets of the Pentland Hills,—a ridge of granitic rocks lying to the south of the city. Until a period within the last two years or so this water-supply was controlled by a private company of adventurers, under the title of the Edinburgh Water Company, the manager of which was Mr. Alexander Ramsay, while the engineer was Mr. Charles Leslie; and it must be admitted on all hands that both the management

and the civil engineering were of the very highest of their respective qualities. Indeed, there is probably no engineer in England, at this moment, who has had more experience in constructing water-works of a certain description than Mr. Leslie, and we can all remember his excellent evidence on the cause of the failure of the Sheffield embankment. At the same time, a feeling had recently grown up in the public mind, that the supply of water to our great cities is, properly speaking, not the functions of joint-stock companies, but of the municipal government. The corporation of Edinburgh, following closely in the wake of Liverpool, Glasgow, and other important places, accordingly acquired, under an Act of Parliament, in the year 1859, the whole works of the Edinburgh Water Company, and the whole title, statutory powers, and legal authority,—vested, as you have said, in certain trustees,—to supply the city of Edinburgh, the port of Leith, and the town of Portobello.

The nature of these works so taken over will be understood, perhaps, from a glance at the following statement, which professes to give a comparative account of the quantities of water contained at this moment in the different reservoirs on the Pentland Hills. The drainage area, we may mention, including the reservoirs, occupies a space of about 15,000 imperial acres; and their average altitude is something like 400 ft. above the level of the sea. Edinburgh, it may be remembered, has a sort of average altitude—speaking roughly—of 200 ft. Leith and Portobello both lie close to the beach. And the population of the whole district included in the Bill may amount at this moment to something like 200,000.

The present water supply of Edinburgh, according to Mr. Wormald's figures, is seven millions of gallons a day, on an average taken over the whole year. Sometimes there are nine million gallons, sometimes less. Even during the two last very dry seasons the average had been more than seven millions; but taken at that estimate there follows a quantity of about thirty-two gallons per head per day, being more by comparison than sixteen of the largest cities and towns in England and Scotland at this moment possessed. Of course, it is not disputed that the major quantity of this, in some respects, ample provision consists of storage; and it has been alleged on the part of the objectors, that it would be very easy and comparatively cheap to increase this storage, so that another ten gallons per head might be added to the present supply. But the following paragraph will convey more information to our professional readers, regarding the capacity of the reservoirs on the Pentlands:—

"The rain and snow which have recently fallen have brought considerable accessions to the quantity of water stored. In Glenore reservoir, where, on the 25th ult., the water stood at 16 ft. from the top, the level is now 8 ft. higher, the stock having increased from 25 million to 33 million cubic feet, as compared with a total capacity of 65 millions. Loganlee, which was quite empty three weeks ago, now contains rather more than one million cubic feet, being about one-eighth full of its capacity. Clabbedean, which was 6 ft. down, or two-thirds full, on the 25th ult., is now running over, its capacity being 9,800,000 cubic feet. Torduff was stated in our last report to be 28 ft. down, or one-third full. It is now only 17 ft. down, or more than half full, the stock being 8,900,000 cubic feet, as against a capacity of about 18 millions. Bonally, 17 ft. down on the 25th ult., has gained 14 ft., its stock having increased from 590,000 to 800,000 cubic feet, which is still less than one-seventh of the quantity it is capable of holding. At the corresponding date last year there were in Glenore 42 million cubic feet, as against 38 millions at present. Loganlee, now containing one million cubic feet, had then four millions. Clabbedean was lower at this time last year, having only 3,500,000, as compared with the present quantity of 9,800,000 cubic feet. Torduff now shows 8,900,000 cubic feet, as against 8,500,000 at this time last year; and Bonally had last year only 120,000 cubic feet, as compared with 800,000 at the present date. Putting the above quantities together, it appears that the present stock reaches a total of 59,600,000 cubic feet, as against 55,120,000 cubic feet at the corresponding date last year—increased this year, 3,474,000 cubic feet. It is perhaps worthy of note that the increase is due to the north side reservoirs. In Glenore and Loganlee together, there were at this time last year 46,000,000 cubic feet; now, 59,600,000 cubic feet—difference in favour of last year, 7,600,000. In Clabbedean, Torduff, and Bonally together, there were at this time last year 10,120,000 cubic feet; now 20,800,000 cubic feet—difference in favour of the present year, 10,474,000 cubic feet."

The sum and substance of all this is that the present reservoirs on the Pentland Hills contain a storage of 60 millions of cubic feet within a small fraction. It need hardly be added, that were it possible to preserve this immense storage of water at its present maximum, there would be no lack of pure water in the Edinburgh

districts. But, unfortunately, the dry east winds of spring, and the hot sun of July, are not so productive of moisture or of rainfall as the winter months are in that latitude; and, accordingly, towards the end of August, it commonly happens that those Clabbedean, Loganlee, Torduff, and Bonally reservoirs (the whole reservoirs, in fact, except Glenore) are emptied to their very bottoms; and a city, or rather, as we have said, a district, of 200,000 inhabitants is thereby reduced to the direct extremities from want of the first necessary of human life.

In order to show this more explicitly, we may compare the summer with the winter statistics. The trustees, who, after acquiring the property, began visiting and exploring the works, were informed upon one occasion (we think last year) that the summer flow of the springs,—they do not seem to have estimated the rainfall which went to constitute the above supply,—was as follows:—

	Feet per Minute.
Crawley Springs (south side).....	70
Barclay and Liston Shiels (north side).....	100
Coleston.....	150
Crosswood.....	80
Comiston and Liranston.....	16
Total.....	476

Making together a total supply of 475 cubic feet per minute. But from this quantity there falls to be deducted a quantity of 102½ gallons, which is given by way of compensation to certain paper-makers and bleachers at Bonally; after which there falls to be added the quantity drawn from Glenore (the largest reservoir, equal to 180 gallons, which gives a final result of 553½ cubic feet per minute, or, in round numbers, 5,000,000 gallons per day. This is equal to 23 gallons per head per day to the population, or, deducting 14 per cent. as the estimated quantity supplied to manufacturers, a quantity of 20 gallons per head per day for domestic consumption. And even this quantity, which is of course inadequate, was diminished by a waste which, according to Mr. Ramsay's former estimate, approximates to 33½ per cent., or nearly one-third of the whole supply.*

Some questions arose and some observations were made by the visiting trustees on the possibility of getting a further supply and increased storage from the southern slopes of the hills, which, it should seem, are still unappropriated; but the conclusion was arrived at by them that such a supply could only suffice to meet the growing requirements of the district for a very limited time; and, in fine, the visiting committee recommended the water trustees to look elsewhere than to the Pentland Hills for an adequate additional supply of water to Edinburgh.

The trustees, however, had long before this made up their minds to go to St. Mary's Loch; and "thereby hangs a tale," as Jacques says, but we cannot now stop to pull it.

HOMES FOR WORKING BOYS.

On Monday evening last, Mr. and Mrs. George Hanbury gathered to their House, in Portman-square, a large number of influential persons, with the view of making known what had resulted from efforts recently made to provide homes for working boys in London, in order to save them from the temptations incident to their residence in the common lodging-houses of the metropolis. Mr. Hanbury, and Mr. A. O. Charles, the hon. secretary, explained the movement; and, from their addresses, it appeared that it was begun in the early part of last year, and is virtually supplementary to the reformatory and refuge work which is being promoted so largely elsewhere; and it was but natural to be told that some of the boys who have come under the operation of the society during the few months of its working were once inmates of the Home for Little Boys, the Boys' Refuge in Whitechapel, the Boys' Home in Regent's Park-road, and the Green Queen-street Refuges. Two homes at present exist, one in Spital-square, Bishopsgate-street, the other in Lower Seymour-street, Portman-square. They accommodate about seventy boys, the fundamental principle of whose admittance is that they pay for themselves as far as they can. Although they may come therefore from reformatories and even workhouses, they there begin a point of existence where they no longer depend absolutely upon charity. This is especially enforced upon them; but as the cost per boy per week, including

food, is 4s. 6d., it is apparent that with boys earning less than that sum the Institution cannot be wholly self-supporting. The wages earned by the boys in the two existing homes range from 4s. to 12s. per week; and owing to the low rate of wages, and a plethora of boy labour, the institutions have suffered a loss of nearly 2s. per week upon each inmate. The boys have, to begin with, a home, superintended by master and matron, with all the comforts of a home provided for them; but, lest mischief should be found for idle hands to do, the directors add to the more material appliances, reading-rooms, gymnasiums, and other provisions of a recreative and educational character, and take care to build the whole structure upon a religious basis.

A number of gentlemen, including Dr. Lankester, Mr. B. Rawlinson, Sir Fowell Buxton, Mr. Taffnell, Sir J. Hamilton, the Rev. Dr. Bigg, Mr. Godwin, and others, being called on by their host, addressed the meeting, and some valuable suggestions were made.

It is to be hoped that Mr. Hanbury and his colleagues will be supported in their endeavours, and that the example will be followed in other parts of London.

FRESCO PAINTING.

In the fourth Cantor Lecture, "On Colours and Pigments," Mr. Barff said,—Experiments in fresco-painting have been made in this country, and from the result of these experiments I am very much afraid that many of us have formed wrong expressions about fresco-painting. We have seen that, in really advantageous situations fresco-paintings have become disintegrated, the colours have gone, and the surfaces have come off either in flakes or in powder. If you visit the city of Munich, and go to the church of St. Bonifacio, you will see that it has been decorated by Professor Hesse with fresco-paintings, which were executed thirty years ago, or more than that. The paintings there are standing well, and have stood well, except where moisture has come in from behind, and has thrown off the painted surface from the front. Now, no painting, whether it be executed in silicious colours or in fresco colours, can stand the action of damp affecting it from behind; that is simply impossible. But I may speak with confidence about fresco-painting, because some twenty years ago a large public building was decorated in fresco-painting, and pictures in it were painted in fresco by Munich artists, and also some by English artists, who had learned the method from the Munich artists. That building I have not seen myself for many years now, but I have been told by many gentlemen that it is still in a state of perfect preservation, and the fresco has not in any way disintegrated either in the ornamental part or in the picture subjects. I can, therefore, speak with confidence of fresco-painting when executed in the way in which it is performed by those gentlemen who have made it their study, since the revival of art in Munich.

I will, to the best of my ability, describe to you the method in which I was taught fresco-painting in Munich, and speak of those influences which are likely to interfere with the permanence of pictures painted in it. But, first of all, I must take you aside, for a few moments, to another subject, although one intimately connected with fresco-painting. When lime is mixed with sand, and used for building purposes, it is called mortar; but how is it that mortar, which is soft when first laid, becomes hard in the course of time? You have lime, some of which has absorbed carbonic acid from the air, and has become carbonate of lime, which is equivalent to chalk; it is, in fact, chalk. You have also sand, for without the sand the lime will not harden, it will break and crumble away; but with the sand it makes a hard compost. The lime, in the presence of water, acts upon the sand, dissolves and unites with some of the silica of which the sand is composed, and so a silicate of lime is formed, and this silicate of lime forms, I believe, the binding power in mortar.

The ground upon which fresco is painted is a lime ground; and, in order to have a permanent picture, it is clear we must have a firm and stable ground. In order to prepare that ground, first of all the wall must be absolutely dry; there must be no leakage of moisture from behind. Lime which has been run (as it is, I believe, technically called by builders) for a year or a year and a half is best to be employed, for

* These figures, which may be regarded as accurate, are taken from a paragraph headed, "Our Stock of Water," in the *Statesman* of February 18th 1871.

* See the Interim Report of the Woods Committee of the Edinburgh and District Water Trustees, p. 5.

in proportion as the lime has been carbonated (though it must not be so to too great an extent) by the action of the carbonic acid of the air it makes a better and a harder mortar. With this lime must be mixed sand, and a great deal depends on the selection of the sand. It must be river sand, and it should be of even grain; the sand should be mixed with water, and allowed to pass along down a small stream, so that in the centre of the stream you would have sand the grains of which would be pretty nearly equal in size. This is a point of considerable importance. The reason why new lime cannot and ought not to be used is because it blisters; small blisters appear on the surface, and that of course would be ruinous to a picture. A well-plastered wall should not have a blister or a crack in it, and this is secured by having your lime run for some time, of good quality to start with, and mixed with good sand. There is no chemical process that I know of that takes place in fresco-painting other than this, that silicates are formed by the action of the lime upon the sand, and carbonates by the action of the carbonic acid of the air upon the lime.

In painting a fresco picture, inasmuch as there is no re-touching the work when it is finished, the artist must make his drawing very carefully. The cartoon is made upon ordinary paper; then it is fixed against the wall, where the picture is to be painted. The part where the artist decides to begin his work is uncovered; that is to say, a portion of the paper is turned down and out away, but in such a manner that it may be replaced. Then the plasterer puts fresh plaster, about an eighth of an inch thick, upon the uncovered portion of the wall, and the plasterer's work is of the utmost importance in fresco-painting. The workman ought to practise it well before he attempts to prepare the ground for a large picture, and I have found it of the greatest importance to allow the man to practise for several weeks before he was allowed to prepare any portion of the ground, even for decorative painting. In this way he becomes accustomed to the suction of the wall, and upon the suction of the wall depends the soundness of the ground and the success of fresco-painting. When the plaster is first put on, of course it is very soft; the piece of the cartoon is replaced upon it, and the lines of the picture are gone over with a bone point, so that an indentation is made, and then the artist begins his painting. At first, he finds his colours work greasy; you cannot get the tint to lie on, it works streaky; but you must not mind that, you must paint on, but you must only paint on for a certain time, for if you go on painting too long you will interfere with the satisfactory suction of the ground, which is so necessary to produce a good fresco-painting. Of course, nothing but practice can tell any one the period at which he ought to stop. I cannot describe it, because I should be simply trying to describe a sensation, which I cannot do. After some practice, you know perfectly well by the feel when you ought to stop. If you feel your colour flowing from your brush too readily, you ought to stop at this period. You must then leave your work for a time, and go back to it again. And then you will find, as the plaster sucks in the colour which you have first laid on, that there will be,—it may be in the course of half an hour, it may be an hour; that depends upon the temperature of the atmosphere,—a pleasant suction from your brush, the colour going from it agreeably, and you will find that it will cover better. Now is the time to paint rapidly, and complete the work you have in hand. When the colour leaves your brush as though the wall was thirsty for moisture, you should cease painting; every touch that is applied after that will turn out grey when it dries, and the colour will not be fast upon the wall. You will see, then, how impossible it is, with such materials, to paint in the same style in which you paint a picture in oil-colour. Fresco-painting involves the adoption of an entirely different style from oil-painting. The frescoes of the old masters are not highly-wrought-up, highly-finished works. They depend for their effect upon the juxtaposition of tints, the shadows being intensified by lines and cross-hatching. If you look at these reproductions of some of the most valuable fresco-paintings of the old masters which are brought before us so well by the Arundel Society,—I may particularly mention "The Presentation" in which there are three or four beautiful heads, which are executed life-size;—and if you examine these,—and I believe every line has been copied from the original fresco,—you will see the method adopted by the

fresco-painters. They depended upon the juxtaposition of tints, not upon covering over, and over, and over again. That juxtaposition of tints I think we alluded to in an earlier lecture, when speaking of the effect of light upon the retina: then we saw that it produces roundness, transparency, and has a very pleasing effect upon the eye. If two tints are put against one another, they do not appear to us as if they were single, but each adds something to the effect of the other, and together they produce a pleasurable and agreeable effect, if they have been properly selected. I do not know that it is possible for me by word of mouth to give you any better description than I have done, of the method to be employed in the actual laying on of the colours. I know well how tempting it is to go back to a piece of painting, and do something to it that ought to have been done before. We think that a touch will improve it, and we go and make it; but in fresco-painting the temptation must be resisted, for it will be absolutely fatal to the permanency of the work.

It is not for me to find any fault with the works of great artists who have painted in fresco in this country. As to their works, their merits are too great for so humble an individual as I am to speak about; but as regards the mechanical work of some of their fresco painting, I believe that I am at liberty to speak. This work cannot have been done properly, or the paintings would not have become so rapidly disintegrated as some of them have, for most of them are in situations the most excellent for fresco-painting, on inner walls, in dry places, where they are not acted upon by damp from behind, or by accumulated moisture from condensed vapour in front.

As to the colours that can be used in fresco-paintings, I have dwelt very considerably upon the action of potash and alkalis upon colours, and I dare say many asked yourselves why I did so. The reason was, that I had in view this subject of fresco-painting, and that of silicious painting, the consideration of which will occupy us at our next lecture. Colours that will not stand the action of alkalis or lime cannot be used in fresco-painting. The pigments which can be used in fresco-painting are these:—For blues, ultramarine and cobalt; of course you must take the best ultramarine, for there are many ultramarines sold which will not stand the action of lime at all; but the best ultramarine, prepared in France, or that which I was in the habit of using years ago, obtained from Nuremberg, will stand very well. Cobalt blue also stands well, but Prussian blue will not stand at all. For reds, you may have various tints of iron reds, and these tints can now be obtained, of great brilliancy, from oxide of iron. The ordinary oxide of iron, ferric oxide, as chemists term it, can be obtained of a very bright colour, but it is not of the same character, of course, as vermilion, and tints varying from it down to the purple of that substance, which is known as colcothar, may be obtained by different treatments of the oxide of iron. These colours may be got, I believe, in this country; but if all the tints cannot, and if any one requires them, there are those who I am sure will be most willing to meet their wishes, and try to prepare them of sufficient brilliancy and purity. Vermilion, provided it is good—the best vermilion, prepared by such a firm as Messrs. Berger & Co., or the equally good vermilion which is contained in those bottles of Messrs. Winsor & Newton, and also some of the foreign vermilion, will stand on lime, and can be used for fresco-painting. But the pure tint of the vermilion becomes changed, just as it does in oil painting. It gets gradually browner, and I think I threw out a hint why this is so, the other night. Then, again, there is a very beautiful red, called cadmium red, a sample of which I have here in a piece of paper, which any one can see after the lecture, which is also very brilliant. All the cadmiums, from red down to yellow, can be used in fresco-painting, but they must be carefully prepared. If they are not, if there be any sulphur left in them, as there often is, or if there be any of the substance left in them from which they have been precipitated, then I will not say that they would stand; but I know, from practice and from experiments, that cadmium sulphides, well prepared, whether they be dark red or pale yellow, will stand well. Then for greens, you have first, terra-vert. This is an unsatisfactory colour altogether, but it is very useful in fresco painting. I mentioned, if you remember, that first of all, when you begin to paint, your colours work

streaky, and you have not proper suction. That is the time, if you are painting green, to prepare your ground with terra-vert: afterwards you may finish with oxides of chromium. I have already alluded to them. There are on the table some oxides of chromium, of various tints, which are absolutely unchangeable. These colours stand the action of lime and of the disintegrating agents that are met with in the air and elsewhere. Then, with regard to yellows,—of course there is cadmium yellow; and, from the experiments which we have performed, I think I may with confidence recommend this aureolin yellow. It has stood the action both of the lime and caustic potash. By-the-by, I must mention that the action of caustic soda on aureolin yellow seems to be more energetic; in fact, the potash seems to have no action, but the soda does in some way change the tint.

If you are preparing to execute a large fresco work, you will see that, inasmuch as there is no touching up to be done afterwards, all the colours that are necessary for the work must be prepared before you commence; therefore you will have to arrange, in proper gradations, all the tints which you mean to use. Of course, they must be ground and mixed in water, and you may then put them into pots, where they will be ready for use, keeping them moist with a piece of moistened rag or flannel on the top. The method to be adopted for deciding the tint that the colour will have when dried is this: A good-sized piece of timber, unburnt, is taken, and the surface of it is dressed off, and then, when the tints are mixed, they are dashed with the brush upon the timber one after another in succession. The timber takes away the water instantaneously from the colour, and you get the tint nearly as it will appear when dry. Properly painted frescoes will stand well in our climate on inside walls; on outside walls they will not.

A PERUVIAN RAILWAY.

THE new line from the port of Mollendo to Arequipa was inaugurated on the 1st of January, with great festivities, in the presence of the president of Peru and his cabinet, the diplomatic corps resident in Peru, &c.

The railway in question was commenced by Mr. Meiggs, in May, 1868, to be completed within three years, at a cost of 12,000,000 soles. The line, 107 miles in length, leaving Mollendo, runs along the seashore for 12 or 14 miles, until it reaches the point of Mejia, which was originally proposed as the coast terminus. Then, striking into the interior, it passes near the beautiful valley of Tambo, the sugar-producing district for Arequipa, and the other inland towns of this section. Leaving Tambo, they encounter the first great barrier, the mountain of Cahuintala, which seemed to defy the approach of the engineer, who, with theodolite and level, sought to render its hitherto deserted defiles useful to man. The train, clinging to the mountain's side, passes over 14 miles; the engine continually passing inverse curves of 352 ft. radius, the longest piece of straight line being only 1,000 ft. This work alone cost three millions and a half of dollars, and called into action the entire resources of the contractor and his engineers. The grade is, in one section of 3 miles, 4 per cent., and the average along the line 3 per cent. Leaving Cahuintala in the rear, the long pampa of Islay comes in sight. Speeding across it, the little inn of La Ioya, in the midst of the desert, is passed, and the heights of Huasamayo, a lofty basaltic mountain, appear in the distance. Here the same nature of obstacles as in Cahuintala presented itself, but in like manner was overcome. All along this portion of the route are immense fillings, cuttings, and embankments, from 100 ft. to 175 ft. high, and from 100 ft. to 200 ft. in length. Leaving Huasamayo, the valley of Arequipa opens before them—a welcome change from the bleak and dreary expanse of sand desert and volcanic mountains already traversed. In the districts traversed by the line there is a great scarcity of labour, and Mr. Meiggs was obliged to import from Chile and Bolivia nearly 16,000 men to work upon the route. All provisions and necessary articles of consumption, even of the simplest description, were brought from abroad, and at one time a thousand mules were employed daily in conveying water alone to the working parties. Another cause of trouble was found in the thin atmosphere at the more elevated points, Arequipa being, at the terminus of the line, 7,800 ft. above the sea, up which, as will

be seen, the line passes from sea-level; and the suffering endured by those not accustomed to the rarified air is described in some cases as intense. Moreover, Mr. Meigs was exposed continually to the dangers and probabilities of revolutions. That the road will eventually be a source of profit to the Government there can be little doubt, but until the line connecting the rich interior districts of Puno and Cuzco with Arequipa is concluded, such a result is not to be expected. Propositions are before Congress to employ all of the disposable public funds in the construction of these more than valuable aids to progress.

CHURCH COMPETITION, COLLYHURST.

A NEW church, with parsonage and schools, is to be built at Collyhurst, by Mr. Charles F. Stewart, of the Atlas Works, at a cost of 12,000*l.*, exclusive of the land, which he has also purchased. For these buildings, six architects, of Manchester and London, were invited to submit designs in competition. The gentlemen who were selected to compete were Messrs. Hansom (London), Paley & Austin (Lancaster), Holden, Brakespear, Lowe, and Dawes, of Manchester. Ultimately the designs submitted by Mr. Lowe were selected, conditionally that they can be carried out for the stipulated cost, and to those submitted by Mr. Dawes was awarded the second premium of 50 guineas.

WASHABLE PAPER.

WE have been looking at some specimens of a new description of washable paperhangings, which seems to possess important economic and sanitary advantages. The surface of the new material is non-absorbent, whilst it has the same dead unpolished appearance as the ordinary paper, and is quite as cheap. Stains of wind, grease, ink, soot, or the ordinary discoloration from wear are readily and entirely removed by simple washing with soap and water, and, should it be necessary, the vigorous application of a stiff brush results in no injury to texture, colour, or pattern. Its capabilities of being cleaned in this manner render it peculiarly suitable for nurseries, bedrooms, hospital and asylum wards, &c., as, after infectious diseases, it would be only necessary to scour the walls like paint, instead of entirely renovating, as is the case with ordinary plastered or papered surfaces. Whilst destructive to insect life, it is in no wise injurious to human beings.

The Amaranth Paper - Staining Company (Limited) has been formed to manufacture this washable paper, and will shortly commence operations on a sufficiently extensive scale.

The patterns, by the way, of the specimens came before us very good.

A FIGHT ON STANDING ORDERS, HOUSE OF COMMONS.

THE first skirmishing of Parliamentary business has commenced. The examiners of Standing Orders have opened their peculiar courts, and are in the full swing of their particular work, preliminary to greater contests yet to come.

Great changes have been made during the recess. The conference-room has been prepared, decorated, and newly carpeted, as the dining-room of the honourable members. It adjoins the tea-room, once renowned as the "Cave of Adullam." The entrance to the Lords' lobby has been partitioned off, and enclosed with a screen of carved oak. Behind the screen is the lift, to raise the smoking joints from the culinary regions below. The honourable members will have a full view of the new St. Thomas's Hospital, now complete, on the opposite side of the river. Altogether the new dining-room is much more pleasant than the old one,—more cheery, light and airy, though, in reality, not much larger than their former quarters. But what has this alteration to do with the Examiners' Courts? may well be asked. Not much, truly, except that it will be sure to attract the attention of the engineers, solicitors, Parliamentary agents, surveyors, and witnesses, who must of necessity pass close by. Besides, will not the old *habitudes* of the place miss the time-honoured refreshment-stall which formerly occupied the site of the spick and span new life? Old associations of pleasant memory will instinctively draw attention to the spot; for in the shady recess, and under the small but beautifully groined ceiling of that little lobby, many a knotty

point has been discussed and amicably settled. For the future it will be tabooed ground, sacred only to the Sayers and Francatellis of the new culinary dispensation. May happy digestion attend the labours of the honourable members, and the Cave of Adullam, so perilously near, be absent from their thoughts as they chew the cud of sweet and bitter reflection!

It is possible that many of our readers may not know where to find these mysterious Courts of the two Examiners, for though public, they are not much known; it may not, therefore, be amiss to give a clue to their local geography, and for the nonce assume the useful functions of a cicerone. This is the more necessary, because they are more or less ambulatory; they are not of necessity always held in the same place, and, indeed, are liable to be shifted from room to room, as the pressure of other Parliamentary business may require; they are, however, generally held in one or other of the Commons' Committee-rooms, in the upper corridor fronting the river. To compare great things with small, like the Law Courts, they are approached through the noble expanse of Westminster Hall, certainly the grandest vestibule to any series of Courts in Europe, whether as respects the magnitude of the building, the beauty of the open timbered roof, and, grandest of all, its unrivalled historical associations. So let us proceed through the noble old hall up the broad flight of steps fronting the stained window, rich with heraldic blazonry; turn to the left, into Saint Stephen's Hall, with its array of statues; pass across the lofty octagon, throwing a passing glance at the mosaics in the vault. Leaving the two frescoed lobbies of the Lords and Commons on the right and left, through a short corridor (still waiting for its pictorial decorations), into the square hall, directly in front of us is the new dining-room, and on the right the staircase, leading to the regions above, once so busy, but now solitary and deserted.—alas! for the palmy days of engineering. At the foot of the staircase is Foley's noble statue of Sir Charles Barry, the architect of the Palace, seated on a marble chair, intensely gazing on a sketching-pad, whereon he has apparently fixed a thought, perhaps an improvement of the House itself, so long talked about, but now so little likely to be effected. The great window close by has been shorn of its coloured glories, and is now filled with a niello work, representing the armorial bearings and insignia of that renowned monarch Edward III., who complacently smiles on the passer by, with his beaver up,—to see the better, or display his long monachesties. Pass up this well-executed staircase,—as good a bit of work as any in the Palace,—a little dark perhaps; then into another frescoed hall, the frescoes, unhappily, crumbling away bit by bit; then the long corridors of the committee-rooms are before us, stretching far away to the right and left, in numbers 16 and 17 of which are the two Examiners' courts,—for courts they must be called,—regular funking rooms for engineers and lawyers, where many a promising scheme of railway enterprise has come to unexpected grief. Here engineers are not unfrequently "hoist by their own petards."

There are two of these preliminary judges, Messrs. Charles Frere and J. H. Robinson, who act for the House of Lords as well as the House of Commons. They seem to enjoy a sort of twofold title. In the list of officers of the House of Peers they are called "Examiners of Standing Orders," salary, 800*l.* each; but in that of the House of Commons they are termed "Examiners of Petitions for Private Bills," salary, 1,000*l.* Their office is onerous and responsible, for they act in place of a committee of members, although their decisions are by no means final; they report any proved non-compliance with the Standing Orders, and in such cases the peccant plans are technically said to be sent "up-stairs" to a committee of members, who may or may not dispense with the Standing Orders; or, in other words, allow the petitioners to proceed with their Bill, and then run through another and fiercer ordeal "on merits," where all the *pros* and *cons.* of the scheme are supposed to be thoroughly investigated, to ascertain if it is worthy of Parliamentary sanction.

In times but recently passed away, what a long array of famous men have played their busy parts in these now deserted halls, when the engineering world was in the full swing of its triumphant career; when Locke, Stephenson, Brunel, and Rendell,—all now dead,—were constant frequenters, as Hawshaw and Fowler now; when every room in these long corridors

was occupied by committees; when they swarmed with eminent counsel, and the lobbies were crowded with excited partisans, anxiously waiting for the all-important decision, fraught with life or death to many a promising Bill and railway scheme. There were giants in those days,—Austin, Talbot, Wrangham, Phinn, and Cockburn,—all gone into the limbo of death, except the last, now Lord Chief Justice of the Queen's Bench.

Amongst the present leaders and men of mark who practise in these Parliamentary Courts, are,—Hope Scott, he of Abbotford and Arundel, whose tall and portly figure, bland address, and elegant manner of indulging in the luxury of unlimited snuff, are well known; Beckett Denison, he of Big Ben and the famous clock; the facetious Merryweather, who enjoys his jokes, as the facile titillation of pungent pinches of rappee, the one as frequent and enlivening as the other; Rodwell; Burke; Davison, the new Advocate-General; Salusbury, and Somerset, with others not unknown to fame in these precincts.

Gentlemen of the long robe, however, do not practise in the Examiners' Courts; their place is taken by the Parliamentary agents, who appear in the capacity of counsel, and although not aspiring to, or adorned with the dignity of wig and gown, possess the faculty of eloquence and much talking in no less a degree than legitimate members of the bar: both delight in showing their skill in the conduct of an argument, no matter how trifling the subject.

Open, sesame! Let us at last enter the august Court. "Hats off!" for we are not standing in the presence of the Senior Examiner, a great and renowned authority, and master of all arts in preliminary Parliamentary matters? and—oh! name it not in Geth!—is he not also the terrible "*Twain* *Meat*?" for the noble house of hereditary legislators, armed with a trenchant pen, to score out sundry and divers long charges in bills of costs? Yea, he is indeed a second Portia come to judgment; he will grant the pound of flesh, but not a drop of blood; that is not written in the bond, Signor Shylock!

There sits the Examiner, a noticeable personage—tall, thin, serenely grave and calm in aspect, like Canning and Lawrence, bald-headed, smugly shaven, well nosed to scent a rat behind the arras of a brief, keen-eyed to peer into plans and allegations, courteous, but firm and decided, with a judicious mixture of properly amalgamated oil and vinegar, to ruffle or smooth the nerves of contending agents or excited engineers; a copious collar of spotless white, duly stiffened and starched, affords a due official gravity in the absence of the more imposing wig and gown of other judges.

His court consists of himself, a smart junior clerk, and a messenger. He sits in solitary majesty at the head of a kind of horse-shoe table; in the middle of the horse-shoe sits the short-hand writer, at a separate table, where he ever and anon plies his cunning craft, and jots down the sage observations and conflicting evidence of the too frequently puzzled witnesses, as well as the invincible arguments of the learned agents when needs be,—but as they are not always worth taking, they are in consequence not always taken.

The bar, if so it may be called, in the absence of barristers, fronts the Examiner, in the shape of a long substantial table, plentifully covered with rolls of mighty plans, bills, briefs, papers of all kinds, and numerous books for reference, with the usual allowance of ink and pens, to say nothing of occasional sandwich boxes for the sustentation of their hungry owners.

Lawyers, engineers, and Parliamentary agents are seated at the table, in all the grandeur of forensic gravity. The agents, the great talking machines, swelling with importance, full of bustle and bottled-up eloquence, of quips and cranks, looking as wise as doves, sharp as foxes, cunning of fence, steeped to the eyes in technicalities and quibbles, of no sort of importance except to themselves, unhappy engineers, and bewildered reference-takers. Behind the bar, scattered about the room, disposed in groups, or lolling on the rail, are witnesses in waiting; assistant engineers, who have had the honour of working up the details of the scheme about to be attacked; surveyors, who have measured the country, and concocted the plans, right or wrong, as the case may be; and reference gentlemen, who make up the lists of owners and occupiers likely to be affected by the proposed railway.

Then come the country part of the fraternity, all more or less engaged in the case, in the shape

of famous town or county surveyors, who are often brought up to London at great expense to prove nothing; clerks of the peace, and humble parish clerks, who prove less than nothing; with a few lookers on, who lounge in, and gaze open-mouthed at the wonderful proceedings, and generally leave the court about as wise as when they entered.

Well, now it has so come to pass that an "eminent engineer"—delightful phrase!—has laboriously prepared the plans, elegantly lithographed, and all that he deems necessary for a line of railway from Muckytown to Dirtyville—all formalities have been in his estimation duly complied with and deposits properly made;—all is congratulation, happiness, and felicity. When, lo and behold, some pestiferous people, rival engineers, get up a furious and unexpected opposition against his immaculate plans, lodge petitions against them, and no end of cunningly-devised allegations, and are prepared to prove that the plans are wrong from beginning to end. Here's a pretty how do you do!

The unlucky engineer and his plans, in spite of the beautiful lithography, are to be pulled to pieces, bit by bit; he has to submit to all the horrors of the Inquisition, with a grave and grim Torquemada to sit in judgment upon himself and his plans, and find him guilty or not guilty of no end of sins of omission and commission. He is told to his teeth that his plans and sections do not agree, that one is longer than the other, that the mileage is erroneous, that his scales are all at sixes and sevens, that he has mistaken roads for rivers, that private roads are public, that he has put fences where ought to be ditches, that fields are woods, and woods are fields, that his gradients are wrong and gravity upset, that his straight lines are crooked and curves nowhere, his levels are wrong; that he will have banks where he should have cuttings, his rails will be under water, and his tunnels too high or too low—his datum is wrong; that his line begins and ends in wrong places; that owners and occupiers are jumbled together in the wildest confusion; in short, he is told that he and his plans ought to be kicked out of the House!

But not so fast, my friends. All these fine charges—this long list of errors and array of indictments—may be disproved; the allegations may be badly drawn; then all this fairy fabric of illusory impeachments falls to the ground dead-born. There is hope yet, confidence revives, a fierce resistance confronts the fiercer opposition, and so the wordy war begins—a right-down fight on Standing Orders!

The Examiner has taken his seat. Silence in court. The case is called; the rivals are in their places; papers are unfolded, plans unrolled: there are the great Parliamentary agents, the orators of the day, mighty men of Gath, titans amongst the minnows, full of eloquence, ready to burst forth like a thunder-storm when uncorked for action.

There sits the great agent, renowned in a hundred fights, a hard hitter, and, like Romeo Coates, prepared to die the death a dozen times whenever called upon; a little man, but great in soul, a veritable *multum in parvo*; grim, gray, and grizzled, short-haired and long-headed, with a nose which, for the hook thereof, surpasses in glory the renowned proboscis of the immortal Wellington, whom in the pride of his heart he thinks he resembles, not only in the physical aspect of his nasal promontory, but in tact, strategy, skill, courage, and success.

Rooms, lobbies, and corridors, have they not rung with the echoes of his oratory, and the very cobwebs been shaken from the ceilings by the roar of his voice and strength of his arguments, keen enough to cut the court poker in two, and shake the tables into shivers? How beautifully sententious, how elegantly terse, how precise and pragmatical! What dignity in the shake of his finger, and grandeur in the solemnity of his pause and steadfast gaze, when he has carried conviction home,—to himself, at least, if not to the grave Examiner! As confident in his case as he is in himself, how can such a mighty *multum*, so full of ponderous logic, hard facts, and ugly blows, be expected to fail? Perish the thought,—it cannot be.

The rival agent is all alert and ready for the fray,—cool, calm, and collected, confident in the consciousness of his own powers of persuasion, serene as an angel, bland and courteous in manner, soft, suave, oily to untouchness, feeding on his multifarious papers like a midsummer grub on a vine-leaf, till, full blown, he emerges into active life in all the beauty and splendour

of his oratorical wings: he soars aloft in reply, takes a calm flight through the airy regions of his opponent's arguments, disarms them of their sting, pours oil on the troubled waters, and flutters unscathed through all the storms and contentions of the mighty struggle. Gentle of eye, mild of voice, red and rosy of face, he looks at once the father and mother of all the Parliamentary agents who plume their noble pinions, and raise their tinny voices, in the awful presence of the august Court.

The "formal proofs" are passed, the combatants are ready; the recording angel, in the shape of a shorthand writer, has opened his book of fate,—the conflict has begun. Up jumps the opposing agent, he of the striking profile; with loud and sonorous voice he commences to read a fearful allegation of terrible import, to the effect that there is no cross section to a certain public road marked on the plans. With grave and solemn accents, worthy of the occasion, or even a greater occasion, he points out the heinous nature of the offence, its non-compliance with the Standing Orders. He is prepared to prove the sublime truth of his deftly-worded allegation, by the testimony of a most respectable, important, and independent witness,—no less a personage than the county surveyor, a man of vast experience, skill, and ability, of twenty years' standing in his profession. He calls the witness,—“Where is Septimus Snooks, the county surveyor?” Septimus Snooks is found in the lobby, his mouth stuffed with sandwich. Septimus Snooks swallows a glass of sherry, nearly choking himself in the operation; he rushes into the room wiping his mouth *en route*. Septimus Snooks takes his seat in the chair; he endeavours to collect his scattered senses; he has been brought up 250 miles as a most important witness, and this is his evidence:—

“Mr. Septimus Snooks, you are the county surveyor?”—“Hi ham.”

“You have been so for many years?”—“Hi ave.”

“Will you be good enough to find the road on the deposited plan before the Examiner?” Mr. Septimus Snooks gets up, looks at the plan; he cannot find the road, he is in a fog; he is getting nervous; will the engineer point out the road? No, he will not. At last Mr. Septimus Snooks has found a road, to his great delight.

“Now, sir, is that a public road?” asks the opposing agent.—“Yes, it is.”

The great agent sits down. He has clearly proved his case, he has no more questions to ask,—when up jumps the bland and courteous agent for the defence, and in his most soft and courtly manner asks Septimus Snooks if he will kindly tell him the mileage of that road on the plan. Of course he will; it is at three miles and a half.

“What, sir? Why that is not the road in the allegation?” Mr. Septimus Snooks is in greater confusion than ever. Which is the road meant? He looks with beseeching eyes to his agent. Can he find the road on his county plan? He searches in vain; he cannot identify the roads. To save time the engineer is permitted to find the road for him; he declares it to be a public road,—that is, to the best of his belief;—indeed, he is sure it is; it must be.

“Pray, Mr. Snooks,” asks the bland agent for the defence, “how do you know it is a public road?”—“Because the public go along it!”

“What—oh—ah—indeed! Now, I will prove by my witnesses that it is really a private road, sir,—actually and unmistakably a private road, sir.” So he calls his witness, one John Longshanks, a great surveyor and inspector of roads, also brought up 250 miles, to rebut the evidence of the great county surveyor. He takes his seat.

“Mr. Longshanks, you are a surveyor, are you not?”—“Yes.”

“Do you know this road?”—“Yes.”

“Well, is it public or private?”—“Private.”

“Of course! How do you know that it is private?”—“There is a gate across it, with the words, ‘No Thoroughfare,’ in large letters.”

Then, in the blandest manner possible, the agent for the defence asks of the discomfited opposing agent if he has any questions to put to the witness.—No, he has not.

Mr. Longshanks retires, and the courteous agent for the defence sits down, wipes his glasses, folds his arms, and looks with delightful complacency towards the Examiner, and calmly waits for his decision, not without an air of triumph and self-satisfaction.

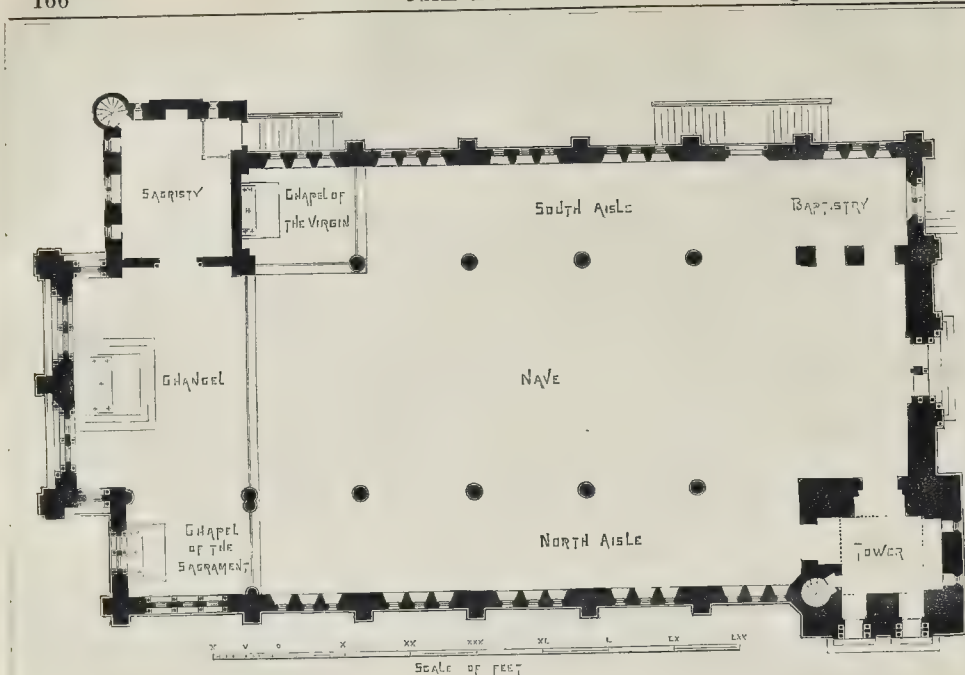
The Examiner strokes his chin, looks very

solemn, and declares the allegation *not sustained*: whereupon the agent for the opposition throws himself into his chair, with a grunt; looks straight down his nose, if that be possible; and fumbles among his voluminous papers. Once again his head is conspicuously reared aloft. Its respected owner has risen to the full standard of his limited height, brief in hand: he reads out an allegation more tremendous than the former; the number of a field has been omitted on the plan, and therefore cannot be found in the book of reference!—a veritable book of fate to many a sucking lawyer; he proclaims aloud the absence of this unlucky number on the plan, and dwells upon the fact with unwearied energy and emphasis. What horrible consequences will flow from this error; the public will be deceived—alas! poor public. How can proprietors find out their property, if such horrible laxity as this is allowed; it cannot, it must not be—it sets the Standing Orders at defiance—the allegation must be sustained.

Softly and slowly rises the courteous agent for the defence, more suave and conciliatory than ever, rubbing his hands, and peering through his glasses. He will explain—of course he will; the whole thing lies in a nutshell. Admitted the missing number is not on the plan, but he will prove that it is safe and sound on the lithographic stone. It is not on the plan, because the paper did not take the ink. It is on the stone; he will produce the stone. The Examiner shakes his head, and it is a terrible head when shaken. The opposing agent protests against the production of the stone; he will have nothing to do with the stone; he might as well bring in a paving-stone. Hush! the Examiner is about to speak: let no dog bark. He says, “The allegation is against the plan, and not against the stone.” The bland and courteous agent begs to suggest. His opponent cannot admit; no, not for a moment. Here they both speak together. It has been decided fifty times before. Right, wrong, absurd, nonsense, and similar words come sharply out of the conflict, now waxing hotter and hotter. The Examiner interposes—silence—and declares that he cannot admit the stone; so *essent* lithos and lithographer. The battle is not ended yet—far from it. The bland and courteous agent declares that if the number is not to be found on the plan, it is to be found in perfection in the book of reference. “Phew!” exclaims the other; “that is unmitigated moonshine. The allegation is against the plan, and not the book of reference or the stone.” He sticks to that: the plan, the plan's the thing. The discussion is brought to an abrupt close. The Examiner declares the allegation to be *sustained*, and thus nips in the bud at least two long-winded orations, ready to burst forth, and astonish the world by the profundity of their imaginary facts and gossamer arguments.

And so the tide of battle rolls along its onward course, surges to and fro, with various ups and downs, now on the right, now on the left flank—then fall at the centre, bust into the book of reference. This time it is the lawyers that are touched up and put upon their mettle—for do they not prepare this wonderful book—a fertile source of endless conflict—and, oh! delightful thought, of endless fees and charges? Once more the opposer is on his feet, brief in hand, to bring forward another and still more startling allegation—the book of reference is wrong in the particular instance of John Jones—a most important case—who is declared in the aforesaid book to be not only the owner, but, at the same time, occupier of the property; whereas, the fact is, that one John Jones is the owner, and quite another John Jones is the occupier,—the latter being, as it turns out, cousin to the former, and therefore, physically, altogether a different person, separate and indivisible in his own skin, flesh, and blood. That only one notice has been sent to John Jones, the occupier, and no notice whatever to the far more important personage John Jones the owner, and therefore the Standing Orders cannot have been duly complied with. All these dreadful derelictions shall be clearly and distinctly proved by the testimony of unimpeachable witnesses—the identical two John Joneses in *propria persona*.

Hereupon John Jones is called. He is not in the room, and nobody expected he would be. John Jones is bawled in the lobby. There is a rush in the lobby, a crush in the court, when, lo and behold, the two John Joneses confront the astonished owner of the hooked proboscis. The Examiner laughs, and the audience laugh with him. The agent assumes a grave aspect,



ST. PATRICK'S CHURCH, DUNGANNON.

Plan.

stretches forth his hand, and declares, at the top of his voice, that he wants John Jones, the owner: so John Jones, the owner, says, "Here I be, mister," and steps to the seat.

"Are you the owner of the house, No. 185, in the parish of Yepyty Eyn?"—"Doan't know."

"Why, man, don't you know your own house?"—"Ees, I do."

"Well, then, is number 158 your property?"—"Never yerd of number 158. My house is number 10, Owen-street."

"Oh, never mind the name and number of your street. Is your house 158 in the book of reference?"—"Never seed the book of reference."

John Jones, the owner, is confused and sorely puzzled,—all he knows is, that he has a house in Yepyty Eyn; the more he is questioned the more confused he gets. The two orators wrangle—explain—mystify, make matters worse, and finally give the witness up as incorrigibly stupid. Then, to make all clear and serene, John Jones, the occupier, is called. He knows nothing of the number 158; never heard of No. 158; never saw the book of reference; doesn't know what it means—doesn't want to know; he lives in Yepyty Eyn; doesn't know anything else; can't tell what they mean; no, he isn't his cousin; he's another man. So John Jones, the owner, has been brought up from the country 250 miles to prove that he is really himself, and nobody else; and John Jones, the occupier, has been brought up the same 250 miles to prove that he is not the other John Jones.

The bland and courteous agent now rises to explain; he is all wreaths and smiles; he can explain the whole matter in a few words: so, addressing the Examiner (who occasionally yawns), he says the truth is, that when the reference was taken, John Jones, the owner, actually lived in his own house, but that at the beginning of the year he left the house, and let it to the other John Jones, who now lives in it: so that he is sure the reference is quite correct, and the alle-

gation entirely disproved,—that, in fact, both owner and occupier are accurately described; and he ventures to suggest, in the most respectful manner, that the allegation cannot be sustained. He will recall John Jones, if the Examiner will allow him, to prove when he really took the house in question. After a long search, John Jones is found. He has been to look at the pictures in the corridors. He once more takes his seat, and is asked,—

"John Jones, when did you engage the house you live in?"—"At Christmas."

"Did you live in it before Christmas?"—"No; I lived at Llansantffraid."

So the courteous agent has proved his case, to his own satisfaction, but not to that of his opponent, who goes off full swing into an argument. He is interrupted. He will not be interrupted,—he has a perfect right to speak,—he will speak,—till he is stopped by the Examiner, who says,—

"Surely you cannot hold the promoters responsible for changes that have taken place since the book was made? I must hold the allegation not sustained."

And so the courteous agent resumes his seat, with an air of intense and unmistakable satisfaction; while the other, foiled by the stupidity of his own witnesses, and the confusion of his allegation, sits down with a chagrined air, and consoles himself by running through his portly brief, nibbling in his sandwich-bag, and sipping a modest glass of sober sherry and water.

Thus the fight ranges from point to point, from case to case, all or nearly all about equal in importance to the elegant specimens just recited for the edification of very patient readers. Wordy contests on such points as these are what are known as Standing Order fights,—occasionally amusing to the lookers-on, but not to those who have to pay,—purely technical, but it seems none the less necessary.

Some of the Parliamentary agents are men of varied ability, professing more or less to main-

tain legal arguments, and are tolerably well versed in engineering details, so far as is necessary for the thorough understanding of the proper conduct of the purely technical portion of their professional duties. They are mostly men of ready eloquence, and are prone to make a full display of it, when permitted so to do. In this respect, however, they in nowise differ from their learned brethren of the long robe.

The Examiners are not unfrequently called upon to exercise the greatest patience and forbearance while listening to the oft-repeated arguments and somewhat wordy oratory of the conflicting agents; for they have heard the same pretty speeches on the self-same subjects, from the same men, any possible number of times. From the nature of these contests, a really new and original point for discussion rarely turns up: such a new case would, indeed, be quite a godsend, and stir the whole court to its very foundations.

One thing is plain from the peculiar practice of these courts, that plans practically correct in all essentials, if opposed, are often rejected, or fail to comply with Standing Orders; whilst others, radically wrong in every particular, if unopposed, pass muster, and escape with all their manifold sins upon their heads. J. L.

ST. PATRICK'S CHURCH, DUNGANNON.

THIS building, now in course of erection, is the parish church of Dungannon, the chief town of the county Tyrone. It has been undertaken principally through the exertions of the Very Rev. Dean Slane. It is built entirely of the fine warm-coloured yellow sandstone of the district. The tower and spire will rise to a total height of 195 ft., and will form a conspicuous object in the surrounding landscape. The design is by Mr. J. J. McCarthy, R.H.A., architect; and Mr. Thomas Byrne, of Belfast, is the contractor.



ST. PATRICK'S CHURCH, DUNGANNON, IRELAND.—MR. J. J. MCCARTHY, ARCHITECT.

machine. This was to make the spiral threads on the natural and developable system. If an annular piece of card or tin be wrapped upon a cylindrical core, having its edge retained in a shallow spiral groove on the surface of the core, it would naturally take up a fixed and determinate position, not at right angles to the surface of the core, but inclined to it, and inclined to it at an angle depending only upon the inclination of the spiral groove on the core. The core could only be constructed approximately, by using a great number of small pieces. The developable threads also produced a more efficient machine than the threads of the usual form, as was shown by reference to tabular diagrams.

Experiments formed the basis of the investigation, and it was deduced from them:—

1. That the quicker the spiral the flatter must the machine be laid to produce its best effect.

2. That screws of quick spiral angle, when laid at their best angle of inclination, delivered a far greater volume of water per revolution than those of slower spiral angle, when laid at their best angle of inclination.

In the most favourable case, the useful effect of the screw appeared at 88 per cent.; and it was concluded that, after making allowance for certain small losses referred to, the useful effect of a well-constructed screw should not be less than 85 per cent.

Reference was then made, by way of comparison, to other machines commonly used for low lifts, viz., suction-pumps, centrifugal pumps, open Archimedean screws, scoop-wheels, chain-pumps, and Persian wheels; and the paper concluded by pointing out the various advantages of the Archimedean screw, more particularly as regards its durability, simplicity, and useful effect.

The second paper read was on "Centrifugal Pumps," by Mr. D. Thomson. The practical rules of construction were thus stated:—

1. The arms of the fan were curved backwards, according to principles of construction which were explained by diagrams. The depth of the fan was one-fourth of the diameter, and the central opening for the admission of the water was about nine-sixteenths of the diameter. The space allowed in the case round the fan should be of ample dimensions.

2. The best duty was given when the speed of the periphery of the fan exceeded the velocity of a falling body, due to the height of the lift, by from 6 ft. to 8 ft. per second.

3. A fan 12 in. in diameter, and proportioned as described, would discharge 1,200 gallons of water per minute.

4. If the diameter of the fan was varied (the speed of the periphery and the lift remaining the same), the delivery of water was increased or diminished directly as the square of the diameter.

5. When a centrifugal pump, properly proportioned, was worked by a steam-engine, the duty that might be realised ranged from 55 per cent. in the smaller-sized pumps to 70 per cent. in the larger machines, of the power shown by the indicator diagrams.

A MODEL LOCAL BOARD.

THERE is a little spot in Monmouthshire where the Cymric language and customs are nigh as common as in the heart of the principality. This locality is called Llanfreckfa; and it possesses a local board that deserves to live in history. From the "business" qualities of the whole elect, there is a wonderful harmony of feeling on one point,—doing the best they can for themselves. At a late meeting, a discussion took place about the impolicy of reporting the proceedings of the Board meetings in full. Some members complained that the reporter exceeded his duty, and that the minutes of the Board were sufficient to go before the public. The reporter, who was present, stood up, and manfully declared that he would not give a garbled report; that, personally it was a matter of indifference to him whether the proceedings were reported or not; but that, while he attended, he would report *verbatim*, and would not consent to suppress anything that took place. The Rev. J. K. Jenkins thereupon moved that the Press was not, in future, to be excluded, but that the present reporter, Mr. Greene, should not be admitted. Mr. Clark supported the proposition, and it was put and carried.

The reporter, after the motion was passed, took up his hat, and bowed a good-bye to the illustrious group.

Now comes the tale of truck. Mr. Lawrence, the worthy chairman of this model Board, has a vital interest in a Company's shop at Cwmbran, and Mr. Clark, the other voting member, is the gentleman who manages this shop. The latter strenuously advocated that the cinders and slag for the repair of the roads should be supplied by Mr. Lawrence (the chairman). There is yet a more energetic individual, whose blunt heroism deserves honourable mention, and who, if he be not a sanitary reformer, evidently knows a thing or two about drainage matters,—one who carries off the palm by boldly declaring, that he would retire forthwith from the Board if he were not allowed to supply the pipes intended for drainage purposes. The sequel is, that Mr. Greene, the reporter, corresponds with Whitehall, and Mr. Tom Taylor replies on the question of supply and demand, reminding the Board of the laws appertaining thereto.

THE LAW COURTS.

Sir,—Mr. Ayrton "doubts not that we shall get a very useful building for the money."

This was said in reference to an arrangement for the erection of the Law Courts for the sum of three-quarters of a million, an amount manifestly inadequate for covering so great an extent of ground, and which simply means, that instead of a Palace of Justice, we are to have "a useful building." We have now an opportunity of adding a grand architectural feature to London, such an opportunity as happens but once or twice in a century, and it appears that the chance is to be thrown away, and we are to content ourselves with "a useful building."

What are two or three millions compared with the creation of a great architectural glory in our city? And what will the citizens of the next century think of our stinginess if we allow so splendid an opportunity to pass by for the sake of a trifle of money? What should we think of our ancestors had they scamped St. Paul's, and left it without a dome, but that they were a mean, parsimonious race, with souls incapable of appreciating excellence? And so will our descendants estimate us if we cramp the architect of the Law Courts in this fashion.

What are the great glories of Venice, of Rome, of Athens? What those of York, Lincoln, and Durham? The marvels of architecture within their walls,—their temples, and cathedrals, and palaces, built not merely to be "useful," but to afford an intellectual gratification by graceful symmetry, grandness of proportion, and beauty of detail, and thither are pilgrims attracted from the ends of the world to gaze upon their beauties. London is not rich in grand structures, and it is to be hoped that in this case the architect may be allowed a little more latitude than seems to be accorded to him, and that this building, which is expected to last until the advent of the New Zealand, may be allowed to rise up in proud dignity between St. Paul's dome and the Victoria Tower, and not be crouched down, by a too careful economy, to the semblance of a warehouse.

F. R.

A FEW REMARKS ON TEACHING DRAWING.

HAVING for some years taken a great interest in the promotion of art, I was glad to see in the report of a recent meeting of the London School Board that it was proposed drawing should be one of the subjects taught in elementary schools. Would it not be a good opportunity for the Science and Art Department to use their influence to get this proposal carried into effect, so that the country might have a real national school of art, and not a mere sham? And this, I venture to say, will not be the case until it is universally taught as a branch of education, the same as it is in Germany. Although there are large sums of money paid for teaching drawing both in our national and private schools, we have little or no results, and this will not be otherwise so long as it is looked upon as "only an accomplishment." It is the fashion to blame the drawing-master for the bad system of teaching usually practised; but it is not his fault: he would gladly carry out a thoroughly sound course of study; but it is impossible; the mammas want a "show," and the pupils will not learn if the master insists, and so he is at the bidding of the pupil, or "his occupation's gone." Most schoolmasters look upon it as a "nuisance;" in fact, Dr. Syntax considers it interferes with his work, and so the lesson must be given in the play-

hours. The money paid for such lessons as these is very badly invested; it cannot be expected to get much real work out of a boy in his playhours. It is a common practice to keep a boy from his drawing as a punishment for failure in his other lessons! The drawing-master cannot complain to the principal, as it is his order, and certainly not to the parent, for that would be a dire offence; and so, from one cause and another, the study of drawing in this country is uphill work. I will give one illustration. The other day, on visiting a friend whose daughter had just "finished" her education at a fashionable "ladies' college," as she was supposed to have a great talent for drawing, I was shown some of her paintings, which at the first glance I thought very good and clever; but oh, horror! could my eyes deceive me? Was it possible such an insult could have been offered to my sense of everything that was right and true? Yes; they were only tinted lithographs! The shaded drawing is given to the pupil, who tints it from a copy, and this is shown as "her drawing." A label at the back (which had been carefully pasted over with paper) gives the following:—"Drawing copies specially adapted for holiday specimens." No.—, by —. It is, I think, hardly possible to conceive anything more injurious to the mind of a young person than such a practice as this.

A HATER OF SHAMS.

SAVE WANDSWORTH COMMON.

IN our number of the 23rd July last, a report was given of a large and influential meeting held at the Mansion House, in aid of the collection of a fund for securing the preservation of so much as remains of the above open space, either by carrying on to an issue a lawsuit then pending to try the rights of the lord of the manor, or by coming to an amicable arrangement for the purchase of those rights.

After many meetings, and much discussion between Lord Spencer's solicitors and the committee appointed by the people of Wandsworth and Battersea, an arrangement was effected by which his lordship was to transfer to certain conservators, to be elected by the ratepayers, all his rights over the common in consideration of a perpetual rent of 250l. per annum, being just half the amount derived from the digging of gravel and outting of turf, on an average of the last ten years.

To carry out this project, a Bill has been introduced, in the present session of Parliament, and its promoters had every reason to suppose that it would pass unopposed, seeing that the very trifling rate of 1d. in the pound was the extreme limit to which the ratepayers of Battersea and Wandsworth could be taxed on this account. A petition to Parliament in favour of the Bill was unanimously signed by the Battersea vestry; but the vestry of Wandsworth, acting in concert with the local Board of Works, were of opinion that the common should be dealt with by the Metropolitan Board, and an opposition was accordingly organised with that view. The promoters of the Bill felt that the inhabitants at large by no means concurred in this movement, and a meeting was held at the Spread Eagle, on Wednesday evening last, to test the question.

About 700 ratepayers attended. It was pointed out by the speakers that the Metropolitan Board had been, on two occasions, moved to take steps for the preservation of the common, but had avowed their inability to do so, because there were certain suits pending as to the manorial rights.

These suits the promoters of the Bill have made arrangements for stopping, provided the Bill become law. It was also pointed out that Lord Spencer had made the present arrangements in a great measure as a concession to the wishes of the people of Wandsworth, and that it was not at all likely that he would let the Metropolitan Board have the common on such easy terms, looking to the price proposed to be given for Hampstead Heath, &c.

The great desirability of having the management of the common in the hands of the ratepayers was also strongly insisted on, and ultimately resolutions were adopted by an overwhelming majority, amidst great enthusiasm (only one hand being held up against them), that the Bill now before Parliament for the preservation of Wandsworth Common afforded the best means of securing the object in view, and would, therefore, be beneficial to the inhabitants of the parish; that it was not desirable that

Wandsworth Common should be placed under the care and management of the Metropolitan Board of Works. The resolution further stated that the meeting regretted that that Board should have thought it necessary to oppose the Bill, and so cause money to be spent in Parliamentary strife which would otherwise have been available for the improvement of the common; and deprecated the course taken by the vestry with respect to the Bill, believing that the vestry did not, on this question, represent the opinion of the parishioners of Wandsworth.

COMPETITION FOR NEW BRIDGE OVER THE STOUR AT KIDDERMINSTER.

EIGHTEEN sets of plans were sent in for the above, the estimated cost varying from 480l. to 3,000l. 4s. 6d. Three designs have been selected by the committee for further consideration, sent in by Mr. George B. Ford, of Burslem; Mr. T. D. Baker, of Kidderminster; and one under the motto "Modus."

LEAMINGTON CHURCH.

STRENGTH OF MATERIALS.

A VESTRY was held in Leamington Town Hall last week to consider a report by Mr. Clarke, C.E., of London, as to the present condition of the parish church. The Rev. J. Craig presided, and there were twenty or thirty ratepayers present. The proceedings were opened by the chairman, who contended that the slight divergence of the evangelist columns, pointed out by Messrs. Slater and Carpenter, the architects who previously examined the building, was not so serious as many persons had imagined. It was impossible to construct a column which should show no divergence when subjected to a mathematical test, and in the present instance the columns were not out of the perpendicular to such an extent as endangered the safety of the building. He considered that it would be unsafe to proceed with the construction of the lantern tower now; but when sufficient time had been allowed for the columns to subside, and the stone to harden, possibly the completion of the work would be practicable. The report of Mr. Clarke was then read to the meeting. He stated that the weight of pressure on each column was 20 tons per superficial foot, and that alone was sufficient to account for the variations which had taken place in their relative positions. He did not consider, however, there was any evidence of deficiency of strength, so far as the present weight on the columns was concerned; but at the same time they were totally incapable of supporting the lofty tower and spire intended to be placed upon them. With reference to the arches overhead, Mr. Clarke agreed with the opinion of Messrs. Slater and Carpenter, that the stone was of bad quality, and the construction unskilful. The manner in which the stonework and brickwork had been carried out had led to the flaking off of the mouldings. The pressure of the masonry on the voussures was nearly eighteen tons per foot, which was much in excess of the ordinary safe proportion. From experiments made with two samples of the stone, he found a pressure of from 62 to 92 tons was required to crush them, and the rule was not to exceed one-sixth of the crushing weight. He thought it was advisable to diminish the present weight on the columns by removing a portion of the superincumbent masonry, and also recommended that the mouldings be redressed and eased at the joints. If that were done, he considered the building would be safe for divine worship.

"GRINDING MONEY."

At the Westminster County Court on February 21st, an action was brought before Mr. F. Bayley, Judge, by two joiners named Saunders and Stevenson, to recover the sum of 2s. each, being two hours' time for grinding tools, and one hour less of time, to claim same from Mr. Charles Fish, Joiner, Cambridge Wharf, Pimlico. The plaintiffs severally deposed that they had been engaged on a job in Bond-street until Saturday, January 28th, and upon being paid as usual at one o'clock at the defendant's office in Avery-row, their back time was also paid, and they were told that their services were no longer required. They asked for two hours' wages in lieu of time for grinding their tools; but they, to claim same from Mr. Charles Fish, Joiner, Cambridge Wharf, Pimlico, and the hour's loss time was claimed for that journey. William Hayling, Joiner, deposed that he had been engaged on the same job until a few weeks before Christmas, when he was discharged, and two hours' wages were paid him instead of allowing him time for grinding. In reply to Mr. Smith, solicitor, of

Denbigh-street, Pimlico, who appeared for defendant, the witness stated that he was paid by Mr. Cole, the walking foreman. In answer to the Judge, witness stated that he asked for two hours and a half, or a quarter of a day; but that Mr. Cole refused to pay that, and allowed him two hours and a half. The Judge remarked that he had previously stated two hours.

William Fisher stated that he had been foreman of the same job, and that plaintiffs were engaged under him, and corroborated their evidence as to the discharge. By Mr. Smith.—Was discharged himself at the same time. He believed there was some fault found with the work. Would swear that Mr. Fisher was not discharged at one o'clock he did not tell him that he would not be wanted after that day, nor that the plaintiffs were to be discharged at one o'clock. Did not tell them they would be discharged. The charge of two hours' wages for grinding was a regular custom of the trade, and had never been demurred to before by the defendant since he had been in his employ. Upon production of the time-sheets, the witness acknowledged that he had sent men's tools out to be ground from time to time to keep them in order as the work proceeded, and charged the same in his weekly accounts.

Both plaintiffs deposed that they had been in the trade many years, and had always been allowed two hours for grinding money.

Mr. Smith, for the defendant, stated that although the claim was for so small an amount, in one case was one of great importance, the question of the allowance for "grinding money" having been in abeyance ever since the celebrated lock-out or strike in 1859, since which the system of paying by the hour had been adopted, and as a necessity of that regulation notices of discharge or allowances for grinding had been discontinued. He would bring evidence to show that there had been no established custom in the trade, and that whilst some firms made some allowance, the nature and amount varied even in the same employ, and some made no allowance whatever. He read the report of a case similar to the present taken from the *Builder*, of about two years ago, which was heard before Mr. Whitmore, of Wandsworth Court, who decided that there was not an established custom in the building trade, and gave judgment for the defendant. He then called Mr. Chas. Fish, who said that he had been engaged in business about twenty-two years, and that since the lock-out of 1859 he had not allowed grinding money as claimed now. That he knew of no established custom to that effect, but had always set his face against everything of the sort. If Mr. Cole had paid the witness Hayling time for grinding, he had acted without orders. He did not hear of it until just mentioned, and it was therefore quite new to him. Prior to 1859, a quarter of a day had been usually allowed for grinding, but he considered that the hour system did away with it entirely.

Mr. F. T. Maitland (secretary of the Builders' Clerks' Benevolent Institution), deposed that he had been in the service of many firms in the building trade, amongst them Messrs. Hill, Keddell, & Waldram; Mr. William Higges, Mr. James M. Macey, &c.; that the practice of discharging men varied in each firm, and in the same firm under different circumstances. Had not been with Messrs. Brown & Robinson, but their practice was similar to other firms. Had the entire management of Mr. T. J. Gieskin's business, and had been constantly in the habit of paying men off for years. Had paid many at a minutes' notice, without allowing grinding money. Was in the defendant's employ, and had never received instructions from him to allow grinding money.

His Honour, in giving judgment, stated that he was glad the case heard before Mr. Whitmore had been referred to, as he had a personal knowledge of it, that gentleman having roundly the case to make inquiries as to the custom, had written for his opinion, and asked if he had any evidence upon it. He (the Judge) had in consequence written to several of the largest firms in London, and received replies, each of which varied from the other. He then read letters from Mr. John Reik, Messrs. W. Cubitt & Co., and Messrs. Geo. Myers & Sons, stating that the custom varied with the firm. Mr. Reik allowed two hours and a half for all trades; Messrs. Cubitt & Co. allowed two hours to joiners and one to carpenters; Messrs. Myers & Sons allowed two hours to joiners only. In the present case there was the evidence of the plaintiff and the foreman that two hours were the established allowance, but that was contradicted by their own witness, Hayling, who had only received one hour and a half; and on the other hand, there was the evidence of the defendant, who had been in the business twenty-two years, and of Mr. Mullett, who knew the practice of several firms, that there was no established custom in the trade. His own opinion was that there was a variety of practices, but that established custom. The charge of one hour for going to Pimlico to make the claim was absurd, and could not be maintained. He should therefore enter judgment for the defendant, with costs.

IN PARLIAMENT.

St. James's Park.—Viscount Royston asked the First Commissioner of Works whether it was his intention this session to open the communication for the public between Marlborough House and St. James's Park, by a footway, walk, by the east end of St. James's Park. Mr. Ayrton stated the opinion of the Government that no change should be made in the use of the Park unless it was shown by experience that that change was absolutely necessary to enable hon. members to obtain access to that House.

Natural History Museum, South Kensington.—Mr. Cavendish Bentinck asked the First Commissioner whether Government had approved any design for the exterior architectural elevation of the proposed Natural History Museum at South Kensington; whether the approved design was a modification of that by the late Captain Fowke which was selected after the competition instituted by the right hon. member for South Hants in 1867; whether the Commissioner of Works, and which Mr. Waterhouse was appointed to execute; whether the approved design was in architectural harmony with the adjacent new buildings of the South Kensington Museum; and whether he would, as early as possible, exhibit drawings and a model of the approved design to the architects of that House, for the inspection of members. Mr. Ayrton said considerable progress had been made in the preparation of the plans and designs for the new Museum of Natural History proposed to be erected at South Kensington; but it would be some time before they were perfected. Until that was done it would, of course, be impossible to exhibit them, nor had they at present received the sanction of the Government.

Labourers' Dwellings in Ireland.—Mr. W. Gregory gave notice that on going into committee upon the 34th of March, he should call attention to the necessity of proper legislation for improving labourers' dwellings in Ireland, and should move a resolution.

Erection of School Buildings.—Mr. Minisale asked the Vice-President of the Committee of Council on Education when those managers of schools who have memorialised the Committee of Council for assistance towards the cost of erecting school buildings might expect to receive an answer to the application made by such managers. Mr. W. E. Forster said the only answer he could give was that all applications would be taken in their turn. The applications were of two classes—those for enlargement and those for the erection of new schools, and they would be taken according to the date of application. He could only say that the officers of the department were doing their utmost to proceed with the work as fast as possible. In the past year there had been 3,300 applications, of which 3,003 had been made within the last few months, and many within the last few days; and he asked the House to bear in mind the extraordinary amount of work which had been thrown on the department since the passing of the Education Act.

Stone of the Houses of Parliament.—In reply to questions.—Mr. Ayrton said that a certain quantity of defective stone had been used in the construction of the Houses of Parliament; and in addition to that misfortune some of the corners of stones had been accidentally broken off and had been repaired by having fresh pieces substituted. As time wore on, all these defects were of course revealed, and naturally created some alarm as to the stability of the building. That alarm, he was happy to say, was unfounded. What deterioration had occurred did not in any way affect the stability of the stonework. Some years ago various experiments were made by different processes with the view of preserving the stone from decay; but, as no consecutive record had been kept of the results, it was impossible to say what had been the strict measure of success. Last year it was decided to make a fresh application of all the processes, and keep a record of the results, the experiments being superintended by a competent chemist. He did not think the results would be absolutely successful, but the greatest care would be taken to achieve a satisfactory result. Should the stones still continue to decay, they would be taken out and fresh ones put in their place, and by that means, at a small annual outlay, he believed the exterior of the building would be kept in a state of preservation for centuries.

BLACK DRAUGHTS.

Sir, "A smoky house and a scolding wife,
Are two of the direct plagues of life."

There is hope for the former; regarding the latter, hope is vain.

I beg to suggest a terminal be fitted on the brick stack (all unsightly pots on pots and unsightly pipes to be cleared away); this terminal to be like a revolver of several attendant chambers, but only one shoot-out barrel; four wide-mouthed wind-lanterns to receive and discharge air into the tube or barrel, perpendicular, without driving against the inside. Forced air always draws an immense quantity of the same after it, and when smoke is intermingled, it readily passes in any direction.

Two doctors (a sweep and a bricklayer) were called in to see three perverse chimneys in my house; they disagreed as to what ought to be done. Dr. Sweep had no faith in extra pots, long crooks, tall-boys, gimcrack windmills, and tuppings, tops, which choke or come to grief. The operated, and I can say the nuisance is unabated. What is required is an emetic pot to make chimneys bring up the smoke for distribution and consumption among neighbours. The above terminal would maintain an upward draught, and be no impediment to the sweeping-machine.

N.B. During high winds mind your dinner is not drawn up the chimney; nail the hearthrug down, and tie the cat away from danger. If the scolding wife is there, let her take her chance.

R. T.

THE ARCHITECT OF THE LIVERPOOL EXCHANGE.

At a meeting of the Liverpool Exchange Company, held last week, the chairman of the Board of Directors, Mr. John Torr, moved, and Mr. R. Brookbank seconded, the following resolution, which was carried unanimously:—

"The works in the architect's department being now entirely completed, the directors desire to place upon record their sense of the ability, zeal, and perseverance with which Mr. Wyatt has devised and carried out the extensive works belonging to the company. The task has been a difficult one, requiring considerable ingenuity in reconciling the requirements of commercial offices with the importance of a large public building. The directors congratulate the shareholders on this problem being solved in a manner so satisfactory to themselves and highly creditable to Mr. Wyatt."

The chairman undertook to forward the foregoing resolution to Mr. Wyatt.

And we have great pleasure in forwarding it to the public.

THE TRAMWAY QUESTION.

Two additional reports on the Street Tramway question, especially as it affects the City of London, have been made by Mr. William Haywood, the engineer and surveyor to the City Sewers Commission, to the Finance and Improvement Committee of the Commission. In the one the reporter thus sums up:—

"I have now, I believe, adverted briefly to the most important points for the consideration of the Commission, and such as may enable them to decide upon the course of action they will adopt. It will be gathered that, while there are undoubtedly advantages in street tramways, yet that there are many disadvantages attending them, and there can be no doubt that they will afford much comfort and convenience to a vast number of people; but, on the other hand, that

in streets of great traffic it will no longer be possible to maintain the pavements in a similar condition to that in which they now are; and therefore that the comfort of those who ride in or drive vehicles of another description will be more or less sacrificed to the comfort of those who will ride on the tramways. The travellers in omnibuses will, of course, a much more numerous class than any other, and may become still more numerous should tramways be adopted."

In the other report, Mr. Haywood says,—

"My conclusions are:—

Firstly, That street tramways afford much public convenience, and will, if they be formed along many thoroughfares to the City boundary, that their convenience will be impaired unless they are continued, and that ultimately they will be laid through such of the City thoroughfares as may be best adapted for them.

Secondly, That it is expedient to await their further development in the suburbs before constructing them within the City.

Thirdly, That the local authority itself should devise such a plan of tramways for the City as may be most conducive to the public interests generally.

Fourthly, That the local authority should itself construct and maintain the tramways, and grant the user of them to others, and take tolls for the use of the same.

Fifthly, That should the local authority deem it inexpedient to construct tramways out of the rates, it should, nevertheless, do the work upon its own plan, and subsequently maintain them as part and parcel of the highway, but at the sole cost of those having the use of them.

Sixthly, That the whole surface of the carriageways in the City upon which tramways are laid should be raised at the cost of those having the use of the tramways.

Seventhly, That paving the streets with suitable asphalt, where there are tramways, will be found to be maintained in a condition the least objectionable to the general traffic, and that this should be done at the expense of those having the use of the tramway."

THE NORFOLK-STREET APPROACH TO THE EMBANKMENT.

SIR.—It is to be desired that one of the independent members of the Metropolitan Board of Works would ask why the above has not been completed before this time. The Temple Station on the Metropolitan District Railway has been opened now for eight or nine months, and therefore that railway (which undoubtedly was the cause of the Abbey Mills Pumping Station being erected with only one six-inch water to the whole of its pumps, sixteen in number) cannot be charged with delaying lately the opening of the Norfolk-street approach to the Embankment. Why did not the Metropolitan Board of Works build the brick wall there, against the new-made wall, and in that manner keep the mortar of the wall wet till the post came? The building of the wall in this way would have been of considerable advantage.

I regret that I cannot think of the name of the stuff which would in these circumstances keep mortar wet for six months. Will some one kindly tell me the same?

SLATE CISTERNS.

REFERENCE to your correspondents, there cannot be any bastard slate slab made into cisterns.

I have used slate cisterns over W.C., and by only painting the outside bottom, no "leakage" or "dampness" will ever adhere or get attached to it. Without doing this, the least opening to admit the atmosphere will always produce what is erroneously called "leakage" or "seepage." Slate cisterns painted on the inside must be best bread and flour safe.

R. WILLIAMS.

CHARGES AGAINST A CLERGYMAN AS TO A BRICKFIELD.

THE JUSTICES of the Peace for Faversham, Kent, after an investigation at the Sittingbourne Police-station, which extended over three days, have come to the conclusion that William English, formerly the vicar of Milton-next-Sittingbourne, but now residing at Emmanuel Vicarage, Canterbury, to take his trial at the next assizes, to be held at Maidstone, on various charges of perjury, and suborning and inciting others to commit perjury. Mr. Evans conducted the prosecution, and Mr. Sergeant Sleight appeared for the defence. The proceedings were taken by Mr. Peter Bawden, a brickmaker and patentee of some brickmaking machines, residing at Notting-hill. From his evidence it appeared that in 1858, in consequence of seeing an advertisement that a certain brickfield in the neighbourhood of Ramham was for sale or hire, he went down to that place, and met the defendant, the Rev. W. English. He visited the brickfield in the company of the defendant, who represented that it contained earth capable of making the best bricks in the neighbourhood. From the representations made by the defendant he was induced to hire the field, one clause in the agreement being that he should pay a royalty for 4,000,000 bricks every year, whether he made that quantity or not. It was declared by several respectable witnesses that the earth in the field was not capable of making marketable bricks. A clamp of bricks was standing in the field at the time in question, which defendant alleged had been made from the earth of that particular field, whereas it was proved that many of the bricks which were placed outside the clamp, and were of a far superior quality to those in the interior, were made from earth specially carted for the purpose from another field. The bricks made from the earth of the field hired by Bawden were said to be positively useless. Bawden consequently sued the defendant for obtaining from him a valuable security by fraudulent pretences in respect of this field, and the action was tried at the Maidstone Spring Assizes in 1870. Defendant was then examined as a witness, and, in consequence of his having, as it was alleged, sworn falsely at that trial, a verdict was entered for the defendant. Subsequently a rule nisi was obtained in the Court of Queen's Bench for a new trial. The arguments were heard before the Lord Chief Justice, who refused to grant the application. The present proceedings were then taken. The evidence of witnesses called went to show that at the trial at Maidstone the defendant, when upon his oath, had sworn that he was not alone with the plaintiff in the brickfield when the representations were made which induced the plaintiff to take the field; that

he never instructed any person to make a clamp of bricks regardless of expense, and no matter where the earth came from, in order to enable him to let or sell the field; that Major Burslem, a former tenant of his, had never complained verbally or by letter that this earth was bad; that the defendant believed the earth was capable of making good bricks; that he never told one Ames that he was in no hurry to sell the clamp of bricks because he wanted to keep it there to enable him to sell or let his field; and that he never communicated with his witnesses during the trial, telling them not to say anything that would contradict his evidence, nor had he incited Alfred Butler and George King to make certain false statements in affidavits on his behalf. All these statements were now alleged by the prosecution to be false. Bail was accepted, himself in 1,000*l.*, and two sureties in 500*l.* each.

THE PUGIN TRAVELLING STUDENTSHIP.

SIX candidates submitted drawings and testimonials to the Institute of Architects for the Pugin Travelling Studentship, and the Council elected from them Mr. William Henman, of Bedford Villas, Croydon, as the student for 1871.

SONNING, OXFORDSHIRE.

A PARSONAGE-HOUSE has been recently erected in the district of All Saints, in the parish of Sonning, Oxfordshire, the cost of which has been defrayed and the site provided by Mr. Robert Palmer, of Holme Park, Berkshire, on whose estate the parish of Sonning, Berks and Oxon, is chiefly situated.

In the year 1841 Mr. Palmer gave the land, and, in conjunction with his sisters, the Misses Palmer, erected the district church of All Saints; and between that and the present time they have provided schools and teachers' residences also for the district. The parsonage might, perhaps, be considered as a completion of the group. All have been erected under the direction of Mr. John Turner, architect, of London, with whom, in the case of the parsonage, has been associated his son, Mr. J. Goldicutt Turner.

The materials used are grey and red brick and tiles. The works have been executed by Messrs. Brown, Cox, and Green, of Sonning, who have performed the trades of plumber, carpenter, and bricklayer respectively.

SCHOOLS OF ART.

The Macclesfield School of Art.—A meeting of the committee of this school has been held to receive the report of a deputation which had recently waited on Mr. Cole, the secretary of the Science and Art Department, South Kensington Museum. The deputation stated, at considerable length, the nature of the interview with Mr. Cole, the result of which was satisfactory to the committee; and plans for a new building were ordered to be prepared by the art master, Mr. J. Ford, to be submitted to the Government. As an evidence of the interest felt in the silk trade of Macclesfield by Mr. Cole (who represents the Government), it was stated that even the maximum Government grant for a new school would be increased, provided this town manifested a determination to have a new school, and to support it in efficiency when erected. The feeling of the Government, as represented by the Department of Science and Art, appeared to be that a silk or manufacturing town should have a good school for the promotion of taste, art, and design. The meeting was adjourned to inspect the plans, prior to their being sent to the Department for consideration.

The Sheffield School of Art.—This annual gathering has taken place with great success. Whether it was the attractive works of art, got together by Mr. Sonner and the Council of the School at much trouble, or genuine interest in the institution itself, that drew together so large and gay a company, our authority, the *Sheffield Independent*, is not prepared to say. Mr. George Dawson addressed the meeting, and in course of his speech he said:—Did it ever strike you to think of what man must be in his savage state? What a poor, little, helpless, queer biped he looks. A wicked satirist called him once a forked raddish with a curiously carved head. We are sent into this world not like that, because we come richly dowered by many generations of culture; but think of your barbarian forefather as he stood on this earth with no furniture whatsoever—not even a pocket to put anything into. But so it pleased the Almighty. He made man stark naked, and ugly, knowing nothing whatsoever, but having a certain amount of intellect. But what a wonderful development he had come to. This curious little biped, appar-

ently helpless, is the most helpful creature in creation. He soon makes for himself a covering; then he makes for himself a pocket, and a pocket is one of the greatest things that civilisation and art ever achieved for a man. You must have a knife in order to live, and if you have no pocket, where are you to put your knife? You cannot carry it between your teeth conveniently for long. So, by degrees, man begins to cover himself, and then the wonderful little person wants to be where he is not. He cannot swim until he learns, and when he learns he does it well; he cannot fly, and he makes a balloon, and by and by he will succeed in that matter admirably. He wants to be where he is not, and he invents a bow and arrow. The flight of the arrow is very short, and by and by he invents a gun, and he is enabled to hit his enemy without going near him. And in these deadly days of detestable slaughter men are enabled to stand here and act five miles off. Man has, however, few years to live in, and he conquers that by producing a library where the thoughts of all ages are gathered together, and this poor little creature of three score years and ten is able to commune with the most ancient days. At a very early period in his life man shows a sense of beauty. He dyes perhaps the last pattern of fashion into his own face in blue mould. The savage very soon becomes ornamental, and that love of beauty you may look upon as one of the great instincts of humanity. Now art is systematic in the pursuit of beauty. Beauty is marked upon every work of God, and, therefore, the love of beauty is simply the fulfilment of the Divine method; and if you will look into nature a little, you will find no mere poor vulgar utility in it. The great architect of the universe never made a single work yet in which vulgar utility was simply the measure of production. One man says "Beauty is only skin deep," therefore it is nothing. "Well," I say, "you fool! who ever expected it to be any deeper? The marvellousness of beauty is, that being only skin deep, it is so deep. It is only skin deep, and though you braid, who can stand against beauty? Graceful men and graceful women are a power wherever they go."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

A SPECIAL general meeting, of members only, will be held on the 6th of March, to consider the recommendation of the council, that the royal gold medal be awarded, subject to her Majesty's gracious sanction, to Mr. James Ferguson, for the Soane medallion (with the sum of 50*l.*) be awarded to the author of the drawings distinguished by the device of a "horse-shoe," that the Institute silver medal, with 5*l.* 5*s.*, be awarded to the author of the drawings distinguished by the word "Student" within a triangle; and that the Institute silver medal be awarded to the author of the essay bearing the device of "two leaves within a circle." The meeting will also be requested to consider a resolution passed by the Professional Practice committee, and since adopted by the Council, respecting the "terms of appointment of architects for public building," issued last year by the Office of Works; to confirm, if approved, the "general headings for clauses of contract," as settled between the Council of the Institute and the Committee of the London Builders' Society; and to take into consideration the suggestion made in the president's opening address for the present session, as to the office of secretary. A communication respecting a proposed scheme for an annual conference of architects, to be held at the Institute, will also be submitted to the meeting. Plenty of business, certainly, for one night.

Books Received.

Laxton's Builders' Price Book for 1871. London: Kelly & Co.

This current edition of *Laxton's Price Book* contains a considerable amount of fresh information. Parts of it have been rearranged, and a large number of prices added of modern inventions and recent novelties. Besides the whole of the Building Act, there are notes of cases explanatory of its working. In short, it is a book to have.

VARIORUM.

The editor of the *Leisure Hour* is giving some interesting and valuable observations on America and its people. Speaking of the general use made of the electric telegraph, he says,—"Another curious instance I may mention of the use of the telegraph in the details even of indoor life. In the hospital at Cincinnati I saw a bureau in the hall, in charge of a smart coloured boy. Wires centred in this office from all the wards, and every hour the temperature in each ward was telegraphed by the head nurse, and entered by the clerk, for the inspection of the medical superintendent, whose room was adjoining. In many private as well as public establishments the telegraphic arrangements are equally complete. The Americans know how to make the most use of electricity, as well as of steam." As to the arrangement of houses in New York,—"One thing I specially noticed, that the basements are far more carefully constructed than in our London houses. I was in the basement of various stores, and, even in low-lying streets like Canal-street, the arrangements were all that could be desired for health and business convenience. In London, while looking in at shop-windows, one is saluted with pestilential odours from the open grating above the dark subterranean ground. In New York the ground floor is usually light and wholesome. With our skill in glass and iron work, a great improvement could surely be made in the basement floors of our business streets. I suspect, however, that the land and property laws partly account for the more careful building in New York. What interest has a tenant in London to erect a building to last much beyond the term of a lease, when the building then becomes the property of the ground landlord? *Sic vos non vobis edificatis.*"—The *Dark Blue* (Sampson Low) is a monthly magazine, intended to be connected with Oxford and Oxford men,—at least, for a time. It is conducted by Mr. J. C. Freund, and has commenced fairly well. Several well-known men are amongst the contributors. Some enterprising publisher will, doubtless, soon organise the *Light Blue*, in the interests of Cambridge, and in due time every line of the spectrum will have its representative journal, the London University possibly winding up the list with the *Deep Red*.—*London Society*, now edited by Mr. Henry Blackburn (Bentley & Son), has taken a fresh start. The number for March is a good one.—In *Fraser*, Mr. R. A. Proctor gives further account of recent discoveries, under the heading, "The Sun's Corona." The paper on Barham (Ingoldsbey) is sure to find readers.

Miscellaneous.

Monster Blast at Granite Quarries.—It is estimated that 80,000 tons of rock have been thrown down by one blast at the Bonaw Quarries, near Inverary, in Scotland. Preparations have been in progress during the past eighteen months for this blast. The fineness of the day induced considerable numbers of the country people to take up their position upon various safely distant points of view on the hills surrounding Loch Etive. A rough protecting house was formed for the battery at a point 100 yards from the mouth of the mine, and on the same level as the quarry floor, along which the conducting wires were laid till they formed a junction with the battery near to the site of the quarry at the shipping quay. From this point Mr. Sim, of Glasgow, the proprietor, crossed Loch Etive to the Goat Island—200 yards distant—with the working cords of the battery. Here he found a desirable place for shelter from flying stones. From his position he was also enabled to obtain a near view of the working of the blast. In the firing there was no report or noise, merely a silent heaving of the mountain, bursting and pressing forward innumerable pieces of rock from the formations in which they had existed in their natural state. The quantity of rock displaced is enormous, being computed by measurement at 80,000 tons, constituting this blast the largest and best which Mr. Sim has had during his 18 years' experience of this peculiar system of blasting.

Somerset County Lunatic Asylum Chapel.—We have received a letter on this subject, signed "X. X. X.," complaining of excess of coat and other things; but we do not feel it necessary now to carry the matter further.

The Proposed Euston, St. Pancras, and Charing-cross Railway.—A public meeting of the owners and occupiers of land and houses lying along the proposed line of construction of the above railway has been held at Caldwell's Assembly-rooms, Dean-street, Soho, Mr. Milnes in the chair, to adopt measures for procuring the insertion of a clause in the Bill compelling the railway companies in whose immediate interests the line was to be made, to give compensation to all those whose property or business might be damaged by the construction of the line. The chairman stated that hundreds of tradesmen and shopkeepers in the New-road and other localities were completely ruined during the progress of the works of the Metropolitan Railway, and therefore the inhabitants of Tottenham-court-road, Soho, and St. Martin's-lane, were fully justified in taking measures to protect their interests. A resolution was adopted in favour of steps being taken for protecting the interests in question, and a petition to Parliament for that end was signed by nearly all present.

The Albert Hall of Arts.—On Saturday last a concert was given to the workmen employed in the erection of the Royal Albert Hall of Science at Kensington-gore, by Messrs. Lucas, the contractors. The hall was, in addition, occupied by a large number of ladies and gentlemen, the entire audience numbering over 8,000. The instrumental performers were the band of amateurs known as the Wandering Minstrels, under the conductorship of the Hon. Seymour Egerton, and the soloists, Mrs. Nassau Senior and Miss Anna Williams. The programme included the overtures to *Masaniello*, *Zampa*, and *William Tell*, the march from *Tannhauser*, and some waltz music. The effect of Gounod's "Prayer," as sung by Miss Williams, was particularly fine. Difference of opinion exists, according to position of listeners, as to the existence or not of an interfering echo. Before determining, we are disposed to wait till the hangings of the boxes and other fittings are in their places. In several respects this first experiment of filling the Hall must be pronounced satisfactory.

The Carpenter's Shop.—A professor at Munich, says the *Cornish Telegraph*, has published the results of his experience on the seasoning of wood, which, as a practical question, is worth attention in many quarters. Growing-wood, says the Professor, contains in winter about 60 per cent. of water; in March and April 46; and 45 per cent. sent in the next three months, with but little variation up to November. Timber dried in the air holds from 20 to 25 per cent. of water; never less than 10 per cent. Wood dried by artificial means until all moisture is expelled, is deprived of its elasticity, and becomes brittle. If the natural qualities of the wood are to be preserved, the drying must begin at a moderate heat, and be carried on very slowly. For the drying of small pieces of wood, such as are used by joiners and cabinet-makers, the Professor recommends a bath of dry sand, heated to a temperature not exceeding 100°. The sand diffuses the heat, and absorbs moisture; but it must be cold when the wood is first buried therein.

A Testimonial.—On the 27th ultimo the clerks and foremen in the employ of Messrs. Patman & Fotheringham, builders, met at the Albion Tavern, Southampton-row, for the purpose of presenting to Mr. James B. Colwill, on his leaving the firm to commence business on his own account, a gold chain and a complimentary address, which bore the signatures of 23 subscribers. Mr. Wm. Richardson acted as chairman on the occasion, and Mr. Wm. Skill as vice-chair. The former accompanied the gift with a few kindly and well-chosen remarks, to which Mr. Colwill responded, avowing his high appreciation of the present, and still more of the friendly feelings by which the donors were actuated.

Cottage Hospital for Consumption.—The Fanny Bazaar to be held in the Duke of Wellington's Riding School, Knightsbridge, in aid of the National Hospital for Consumption, on the separate or cottage principle, erected near Ventnor, Undercliff, Isle of Wight, is fixed to take place on the 11th, 12th, and 13th of May, 1871, in anticipation of the completion of the third pair of houses now being erected at the entire cost of two gentlemen, and for the purpose of obtaining funds to defray the expense of furnishing and opening these houses for the reception of patients.

Building Operations in Walsall.—During a general ramble round Walsall, with note-book in hand, the *Walsall Observer* has dotted down his thoughts on several of the buildings and other works executed during the past year. He was not aware, he says, that so much had been done during the time. First he notices the new church at Caldmore, St. Peter's Schools, and the Church Schools at the Batts. The first is incomplete; want of funds to carry out the aisles completely spoils both the internal and exterior appearance. Mr. Veal is the architect, and the builder Mr. Lovett, both of Wolverhampton. Of St. Peter's School, Mr. Chamberlain was the architect, and Mr. Atkins the builder. These schools have been recently opened. The Batts Church School was designed by Mr. Griffiths, of Stafford, and is being built by Mr. Wilkes, of Darlaston and Walsall. The *Observer* then notes particulars as to numerous villas and other houses, &c., and says, "We sincerely trust that all intending builders of houses will avail themselves of the services of some person of skill and taste, so that our suburbs may not be disfigured by such a tasteless and incongruous mass of erections as at the present."

The New River Company and its Property in Hertford.—At a meeting of the Hertford Council, Councillor Garratt, in moving that a committee be appointed to report upon the rateable value of property belonging to the proprietors of the New River Company, within the borough of Hertford, said the New River Company sends to London a daily supply of 23,500,000 gallons of water, from which it receives, by the sale annually, the sum of 252,000*l.*, or equal to more than 9,300*l.* per annum for every 1,000,000 gallons supplied daily. Chadwell Spring contributes to that quantity 4,500,000 gallons daily, which is equal to one-sixth, and a trifle over, of the whole supply. The total expenses of the New River, including working expenses, rates, taxes, income-tax, &c., amounts to 119,000*l.*, leaving a net profit of 133,000*l.* Taking one-sixth of that sum as the profit of the New River from the Chadwell Spring, it amounts to 22,166*l.* 13*s.* 4*d.*, which profit is derived from this borough. About 18,500,000 gallons were daily taken from the River Lee, which flows through the borough, and which produces a profit of about 100,000*l.* per annum after working expenses, rates, taxes, income-tax, &c., are paid. The motion was agreed to.

Effect of Cheap Railway Fares.—The chairman of the North-Eastern Railway Company (Mr. H. S. Thompson) made an interesting statement at the annual meeting of the shareholders on Friday. The result in twelve months of a reduction of from 20 to 25 per cent. in their fares had been an increase of 54,158 first-class, 154,122 second-class, and 1,179,000 third-class passengers. The aggregate receipts of first-class fares showed a loss of 87*l.*; but, on the other hand, the increased receipts from second and third class passengers amounted to 9,423*l.* and 34,191*l.* respectively.

The War and the Railways.—The reduction in the receipts of the South-Eastern Railway during the past half-year, caused by the war, was 66,000*l.* The capitulation of Paris had such an effect on M. Petiet, the managing director of the Great Northern Railway of France, that he succumbed to an attack of apoplexy. The public were indebted to M. Petiet and Mr. Eborall for the introduction of the system of through booking between France and England.

The Fatal Sewer Accident at Mile-end. An inquest has been held on the bodies of the three men suffocated by the fall of earth, while excavating, on Saturday week, at the bottom of a new sewer in Paul's-road, Mile-end. The sewer was 25 ft. in depth, and the sides of the cutting were composed of clay and sand, through which the water oozed. Some witnesses deposed that the sides were not properly strutted, and that the foreman had been remonstrated with. The jury returned a verdict of "Accidental Death, resulting from the insufficiency of the strutting of the sewer." The jury requested the coroner to censure Mr. Hubbard, the foreman of the works.

Monumental.—The marble statue of Abraham Lincoln, of which Miss Vinnie Ream was the sculptor, was unveiled in the presence of the President and Congress, on the 25th of January, in the Rotunda of the Capitol at Washington.

The Annual Trades Congress.—Messrs. G. Odger, W. Harry, G. Howell, G. Potter, and W. Cremer, the committee in whom the last Trades Congress, held at Birmingham, vested the authority for convening the next congress to be held in London, on Saturday last issued a circular to every trades council and trade society throughout the United Kingdom, informing them that the Congress was convened for Monday, March 6th, at eleven o'clock, at the Portland-rooms, Foley-place, Fitzroy-square, and inviting them to send delegates. The sittings of the Congress are expected to last for the whole week. The programme contains the following subjects for discussion:—1. Trade-unions and Legislation. 2. Mines Regulation Bill, the Truck System, and Weekly Payment of Wages. 3. Employment of Women and Children in Agriculture, Workshops, and Factories. 4. Convict Labour v. Free Labour. 5. Application of Arbitration and Conciliation in Trade Disputes. 6. Reduction of the Hours of Labour. 7. Co-operation and Industrial Partnerships. 8. Taxation, Imperial and Local. 9. Education, Primary and Technical. 10. Direct Representation of Labour in Parliament. 11. International Fraternisation of Labour. 12. War, Standing Armies, and their Injurious Effects upon Industry. 13. Utilisation of Waste Lands and Unemployed Labour. 14. Emigration as a floating Working Men. 15. The Commission appointed to inquire into the working of Friendly Societies.

Explosion in the Chartered Gasworks.—At the works of the City of London Chartered Gas Company, near Barking, one of four enormous gasometers had risen as high as it could upon the columns supporting it, which, apparently from its being overfilled, and by the force of a gale of wind, the supports or columns gave way, and the gasometer tilted on one side, which had the effect of letting the gas escape. The volume of gas was blown by the wind to a distance of about 100 yards into a blacksmith's forge, the fire of which is supposed to have ignited it. The result was a terrific explosion, the sheet of flame extending high into the air, and being visible for miles around. The workmen, on seeing the columns give way, ran off, and before the gas became ignited had got beyond reach of danger. Except damage to the gasometer and loss of the gas, which was considerable, no serious injury was sustained. Fortunately the wind was in the direction to blow the gas away from the other three gasometers. Portions of the gasometer were doubled up like a roll of carpet, and the pillars were broken down.

Proposed New Public Buildings, Eilston. Mr. Taylor, town surveyor, has prepared a plan showing the accommodation which buildings erected on the site just purchased by the Commissioners will afford to the town. The piece of land proposed to be appropriated to the purposes of a free library will hold a building comprising a library, 21 ft. by 9 ft.; and reading-room, 35 ft. by 21 ft. The town-hall will afford space on the lower floor for the undermentioned rooms:—Committee-room, 21 ft. by 14 ft.; board-room, 21 ft. by 18 ft.; clerk's office, 14 ft. by 21 ft.; surveyor's office, 21 ft. by 14 ft.; collector's office, 14 ft. by 20 ft. The upper floor, according to the plan, will comprise:—Town-hall, 52 ft. by 64 ft.; ante-room, 18 ft. by 12 ft. 9 in.; cloak-room, 9 ft. by 12 ft.; retiring-room, 18 ft. by 12 ft., together with lavatories, closets, &c. The Commissioners have resolved that the town-hall and free library shall be of one style of architecture.

Oxford Architectural Society.—Merton College was visited on Saturday last, when nearly a hundred of the members and their friends were present. The party then went into the gardens, and visited the city wall, when some interesting particulars were given by Mr. J. Parker, who said that the probable date of its construction was about the middle of the reign of Henry III. The party then visited St. Alban Hall by the kindness of the principal, and returning to Merton College Gardens, went out by the gate facing the meadow, and traced the course of the city wall.

Cameo Cutting.—We are sorry to hear that none of the students of the Female School of Art have responded to the offer of a premium for the best cameo produced in the school, as announced at the last general meeting. The proposer has authorized the committee to offer the amount as a prize in such other form as they may determine.

Railways on Suspension Principle.—The Melbourne *Austral* says.—In the London *Engineer* of 30th September, 1870, there is a description of a new and cheap railway on the suspension principle, designed by Mr. J. B. Fell, the engineer who is so well known in connexion with the construction of the Mont Cenis line across the Alps, and it is stated that by this plan practicable railways, which may be worked either by locomotives or by an endless rope, can be made at a cost of 1,000l. per mile. It is somewhat remarkable that a precisely similar scheme was brought into notice here two years ago by Mr. Joseph Dyer, and that this gentleman then associated it with Mr. Fell's discovery of traction by adhesion to a central rail. Mr. Dyer had previously laboured hard to introduce the same plan in New South Wales, and had spent thirteen years in advocating it there. In 1857 he declared that he could make railways for 1,000l. per mile, but was always met with ridicule. He now entertains the hope that the weight and authority of Mr. Fell's name will lead to the trial out there of some practical experiment with this new form of railway.

Tramways for the City.—The Court of Common Council, sitting at Guildhall, have had under their consideration the question of allowing tramways to enter the City; and Mr. De Jersey, the chairman of the Commissioners of Sewers, brought up a report from that body, which has now the care and the maintenance of the highways of the City, recommending that it be constituted the authority for carrying out within the City the powers of the Acts of Parliament relating to street tramways. It was eventually resolved that the court petition Parliament on the subject, in order that they might thereby have a *locus standi* there, and should be able to modify the provisions of any such Bills in the interest of the City. The Commissioners of Sewers, by whom the report was presented, expressed themselves in favour of the introduction of tramways into the broader streets of the City.

Spongy Iron as a Deodoriser.—There is some mystery in the spongy form of metal and other substances, not yet cleared up. Spongy platinum is a substance with curious properties, and the spongy form of charcoal seems to have something specially to do with its deodorising power. Dr. Voelcker now declares spongy iron to be a deodorising material of greater power than animal charcoal. Sewage water passed through a filter of this substance is said to be completely purified, and this filtered water, after having been kept six months protected by the air, has been found to be perfectly sweet, and free from any fungoid growth. The spongy iron is obtained by calcining a finely divided iron ore with charcoal. Mr. Spencer, of London, but one of Liverpool, whose name is connected with the discovery of the electrolyte, has for some time been advocating the use of a filter of this description.

Wrought-iron Sleepers.—A new railway sleeper has been patented by Mr. Richard Gammon, of Westbury. This sleeper is made up of a number of webs and plates of rolled iron, riveted together, and pierced with bolt-holes for the chairs. This saves about two-thirds of the labour in laying, and leaves but little work to be done by labour. The direct cost is said to be not more than 1s. each above that of the best wooden sleepers, while they are calculated to last ten times as long in tropical countries, and three times as long in Europe.

Opening of Staines Bridge.—On Saturday Staines-bridge was thrown open free from toll. The ceremony was of a very simple character. The inhabitants of Staines, to show their appreciation of the efforts of the joint committee, and of the benefits which will result to the town and neighborhood, invited the members of the committee to a public *dinner* after the opening. Colonel Chalonier, president, and General Wood occupied the vice-chair.

Safety of Railway Travelling.—Although 9,500,000 passengers had been carried over the South-Eastern Railway, not a single accident was reported on this line in the Board of Trade returns for the past year. They ran 666 trains per day, which stopped and started 4,083 times during the twenty-four hours.

The Trades Movement.—The joiners of Edinburgh have held an aggregate meeting, and resolved to resist any attempt to further reduce their wages.

Edinburgh Architectural Association.—At a meeting of this Association, held in the hall, 5, St. Andrew-square, on Wednesday, the 15th ult., a paper, by Mr. Wm. Richardson, was read, on "The Architects and Architecture of the Present Day." The writer condemned the practice of taking a number of pupils for merely selfish purposes, and urged that an architect should adhere to one style only.

The Trade-Union Bill.—At an adjourned meeting of the Conference of Amalgamated Trades, the report of a sub-committee appointed to consider the provisions of the Trade-Union Bill has been adopted. The principal recommendation was, that the third or criminal clause be expunged, on the ground that it would be unjust and exceptional in its operation.

The Drinking Fountain Movement.—A marble fountain at Newbury, presented by the Baroness Weld, in accordance with the intention of her late husband (Mr. Winterbottom), has been opened for public use with very little ceremony. The fountain stands at the junction of the Southampton and Andover roads, on the site of some dilapidated cottages which disfigured that approach to the borough.

The Market Hall, Whitechurch.—At a special meeting of the local Board, the contract for the building of the new market hall was entered into. Fourteen tenders had been sent in. After some discussion the tender submitted by Mr. J. Stringer, of Sandbach, builder, was accepted. The amount of this is 5,910l., including fixtures. The work is to be begun soon, and finished in twelve months.

The Post-office.—Sir: I read, in this week's *Builder*, some observations in explanation as to whom the credit (?) of the design of the New Post-office in St. Martin's-le-Grand is due? Can the same authorities tell us to whom the credit (?) should be given for the addition over the central portion of the older building—the present Post-office on the other side of the way?—Z.

Architects' Benevolent Society.—The annual meeting of this Society will be held at the House in Conduit-street, on Wednesday, the 8th instant.

Sculpture.—Mr. G. G. Adams has recently executed a bust of Lord Brougham in marble, which has been placed in the Council Chamber at Guildhall.

TENDERS.

For Cobham Park, Surrey. Mr. Edward M. Berry, R.A., architect. Quantities supplied by Mr. J. H. Strudwick and Messrs. Strudwick & Menzies:

Cubitt & Co.	£31,415 0 0
Lucas Brothers	30,900 0 0
Howard Brothers	29,574 0 0
Trollope & Sons	29,343 0 0
Smith & Co.	29,937 0 0
Shearburn	28,530 0 0
Holland & Hannen (accepted)	27,700 0 0

For building a new chapel, vestry, and organ-chamber to the district church, Christ Church, Westminster. Mr. T. H. Wyatt, architect:—

Revised tenders.	
Seamell & Pontin	£771 15 0
Strong & Searchfield	725 0 0
Parsons & Dutch (accepted)	724 7 0

For villa residence at East Sheen (exclusive of stabling). Quantities supplied by Mr. Gandy. Mr. E. Ingress Bell, architect:—

Sharpton & Cole	£2,283 0 0
Adamson & Sons	2,122 0 0

For additional story to St. Matthew's Schools, City-road. Mr. Leamy W. Ridge, architect. Quantities by Mr. L. C. Riddett:—

Hill & Sons	£698 0 0
Adams & Sons	2,346 0 0
Dove Brothers	633 0 0
Williams	684 0 0
Roberts	694 0 0
Capps & Rizzo	654 0 0
Scrivener & White	668 0 0

For the erection of a paper warehouse in Farringdon-street. Mr. Lewis H. Isaacs, architect. Quantities supplied by Mr. L. C. Riddett:—

Arlford	£2,375 0 0
Adamson	2,346 0 0
Scrivener & White	2,388 0 0
Capps & Rizzo	2,272 0 0
Elkington	2,248 0 0
Browne & Robinson (accepted)	2,180 0 0

For the erection of Parsonage House, Lyonsdown, Barnet. Mr. Philip H. Peters, architect:—

Lizell	£2,220 0 0
Bird	2,146 0 0
Scrivener & White	1,900 0 0
Pocock	1,870 0 0
Brown & Sons	1,859 0 0
Walton	1,812 0 0

The Builder.

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Ornamentation.



RECENTLY a discussion took place in the rooms of the Society of Arts, on a paper read by Dr. Christopher Dresser, "On Ornamentation considered as a Fine Art," and which was partly printed in these pages. A number of capable men took part. The tone and temper evinced seem to have been all that

could have been wished, and such as to lead us to speak of the proceedings with cordial respect, though we are forced to consider that Dr. Dresser, carried away, perhaps, by a rhetorical flow of language, rather departed from that sound, practical ground on which any true theory of ornamentation must be legitimately based.

We feel the less hesitation in offering our criticism, from the fact that the lecturer, in his reply, contended that some of the opposition evinced to his views by one and another of the speakers had been founded on mistake of the purport of what he had really advocated. He disclaimed a "horror of figure drawing." He disclaimed the use of floral ornament in decoration, for which he was regarded as an advocate. Perhaps the cause of this misapprehension, as well as of that with which we have more directly to deal, arose from the want of beginning at the beginning, and of stating, in plain, simple, definite language, what it was that the speaker wished to express, and what he wished to condemn.

It is not that there was an absence of summary of main points, or of definition of the sense in which certain terms were used by the lecturer. All this there was; but in those very definitions we find the lack of that clear, precise grasp of the subject for the necessity of which we contend. Thus, to say that true ornamentation "is of purely mental origin, and consists of symbolised imagination or emotion only," is to say what we feel pretty certain cannot be understood or appreciated by the pupils of any school of art, from the difficulty which we ourselves experience in attaching any very distinct meaning to the utterance.

If it is meant that ornament should, as a rule, be symbolic, we differ altogether from the view. Ornament and symbol are distinct. There may, of course, be ornamental symbols and symbolic ornaments, just as there may be alliances and interdependences in all branches of art. But the idea of ornament is essentially different from that of symbol; and as the origin, so does the history of either differ. Symbol, as far as we can generalise from all the known facts of human history, undergoes a marked and well-known set of phases. Its first function is that of the

teacher. It intimates something, perhaps too subtle, perhaps too sacred, for constant iteration in words. It appeals to the spiritual sense, and strives to keep up continual memory by a visible sign. The symbol, at first regarded in this light, soon masters more and more sympathy. It becomes venerated, then worshipped. Finally, reversing the law of progress of Comte, it sinks into an absolute fetish. That this has been hitherto the case is the outcome of all forms of idolatry. Thus it is then the case, and likely so to remain, no impartial person who is familiar with Southern Europe, or, at least, with the Iberian, Italian, and Hellenic peninsulas and islands, is likely seriously to doubt. Ornament, on the other hand, commencing in simplicity, becomes first rich, then gorgeous, then overloaded, increasing in elaboration until it is lost under its own splendour, and becomes a mere vehicle for the display of wealth.

Again, as to ornament being of mental origin. We can attach no distinct meaning to the expression. We regard ornament as the æsthetic treatment of surface, or the production of a finish that shall delight the eye. Ornament thus regarded is the complement of structure. The latter follows the rules of science; the former, those of art. Not only so, but of the two main modes in which external objects affect the eye, by form and by colour, we hold that structure chiefly regards the first, and ornament the second. The colour of a substance structurally adapted for a given purpose, as a column, the rib of an arch, or the bone of a vertebrate animal, may be regarded as the accident of the substance of which it is composed. The forms, on the other hand, of a diaper, or a moulding, or a textile pattern, are chiefly apparent as the outlines of light and shade, or of blending or contrast of colour. Colours and shades are, of course, arranged in definite forms, but these die into one another often with a misty uncertainty that adds to, instead of detracting from, the harmonious beauty of the composition.

Great stress was rightly laid on what is called the truth of ornament, and ground, long fought over in the *Builder* of former years, was retread. But in applying a moral turn to an æsthetic question, we run the risk of mistaking illustration for argument. We are in danger of implying either too much or too little, either of announcing, it may be in graceful phrase, that which every artist, worthy of the name, will admit, or of insinuating that which many will deny. If for the general term truth, on the other hand, we substitute the particular form of truth to which we refer, this confusion will not arise. What is frequently meant by truth is, keeping the special harmony existing, for example, between certain substances and certain methods of treatment. There can be no doubt that is a very essential element of excellence in art. It is one to which due attention has been by no means called. But it has been instinctively appreciated by the greatest artists, and in this appreciative treatment lies one of their chief claims to admiration. Thus wood, stone, metal, gems, textile fabrics, all have their proper methods of structural treatment, intimately connected with which is the proper method of ornamental treatment. To apply a method of ornament fitted for wood, to stone, is out of keeping;—it is an error somewhat of the same sort as to apply structural formation proper for wood to stone. We have notable and famous examples of this in the most ancient relics of art in India. The gates of the temples—take the Sanchi Tope, for instance—perfect marvels of patient and elaborate ornamentation in stone, are essentially wooden in their treatment. No artist can doubt that the masons and stonecutters who reared those lofty and ornate rails, imitated the work of men who preceded them, and wrought in wood. The wood has perished, but the stone is an enduring testimony to the

former existence of work in that material. Nor is there any doubt that those curious and intricate carvings are out of keeping as sculpture in stone.

For such reasons we altogether oppose such a statement as, that "all graining of wood is false, as it attempts to deceive, the effort being made at causing one material to look like another, which it is not." We do not hold this to be the case. To grain an iron column or girder might come under the latter objection. But take the case of a well-made door. No doubt, for well-made internal work, a good varnish that will show the natural graining of the wood is the best and most appropriate ornament. But for wood exposed to rain, or ordinary joiners' work, paint is needed. And a well-painted and grained door may be a very agreeable variety to the constant repetition of an unbroken wash of colour, recalling nothing at all. Many think it is. They think the grained door, if well executed, in better keeping than the self-coloured door. And while we will admit that, in many instances, that question may come within the fair limits of private and personal taste, we altogether deny the propriety of stigmatising the grained door as immoral and soul-damning.

Again, with reference to the use of the word "imitation." The word is very comprehensive. In one sense—on the very highest authority, that of Aristotle,—a sense which has been so well illustrated by Horace,—it is the germ of all art—poetic, dramatic, or pictorial. In another sense, when it is servile and base, it is a mark of the decline of art. The proper limit to the fidelity of imitation, in every case, is again a question of "keeping." It is here that the true province of the conventional in art occurs. Absolute mimicry is not artistic imitation, which may rather be defined as translation or rendering. Here, again truth means that which is appropriate at once to the subject, and to the material in which it is rendered. The exquisite beauty of some of the Gothic foliage work would be very ill replaced by plaster casts or electrotypes of actual foliage applied to the building, however skilfully this was done. There is the truth necessary for the material—stone,—as well as the truth appropriate to the object represented—foliage,—to be regarded. It is the instinct of the artist which teaches him where to draw the line; how far to conventionalise, and how far to imitate nature.

The true nobility of ornamentation cannot be for a moment doubted by the intelligent student of nature. The inorganic and the organic kingdoms are alike robed in wonderful beauty. Apart from that beauty which is structural, and, as such, is rather a matter of intellectual than of æsthetic appreciation, the wealth of pure, lavish, exquisite ornamentation that surrounds us is untold and unexamined. Without entering into the question of final causes, it is yet impossible to deny that many forms of beauty exist, as if for beauty's sake alone.

If we seek for that natural example in which there are to be found, at the same time, the greatest indistinctness of structural definition and the greatest wealth of pure ornamental beauty, we may instance a purple sunset. The glorious colours into which the radiant light of the sun is refracted and reflected, when the great planet is near the horizon, assume their most brilliant tones. Crimson and purple, lining vast pillowy masses of clouds, passing into the very splendour of the luminary, or relieved against the pure pale blue of the upper sky, form such studies as no human artist has rivalled. Two main laws are apparent amid this lavish luxury of beauty. There is a harmony in the limiting forms,—a unity, not a uniformity. The outlines of the clouds are accordant with one another. Without need of any pedantry of nomenclature, they have been formed by similar meteoric causes, and present a strong family likeness. So, also, is there a harmony or keeping

in the tone of the colouring. These two principles regarded, how infinite is the variety of a cloudy sky. If we regard the heavens on a starlit night, a different, but not dissimilar, lesson may be traced. We look, it may be, at the indications of a great structural universe. But suns and systems strike our eyes only as points of light. We have the pure deep-vaulted arch of heaven lighted up with "eyes of fire," spangled in an orderly disorder, of which the secret altogether mocks our intelligence. All that we see is the wonderful beauty. The contrast, on the one hand, between the solemn depth of the sky, and the leaping and twinkling lustre of the stars, and the harmony with which the irradiations of luminous points is spread over the whole visible hemisphere. The effect of beauty is produced in the simplest manner, by the contrast of light and of darkness. One vast-spreading, profound; the other, concentrated, numerous, life-like. Our intellectual appreciation falls far short of the grandeur of the visible heavens; as a system they elude our grasp; of their beauty, the human voice has discoursed since poetry first had birth.

From the regions which are almost inaccessible to man, we may descend to the planet on which his abode is fixed, and still find the same veil of beauty drawn over the landscape. The masses of land and sea, of hill and plain, of wood and valley, of cornfield and pasture, the links of a winding river, the reaches of an inland lake,—all impress the eye with the sense of beauty and of delight, in a mode similar to that which we have described. Masses of colour, depths of light and shade, form blending into form in one harmonious whole,—such is the beauty of the natural landscape. The works of man are instantly recognised as intrusive; noble, it may be, in themselves, and adding a certain human interest to the aspect of nature, but marked by the absence of that natural and inseparable beauty with which nature is clothed. The spire village church catches the eye in a moment. It is not to be mistaken for the spire of the larch. It is the outcome of a mind which, it may be, loved and sought to produce what was beautiful, not of one that could speak in no other language.

If we descend from a subject so wide and general as landscape to the individual forms of organic nature, we shall find the same law to be illustrated. Every natural form has beauty, and beauty peculiarly appropriate to itself. In these special instances, moreover, it is easier to grasp the law of ornamentation. Beauty of surface may exist, as we know it does, for its own sake; but there may also be reasons why that beauty should be expressed in one mode, and not in another. There is something special which determines the mode, and while in ignorance of the laws of this subject, we shall prove but poor bunglers if we attempt artificial ornamentation.

Let us take the example of a tree. We will not insist on the more splendid specimens of colour, as the tulip tree or the catalpa; or on the most elaborate example of constantly repeated detail, as in an oak, rich with acorns. Let us look at a lime, or a plane. From landscape distance we observe a defined and rounded form, broken into large wavy masses of light and shade, which relieve the full green of the foliage. It is within our power to examine how these imposing masses are composed. We find, in the first instance, uniformity of plan, harmonious reiteration of given curves, and innumerable repetitions of details, all of which are one in design, but no two of which are so exactly similar as to lose a sort of individuality. One leaf, out of all the thousands, is never the exact counterpart of another, if regarded with minute care. The general outline of the tree—we speak of an uninjured fine-trained tree—is indicated by the form of the leaf. The proportion of stem to foliage, the angles and curves of the boughs, the profile that cuts on the horizon, are sketched in the stalk, and nervures, and serrated or plain edges of the leaf, which may be thus regarded as a sketch of the tree. The same angles, the same curves, the same proportions, re-appear throughout the whole minutely compound structure. Such is the living detail of the foliage, which, when regarded only as a feature in landscape, presents to the eye masses of modulated shade. We can trace, in the tree, not only how the ornamental aspect is produced, but, to a certain extent, we can understand why it is so produced. We find unity of design, which never sinks into uniformity of execution.

If we were to attempt the erection of a fac-

simile tree by human art, what would be the result? By faithful and painful copying of nature we might form trunk and main branches. With more stiffness and less verisimilitude, we should descend to smaller boughs and twigs. We should cast, or stamp, tens of thousands of leaves, of perhaps two or three different sizes, hang them on the twigs, and produce a barber's block. The imitation would be at once distinguishable, and very painfully distinguished, from the reality. The subtle play afforded by the minute differences of actual living growth would be missing, and lamentable failure would be the result.

We may take a yet more striking instance of the ornamental work of nature if we go to the feathered classes. No object is more beautiful than a bird. While the beauty of structure is there,—with the scientific proportion of means to end, and the flowing lines of graceful outline,—we have a separate sense of pleasure awakened by the colours of the plumage. Of these we can only say that, whatever be their origin, their effect is that of ornament of the most perfect and harmonious description. We find the ornamentation designed in every tone and key of colour,—strong sharp contrast, of black and white, or black and red, pale half tints, or lustrous rainbow hues, that bathes every feather in glory. In regarding the details of the plumage, we find the same law to prevail as that which regulates those of the foliage of the tree. The ruling forms are simple. The details of one feather are the same, in design, as those of another. Yet one will expand into the strong plumes of the wing, another curve and droop in a tail which, certainly is not simply mechanical, another crown the crest with a diadem of gems. Slight modifications, in every instance, all ruled by the same law, and resulting in perfect beauty of decoration. Over such delicacy of detail the appropriate colouring is thrown like a transparent veil. The trogon, with his plumage of green chenille, or the Argus Pheasant, or even our own peacock, with his studded train. What a lesson does such a creature give to the man who thinks ornamentation is an art, special in itself, and to be applied at will or at whim!

When, in artificial works, we attain a natural multiplicity of detail arising from the nature and legitimate use of the material, we have a natural ornamentation. Thus a wall, built of shapely and well-dressed stones, is far from an unornamental object. It may be enriched by sculpture or by mouldings, pierced with lights, strengthened by buttresses, treated in any way demanded by pure architectural requirements, and it will still possess, if the work be of a high class, a certain beauty of its own. But when we leave the province of construction, and come to that of making money,—when we seek to save instead of to build,—it is not marvellous that ill-burnt and ill-shaped bricks and roughly-spread mortar produce something in which the eye can take no pleasure. Then we cover it with stucco. Then, if it be an internal wall, we may hand it over to the decorator.

What can this artist do? He has to render a blank space slightly to the eye. From all the aid and guidance afforded by the repetition of structural detail he is debarred. He can do nothing but attempt some design which, call it what we like, is really more or less pictorial. In this he is limited by his field of display. In the nobler forms of architecture there will often be so much of structural law apparent as to indicate very clearly the proper course of decoration. But if you have a plain wall, which you are not to drape with curtains or to hang with pictures, what can you do to ornament it but introduce some modulations of colour or of light and shade for which there is no reason or necessity in the structure, and which must thus be purely arbitrary and artificial?

Now, when we find that the greatest artists—not of all time, but of all who have left us any clear record of their pictorial skill—have approached this question in a manner suitable to their genius, and that in the very effort at mural pictorial decoration Painting has produced her *chefs d'œuvre*—no easel-work attaining the grandeur of fresco—and that we have thus a characteristic architectural style, of which the date, the object, and the authors are all known,—we cannot doubt that we are in presence of a very high form of art, and it gives us no confidence in any theory as to the exercise of ornamentation as a distinct art in this country to find those who would so regard it speak in terms of extreme disrespect of the stanzas of the Vatican, and of

the magnificent pictorial decorations of the great Italian painters.

To every style its own. Its mouldings and tracery and diapers to the Gothic; its frescoes to the Cinque Cento. It is well to have, if we can attain it, a style of our own. But it is only by a faithful and impartial study of the actual work of the past that we are likely to attain excellence in this respect. It might be better to produce, if we could, a true English style, or a true nineteenth-century style, than to ape one of the thirteenth or of the sixteenth centuries. We have hopes of success in this respect, chiefly founded on the progress of our ceramic designs and workmanship. But, while we are content to borrow the architecture of past, and more earnest ages,—to build churches in Early English, or museums in Cinque Cento,—let us at least not commit the folly of imperfect and bastard imitation. If we can only imitate, let us imitate consistently. Do not let us attach to the structure of one country or age the decoration appropriate to another; or strive to invent, in a search after symbolism, that which has neither its origin in reason nor its pattern in either heaven or earth.

We think, then, that any attempt to construct a special art of ornamentation, still more to speak of decoration as a high art in itself, is a step in the wrong direction. Appropriate ornament is included in good design, the nature of the material and the object of the article furnishing the motive of the decoration. The goldsmith, the potter, the cabinet-maker, should each be trained to familiarity with the ornamental, no less than with the purely structural, part of his own craft; but this is far from being general ornamental art. In adorning textile fabrics, the object of the web must be regarded as well as its texture. The graceful art of the East, familiar with a harmonious distribution of colours, that mocks the skill of inhabitants of less brilliant skies, furnishes us with abundant examples of all that is most lovely in textile ornament. In Oriental patterns, moreover, as in hand-made lace, is always to be found that irregular symmetry that bespeaks the labour of man, not the product of a machine, and that thus approaches nearer to the great lesson of natural ornament. Where the greatest scope exists for arbitrary ornament is in architectural decoration. Here the nobler forms of structure are associated, in the minds of men of culture, with special modes of ornament. Either pictorial designs, as in the art of the Catholic countries of the South, or modified geometric or arabesque forms, as in that of the Mohammedan countries, where the introduction of figure-drawing is forbidden by religion, are the chief forms of mural ornament, if we exclude the consideration of tapestry and hangings. Into the aesthetics of paper-hanging we will not now descend, merely remarking that the absolute mechanical repetition of even the most costly and well-designed wall-papers destroys the charm they might otherwise exert. A hand-painted design, even if comparatively poorly done, has more in it to please the eye than the work of the printer, however rich and elaborate. In the complex form of Oriental mural ornament, as in those of the hand-wrought shawls, imitable by our looms, it is rather the distribution of colour than the delineation of form that attracts the eye. So, we believe, it must be in all good geometric decoration. We may refer to the dentilated work of Indian windows, and of Moorish roofs, as an instance of the mode in which art copies, not the form, but the procedure of nature. In the exquisite pierced marble windows, with the outlines of which photographs from India have made us familiar, there exists a distinct structural motive. Free passage of air without direct draught, and transparency without transparency, were required. The labour of years has produced these requisites from the marble, by a constant repetition of detail, equal to that of the vegetable kingdom. All this may, and should be, studied, but studied in its appropriate connexion. Let it be remembered that some artists,—we suppose, all the most eminent,—actually see their work before they put it on paper. With closed or with open eyes, in the dark or against a blank wall, the actual design stands out against the retina, as if drawn in the air. Are such inspirations of art left naked and bare, waiting for added decoration? On the contrary, they rise on the mind's eye glowing in harmonious hues. That school of design will best promote the cause of art that most fully stimulates the imaginative power of the artist, whatever be his special walk.

REPORT OF THE ROYAL SANITARY COMMISSION.

SEWERAGE.

The evidence taken before the Commission having been published some time ago, the commissioners now present their report. The history of the sanitary laws of the country is very interesting, as classified and arranged in the report; but we will pass over it to consider practical topics.

Local self-government is recognised as being of the essence of our national vigour, and local administration, under central superintendence, as the distinguishing feature of our government. The theory is that all, that can, should be done by local authority, so far as concerns individual districts, and that whatever concerns the whole nation must be dealt with nationally. In this spirit the Commissioners draw up their report.

It is useful sometimes to read backwards, and we will first quote the concluding observations; they seem to us to be words of wisdom, and are these:—

"We cannot conclude this part of our report without giving expression to our profound conviction that no code of laws, however complete in theory, upon a matter of such importance and complexity as the health of the community, can be expected to attain its object, unless men of superior education and intelligence, throughout the country, feel it their duty to come forward and take part in its working."

The system of self-government, of which the English nation is so justly proud, can hardly be applied with success to any subject, unless the governing bodies comprise a fair proportion of enlightened and well-informed minds; and if this be true as a general proposition, it is especially true in regard to matters affecting public health. This is not only shown by the evidence which we have taken, but manifested from the nature of the case. For in the first place there is at present among the great body of the people very insufficient information on such questions. A more vigorous and intelligent public opinion on sanitary matters has yet to be created in many places, and until it is created the action of the authorities will be more or less hesitating and inconsistent. In the next place, many sanitary questions of vital importance are from their very nature unsuitable to be completely provided for by any amount of legal enactment, however minute and explicit. So large a discretion must of necessity be left to local authorities as to details, that in practice much will always depend on the energy and wisdom of those who compose such authorities. Moreover, there are limits to the power of any central authority to remedy the evils produced by local inefficiency. It may control, stimulate, and in some cases supplement the efforts of local bodies, but it cannot be a substitute for them.

It seems, therefore, peculiarly incumbent on those who have leisure to take their share in administering these laws. In this work not only will prejudices have to be overcome and inactivity quickened to exertion, but a sound judgment must be exercised as to the extent to which, and the limits within which, considerations of public welfare ought to interfere with the absolute rights of private owners of property, and even with the personal liberty of individuals. It is work, therefore, which cannot be performed without effort; but it is hoped that it will be zealously undertaken, when the nation becomes fully alive to the importance of the subject.

We trust, therefore, that those who possess the necessary qualifications for the work may be induced to aid in working out within their own localities measures so largely affecting public interests. Such labours may be crowned with little honour, and will be rewarded with no emolument; but if they should hold out small temptation to ambition, there is here a high motive for them in public spirit and a sense of duty. No institutions of voluntary benevolence are more popular or more efficiently administered than hospitals. Not only money, but time and a large amount of personal superintendence, is given by their supporters; and it may fairly be asked whether to prevent disease is not as worthy an object as to remove it, and whether it can be better prevented than by giving full effect to the laws enacted for that purpose."

In the suggestions for a new statute, the Commissioners are of opinion that it should save and continue all local boards of health districts and all local boards acting therein, whether town councils, commissioners, or local boards appointed under the Public Health Acts and the Local Government Acts, with slight amendments to their constitutions; also all special drainage districts, providing for their future government by, and carrying over their property and liability to, elective boards, to be appointed under the new statute; and, as by the repeal of the Acts under which they derive their powers nuisance authorities and diseases prevention authorities, as such, and sewer authorities (vestries), and united sewer authorities, as such, will cease, provision is to be made by the new statute for carrying over the works and property, contracts and liabilities, of all such discontinued authorities to the authorities to be constituted under the new statute. It is next proposed to repeal the Towns Improvement Clauses Act, 1847.

In country districts the Boards of Guardians are to be the sanitary authority, and are to be elected for three years, instead of one as at present, in order to assimilate their position to that of members of boards of health and town councils.

Under the new law the sanitary authority is

to have the name of "Local Health Authority," and the term "Central Authority" would mean that branch of the executive government having the supervision and control of the local health authorities.

The central authority is to consist of one minister for the administration of the sanitary law and the poor law, whose title should clearly signify that he has charge of both departments. He is to have power to unite or combine districts, to divide them, to make additions to or separations from them; or to dissolve and re-adjust them.

According to the present law, the word "sewer" has a general significance assigned to it, which the Commissioners think it might be well to maintain, and "drain" has the arbitrary meaning assigned to it as "the drain of one building." In the new statute, the Commissioners say, it will be necessary to speak of works for receiving and conducting foul fluids, and of those for conducting unpolluted water. In the new statute the word "drain" is proposed to be interpreted to mean "any channel or conduit for receiving and drawing off unpolluted water" (unpolluted water being any water not fouled by sewage, domestic use, &c., and includes surface drainage); whilst "sewer" whether main sewer, connecting sewer, or house sewer, is to be any channel or conduit for sewage.

The powers of local authorities seem to the Commissioners to be generally ample on the subject of sewerage under the existing statutes; but many defects appear to obstruct the active exercise of these powers, and they say that on some points they require supplement. We had been looking forward to this report for suggestions on a defect in the existing statutes which is of vast importance, viz., the defect that they do not provide for the proper ventilation of house-drains by the owners of the houses; and we must say that in this respect we are disappointed with the report.

Notwithstanding the ability with which the report has been drawn up, in all matters legal and medical, there is an apparent want of appreciation of the importance of the proper construction of the works upon which the report treats. This most important subject of the ventilation of house-drains is noticed but twice in the whole report, and that in the most casual and indifferent manner. At page 44 it is said, "It has been remarked in the course of our evidence that sewers themselves convey disease if imperfectly ventilated;" and, notwithstanding that evidence, which was given by Dr. Farr and Dr. Trench, the only other notice the Commissioners take of the subject is to say (page 97), "We recommend that the effect of section 33 of the Towns Improvement Clauses Act, 1847, as to trapping and ventilating sewers should be introduced into the new statute." But what is this clause? It is stated at page 166 of the report, in an analysis of the Act, to be that, "All sewers and drains within the limits of the special Act, whether public or private, shall be provided by the Commissioners or other persons to whom they severally belong with proper traps or other coverings or means of ventilation so as to prevent stench." But that is imperative without a bye-law to enforce a particular method of construction, because, in practice, foul air is more or less a stench to different people according to their sense of smell, and the master of a house, hold may be allowing most poisonous gases to enter his house without knowing it; or, even if he knows it in a small degree, without admitting that it is injurious; and when we consider that, besides his own house, he may be the owner of many houses occupied by other people, and that it is he who will have to pay for any remedy, we can easily see that in either case he will be unwilling to do anything to prevent what will probably appear to him to be unnecessary. Indeed, this is exactly one of those cases that make further legislation at all necessary. It is necessary for those who are able to ascertain which are the best means of preventing admitted evils, and to enforce them. Ventilation of the drains of some sort may be admitted by everybody to be necessary; but when any method is suggested that is not of the merest paltry and makeshift character, opposition is set up by those who have to pay for it.

And the owners of house-property—especially of the smaller class—are frequently those, with their friends, who have to make or not make the bye-laws; and experience shows that they are very reluctant to move in the matter. Indeed, the Commissioners seem to have been aware of this, from the following remark, page 31:—"Great is

the *vis inertia* to be overcome; the repugnance to self-taxation; the practical distrust of science; and the number of persons interested in offending against sanitary laws, even amongst those who must constitute chiefly the local authorities to enforce them."

The Commissioners, however, seem themselves to recognise the preference of direct legislation to bye-laws in such cases as this, for they say, page 53:—"We conceive the principle to be followed is this: that matters of general applicability should be included in general legislation, but that matters which require to be adapted to varying times and localities, or are too minute for general legislation, are the fitting subjects for bye-laws." Well, necessity of the ventilation of drains surely does not vary either in time or place.

The basis upon which a system of ventilation of drains must be effected is the consideration that sewage consists of two fluids, the one liquid (the sewage proper), and the other gaseous, the foul air liberated by the decomposition of the sewage; and as these two kinds of fluid travel in opposite directions,—the one downwards, by gravity, and the other upwards, by reason of its having less specific gravity than the atmosphere (at least, some of the component gases have, and those most injurious to health), it follows that, to construct a channel merely for the one part, without completing the work by providing an exit for the other, is to make an imperfect work; for, as the formation of gases cannot be prevented in the sewers and drains, they will accumulate in the higher parts of the drains (and these are in and close about the houses) until their elastic force drives them through the traps and through the soil-pipes of the water-closets into the houses, unless a ventilating-pipe be so connected with the drain as to carry off these injurious gases. And how shall that be done?

It is the business of the Commission to ascertain, by the best evidence they can procure, which is the best method of doing any specific thing that it is admitted ought to be done, such as ventilating sewers and house-drains, but as we have more than once stated in the *Builder* a method that has succeeded, and which has every sound argument in its favour to recommend it, we will here repeat it. But it has been over and over again acknowledged by the most competent authorities to be effectual, and it is only because the Commission have overlooked the importance of the subject and neglected to take evidence upon it, that they have not been put in possession of such facts as would have led them to introduce an effectual method into their report. The method of ventilation to which we refer is to carry up at the head of every house-drain a pipe, of 3 in. or 4 in. diameter, to the top of and a few feet above the highest part of the roof of the house, and, where there is a water-closet, to connect the soil-pipe with it by a branch pipe sloping upwards at an acute angle, which branch pipe is to be derived from the soil-pipe at a point immediately below the "trap" of the basin. The eruption of the confined gases will not then tend to force themselves through the traps, but will freely ascend the channel provided for them, and when they make their exit from the mouth of the pipe above the roof they become sufficiently diluted with atmospheric air to be harmless to dwellers below, for they have the tendency to still further ascend; until, indeed, they become practically annihilated. That gases in drains do really attain to great expansive force when pent up, is proved by the repeated observations of many persons that they frequently bubble up through the water contained in the "trap," and which is placed there to prevent their escape; how much easier, then, is their escape when this small film of water is removed either by evaporation or by accidental cause.

THE '71 EXHIBITION AND THE ROYAL ACADEMY.

It is curious to note the difficulty that the Commissioners of the '71 Exhibition appear to find in getting together a sufficient stock of architectural drawings, to represent the "architecture" of the period, and the status of the British architect. Why is this? How is it that the architects of the day are so slow to send in, for the world's show and view, specimens of their artistic skill? Never was there a better chance of making oneself world-famous; surely there must be some great and vital reason for such a state of things. Perhaps

several reasons combine. It is greatly to be feared that in the intense anxiety to educate, and bring forward the young architectural practitioner, the old and thoroughly practised man of experience and business has been almost forgotten. He it is who can alone refer the world to his published and existing works, to his buildings, and to that real and practical exhibition of architecture which alone, after all, is of value. This subject is, therefore, of the last importance at the present moment, for while the practising architect of experience and advanced knowledge can point to his works, the young practitioner can but "make a drawing" of some fanciful building, and send it in for exhibition, trusting to fortune for its acceptance.

But there is yet another view of this matter which calls for notice. It is that of the idea which some seem to have got into their heads, that no architect can be fairly judged except through the medium of an actual building, and that no mere drawing is any test of architectural skill. An architect, it is said, cannot be judged by his drawings, but only by the finished and built-up works which he may have executed; and it is quite certain that no dictum which could possibly be laid down could be more to the purpose or truer. We do not pretend to judge Sir Christopher Wren, or Inigo Jones, or Sir Charles Barry, by the few drawings which they may have left behind them, but by actual eyesight of their finished works, and of the buildings which they produced. If we want to know what Wren could do in the way of architecture, we doubtless look at St. Paul's and Bow Church; if we want to know what Inigo Jones could do, we look at the Whitehall Chapel and the Water-gate, and the Covent-garden Church and Piazza; and if we want to know what Sir C. Barry did, we look at his Reform Club-house, and at the Travellers' Club-house and Bridgewater House, and the Houses of Parliament; and hardly at the drawings of those buildings, even if they were at hand to look at. Yet, may it be observed in passing, it would be not a little interesting to be able occasionally to get sight of some of the *bonâ fide* architectural drawings of these great architects, how much they would convey, and how they would show the methods of their work, and the processes by which the actual buildings were matured by their authors, and brought into visible existence. But with the student of architecture and the humble practitioner, of whom we more particularly speak, all this is totally changed. It has been forgotten to note the important fact that such architects have produced no buildings to which they can refer the world for evidence of their artistic power and architectural skill. It is to find an opportunity for such exercise of knowledge and skill in architecture that they are in search, and the only way in which it is possible for them in their circumstances to show any skill at all is to exhibit drawings or representations of proposed or contemplated buildings; and it must be necessarily to these drawings that such men must point and ask the public to go and look at. It is strange indeed that it should have been forgotten, all important as this fact is. A young architect who should have to wait for work till he could point out some conspicuous building brought into existence under his own direction, could, of course, never even commence architectural practice at all; it is in a drawing or representation only that he can at first evidence his talents, and indicate to the world what he is made of, and what it is he can do. There is no other possible way of going to work.

Again, still further away from the mark, it has been said, and it shows how thoroughly chaotic things-artistic are, we should find it impossible to persuade a body of artists to open a room specially suited not to a general, but to a strictly architectural public. What is such a privileged and well-to-do institution as the Royal Academy for, if not to prevent the necessity of any section of artists from doing such things for themselves? The Academy was instituted for the very and express purpose of helping all the fine arts, and of bringing them prominently before the public eye and mind, and calling public attention to them in a prominent way, and thus to induce the public to look at things which but for the Royal Academy they would never care to look at or give a moment's thought to. The public is not yet prepared to profitably patronise a purely "professional" and architectural exhibition, especially one of details and working drawings; but we contend that they will go a little out of their way to look

at such, if in connexion with things which all are interested in, and which everybody will look at if placed before them, like pictures and oil paintings.

No institution at present existing has so wide a field of usefulness as the Royal Academy, if but conducted on the fair and even principles of *free trade* in art. Why should architecture be put aside, as it always is, in one narrow room, and killed, as it always is, by so many bright oil-paintings being mixed up with its plainness and dullness? No mere water-colour drawing can possibly compete with the brightness of oil, and certainly no mere detail or line drawing can hope to get notice by the side of a large picture fresh from the studio of a painter in oil colours. And here it is that we would venture to make a suggestion, which we cannot help thinking would be worth trial, and might be doubly helpful; it is that the sculpture and the architecture should be exhibited together in one or two rooms, while the paintings should remain *per se*. By this arrangement a very considerable gain would be likely to ensue; for the architecture would certainly gain by the close proximity of the sculptured forms to which it is always so nearly allied, and the sculpture might even gain by the closeness of the architecture to it. Both might find it a gain, and neither surely could lose. Of course, the architecture would be confined to the walls of the room or rooms, and the sculpture to the middle of it, or rather round it, leaving room for a passage; and while we are about it, may it be suggested that the more modest elegant frame round an architectural subject is, the better for it, and for the room, and for the sculpture. To our mind, this arrangement would be a great advance on the present system of doing things, and would be hailed as an improvement by both architects and sculptors.

There are many other things well worth a thought and a comment here, but they would lead us too far from the present subject. We would therefore note only one other matter often pointed at before in the *Builder*, viz., that it would be a good thing if architects,—that is, the older practising members, were to lend their drawings for the information and instruction of their younger brethren. One word as to the architectural "prospectus" just issued by the Academy, and put forward, as it would seem, as a sort of novelty. A Royal Academy teacher, there can be no manner of doubt, has as good a chance as any one ever had; the open road is before him, but if he is to jog along at the pace and in the style in which his predecessors have moved, woe to those who are destined to drag along with him. Nothing could exceed our surprise when we saw the "prospectus" for the first time, for we did expect that some little bit of novelty would be forthcoming in the way of architectural teaching, after so much of promising and preliminaries. But this prospectus is the good old affair on the well-known blue paper over again, almost word for word. To do the Royal Academy justice, it has always promised as much; there has been no time in which it has not offered to students of architecture the privilege of copying from the round; there was always a plaster cast on view to be copied from. There was always a huge file of folios to refer to, full of every kind of difficult information in pretty nearly all the languages of Europe. Never has archaeology been absent from the minds of the Academicians, whether adopted by French professors or no, and no human being can ever accuse the Academy of being blind to the merits of "Academical knowledge of precedent," as the best foundation for the acquirement of a knowledge of architectural design, or any other phase of design. Whether the proposals will be better carried out than of old remains to be seen. Some things at the Academy are worse, rather than better, for the students' term of study is now limited to seven years,—in old times it was ten; and without any conceivable reason has the change been made.

It may be here, perhaps, allowed us to make one suggestion which, if carried out by the Exhibition Commissioners, might afterwards be not a little useful as a precedent, and as a something to go by; it is, that a portion of a room or rooms should be accorded to those who carry out in detail, and, in fact, do, the real work in the production of painted glass and decoration. In old days, of course, if you had asked to see the draughtman of a painted window, you would have been introduced to the man who undertook to fill in the stone mullions of a window with coloured glass, and there

would have been no mystery about it. But in these enlightened and advanced times things are changed, the "man of business" is everything; the real, *bonâ fide* artist, whether student or workman, is almost nothing; and, indeed, never appears at all; or, if he does, it is when massed with others of a like trade. *Individually*, the working artist has for a long time been nothing, and is nowhere. Why not, then, in this exhibition, wherein there is at least plenty of room and wall space, encourage him to exhibit his bit of work, whatever it may be. Suppose, for example, the figure in a window. If it be possible to conceive a figure all done by one man, or boy, or student, let the Royal Commissioners encourage such to send in specimens of their own *bonâ fide* work,—on the glass itself if it be possible, but if not, the cartoon for it; and let us see how and by what process a stained glass window is conjured into actual existence, and let us at least know the name of the man or boy who really must have had, somehow or other, some sort of conception in him of David, or Solomon, or Peter, or Paul, or saint, or angel! Let us see the artist, and not the man of business.

MEDALS AND PRIZES OF THE INSTITUTE OF ARCHITECTS.

At the special meeting of members, on the 6th inst., after formally awarding the Royal Gold Medal to Mr. James Fergusson, it was resolved,—

That the Soane Medallion (with the sum of 50*l.*, under the usual conditions) be awarded to the author of the Design for Royal Stables, &c., distinguished by the device of a Horse-shoe (W. Galsworthy Davis).

That in the same competition, the drawings bearing the motto, "*Par ballon monté*," be honourably mentioned (Arthur Hill, B.E., Assoc.).

That the Institute Silver Medal, with 5*l.* 5*s.*, be awarded to the author of the Drawings illustrative of St. George's Chapel, Windsor, distinguished by the word "Student" within a triangle (S. Wyborn).

That the Student's Prize in Books be awarded to the author of the Design for a Drinking Fountain, bearing the device of a Cross within a circle (John Sulman, Student).

That the Institute Silver Medal be awarded to the author of the Essay on the Decoration of a Suite of Apartments in a first-class Town Mansion, bearing the device of two leaves within a circle (Alfred Jowers, Associate).

THE OFFICERS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the Special General Meeting of members only, held on the 6th inst., the President (Mr. Wyatt) having referred to some remarks made in his opening address for the present session, expressed his opinion that it would facilitate the transaction of business at the Institute if the "Assistant Secretary" were to be appointed "Secretary," and made directly responsible to the council instead of to the hon. secretaries. He explained that in the event of such an arrangement being sanctioned, one hon. secretary alone would remain in office, inasmuch as under the charter there could be but two "secretaries" to the Institute; and he proposed that the hon. secretary should then be charged with the duties of foreign correspondence.

After some discussion on this subject, it was moved by Mr. F. Marryale, and seconded by Mr. C. H. Cooke:—

"That there be two secretaries of the Institute elected annually—one of whom at all time be paid salary as the Council may from time to time determine, and that the word 'Assistant' be omitted from Section VIII. of the bye-laws."

In order to insure full discussion on this proposal, the meeting was adjourned until Monday next, the 13th of March.

In consequence of this discussion, Professor Donaldson has addressed the following letter to the President:—

"24 March, 1871.
MR. PRESIDENT.—The proposition which you have formally submitted to the Royal Institute of British Architects, that the present Assistant paid Secretary should be raised to the office of chief (not honorary) Secretary and member of the Council, and should have the sole control and management, under the Council, of the affairs of the Institute, so that, in effect also, the honorary secretary would be subordinate to him, an arrangement which I think will be very prejudicial to the official department of the Institute, and consequently to its best interests. This leaves no other step for me to take, or any other member of the profession who has any respect for himself

as honorary secretary, than to decline to be put in such humiliating subordination.

I therefore place my resignation unreservedly in your hands, and I must request that my name be withdrawn from the list of Fellows.

I desire not for one moment to stand between the wishes of the members and what they may consider best for the interests of the body. I beg them to consider this as only one more last instance, painful as it must be to me, of the affection and devotion I feel for an institution in whose formation I was a humble instrument, and to whose success I have devoted the most earnest services and unwavering duty during six-and-thirty years. I have done so without any other object or desire of reward than the consciousness of having served the profession.

Believe me, Mr. President,
Very faithfully yours,
LUIS L. DONALDSON."

As the discussion which led to this letter took place at a meeting not open to the public, we should have considered ourselves bound to avoid reference to it, had we not received, at the last moment, official particulars, as well as letters from at least half a dozen quarters. We have but time for a very few words. On the question of a dominant paid secretary, in lieu of the honorary secretaries, hitherto, and, on the whole, with good effect, ruling under the council, there are two opinions, and much may be said on both sides; but as concerns the necessity for avoiding the faintest appearance of a slight to Professor Donaldson, the founder and for long years the mainstay of the Institute, there can be only one feeling throughout the association. It would be a discredit and a damage if he were allowed to withdraw himself in anger from the body, and we earnestly trust that an arrangement will be come to on Monday to prevent, at any cost, such a disastrous occurrence.

THE WORLD IN THE CEILING.

THE rounded house in the Strand, at the corner of the turning leading to Trafalgar-square, has its top room crowned with a small dome, and this, Mr. Chas. Bowles, one of the firm of American bankers occupying the house, has caused to be painted with a map of the northern half of the world. It is exceedingly well and clearly done, and full of suggestion to those who view it with the mind. Little golden spots mark out the cities and towns; the railways, the telegraphs through land and sea are plainly seen, and the degrees of latitude and longitude are shown. The causes which have tended to raise towns and countries to importance, the enormous extent of the Russian empire, the importance of the Suez Canal, the extraordinary railroad recently completed across America, are a few amongst the points that are at once conveyed to the mind of the observer. The value of a silent teacher like this in a great school would be immense, and the idea might usefully be carried out further. Why should not the walls of educational establishments be decorated, as we have before now suggested, with instructive diagrams, enlarged maps of countries, statements of leading facts in history, outlines of sciences, historical dates,—in fact, mind excitements of all sorts? Anyhow, Mr. Bowles has turned his ceiling into what Byron calls the skull, a "dome of thought."

THE WOLF ROCK LIGHTHOUSE.

MR. DOUGLAS, the engineer of the Trinity House, recently gave an account of the erection of the latest of our lighthouses, constructed by the Corporation of the Trinity House on the Wolf,—a dangerous, rugged porphyry rock, about nine miles south-west of the Land's End, exposed to the full force of the Atlantic, and overflowed by the sea at high water. The *Cornish Telegraph* gives a report of the lecture, from which we quote. Since the year 1793, several very strong iron beacons had been swept away by the violence of the sea, and the corporation determined to erect a lighthouse. In 1860, the design was furnished by their engineer, the late Mr. James Walker, and its execution was first undertaken by the speaker and his brother William, who succeeded him as resident engineer in October, 1862. On the 1st of July, 1861, Mr. Douglas commenced his first survey; and, on returning to the vessel that same day, was hailed on board through the surf by a line fastened round his waist,—a mode of embarking frequently afterwards resorted to. The cutting-out the foundation began on the 17th of March, 1862. Only twenty-two landings and eighty-three hours' work could be done during that year.

In succeeding years more frequent landings, and increased working-time, were obtained; and,

at length, on the 19th of July, 1869, the last stone of the tower was laid by Sir Frederick Arrow, the deputy-master of the Trinity.

The exact height of the tower is 116 ft. 4½ in. Its diameter, at the base, is 41 ft. 8 in. It is built of granite, each face stone being dovetailed horizontally and vertically and secured by strong bolts of yellow metal. The stonework was prepared at Penzance, and conveyed to the rock in barges by means of a steamer; and, in the latter portion of the time, the blocks were lifted into their position by a steam winch—probably the first employment of steam power upon a tidal rock. A fog-bell weighing 5 cwt., is fixed on the lantern gallery.

The lantern itself was constructed by Messrs. Hodge, of Millwall, and in its construction Mr. Douglas was very much assisted by the advice and assistance of Professor Faraday, the scientific adviser of the Trinity House, and his successor, Professor Tyndall. The optical apparatus was designed by Mr. James F. Chance, and the plate glazing was supplied by the Messrs. Chance. The light, exhibiting alternate flashes of red and white at half minute intervals, is of a purely distinctive character, being a dioptric light of the first order; the arrangement being adopted after experimental observations by Professor Tyndall and Mr. James Douglas. The illuminating power of each beam is estimated at 31,500 English candles, or units, of light.

On the first day of the new year, 1870, the light was first exhibited.

The average number of persons employed in this work, at one time, was about seventy; and no instance of loss of life or limb occurred to those engaged. The total cost of the erection was £2,726. The tower was erected in 809½ hours (only 101 working days of eight hours each). 266 landings were made in seven years. It contains seven rooms, adapted for living, sleeping, stores, and apparatus.

Since the completion of this lighthouse, no shipwreck has occurred on the shores of Mount's Bay, or in the vicinity of the much-dreaded Land's End.

OPENING OF THE SOMERSET DOCK, MALTA.

ON the 16th of February the great naval dock just constructed at Malta was opened; the last stone being laid by the Bishop of Gibraltar, "under the directions of the Hon. Barbara Yelverton," a daughter of Admiral Yelverton, the Commander-in-Chief in the Mediterranean, who declared the dock to be opened. This is said to be the largest naval dock in the world. The following comparative dimensions show the greatly increased accommodation afforded to the navy by the Somerset Dock:—

	Somerset Dock.	Old Dock.
Depth in entrance and on floor.....	34 ft.	25 ft.
Width between copings.....	104	32
Length on floor.....	430	301
Width of entrance.....	80	73

Thus there are 9 ft. additional depth of water, 22 ft. increased width, 120 ft. increased length, and 7 ft. greater width of entrance. In respect of cost, the Somerset Dock is compared favourably with the old dock. The cost of the latter was £60,000, and it was afterwards lengthened at an additional cost of 90,000. This gives a total of 150,000, which is about the same as the Somerset Dock, excluding the extra work in clearing the rock overlying the site and the wharves adjoining thereto, which did not occur at the old dock.

The cost of the Somerset Dock is swelled considerably in consequence of the great expense incurred in making the entrance to it, which is equal to a dock in itself of 270 ft. in length, 83 ft. wide, and 34 ft. deep. No such additional work was necessary in forming the old dock, as it was merely an extension of the creek.

The dock is situated under St. Michael's Bastion, in convenient proximity to the fleet, on the one hand, and the Government docks and workshops on the other. This location of the dock was selected by its projector, Lieut.-Colonel Clarke, R.E., C.B., Director of Admiralty Works.

Before the works were commenced, it was proposed that they should be made by contract, by English contractors; but, by the advice of Mr. Charles Andrews, the civil engineer, it was decided to use only the Maltese contractors for such works as they were accustomed to; the remainder (and most difficult operations) being done by Government men, employed by the civil engineer, whose duties and responsibilities were, of necessity, much increased by the arrangement.

A Commandership of St. Michael and St. George, or a Companionship of the Bath, has been recommended by the Commander-in-Chief to be conferred upon the engineer of the dock, Mr. Andrews.

OPENING OF BRITISH SCHOOLS, CHESTER.

THE buildings intended as British Schools in Windmill-lane, Chester, have been opened by the Marquis of Westminster. The committee purchased a piece of land adjoining the old site, whereon to build the new premises; since, though the price (£320) was comparatively high, proximity to Newtown was of importance. The designs of Mr. Lookwood, of Chester, architect, were approved, and a contract being entered into with Mr. Ray, of Nantwich, the work was begun towards the close of last summer. The builder's contract was 1,160*l.*; but, adding the cost of the land and other expenses, the total outlay will be about 1,700*l.* Accommodation is afforded for some 500 children,—that is to say, 250 boys, 150 girls, and 100 infants; the latter department being new.

The building is Gothic in style, the material being brick, with ornamental dressing. It consists of two stories, each 14 ft. in height; the entire height from the ground line to the ridge being 38 ft. The boys' schoolroom is on the upper floor: the girls' and the infants' on the lower. The former is 78 ft. long by 18 ft. wide, exclusive of a lateral wing projecting over the infant school, which forms a material addition; the whole affording accommodation for the number of children named. The girls' schoolroom on the ground floor is 69 ft. by 18 ft., a wing at the northern end providing a convenient class-room here, as with the boys' in the story above. The walls are lined internally with glazed tiles to a height of 5 ft. throughout the building, making impossible either the rubbing off of whitewash or the spoiling of woodwork. The fabric stands upon an area of about a quarter of an acre, so that ample playgrounds are secured for the children.

ROAD STEAMERS.

NOTWITHSTANDING the stupid restrictions on the running of steam carriages on roads, such as walking with a red flag in front of them, they are making progress. The recent severe frosts have put these steamers, which have lately begun to rise in public opinion, to a severe test. Happily, it is said, they have gone through it successfully. Mr. Witte, of Ketock's Mill, near Aberdeen, worked his road-steamer regularly throughout the frost. It runs between the mills and the town, a distance of three miles, part of which has a rising gradient of 1 in 10. Up this steep incline the road-steamer bravely drew a load of seven tons, though the road was covered with solid ice. The wheels of these steamers are covered with india-rubber tires, and as india-rubber does not slip on ice, the steel guards are removed, and the engines do not slip. The question is a very important one as regards the practical value of the steamers, as they can now be used for regular traffic in very cold countries, such as Russia and Canada, where sledging is commonly employed. The india-rubber tires run over almost any kind of surface, and can consequently, it is believed, be used on the dry hot sands of India as well as on frozen roads.

Thompson's road-steamers are about to be brought into use in India. It is intended to run them between two stations in the Punjab, viz., Rawul Pind and Jhelum, 68½ miles apart. The boiler is on the vertical principle, by which means a nearly uniform water level is maintained when either ascents or descents are being made, a thing in itself of great importance. The india-rubber tires are about 4½ in. thick, and flatten with the weight of the engine, thus giving great adhesion and elasticity on bad roads. The engine runs on three wheels only, and in this way a small wheel base is obtained and great facility given for steering. This train will, on ordinary occasions, consist of one, and on extraordinary occasions of two, omnibuses, and will run the distance in seven hours, inclusive of all stoppages. One omnibus will carry 20 first, 20 second, and 20 third class passengers, with 50 cwt. of mails and luggage, which will be sufficient for every-day traffic. The steamers are well known in the streets of Edinburgh.

WHARFEDALE WORKHOUSE
COMPETITION.

*On the 3rd inst. a special meeting of the guardians of the Wharfedale Poor Law Union was held at Otley, for the purpose of selecting a design for the new workhouse, out of twenty which had been furnished. The Chairman (Mr. Thomas Denison) presided. The report of the Building Committee was read, in which the plans bearing the mottoes "Alpha," in black, and "Economy," in blue, were recommended for the first and second premiums respectively. It was moved and seconded that the report should be adopted. A good deal of discussion ensued, and various amendments were submitted. Ultimately, however, the original motion was carried. The mottoes of the various designs were then opened, and it was found that the designs bearing the motto "Alpha," in black, had been sent in by Messrs. C. S. & A. J. Nelson, of Leeds, to whom the first premium, of 50*l.*, was awarded; Mr. C. E. Taylor, of the firm of Taylor & Garthwaite, of Bradford, the author of the designs bearing the motto "Economy," in blue, being entitled to the second premium, of 25*l.* The following is the list of competitors:—Mr. E. W. Stephens, London; Messrs. Hope & Jardine, Bradford; Mr. J. W. Morris, London; Messrs. Webb & Wheeler, London; Mr. John F. Cobb, Newport; Mr. John Walker, London; Mr. R. K. Blesbrey, Middlesbrough; Messrs. Robinson & Marshall, Bradford; Mr. T. Ambler, Leeds; Mr. Alex. Stenning, London; Mr. W. Hill, Leeds; Mr. J. S. Fisher, Birkenhead; Mr. Chas. Fowler, Leeds; Mr. R. B. Dixon, Darlington; Mr. Thomas Clark, Bradford and Yeadon. Two of the designs, bearing the mottoes "Wharfe" and "Utility," had not the names of their authors attached to them.

MUNICIPAL BUILDINGS COMPETITION,
BIRMINGHAM.

WE learn that twenty-eight designs have been delivered, in competition for the Corporate Offices, proposed to be erected in Birmingham. Many of these are from architects in London. Amongst the Birmingham architects who have sent in designs are Messrs. Yeoville Thomason, Bateman & Corser, Naden, Holmes, Osborn, and Ward.

THE SANITARY INQUIRY AT LIVERPOOL.

THE two commissioners appointed by Mr. Huxley, as president of the British Association, namely, Professor Parkes, F.R.S., and Dr. Sanderson, have gone to Liverpool on the subject of the inquiry. At a meeting with various officials, including the Mayor and Mr. Trench, at the invitation of the local Health Committee, Dr. Taylor, chairman of the committee, addressed the Commissioners, and Professor Parkes said that the points which had been brought before their notice would be fully inquired into. What they purposed doing in the first instance was to select the most unhealthy parts of the town and enter into a very minute investigation of all matters relating to it. Subsequently they would go into other portions of the town; so that they would commence in a practical way, and would afterwards seek for evidence, if it was thought desirable that such should be given.

Dr. Taylor perfectly acquiesced in the course indicated, and added that the commissioners would be glad to receive information from any member of the Council, from other public bodies, and from the public generally.

COMPLETION OF STANDEDGE TUNNEL.

THE tunnel through the Standedge Hills, separating Marsden on the Yorkshire side from Diggle on the Lancashire side, has been completed and opened for regular traffic. Three tunnels pass through this range of hills at Standedge, one a canal tunnel and the other two for the purpose of railway travelling. The first-named tunnel was commenced in 1794, and completed in 1811. It cost 123,803*l.*, and it is three miles and 171 yards long. During its progress there was serious loss of life in carrying out the first of the Standedge railway tunnels. It is longer than the Woodhead tunnel by about forty yards, being three miles and sixty yards long. Commenced in 1845, it was completed in 1848. It

cost 171,003*l.*; the approaches, 30,605*l.*, making a total cost of 201,608*l.*, and the largest number of men employed on the undertaking was 1,953. Nine fatal accidents occurred in its construction. Messrs. Thos. Nelson & Sons, of Carlisle, were the contractors for the second or new railway tunnel. The work was commenced in April, 1868, and completed in October, 1870. Its exact length is 5,435 yards, or one yard less than the tunnel running parallel; but the actual length constructed by Messrs. Nelson is 5,297½ yards, the difference arising from a short piece at each end having been made when the first railway was executed. The above length is lined with red bricks, faced with blue Staffordshire bricks; the height of the tunnel inside the brickwork is 20 ft., and the width 15 ft. The total quantity of brickwork built is 52,156 cubic yards, the total number of bricks used being 16,831,149, equal in weight to 68,000 tons. 6,271 tons of coal, 472 tons of coke, 2,421 tons of lime, 140 tons of cement, 1,744 casks of powder (equal to 174,400 lb.), 35,853 fuses (in coils 25 ft. each, equal to 170 miles), 8,745 dozen lb. of candles (equal to 104,940 lb.), 6,416 gallons of oil, and vast quantities of timber, were used in the construction of the new tunnel. The debris was conveyed away by means of tramways, which ran through passages under the old railway, and was tipped into boats on the canal. Of these tramways there were twenty-one, but only sixteen were used at one time. Twenty-five boats and four steamboats were constantly in use in "leading" off the debris. Only one life has been lost in the time the tunnel has occupied in making, though accidents of a less serious nature have been frequent. The whole work has cost over 120,000*l.*, and has been pronounced satisfactory.

LECTURES ON ARCHITECTURE AT THE
ROYAL ACADEMY.

BY MR. EDWARD M. BARRY, R.A.

MY first appearance here as a lecturer is to me a matter of anxiety and regret; anxiety from my conscious inability to do justice to the great topic of our art, and unfeigned regret for the reasons which have prevented you from hearing it treated, in his usual masterly style, by our Professor of Architecture. All will, I am sure, agree in expressing a sincere hope that, after a short abstention from his most pressing cares, we may have the pleasure of again welcoming Mr. Scott in this place, in restored health and vigour. I may, perhaps, before entering on the subject of my lecture, bespeak your indulgence for myself, suddenly called on to address you, without time or opportunity for special preparation. It is also one of the difficulties of the lecturer, himself an architect, to feel only too acutely the inferiority of his practice to the ideal on which it is his duty to insist. Moreover, an intrusion into a regular course is in itself a difficulty. Sincerely trusting that such intrusion is but temporary, I shall only ask your attention to-night to some general principles which affect our art, and indeed the art-knowledge of the country, and shall then briefly touch on some of those essential qualities in architecture which appear to merit the special consideration, as well of those who love as of those who practise it. If, in so doing, I may appear to travel somewhat beyond the region of architecture, pure and simple, it will be from a conviction akin to that of the physician who looks to the general health of an individual before dwelling on partial disorders. By taking this course, my lecture will inevitably assume an introductory character, but I trust I shall thereby avoid the risk of interference with any points of detail which the Professor might hereafter desire to treat in a more connected manner, or with a view to the development of any complete theory of art. I shall thus endeavour to leave the stage free for that resumption of his teaching at which we should all rejoice.

It is, indeed, very necessary that in the practice of our art, the main guiding principles should be well understood. Without a clear perception of them, there is ever, and perhaps especially now, a risk of drifting into an architectural chaos. I shall, therefore, ask you to-night to consider the present position of architecture, and the reasons of that position. The true principles, which have ruled the past, and on which progress must be based in the future, will then claim our attention. If art be long, and life short, this is pre-eminently the case with architecture. It is scarcely possible to fathom all its depths. It has always instruction

for the most learned, a new joy for its skilled devotees, and at the same time pleasure and delight for those who can read as they run. There has never been a time in the world's history when architecture did not assert and prove its importance. To-day, it is true, there may be discouragements, but these, when examined, will be found to arise from special circumstances. Architecture has only to be true to herself in order to hold her own; but to do so she must remember her dignity as a living art, and must not be content with the trappings and shibboleths of the dead. Other branches of art may be finite, but not so architecture. If it be in one sense fettered by the material conditions which are essential to its realisation, it may see in them, on the other hand, a boundless scope for infinite advance and improvement; only it must know in what direction to look. Allied to science, ever advancing, ever learning, there can be no reason why our art should not share and illustrate its glories. It may be that its future triumphs may differ in kind from its past glories, but there can be no reason why they should be less conspicuous. It has ever been the special privilege of architecture to illustrate its own epoch. The tombs and temples of Assyria and Egypt are eloquent of those who built them, in the same degree as are the temples of Greece, the monuments of Rome, and the cathedrals of Mediaeval times. Nothing can be more touching than the intensely human desire for permanence which seems to pervade these works. The builders of the Tower of Babel did but illustrate man's craving for something that might remain,—"a passive rebellion against the dread fiat, 'Thou shalt surely die.'" And so in all ages architecture has been the central point of those associations which have tended to elevate the mind from the sordid cares of the moment, and fix it on the glories of the past and on the hopes of the future. A natural conservatism has therefore been the product of the love for our art, and in no day has this been more evidently displayed than in our own times. Indeed, it may be feared that with us its influence has not been wholly for the advantage of art. The world is only at the beginning of its education, and each day adds to the sum of its knowledge. To explore the secrets of science and natural philosophy, to apply the discoveries of the closet to the comfort and well-being of millions, are now the noble duties of the best among us. By the invention of printing, the human child (if I may use the metaphor) learnt to speak. By the discovery of the steam-engine it began to move. Electricity has taught it to concentrate its energies and to use its powers, and seems to indicate a boundless extent of future acquisitions and progress. Shall architecture lag behindhand? It has never done so before. Each age has told its own story in stone. The feelings of every epoch have found in it their appropriate expression, and loyalty to his art will not permit the artist to despond for the future. If, indeed, he allow himself anxiety on the subject, it can only be from perceiving on the one hand something of a tendency amongst architects to regard archaeology as architecture, and on the other a disposition on the part of the public to deny to art its rightful place in the economy of things, and to reject its claims as a noble and elevating instructor of the people. I have just said that every age has told its own story, but this statement must be limited in its application. In modern times architecture has even seemed to renounce its claims to originality, and to be content with the subordinate position of an imitator. It has resorted from this that works are too often valued for their technical correctness as copies rather than for the qualities of art which they display. Architecture has been hastily assumed to be incompatible with utility, and we have been expected to be content with its dry bones. It must, however, never be forgotten that architecture, though a fine art, is also a useful art, in a manner distinct from its sisters of painting and sculpture. It is subject to conditions from which they are exempt. It fulfils useful functions, of which they have no knowledge. As a fine art, it is never complete without their aid, but it also depends for its perfect success on its more or less skilful adaptation to useful ends. Hence it follows that an architect must study convenience, and must be guided by common sense, if he is to produce really successful work. If he practises his art in defiance of common sense, failure will result as surely as from any negation of the higher qualities of art. This may seem the assertion of a truism, but in reality common sense is not common, and its

legitimate influence in architecture is too often overlooked. Thus, in an age which revels in the facilities given by the employment of iron for covering large spaces, we frequently see the timid constructions of bygone days copied even to the smallest details, and the province of improved construction abandoned to the civil engineer. Interiors where the powers of seeing and hearing are all important are encumbered with needless columns, for the sake of supposed architectural effect. Houses are built like castles, and light and air denied to their inmates. All this is degrading to the character of true art; and, speaking to its younger practitioners, I may perhaps venture to ask them to consider if the prevalence of such ideas among architects may not account for much of the general apathy and ignorance about architecture of which there is so much reason to complain. For we are often told that our art does not at present command the respect and sympathy which are its due. There is probably no civilised country where art and its professors receive less of public honours and rewards than our own. Men of high cultivation, who would shrink from avowals of ignorance of science or history, think it no shame to know nothing about art. Indeed, even those who from circumstances might seem bound "to affect a virtue if they have it not," sometimes appear to take a special pride in showing their low estimate of its civilising influence. It is scarcely possible that in the capital of any other cultivated nation the exclusion of art from a public building could be made a matter of public congratulation. There was a time when our leading men thought otherwise, and used far different language; and it is to be hoped that in art, as in other matters, means may even yet be found to "educate our masters." In a really art-loving community a different state of things would be demanded, and ignorance would, at least, be unable to boast itself. I have already referred to some of the causes which may have served to bring about low ideas of our art, as far as they relate to the notion of architects themselves. But, in truth, these are merged in the greater question of education. Architecture is now a profession, and on its fruits its professors must live. This circumstance has an important effect, and may render the production of masterpieces of art difficult and uncertain. One result it certainly has, namely, to leave to the architect a diminished responsibility and freedom of action. A true artist will, of course, assert his legitimate influence, but in the practice of a practical art like architecture, the views and tastes of the public must be considered. There is, consequently, too often a *fashion* in architecture. Now a fashion is not in itself a necessarily bad thing. We have already seen that bygone ages have left their marks in the world's history by building after the fashion of their day. We know, when we see the sculptures and hieroglyphics of the Egyptians, that if we can decipher them we shall be admitted into their secrets, public, social, and domestic. In other words, we shall know the fashion of their time from the records they have left of it. It was the same with all times when architecture was a living art. The fashion, therefore, which is to be deprecated is something different from this. It is the fashion of copying, the fashion of arbitrarily selecting a certain form of bygone art for deliberate and servile imitation. It is the return to obsolete modes of constructions for reasons apart from their intrinsic goodness, a deliberate preference for something less than perfection. Now on these points it is not fair to wholly blame the architects. They cannot exercise their art without the public, and if the public wish to be deceived by semblances of art, it will be so deceived. There are, of course, degrees in such compliance, and the real artist will at any sacrifice decline to wholly prostitute his talents. In so doing he must, however, be prepared to stand aside in empty protest, and see the practice of the art he loves so well pass into other hands. Doubtless there is much in the state of modern architecture for which the architect must take his share of responsibility; but the first necessity for the revival and possibly the eclipse of former glories is the formation of a healthy tone of critical appreciation of his work; in a word, the diffusion of art-education. The circumstances of our day appear to be specially favourable to this diffusion, at a time when the absolute need of education has been solemnly recognised by the State. Knowledge is power, and the true policy of a community is to secure their connexion. If

no other sign of the world's progress were evident we should find it in the increasingly-admitted obligation to procure for the masses that which they cannot obtain for themselves. Where in Egypt, Greece, or Rome are to be found the hospitals and schools which are the sign of this now-confessed public duty? Costly and magnificent buildings were there, devoted to the superposition, the cruelties, the vice of the times; none for the relief and elevation of suffering humanity. There is much in the experience of the day to jar rudely on our ideas of progress as affecting human happiness. War, terrible and dread, among civilised nations, must seem to the watching heathen world a strange commentary on the old saying, "See how these Christians love one another." The curse of paperism at our doors ought to cause us anxiety and misgiving. A thousand social ills call for remedy, and bid the philanthropist-reformer give no trace to the opposing powers of evil. But in spite of the urgent calls for improvement around us, it may be claimed for the present age that in none has there existed a more real desire to improve, in none has the principal *raison d'être* of government been so readily admitted to be the maximum happiness of the greatest number. We may therefore look forward with confidence to sure, if slow, amelioration, to be obtained by the spread of real and thorough education. And from this place I may perhaps be allowed to say that no education can be real and thorough from which the joys of art, with all their elevating and civilising influences, are excluded. Can it be doubted that in Greece every man, from the noble to the peasant, entered, more or less into the triumphs of art, which were to them as household words, and were so conspicuously displayed that each man might feel a sense of property in them? May the day come in our own country when the toiling masses may assert their right to insist on such an employment of the public resources as may provide, on a worthy scale, museums, pictures, sculptures, and other works of art for the instruction and delight of a great and art-loving people. It will be unfortunate for all if our boasted education is to stop short. Knowledge without education may, in that case, prove a curse. The imagination, the love of beauty, the desire to gratify the senses, will exist whether they are cared for or no. Shall they be relegated to the debasing influences of excess and debauchery, or shall art be called in to instruct, to refine, to delight, to co-operate with religion in bringing out the God-like part of our poor human nature? It is very satisfactory to find that a recognition of this principle has at length been made by our two great Universities of Oxford and Cambridge. By the munificence of an individual, chairs have been founded for the instruction of the students in the history, theory, and practice of the fine arts. Looking to the advantages of diffusing a knowledge and love of such matters among the classes that frequent the Universities, the importance of this onward step can hardly be overrated; and it may perhaps be allowed to me to express my special satisfaction that one of these important posts is filled by a brother architect, of whose eminent qualification for his labour of love there can be but one opinion. Coming nearer home, a word of reference may be permitted to the steps recently adopted by this Academy to spread the instruction they have ever been ready to afford, and to assist the steps of the art-student in his arduous path. Additional teachers have been appointed in each of the three branches of art, whose province will be to instruct their pupils in fundamental principles, and so prepare them for that higher instruction which individual members of this body have at all times cheerfully given in a spirit of self-sacrifice which is perhaps hardly known as it should be, but of which one who, like myself, has had no share in such work, may, perhaps, as a spectator, be permitted to express his appreciation. Other art bodies have not been backward, and the Royal Institute of British Architects has framed and carried out a scheme of examination so comprehensive as to be for the moment almost in advance of the demands made upon it. The increasing number of periodical exhibitions is also to be noticed, and the opportunities for art culture afforded by the museums and collections and schools at Kensington are matters of much congratulation. The vast numbers that visit these collections, are the best witnesses of the readiness and intelligence with which the people avail themselves of opportunities when they are offered with a free and liberal hand.

It is to be hoped that nothing may be spared to maintain and further such efforts to aid and guide the art knowledge of the country. Any direct teaching can of necessity reach but a small number. The art-education of the masses must be chiefly the education of the eye. I will not subscribe to the belief in the natural inferiority in art matters of the English artisan, at least until he has had a fair trial. How few and scanty are his opportunities as compared with his more favoured foreign brethren! A climate unfavourable to out-door enjoyment,—a system of Government which has millions for every purpose but art,—a policy which shuts in his face our public galleries on the only day when he can visit them,—these are some of his hindrances in the cultivation of his taste. It is idle to suppose that after a hard day's toil his mind can be in a state to study and enjoy the arts. It should be the duty of those who still believe in these purifying and ennobling influences to smooth these difficulties, and under proper regulations to throw open the means of self-instruction at such times as may render such instruction practicable. Then, and not till then, shall we find artistic culture spread and increase. Consideration for art will find a tardy recognition in the national councils, and the end may be looked for of that boastful ignoring of its claims which, sublime in ignorance, is ignorant and not ashamed. I cannot but look forward somewhat hopefully to the future, considering the changes made and in progress as to the distribution of power in the State. How far such changes are valuable politically is not to be discussed here, but in the interests of art they may have a considerable and possibly an advantageous effect. To interest the people in the national collections, no means can be surer than to give them a sense of property in them. Many of us have doubtless been struck by the advances made in our provincial towns where the inhabitants are masters of their own affairs in a manner which is denied to dwellers in this overgrown metropolis. It is true that paternal government is now discredited, and men govern for themselves and by themselves; but without the action of Government any national recognition of art is impossible, and the purchase of pictures and sculptures, and the erection of fine public buildings, form a proper subject of national concern. It is impossible to repress a feeling of disappointment when we compare our poor and unsatisfactory art buildings with the splendid structures erected by foreign nations for similar objects, but with far less means and opportunities than we possess; and there can be little doubt that the real opinion of an instructed public would soon be clear on such points if it could be heard amidst the noise of its self-elected exponents. In this country economy will, it is to be hoped, be always considered; nevertheless, the greatest crimes have often been committed in the name of the greatest virtues. There can be no true economy in starving all that relates to the artistic progress of a nation, while millions are readily expended for purposes of human slaughter. These considerations affect in a special way the branch of art now under our consideration, for it is one of the chief difficulties of architecture that it depends on others to allow it even to exist. This difficulty is shared to a certain degree by sculpture. The drawing of a building rarely if ever can convey a true idea of its architectural effect, and before the building can exist a large expenditure must be incurred. The great architectural monuments which remain to us were public buildings erected on a scale of grandeur and expense beyond the reach of individuals. Architecture must, therefore, always be more or less dependent on the growth of a healthy and enlightened public spirit, removed as far from meanness as from extravagance.*

THE ACTION OF COLD ON IRON.

A DISCUSSION has been going on as to the action of cold on the strength of iron. Every one knows, we dare say, that the breaking of axles on railways is oftener heard of in winter and in frost than at other times. Nevertheless, some eminent men of experience seem to believe that frost does not render iron more brittle than at other times. The discussion of the subject, at the Manchester Literary and Philosophical Society, and the apparent undesirability of the experiments for ascertaining the effects of cold

* To be continued.

upon iron, recently brought before the society, have induced Mr. P. Spence to undertake a farther series. He limited himself to ascertaining whether the reduction of cast-iron with regard to its powers of resisting transverse strain either of weight or pressure. As experiments made with iron of special quality are quite worthless for all practical purposes, Mr. Spence was careful to obtain such as might be considered as generally obtainable in the market. Mr. Spence's experiments are said to prove that "cast-iron, having at 70° Fahr. a given power of resistance to transverse strain, will, on its temperature being reduced to zero, have that power increased by 3 per cent." At the temperature of 70° Fahr. the maximum breaking weight was 4 cwt. 3 qrs. 26 lb., and the minimum 2 cwt. 2 qrs. 14 lb., equal to an average of 3 cwt. 3 qrs. 6 lb. At zero, the maximum breaking weight was 4 cwt. 3 qrs. 13 lb., and the minimum 2 cwt. 3 qrs. 10 lb., equal to an average of 3 cwt. 3 qrs. 11 lb. The difference, therefore, is but 6 lb., or less than 12 per cent. increase by the reduction of temperature. Adding together, however, the breaking weights of the seventy samples tested at 70° Fahr., the total is 268 cwt. 3 qrs. 18 lb., equal to an average of 3 cwt. 3 qrs. 10 lb. The total breaking weight of seventy samples tested at zero was 276 cwt. 3 qrs., equal to an average of 3 cwt. 3 qrs. 22 lb. The difference thus shown is 12 lb., or about 3 per cent. increase, as Mr. Spence states.

Mr. Brookbank gives the result of a renewed inquiry in these words:—"Iron is weaker under sudden impact at low temperatures, although not materially weakened under tensile strain."

EXHIBITION OF THE ROYAL SCOTTISH ACADEMY.

THE exhibitions of the Scottish Academy present, year after year, much the same aspect: the works, certainly, are different, but the ideas vary not. Works of a high order are rare; a respectable mediocrity prevails, interspersed with no inconsiderable admixture of what is far from being satisfactory. In technical excellence there is a gradual and steady progress, but unaccompanied by a like advance in originality and expression. Much of the work is honest, and does not misrepresent nature, but some of it is unreal and, in a sense, mechanical.

It sometimes happens that an artist, after working for years in a particular manner upon a certain class of subjects, suddenly changes both of these. The effort is not unfrequently spasmodic; but occasionally the artist achieves an unlooked-for success, and continues to follow the new path. Such, we hope, will be the case with Mr. R. Herdman. Hitherto his pictures have been of the drawing-room sort, pretty and carefully elaborated; but No. 467, "After the Battle: a Scene in Covenanting Times" is sombre in colour, as befits the subject, vigorous in execution, and full of pathos. A young Covenantant has been brought home mortally wounded. He is laid across two chairs, his head propped on some loose straw, his wife kneels at his side clasping one of his hands, while an aged woman, his mother, we presume, lavishes his temples with water from a basin held by a young girl. There are several other figures introduced, all of them with an object, and the better to illustrate the incident; as, for example, an old man who has been reading from "The Book," and, as showing the all-absorbing interest of the crisis, the baby in its cradle is thrust away under a table. The mixed expression of suffering and fortitude upon the face of the young warrior is depicted with great truth and force, yet without exaggeration.

Opposite to this picture, and its opposite in every sense, is No. 557, "Wishart preaching against Mariolatry," by W. Fettes Douglas. An air of exaggerated unreality pervades the scene, a crowd of lay figures, arrayed in the costume of the period, attitudinized in a theatrical manner, and the colour is that of a crude modern stained-glass window.

As examples of rich colour toned into harmony nothing could be much finer than 252, "Prayer," and 309, "Reflected Light," by G. Paul Chalmers. The artist has probably attained all he has aimed at, and it is no mean attainment; but we look for something more:—

"The outward form is fair,
But the inner soul is wanting."

There are some things beyond the legitimate

sphere of art, and No. 327, "The Commander-in-Chief in the Crimea, and Staff, January, 1855," by Sir Noel Paton, is one of these. Our readers who have not seen this work may naturally remark that the subject is commonplace enough; but when we state that the warriors and steeds are "grizzled skeletons," the matter may appear in a different light. This mode of teaching the horrors of war is more suited for the pages of a *Tomahawk* than for a fine-art gallery. It is only an uncoloured sketch, however, and may be looked upon as a freak of the artist. Turning from this to No. 272, Mr. Hugh Cameron's group at "The Village Well" is a wholesome relief—it is like a bouquet of spring flowers, fresh and lovely. Mr. W. E. Lockhart follows successfully in the steps of the late John Philip. No. 1, "A Spanish Venta: Muleteers departing," displays much of the vigour of touch and brilliancy of colour which characterise the works of that master, combined with appropriate action and expression. No. 49, "Van Tromp's Duel" by J. B. McDonald, is a subject taken from the history of the Dutch Republic. "This is a barrel of gunpowder," said Van Tromp: "come, sit down beside me. The bravest man will set fire to it." The scene is graphically set forth, but the colour is somewhat muddy and opaque.

Two years ago we noticed favourably a work by Mr. Edwin Douglas, a young artist, as exhibiting promise, in the department of animal painting. He either lacks invention or has been spoiled by commendation. Last year his subject was the same animal as before,—a sagacious-looking sheep-dog,—and again we have him, twice over, with exactly the same accessories, and painted in the same smooth, soft manner. Mr. R. P. Bell seems disposed to give up depicting cavaliers, and to turn his attention to scenes of every-day life. The change is, we think, in the right direction. No. 490, "The Lesson," representing a cottage interior, with an old man teaching two girls, is well and carefully painted, and the expression of abstraction on the face of one of the girls happily rendered. Mr. John Dunn's "Country Wedding" (37) deserves commendation. The artist is a young man, and his work, though not free from affectation, is better as a work of art than some productions of men of established position. The effect of sunshine is particularly well rendered, but the manner in which the bride leans her head to one side and the bridegroom to the other may be natural, but looks queer.

Scenes upon the sea-coast, introducing groups of our fishing population, are now receiving deserved attention. Mr. Macgagart took the lead in this line, and still holds the foremost place. He exhibits No. 327, "Adrift," which appeared at the last Royal Academy; he has since bestowed more labour upon it, and added greatly to the effect. Mr. Vallance continues in the even tenor of his way upon the same class of subjects, and Mr. Colin Hunter goes on improving. It is in landscape-painting that the Scottish school appears to greatest advantage, and a class of young men are arising who bid fair to maintain a good position. In feeling and sentiment Sir George Harvey has no rival, but his subjects lack variety of expression. No. 355, "Inverarnan," is a characteristic example; "all around is still and calm, as if nature were asleep." Mr. Sam Bough paints nature in all her moods, and if his works are not pervaded by the sentiment of the President, they possess a truthfulness and force of expression which are more lively and impressive. No. 152, "Iona," shows us the resting-place of the ancient Celtic kings on a day in "the bright, brief summer of the Western Isles," when not a cloud flits across the sky. A tall ruin cross stands boldly out in the foreground, a roadway leads to the hoary ruins, and behind is a range of low hills. Every feature is clear and distinct, and yet the effect of distance is wonderful,—a phase of nature very difficult to render.

No. 62, "The Vale of St. John," is another fine landscape, with gleams of sunshine streaming through clefts in a bank of clouds, and gilding the hill sides.

No. 100, "Gumping Trout on Giffard Water," by W. D. McKay, is a very promising production; the rapidly-flowing brook, with its grassy banks and bosky dells, are rendered with great care, yet without hardness, or producing the effect of being laboured.

"Purple, orange, and gold glow down in the glowing West," on every canvas of Mr. Walter Paton's. Very pretty and popular they are; better that he should continue to follow the

bent of his nature, and produce those clean lightly-finished works, than degenerate into the slovenliness displayed by Mr. Alexander Fraser. No. 175, "Inverloch Castle," is not deficient in a certain artistic ability, but it smells of paint, and is harsh in colour: some people say it is juicy, but the moss and stones of an old ruin are not juicy, and do not appear so even when they are spongy. Mr. Fraser did at one time bestow more care upon his work, and he is in error if he thinks he can dash off an effect after the manner of Bough. Mr. Arthur Perigal has been in Norway, and according to his rendering of the scenery, the mountains there are even more hard and metallic in appearance than he would have us believe are those of our native land. No. 720, "Romsdal, Norway," is a grand scene undoubtedly, but why the picture was purchased by "The Royal Association for promoting the Fine Arts in Scotland," is to us a mystery.

We have confined our remarks to a few of the works by Scottish artists, our object being to give our readers an idea of what is being done in the sister country; no notice therefore has been taken of the works of MacIver, Birket Foster, Pettie, and others which adorn the galleries; or of those of foreign artists, of which there are a small number, smaller indeed than usual. Architecture, in our next.

ENGLISH STABLES IN THE EAST.

THE accompanying illustrations represent the interior and exterior of a portion of stable buildings designed and erected for an Eastern potentate, and fitted up by the St. Pancras Iron-work Company, of Old St. Pancras-road, London. The stables, built to accommodate 100 horses, consist of stalls and loose boxes, ample in size, and provided with every requisite for the comfort and safety of the horse; the divisions being formed of wrought-iron posts, ventilating ramps or gratings, and rails; the feeding arrangements comprise enamelled manger fittings; and the drainage is effected by properly trapped pots. The window-openings in the sides of the stables have galvanized wrought-iron Venetian shutters, with movable louvres. These shutters are so formed that they can be opened or closed bodily, if required, or can remain closed, and have the louvres in them adjusted to different widths of opening. By these means a greater or less quantity of light and air can be admitted whenever necessary. The stables are lighted by handsome copper lamps, suspended from the ceiling.

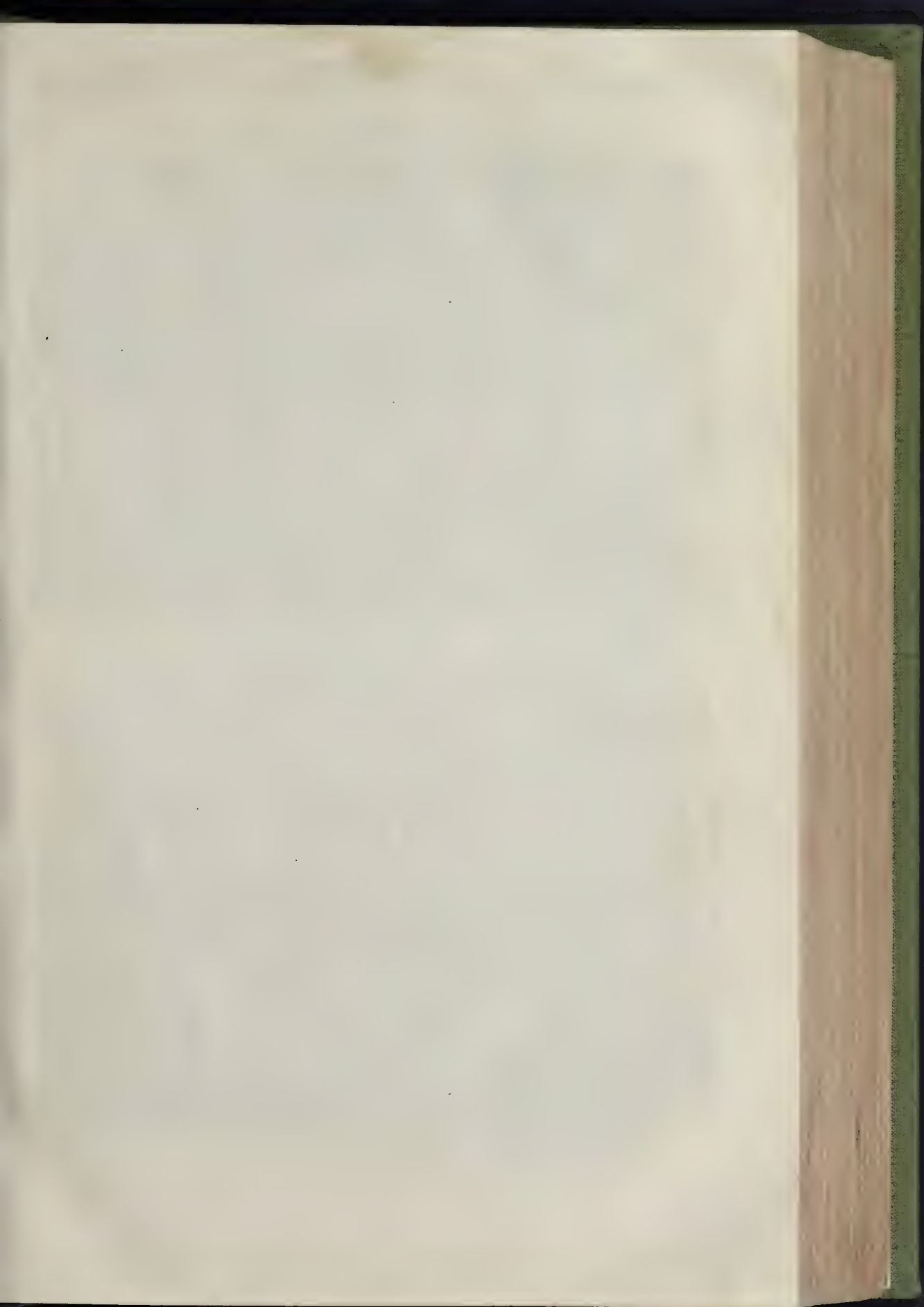
The roofs of the stable are entirely of iron. The principals consist of rafters, king and queen rods, tie, struts, &c., all of forged iron. To these principals are fixed the longitudinal wind-ties, and the wrought-iron purlins carrying the galvanized corrugated iron sheeting, forming the roof-covering. The whole of this work is designed and constructed to combine, in an eminent degree, the two essentials of lightness and strength, and so to assist in the ventilation of the stable as to keep it cool during the hot season.

Attached to the stables are harness-rooms, with all things requisite for the protection and preservation of the harness; and a farrier's forge fitted up and provided with tools, iron, &c., ready for immediate use.

The exterior view represents the courtyard formed by the stable buildings. In the centre is a kiosque, constructed entirely of iron, and elaborately ornamented in all its details: The kiosque is surrounded by a marble basin holding water, giving thereby the cool and refreshing appearance so necessary to all Oriental constructions. The ride for exercising is formed round the sides of the adjacent buildings, and is covered in by a spacious verandah, formed also of iron, with columns, girders, frieze, and spandrels of an ornamental character. In convenient parts of the courtyard are fixed enamelled water-troughs for the horses, providing a ready means of watering them without entering the stable.

The water is obtained from wells by means of powerful pumps worked by steam power, and is stored in an extensive cast-iron tank, properly stayed, and roofed in with galvanized corrugated iron.

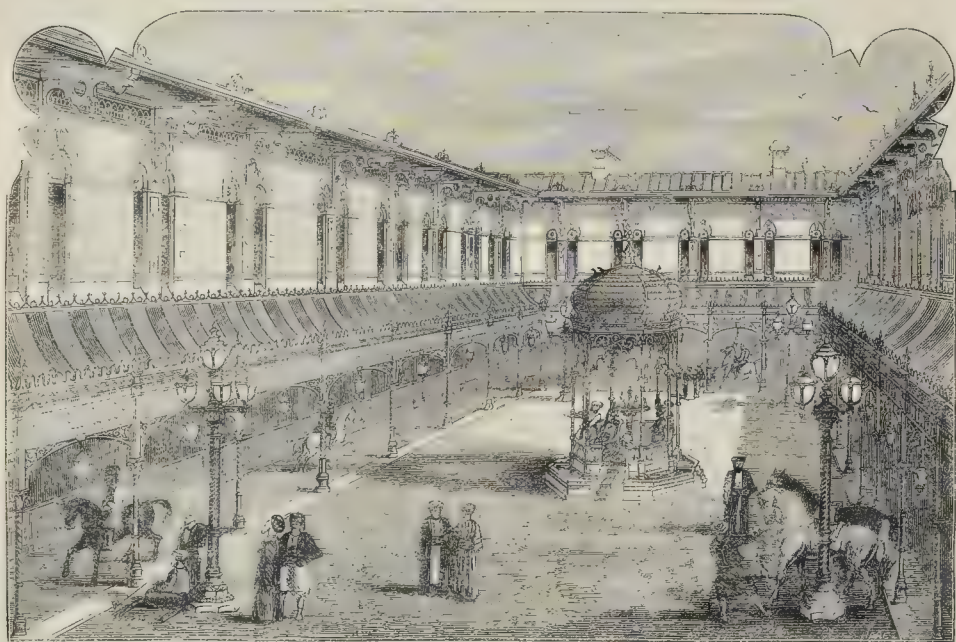
The whole of the work described has been performed by the company to designs and plans furnished to them. Every part has been so constructed that the whole can be readily put together by unskilled labour, and in other respects the varied requirements of an Eastern life have been carefully considered.



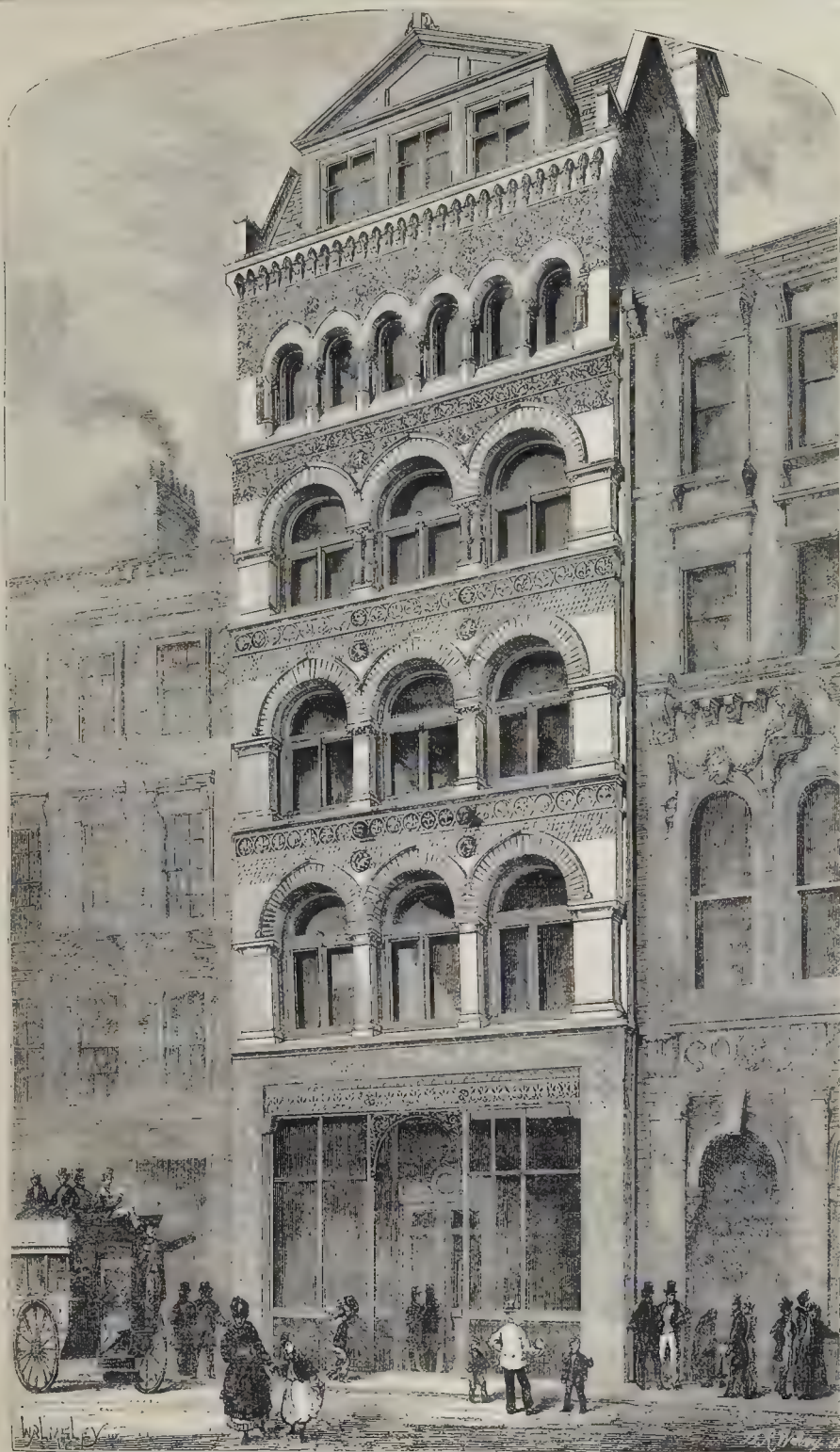
ENGLISH STABLES IN THE EAST.



INTERIOR.



COURT YARD AND RIDE.



LONDON STREET ARCHITECTURE: PREMISES IN CORNHILL.

MR. EDWARD L'ANSON, ARCHITECT.

LONDON STREET ARCHITECTURE.

PREMISES, CORNHILL.

We give in our present number an illustration of the Cornhill front of the premises belonging to Messrs. Henry S. King & Co., No. 65, Cornhill, which have been quite recently completed by Messrs. Wm. Cubitt & Co., of Gray's-inn-road, from the designs and under the superintendence of Mr. Edward Atkinson.

The premises, although they occupy a comparatively narrow frontage upon the street, extend back to a depth of about 80 ft., and have a considerable frontage upon the north and east sides in White Lion Court, which is entered by a passage-way under the house adjoining No. 65 Cornhill, to the eastward. The new building is divided into two blocks, separated by an area 8 ft. wide, lined with glazed tiles, and connected on the upper floors by light galleries, the lower part on each floor enclosed with white enamelled slate, and the upper part glazed. The whole of the windows of the back portion, with the exception of the ground-floor, have cast-iron casements fixed flush with the outer face of the walls, with cast-iron linteols over. The inside reveals of the windows are lined with white glazed tiles, and the external angles throughout are rounded. The floors and staircases are of teak, 1½ in. thick. The rolling shutters to the ground-floor windows were provided by Messrs. Warren, Hands, & Co.

The whole of the Cornhill front, with the exception of the ground and attic floors, is constructed of terra-cotta, with a backing of brick-work in Portland cement. The enriched strings under the one-pair, two-pair, and three-pair windows, as well as the shafts to the windows on the three-pair floor, are of a deep red colour; the rest of the work is of a warm buff colour. The terra cotta was modelled and entirely executed by Messrs. Cubitt at their works in Gray's-inn-road, under the direction of the architect. The piers to the ground-floor, as well as the architrave over the ground-floor, are of Aberdeen granite, finely tooled, but not polished. The dormer to the attic story is of deal, covered with lead. The shop front and the eashes to the windows next Cornhill are of mahogany, glazed with plate glass. The old house was pulled down in June of last year; the rebuilding was commenced immediately afterwards, and was completed by the end of the year, Messrs. Henry S. King & Co. having had possession of a portion of the building some weeks previously. The amount of the contract was 10,367*l.*, exclusive of painting and ironmongery.

The old building which has been replaced by the present structure presented no feature of interest architecturally. It was built probably somewhere about the middle of the last century, and at the time of its demolition was thoroughly worn out. In a curious drawing of the parish of St. Martin Outwich, and part of the parish of St. Peter in Cornhill, dated 1599, preserved at Merchant Taylors' Hall, the houses on the north side of Cornhill, opposite St. Peter's Church, are very distinctly shown. The house on the site of No. 65, as well as those adjoining, appear to have been small two-story houses, with rooms in the roof, and gables towards the street. The fountain, or *carfax*, as it was called, from its having four faces, at the intersection of Cornhill with Bishopsgate-street, is also shown in the drawing, and the pipes leading therefrom are indicated, apparently with great accuracy.

This fountain, *carfax*, or *carrefour*, was better known as the Standard on Cornhill, from London distances having been computed from it. It was built in 1556, and was first used as a water standard in connexion with the waterworks at London Bridge. It existed until the Great Fire, sometimes dry and sometimes overflowing, and was frequently presented by the inquest of Cornhill Ward as a nuisance as "the carrefour and four epowts." It was not entirely destroyed by the fire of 1666, and Evelyn notices it in his diary as still standing after that catastrophe. It was taken down in 1671.

Cornhill was just on the edge of the boundary of the Great Fire, it having stopped near the Standard on Cornhill. The house No. 65, Cornhill, was no doubt consumed. In the year 1765 another great fire took place, destroying the whole of the houses on each side of Bishopsgate-street, from Leadenhall-street to Threadneedle-street, extending as far as White Lion-court, to the east, and to a depth of seven houses in Leadenhall-street, westward, as far as the Bull Inn. This fire, like a similar one which destroyed

nearly the whole of the south side of Cornhill, in the year 1746, began at a peruke-maker's. It is possible that No. 65, Cornhill, was rebuilt about this time; the construction of new buildings in the neighbourhood, necessitated by the fire, would, no doubt, stimulate the rebuilding of old-fashioned houses, and the premises recently demolished bore every appearance of having been erected about this date.

The old house in Cornhill is memorable for its association with Leigh Hunt, Thackeray, Charlotte Brontë, Mrs. Gaskell, and other eminent writers. It was there that in 1847, after a wearying round of refusals from various London publishers, the authoress of "Jane Eyre" determined as a forlorn hope, to send the MS. of her novel, "The Professor," which she afterwards elaborated into "Villette." "It came," says Mrs. Gaskell, "in a brown paper parcel, to 65, Cornhill . . . Besides the address to Messrs. Smith, Elder, & Co., there were on it those of other publishers, to whom the tale had been sent, not obliterated, but simply scored through, so that Mr. Smith at once perceived the names of some of the houses in the trade to whom the unlucky parcel had gone without success." "The Professor" was declined at that time, but emboldened by the terms in which the refusal was conveyed, the MS. of "Jane Eyre" was submitted to the same publishers in August of the same year, and published by them in the ensuing October. In the following year, Charlotte Brontë, accompanied by her sister Anne, came up to London, in order to confute the assertion made by "Acton and Ellis Bell's" publishers, that the authoress of "Jane Eyre," "Wuthering Heights," and "The Tenant of Wildfell Hall," were one and the same person. It was to No. 65, Cornhill, that the two girls made their way, after taking an hour to walk from the Chapter Coffee-house, Paternoster-row, and presented themselves to their publishers, who were ignorant of their person and sex, and had imagined, as did all the world at that time, that Currer, Ellis, & Acton Bell were men.

From the same premises issued the *Cornhill Magazine*. "Our storehouse being in Cornhill," explains its first editor, W. M. Thackeray, in a letter to a friend forming the preface to the first number, "we date and name our magazine from its place of publication." Father Prout (F. Mahoney) contributed an inaugural ode on the occasion, in which he gallily rallies the editor:—

"There's corn in Egypt still
(Pilgrim from Cairo to Cornhill);"

and advises him—

— "as to those
Who bring their lumbering verse or ponderous prose
To where good SMITH & ELDER
Have so long held their
Well-garnish'd Cornhill storehouse—
Bid them not bore us,
Tell them instead
To take their load next street, the Hall of Lead."

Thackeray himself alludes to the house in the first of his "Roundabout Papers":—"I had occasion," he says "to pass a week in the autumn in the little old town of Colre or Chur, in the Grisons, where lies buried that very ancient British king, saint, and martyr, Lucius, who founded the church of St. Peter which stands opposite the house No. 65, Cornhill." After describing the statue of the saint, he remarks:—"From what I may call his peculiar position with regard to No. 65, Cornhill, I beheld this figure of St. Lucius with more interest than I should have bestowed upon personages who, hierarchically, are, I dare say, his superiors."

The firm of Smith, Elder, & Co., which for many years carried on business on this spot, was founded in 1818 by George Smith and Alexander Elder. In 1846 Mr. Smith died, and Mr. Elder retired from business, leaving the affairs of the firm in the hands of Mr. George Smith, jun. The increasing business of the house, especially in the departments for East India and Colonial Agency and Shipping, rendered it necessary to divide the responsibility of conducting it; and in 1853 Mr. Smith was joined by Mr. Henry S. King. The business soon outgrew the premises, and advantage was taken of the removal of the India Office from Leadenhall to Westminster to occupy a house in Pall-mall for the banking and agency branches, which required constant communication with the Pay and other departments under the Secretary of State for India.

In 1868 a dissolution of partnership took place. Mr. Smith removed to Waterloo-place, taking with him the book publishing department and the old style of Smith, Elder, & Co. All the other branches of Smith, Elder, & Co.'s

business remained at Cornhill and Pall-mall, the only change being in the designation, which thenceforward became Henry S. King & Co. One of the first steps of the new firm was the establishment of branch houses at Bombay and Calcutta. Their growing trade with the East, which has shown capabilities of further extension since they established these direct branches in India, determined the firm to substitute the present handsome and convenient edifice for the old-fashioned and ill-adapted structure formerly standing in its place.

LIVERPOOL ARCHITECTURAL SOCIETY.

At a recent meeting of this society Mr. C. H. Beloe gave particulars of "A Ramble through Bristol." Speaking of the improvements now being made in the Bristol Docks, the lecturer said,—

Two new locks are in course of construction, one leading from the river into the Cumberland Basin, and the other from the basin into the floating harbour. They are each 350 ft. long and 62 ft. wide in the clear. The outer lock is most advantageously situated with regard to the direction of the main channel, so that long ships can easily enter or depart from the docks; whereas, at present, owing to the entrance being nearly at right angles to the very narrow river, vessels coming out of dock frequently run into the opposite bank before they can be turned down the stream. Several of the abrupt corners which occur on the river, between the port and the Severn, are being removed, and the channel straightened as much as possible. A branch railway from the Great Western Railway is also being constructed, to terminate on the quay of the western harbour, near Prince's-street Bridge. All these improvements have, no doubt, been carried out by those interested in the port of Bristol, in order to enable them to compete with the new docks now in course of construction at the mouth of the river, of which Mr. Brunles is the engineer. The new locks at Bristol are being built in the most substantial manner. The stone is obtained from the excavations on the banks of the river below the suspension-bridge, and appears to be of excellent quality. The plan adopted in bedding these stones is somewhat peculiar. The beds are only worked fair for a brick thick from the face; a course of bricks is laid between the stones, and in some instances in both vertical and horizontal joints; the remainder of the joint is made up of small stuff and mortar. This plan was adopted to save labour in dressing the stones, which are very hard; but I doubt whether it is a good one, as the bricks in the face will certainly perish sooner than the hard stone, and in any case the joint cannot be so good as stone on stone, and I certainly prefer the granite rubble walls which have been adopted with so much success in the walls of the Liverpool docks, which plan, when hard stone has to be used, saves more labour than the Bristol fashion. I only noticed this system in the inner lock, the walls of which are completed; in the outer lock it does not appear to have been adopted. The copings and hollow quoins are of granite, and the gates of timber. These works are being executed from the designs and under the superintendence of Mr. Thomas Howard, C.E.

THE INSTITUTION OF CIVIL ENGINEERS.

On February 28th, Mr. C. B. Vignoles, F.R.S., president, in the chair, the paper read was "An Account of the Basin for the Balance Dock, and of the Marine Railways in connexion therewith, at the Austrian Naval Station at Pola, on the Adriatic," by Mr. Hamilton E. Towle, of New York. The harbour of Pola, naturally favourable for the purposes of a naval station, was selected by a committee of Austrian engineers and officers, as the most suitable that could be chosen for the extensive arsenal and dockyards, which it would be necessary to construct when the port of Venice was abandoned. It was situated directly south of Trieste, on the western coast of the peninsula of Istria, south-west of Fiume, and about sixty miles distant from both those ports. Venice, on the other side of the Adriatic Sea, was eighty miles distant in a north-westerly direction.

It was at first intended that excavated docks should be formed, but, in consequence of the volcanic and treacherous nature of the ground,

this idea was found to be impossible of execution. A floating dock, basin and railway system were therefore decided upon, the dock adopted being that known as Gilbert's Balance Floating Dock. The basin and railways were in general principles the same as those constructed at the United States Navy Yards at Portsmouth, New Hampshire, and at Pensacola, Florida. These were the first dock basins with railways that had been constructed, and were commenced in the year 1849.

The function of a basin for a floating dock was to supply a place in which the dock itself might be grounded, either with a vessel upon it to undergo extensive and prolonged repairs, or to enable the vessel to be hauled out of the floating dock upon the railways, which latter operation was only required in cases where vessels were moved from the dock to land above the sea level, or the reverse. A basin to fulfil these requirements must be so constructed as to permit the dock to be floated into it, and the entrance closed by means of gates or caissons.

The general dimensions of the basin at Pola, determined by the magnitude of the floating dock, were as follow:—

	Ft.	In.
Width inside the enclosing walls	211	6
Length	311	6
Depth from the top of the walls to the stringers in the floor of the dock	17	14
Depth from the level of ordinary high water to the top of the stringers	13	0
Depth from the level of ordinary low water to the top of the stringers	11	0

The maximum difference in the hydrostatic head, inside and outside the basin, existing during the progress of the construction of the basin, was 20 ft.

Detailed surveys and sections of the site were taken, so as to determine the precise contour of the rock, and of the mud overlying it, which varied in thickness from 2 ft. to 12 ft. As the rock was unfitted for holding, or even for receiving sheet piles, except when they happened to strike a fissure, it was decided not to use the ordinary clay-puddle coffer-dam.

The materials selected for the walls of the basin was Santorin *béton*, composed of Santorin earth—a volcanic product from the Greek island of Santorino,—and lime paste, in the proportion of 7 to 2, forming the hydraulic mortar; to this was added 7 parts of broken stone, the mixture being made into a conical heap and tempered by exposure in the open air for from one day to three days, when it was ready for use. Of this *béton* extensive wharfs and moles had already been constructed at Trieste, Fiume, and Pola; and, as it had been found durable and efficient, was moderate in cost, and obtainable in any quantity, it was considered that no better material could be determined upon for the walls of the Pola basin. It might be mentioned that the largest blocks previously made were those at the mole of Fiume, which were 25 ft. in vertical depth, 22 ft. wide at the top, with a batter of 1 in 4 or 1 in 6, and 60 ft. long.

It was believed that, by adopting proper precautions, the mud which covered the rock bottom would form a suitable foundation for the walls of the basin, provided that a water-tight joint could be made at the bottom of the wall, for there could be no leakage or percolation through the *béton*, so long as it remained uncracked by unequal strains or settlements. It was, however, assumed that such cracks would occur, and that it would be necessary to provide for such a contingency. A wall of a plain rectangular section was determined with reference to the fact that the foundation consisted of greasy mud, lying at angles varying from 2° to 10°, which would render a slip possible. Joints were made across the wall, at intervals of from 40 ft. to 90 ft., in order to form weak places, which, being selected with reference to the nature of the bottom, would, in all probability, determine the location of any cracks that might occur.

It was ascertained by calculations, based up on the data afforded from a knowledge of the contour of the rock bed and the mud bottom, that no crack could exceed 6 in. as a maximum, and the ends of the blocks marked the localities where the settlements would probably take place. To check the passage of the water through the wall at these points, as well as to prevent the blocks from moving laterally upon one another, a rectangular post, 18 in. by 24 in., was inserted vertically in each of the joints, reaching from the upper surface of the block, through the mud, to the rock bottom below. These posts projected 12 in. into each block of

béton. Subsequent experience proved that this device was thoroughly efficient, the largest crack, which had a maximum width of 5½ in., not admitting any water. The thickness of the walls varied from 15 ft. to 20 ft. and 26 ft. The floating dock entrance was placed on the north side, and was adapted for an iron caisson to close it. This entrance was 120 ft. wide in the clear, but the caisson measured 128 ft. along the top line. The pump well was situated in the south-west corner of the basin. Great care was taken to make the stage piles stand vertically, as they were to remain permanently in the walls. The vertical diagonal bracing between the piles was removed as the *béton* was filled in. The enclosing sheet piles were carefully squared, so as to obtain perfectly true faces, for the purpose of obtaining tight joints, and to give the *béton* walls, of which the sheet piles formed the moulds, a fair surface.

As was anticipated, the butt joints between the *béton* blocks were found to open, more or less, according to the character of the mud on which they stood, and the contour of the rock bed, but in no case did the timber-joints fail. After the maximum settlement had developed itself, the cracks were carefully cleaned out, and filled with masonry to the depth of 1 ft. from the face of the wall, and tubes or pipes were inserted in the wall for conveying away any slight leakage that might escape without washing away the fresh mortar. Where a crack or joint appeared open on the external side of the *béton* walls, a pad, secured to a plank or timber, was firmly braced against it, until it was tight enough to prevent the escape of fine mortar or cement. The openings or cracks were then filled with thin grout, injected through a tube, under a head of about 10 ft. above the wall.

The caisson for closing the opening to the basin was built by the Messrs. Rennie, of London, and was found to answer its purpose completely.

A SUGGESTION FOR WARMING APARTMENTS.

WHEN the thermometer is at, or near to, freezing point, few persons of small income can contemplate an adjournment to bed with anything like resignation, because as coals, at least in London, are expensive, they cannot afford fires in their bedrooms in addition to those which are necessary in the parlour or kitchen. Though tolerably well fortified with blankets, we seldom enjoy going to bed from the beginning of November to the end of March. But how fares it with the lower and lowest classes during these five months?—

"How shall their houseless heads and unfed sides,
Their loop'd and window'd raggedness defend them
From seasons such as these?"

Almost all bedrooms of modern date have fireplaces and large chimneys, which, except on state occasions, and during illness, are, in a large number of cases, never used. They serve, indeed, for ventilation, in some measure, during summer, but in the colder months constantly inundate the unhappy sleeper with an atmosphere of fog or frost, which descends, by reason of its greater specific gravity. Is the *ne plus ultra* of perfection yet attained in economising heat and coal, and yet retaining more comfort than we do in our sleeping and other rooms? It was only the other day that gas was invented; while the virtues of the Norwegian cooking-stove are even now known to few Englishmen; so we need not despair. Most of the systems of warming now in use unite in principle, viz., they more or less effectively warm up the air, which a room already contains, but either destroy the oxygen, in the case of stoves without flues, or, like fire-places with chimneys, replace the heated air which escapes by a rush of cold from doors and windows.

Now, I think it would be more efficacious and wholesome to turn out all the cold air in a room by the direct introduction of hot in its normal or natural chemical condition, and believe that it would prove just as simple, and cheaper by far. Air, when heated, invariably ascends. By turning this fact to account, man may reduce at least one-half of his misery in winter.

If we heat the thick end of a long tobacco-pipe red-hot, and blow through it upon a stick of sealing-wax, 1 in. distant from it, the wax will melt. If we heat it again as before, and instead of blowing through it, hold it perpendicularly below the wax at the same distance, the same result will be produced by the natural current through it. Let us now apply the same principle

to an ordinary gas-pipe 1 in. in diameter. If one end of the said pipe were heated in the fire, and the other end conveyed up the chimney or brick beside it into an upper room, there can be no doubt that the air which ascended through it would gradually make the upper part as hot as that which was in the fire; but the heated air discharged into the chamber above would have lost all its vital usefulness, from the oxygen being combined with the iron pipe, and it would also ignite the ceiling of that room in a short space of time; but, as the principle holds good at all minor degrees of temperature, we find an avenue of safety. At 212°, the boiling point of water, there is not the slightest danger of setting fire to your house when you are asleep; so, if the pipe, having its lower end out of doors, be conveyed through a large boiler, to form a reservoir of heat, it would not only warm rooms gradually, but would also renew their atmosphere with pure air in its normal or natural condition. The branches into different rooms should be fitted with a stop-cock at the end of each, of large size, to regulate or stop the current of air at will. There being no ventilator or chimney needed, the heated air would be forced onwards through the interstices of the doors, and render lobbies and passages comfortable. As the large boiler would be the only really expensive article required, in addition to the gas-pipes, and would be useful for baths and other domestic purposes, the money would be well and usefully expended. It is almost needless to say that, by this plan whole streets of contiguous houses might be cheaply warmed, just as they have long been lighted by gas; and to none would it prove a greater blessing than to the miserably poor.

M. H. P.

ON WHAT FLOOR OF A CHURCH-TOWER SHOULD THE BELL-RINGERS BE PLACED?

In reply to this query, certain respected friends will say, "On the ground floor; for where they occupy a stage above, and are out of sight, evil works are often carried on."

Now, I believe that the most able ringers of the present day are respectable, well-conducted, and trustworthy men. If, however, it can safely be said that disgraceful practices are carried on in any ringers' chamber, here is an effectual remedy. Let the clergyman appoint a trustworthy person as foreman, who shall be responsible for the good conduct of the ringers, and the enforcement of all the necessary rules.

Here and there a tower exists which is so constructed that the bells are properly rung from the pavement; but in other instances the ringers are placed above, and out of sight; while in numerous towers it would be utterly impossible to bring the ropes down so as to ring the bells in peal on the ground floor. This applies to all the finest peals of bells which I have surveyed in the metropolis, as well as to most of those in the country. I may add that, among the many edifices by Sir Christopher Wren, I cannot call to mind any church tower in which the ringers stand on the lower story.

In conclusion, I would observe that a very remarkable edifice, the "round" part of the Church of the Holy Sepulchre, Northampton, being under restoration, it has been found necessary to take down the old ringing-chamber in the tower, together with a partition, which blocked up the pointed arch at the west end of the church. But the question now arises,—"Where should the ringers and chimers be placed?"

My answer is, certainly not on the ground-floor; for where there is an entrance to the church through the lower story of a tower, as in the case now under consideration, if you place the bell-ringers there, you will necessarily lead the people to enter the sanctuary by some other way, to say nothing of other objections to such an arrangement.

I venture, then, to submit that as the position is admirably adapted for the purpose, a new floor should be substituted for that of the old ringing-chamber, the front to be left open to the church, thus forming an appropriate gallery or ringing-loft.

THOMAS WALESBY.

Peace and Free Trade.—A member of the Social Science Association has offered 10l. 10s. for the best essay on the subject, "How far is universal free trade a necessary condition of universal peace?" The essays must be sent in on or before May 1.

BUILDERS' CLERKS' BENEVOLENT INSTITUTION.

The fourth annual general meeting of this Institution was held on Tuesday, the 28th ult., at the Office, 14, Bedford-row; Mr. Benjamin Hadden, the president for the ensuing year, taking the chair.

The attendance, which was numerous for a meeting of this character, was composed mainly of builders' clerks; amongst the chairman's direct supporters were Messrs. Thomas Stirling, Henry Earle, Matthew Hall, Marcus Newton, &c.

The Chairman, in moving the adoption of the report and balance-sheet, said,—"You will have noticed that the increase of subscriptions in 1870 is but little over those received in 1869; but the fact that there is an increase in spite of the war on the Continent which has affected all charitable institutions, and of the depressed state of the building trade, is a very gratifying one. When once these causes are removed, we may hope that this institution will show a more marked improvement than in any preceding year. It is a subject of considerable gratification to me to see that your funded property also increases. With regard to the Asylum Fund, I notice that the rules state that the object of the institution is the relief of decayed builders' clerks, and the maintenance and education of their children. The name Asylum Fund seems to suggest something in the shape of almshouses, but upon this point the builders are more likely to have correct views than most societies, and they have come to the conclusion that pensions granted to their decayed members is the way to effect the greatest good with the money. To build almshouses for the poor costs as much as providing mansions for the rich; and after building they must be endowed, and the isolation of the inmates living in these small dwellings renders it a very questionable benefit to them. 20l. a year as a pension, enabling them to live with their friends, is a much greater boon.

Mr. H. T. Boyce, in seconding the resolution, thanked Mr. Hadden for his remarks about the Asylum Fund, which, he said, ought, perhaps, with more propriety, to be called the *Orphan* Fund, and explained that there was a rule in the institution, passed in 1869, at a General Meeting should be held to consider its appropriation. A motion had been made about eighteen months ago that life presentations in one of the existing orphan asylums should be purchased in the names of the President or Trustees, and that by means of life insurances upon those names, the institution should have perpetually the means of renewing such presentations. The cost of the first purchase would thus be the only outlay required, and he hoped still that this proposition might be entertained by the members of the Institution, and education afforded to the children of some of the pensioners.

Mr. Theo. Stirling said he hoped there would be another election of pensioners in November; and announced that Mr. John Waldram, of the firm of Messrs. Hill, Keddell, & Waldram, was willing to give two guineas to the successful candidate at this election, provided four other gentlemen would do the same.

The motion was then put to the meeting, and carried unanimously.

Mr. Alfred K. Smith proposed various alterations in the rules, so as to admit the widowed mothers of builders' clerks within the pale of eligible candidates for relief, remarking that one who had been entirely dependent on a son for support would be in as bad a position as a widow, and that every circumstance tended to show that the relief would not be required for so long a period as in the case of a widow, the majority of whom would be comparatively young.

Mr. Ward objected that it was entirely altering the objects and principles of the Institution, and that in its present youth it was taxed sufficiently to meet existing claims.

Considerable discussion took place, in which Messrs. Marcus Bourne Newton, Thos. F. Cooke, R. Ball, and H. J. Whetley took part; several of the speakers expressing great sympathy with the objects of Mr. Smith's proposition, which were severally brought forward and negatived.

A cordial vote of thanks to Mr. Theo. Stirling, for the valuable assistance he had rendered to the society; and another to Mr. Hadden, for his conduct of the business of the meeting, brought it to a conclusion.

THEATRICAL.

St. James's Theatre.—The reputation which Mr. Albery obtained by his capital little play "Two Roses," still on the stage, led many to wait with interest for the production of his new venture, though, as it now seems, his earlier work, "Two Thorns," at the St. James's Theatre; and although it may not be thought in all respects equal to that which has given so much pleasure to the town, we do not hesitate to say it will not diminish his reputation, but increase it. Admitting a certain amount of haziness and involvement in the plot, and a few trifling outrages of probability, the construction of some parts of the play is marvelously ingenious, and the writing throughout sharp and pointed. It has the advantage, too, of some admirable

acting, we may say some very fine acting on the part especially of Mrs. Hermann Vezin, Mr. William Farren, and Mr. Henry Marston. The scenery, by Mr. W. Hann, is bright and appropriate: the last scene, a rose-covered cottage and grass-covered stage, is a home for a fairy. The piece can scarcely fail to have a long run.

King's Cross Theatre.—This little box of a house is decorated with more taste and delicacy than is usual now-a-days. The modelling of the ornaments is very good of its kind.

Hanley.—The new theatre has been opened, and is a great improvement on the former structure. It will seat about 2,500 persons, and on an emergency 3,000 may be accommodated within the walls. The auditorium is divided into dress boxes, upper boxes, pit and gallery. There is a refreshment-room on each tier, and at the sides of the stage are a green-room, seven dressing-rooms, band-room, property-room, scene-dock, wardrobe, lime-light room, &c. The boxes have a cloak-room for ladies, and there are also private boxes. The principal source of artificial light is a gaselier suspended from the ceiling. The building has been erected from the designs of Mr. T. Hinde, one of the original proprietors of the old theatre, under the supervision of the Borough Surveyor and a sub-committee of the Town Council. It is believed the whole of the interior could, in case of a panic, be cleared of occupants in three or four minutes. The street frontage is of red brick, with pilasters (surmounted with carved stone capitals) in white brick. The length of the front is 104 ft.; the depth of the pit is 50½ ft.; that of the stage 46 ft.

INDIAN COLLEGE.

In the House of Commons, Sir F. Goldsmid has called the attention of the House to the recent establishment, under the orders of the Secretary of State for India, of a college, to the students of which (as he asserted) were to be transferred the opportunities until lately afforded to young men possessing the attainments required (wherever they might have been educated) of entering the service of the Government of India as civil engineers. He moved the following resolution:—

"That in the opinion of this House young men qualified by character and attainments for admission into the service of the Government of India as civil engineers ought not to be excluded from such service by reason of their not having been educated at a Government college."

After some discussion, in which the Chancellor of the Exchequer and the Under Secretary for India took part, the motion was agreed to by a majority of 52 to 46, against the Government.

In reply to Mr. Dickinson, the Under Secretary for India, Mr. Grant Duff, said there would be no charge on the Indian revenues, because the fees of the college would be in excess of the expense. The cost would be 21,950l., and the fees would amount to 22,500l., which would leave a balance of 550l. to be paid to the Indian Government.

"THE TENDER SUBJECT"

INFIRMARY, WORCESTER.

STE.—The following is a list of the tenders delivered for alterations and additions to the Infirmary, Worcester. Messrs. Martin & Chamberlain, architects. Quantities supplied:—

	Per-centage on Lowest.
Wood & Son.....	£4,397 A
Beard.....	4,494 B
Architects' estimate.....	4,500 C
Jeffrey & Fletcher.....	4,630 D
Jones.....	4,720 E
Wells & Son.....	4,900 F
Lovatt.....	4,900 G
Horsley Brothers.....	4,934 H
Bennett.....	4,947 I
Barnes & Sons.....	4,950 K
Briggs & Sons.....	4,999 L
Egley.....	5,075 M
Thompson.....	5,223 N
Yates.....	5,285 O
Everal.....	5,735 P

It is said, so intense is the competition between the river steamboats on the American rivers, that explosions are of frequent occurrence. In their furious endeavours to secure the traffic, they often bring about their sudden destruction. That, sir, I fear is exactly what the builders of the present day are doing, in their frantic efforts to do the meagre amount of building at present doing. Here is a deplorable example of this terrible rivalry. We can excuse a builder's desire to secure a 40,000l. contract, like the foundations of the Law Courts, the bulk of which consists of labour; but how can we account for fourteen of the most respectable Midland builders

tearing each other to pieces over a paltry 4,500l. contract, consisting principally of materials. One builder may contrive to get 30 per cent. more work out of men than another calculates upon getting, but it is impossible for one to buy his raw materials 30 per cent. cheaper than another. The raw materials themselves for this contract amount to close upon 3,000l.: consequently the lowest must either get his men for half the wages the highest pays, or the former must get double the amount of work out of each man that the latter can, or calculates upon getting. We have seen during the late war that one German soldier is quite equal to two French ones, but have yet to learn that one English operative is quite equal to two English operatives. Consequently, if we do not allow that the lowest tenderer is wilfully wasting his substance, we are driven to the conclusion that P. pays cent. per cent. higher wages than A. does. The average wages in the locality is 6d. per hour; but let us suppose the one nearest the mean pays the mean or average wages, which is 1l.: then we find that A. pays at the rate of 5-20d. per hour, whilst P. pays at the rate of 10-40d. per hour.

I think I may venture at this point to leave you to draw your own conclusions.

GARGOYLE.

FIRE AND TRAP DOORS.

SIR.—The fires that have occurred during the last few days, causing such a melancholy loss of life, lead me to ask you for a corner for the following hints. The trap-doors are at present placed on the upper landings of stairs leading on to the roofs of houses; and, when a fire takes place, if an attempt is made to escape by the roof, the opening of the trap-door acts as a funnel, and often prevents escape. I have had them placed in one of the rooms adjoining the upper landing, so that by closing the room-door time is often given for escape. Another precaution, frequently neglected, would have a good effect, especially in large establishments, factories, &c.: I mean that of occasionally calling the occupants together, and pointing out what should be done if a fire happened at any given part of the premises,—as, of course, all is confusion on such occasions. E. O. SYMONS.

RE METROPOLITAN RAILWAY COMPANY'S SURPLUS LANDS UTILISATION SCHEMES.

SIR.—The competitors are anxiously waiting the decision of the Board, which has now been so many months pending.

ONE WHO WANTS TO KNOW.

SWANSEA LAW COURTS.

THE Corporation of Swansea has just completed important alterations in both the Crown and Nisi Prius courts, at a cost of upwards of 3,000l. An entire suite of new offices, judges' rooms, barristers' rooms, &c., has been added, and the whole of the internal fittings rearranged, whilst both courts have been ventilated and warmed. The architect was Mr. C. J. Phipps, of London; the contractor, Mr. Everat, of Malvern.

ROYAL ARCHITECTURAL MUSEUM.

SIR.—The appeal just made to free the Architectural Museum from debt has met with a most hearty response.

The special fund now amounts to above 1,200l.; and we thus secure the liberal but conditional offers of Sir William Tite and others. The cordial support received, as well from the profession as from friends outside, will enable the council to carry out a work they have for years been unable to accomplish, viz., the publication of a new and comprehensive catalogue of their immense and unequalled collection, now still more valuable on account of the ravages during the late Continental war, and from the many additions in various styles lately contributed by the Royal Academy, Royal Institute of British Architects, the South Kensington Museum, the Royal Asiatic Society, and private individuals. Unencumbered with the burden of debt upon the building, we can now carry out many valuable suggestions made to us from time to time.

It must, however, be remembered, that the

object of the Museum is not to attract a crowd of mere sight-seers. Though not situated in a conspicuous locality, it is so conveniently placed that all may study in it who care to do so.

It is only those who know the difficulty of securing a site in London who can realise the trouble the council had in finding one so easily accessible as our present one.

JOSEPH CLARKE, Hon. Sec.

VALUE OF LAND.

Loughborough.—At the sale by auction, under an order of the Charity Commissioners for England and Wales, by Mr. S. Jackson, the property situate on the Forest-road, Loughborough, realised as follows:—Lot 1, 3a. 1r. 37p., 445l.; lot 2, 1a. Or. 38p., 178l.; lot 3, 3a. 2r. 13p., 320l.; lot 4, 4a. Or. 10p., 440l. The total, 24a. 2r. 17p., brought 2,414l.

Near Wigton.—Messrs. E. Dugdale & Son have sold the two estates of Soales and Brookbank, late the property of Mr. Beatty, deceased. The Soales estate, which contains about 67 acres, was knocked down at 3,700l. The Brookbank estate, containing about 130 acres, was knocked down for 1,660l.

Louth.—Messrs. Mason & Son have sold four lots of land situate in the parish of Theddlethorpe. Lot 1, 2a. Or. 25p. of pasture land, was bought by Mr. D. Briggs for 800l.; lot 2, 4a. Or. 10p., 370l.; Mr. Taylor; lot 3, 4a. 2r. 21p., 450l.; Mr. P. Wilson; lot 4, 1a. 3r. 8p., 140l.; Mr. Baxter.

BUILDING FRONTAGES, QUEEN VICTORIA-STREET.

Sir,—Recently some of your correspondents have been remarking upon the late great failure of offering the vacant lands on the Holborn Viaduct by auction, and upon the cause of that failure, namely, the excessive prices demanded. I think their strictures might be extended to the state of Queen Victoria-street, especially that part next the Mansion House. There was an auction sale of a few lots of ground there last spring, and two or three small plots were disposed of; but the largest plot, that fronting in Walbrook and Queen Victoria-street, was bought in, I believe, for the same reason as above stated. There was a very large attendance of buyers, but no one would give the money reserved. No doubt, in such a position the land is enormously valuable, but it seems to be overlooked that it lies back from the best thoroughfare. The most projecting corner of this large plot is about 50 ft. set back from the line of the Poultry, "produced" to the front of the Mansion House. True, that it has a commanding frontage to Queen Victoria-street, but that, at present, is a raw new thoroughfare, and not so highly valuable as Cornhill or the old established and beaten main roads of the City.

If well managed, Queen Victoria-street is likely to be a grand success and will pay for itself, which is a remarkable novelty in public improvements; but if "muddled" it may prove as great a horror as the howling wilderness of Victoria-street, Westminster.

The plot was bought in at the rate of 1,350,000l. per acre.

BALSWATER.

POST-OFFICE PROGRESS.

THERE has been no year probably since the introduction of the penny post in which a larger increase will be marked in the postal deliveries than the year 1870, and the current year 1871, the last more especially, as only three months of the half-penny post-card and circular, and the half-penny newspaper postage, come into the statistics for 1870. It is unfortunate that certain important statistics, published by Government departments, do not appear until so long after the periods to which they are made up as to diminish greatly the value and interest that would otherwise attach to them. It is so with the railway returns published by the Board of Trade, with the trade and navigation returns, of which the statement for January, 1871, has appeared, but not the statement for December, 1870; it is so with the annual report of the Postmaster-General—the sixteenth—just published, which embraces the statistics of the Post-office for 1869.

For comparative purposes, to show the growth of Post-office business, it is necessary to take much earlier returns than those quoted in the new report, which only goes back for comparison to 1860. In 1839 the first general reduction of postage came into operation. At that time Members of Parliament enjoyed, and took large advantage of, the privilege of franking letters, by which themselves and others were able to have their letters carried and delivered post free. In that year, 1839, upwards of 6½ millions of franked letters thus passed through the Post-office. The total number of letters delivered in that year, including franks, was 82,907,372. In 1840 the number was 168,768,344, being an increase of 122½ per cent. In 1850 the number was 347,069,071. In 1869 the number was

831,914,000. In 1854 only 400,000 book packets, exclusive of newspapers, passed through the Post-office; the number of newspapers delivered, including re-transmissions, was about 71,000,000. The number of book-packets, newspapers, and pattern-packets delivered in 1869 was 108,668,000. In 1846 there were 1,280 money-order offices in the United Kingdom; in 1856 there were 1,935; in 1869 there were 4,061, of which there were 5,066 in England and Wales, 453 in Scotland, and 542 in Ireland. The amount transmitted through the Post-office by money orders in 1855 was 11,009,279l., and in 1869, 19,395,635l., of which 584,067l. was for money orders issued in the United Kingdom for payment abroad, or for orders issued abroad for payment in the United Kingdom. The gross revenue of the Post-office, the cost of management, and the net revenue, are as below for the years quoted:—

	Gross Revenue.	Cost of Management.	Net Revenue.
1839...	£2,340,278	£866,768	£1,473,510
1846...	2,380,763	766,999	1,613,764
1847...	1,859,498	688,677	1,170,821
1850...	2,165,349	1,324,563	840,787
1860...	3,631,166	2,831,137	800,029
1869...	4,794,373	3,469,227	1,325,146

The staff-officers, clerks, postmasters, sorters, guards, letter-carriers, and messengers, &c., numbered 22,547 in 1855, and 25,192 in 1860, and 26,910 in 1869, exclusive of the telegraph department. In 1869 there were 1,085,785 depositors in Post-office Savings Banks, to whom a balance was due of 13,524,209l., being an increase of 15.9 per cent. upon the preceding year. The average amount of deposit was 12l. 9s. 1½d. The total number of depositors in the Post-office Savings Banks and the old Savings Banks was 2,464,510 in 1869, or 1 in 12 persons of the population. The policies effected with the Government for life assurance, at the close of 1869, were 2,168, for 164,397l., being an average of 75l. 16s. 6d. to each insurer. The immediate annuities taken were 1,226 for 25,600l., and the deferred annuities 199, for 3,789l.

GAS FLAME DENUDED OF ITS IMPURITIES.

Sir,—My attention having been called by a friend to a letter under this head, in your issue of the 21st January, may I venture to suggest one or two queries which occur to me as a practical man. How can water be applied to the gas flame itself? Must it not either be applied to the gas or to the products of combustion? If the former, no previous experience, of which I have had some, informs me that the quality of the gas is in any way improved thereby; if the latter, we have already distinct data to guide us, as it is well known that the products are carbonic acid gas; and in the case of impurity existing, a certain percentage of sulphurous acid gas, 1 cubic foot of gas producing about 1 cubic foot of carbonic acid gas, which at the ordinary pressure of the atmosphere would require 1 cubic foot of water, or thereabouts, to absorb it (a very ordinary furnace will consume 5 ft. per hour of ordinary gas,—thus requiring 5 cubic feet of water to absorb the products of combustion). A very short calculation will show the large volume of water required,—30 gallons per hour for each burner.

The letter does not clearly state whether the principle is intended to apply to a gas stove only, which might perhaps be inferred, or to any ordinary burner, and contains no allusion as to the method of disposing of the water when done with. Feeling, however, considerable interest in the subject, I should be obliged by the insertion of this letter.

A SURVEYOR.

SMITHFIELD DRINKING FOUNTAIN.

Sir,—My design is accompanied by an estimate from a good carver to complete the whole thing for 1,200l., including the figures, which your critic suggests would nearly cost all the money. Is marble or bronze the right material? In hard stone they may be done well as estimated.

H. H. VALR.

THE NEW STAMP ACT.

THE following extracts from the Stamp Act 33 and 34 Vict., 1870, need our readers' attention:—

"As to Appraisements."

Every appraiser by whom an appraisement or valuation is made shall, within fourteen days after the making thereof, write out the same in words and figures, showing the full amount thereof upon duly stamped material; and if he neglects or omits so to do, or in any other manner delivers out or states the amount of any such appraisement or valuation, shall forfeit the sum of fifty pounds; and if the same be written out and stamped as aforesaid, shall forfeit the sum of twenty pounds.

"As to the Certificate of Registration of a Design. The duty of five pounds upon the certificate of the registration of a design is to be denoted by a stamp, to be specially appropriated for expressing and denoting the said duty."

"Appraisement or Valuation."

Appraisement or valuation of any property, or of any interest therein, or of the annual value thereof, or of any

* From this year there was a general progressive increase under each of the heads.

dispositions, or of any repairs wanted, or of the materials and labour used or to be used in any building, or of any artificer's work whatsoever.

Where the amount of the appraisement or valuation does not exceed £20, the duty shall be 0 0 0.

Exceeds £20, and does not exceed £100	210	0	0
" 100	20	0	0
" 200	30	0	0
" 300	40	0	0
" 400	50	0	0
" 500	100	0	0
" 1000	200	0	0
" 2000	500	0	0
" 5000	1000	0	0

"Exemptions."

Appraisement or valuation made for, and for the information of, one party only, and not being in any manner obligatory as between parties, either by agreement or operation of law. Appraisement or valuation made in pursuance of the order of any Court of Admiralty or Vice-Admiralty, or of any Court of Appeal, from any sentence, adjudication, or judgment, of any Court of Admiralty or Vice-Admiralty. Appraisement or valuation of any property made for the purpose of ascertaining the legacy or succession duty payable in respect thereof.

ORDNANCE SURVEY.

Sir,—Chamber's Journal for the 7th of January, 1871, contains an article upon this subject, showing that the survey of England and Wales is now completed, save 1 in. to a mile, having been commenced on the 1st of January, 1870. It was finished on the 1st of January, 1871. During these seventy years various changes have occurred, rendering alterations in the maps necessary. For instance, in the map of North Devon, surveyed in 1803, the Barnstaple and Ilfracombe turnpike road, which was constructed subsequently, is not, of course, contained in the map. The notice does not refer to the parish maps now being constructed under the superintendence of Sir Henry James, and which will be very valuable, especially if old buildings and their sites, as well as bye-roads and pathways, are marked in it, as they should be. As a pedestrian, I have received much assistance from the county ordnance maps, which contain notices of ancient buildings and cromlechs, &c.

Srs. COOK.

FALLING CORNICES.

Sir,—As the father of the unfortunate gentleman who lost his life by the falling of a heavy cornice from a building in Fenchurch-street a few weeks since, may I request of any of your subscribers kindly to inform me in your next number of the date of a similar accident which occurred some years ago in Wood-street. I do not refer to one which took place in January, 1855, in Great Winchester-street, where one of the workmen was killed, and several injured.

As this is the third accident of late years through the falling of cornices, should it not be the duty of the public officers to keep an eye on such dangerous projections while building, and thus prevent the ruin and misery in which carelessness or accident may involve the passengers in our crowded thoroughfares?

JOHN RAYLE.

2, Blunsford-street.

AMERICAN INSTITUTE OF ARCHITECTS.

The report of the proceedings of the Fourth Annual Convention of the American Institute of Architects* contains the opening address by Mr. Thos. U. Walter, the closing address by Dr. Furness, and reports from various chapters, which show that considerable activity prevails, and that the profession in the United States includes many men of ability. We shall be able hereafter to give a fuller account of the "Proceedings."

The Institute now appears to consist of branches, or "chapters," at New York, Philadelphia, Chicago, Cincinnati, Boston, and Baltimore.

The English honorary members in the printed list are Mr. Burges, Professor Donaldson, Mr. Godwin, Mr. Beresford Hope, Mr. Layard, Mr. J. H. Parker, Mr. J. A. Pictou, Mr. Ruskin, Professor G. G. Scott, Mr. G. E. Street, Mr. Waring, Sir Digby Wyatt, and Mr. T. H. Wyatt.

DEATH FROM FAULTY CONSTRUCTION.

DURING the last five or six weeks Mr. Hookham, of Deal, has been building a house in Lower-street, Deal, and the building was approaching completion, when on Wednesday, the 1st, just before the dinner-hour, the whole of the fabric suddenly fell to the ground with a loud crash, and when the dust had somewhat cleared away, five persons were removed out of the ruins, viz., Mr. John Hookham, the builder, who was taken out dead; his son, Walter Hookham, seriously injured and leg broken so badly as to need immediate amputation; Epsley, a brick-layer who had his leg also broken; and two carpenters named Aaron Burton and Henry Baker, seriously bruised and shaken. At the inquest on the body of the deceased held on the 2nd, before the borough coroner at Deal, Mr. G. Mercer, the jury returned a verdict to the effect "That deceased came by his death through the

* Proceedings of the Fourth Annual Convention, held at Philadelphia, September 28th and 30th, 1870. Western & Co., Park-row, New York, 1871.

falling of the house which he was building of too flimsy and faulty a construction."

They recorded their opinion that none but a certified builder should be allowed to erect any buildings in the borough, and that in all cases a competent architect should supervise the construction. They directed the coroner to bring the matter before the local authorities at their next meeting; and the coroner intimated his perfect concurrence in the recommendation, and promised to comply with their request.

PROPOSED DECORATION OF THE COUNCIL CHAMBER, LIVERPOOL.

The confirmation of the finance and estate committee's recommendation that the tender of Messrs. Cottier & Co., for the decoration of the council-chamber and luncheon-room, for the sum of £600l., be accepted, has been considered by the town council.

Mr. Pictou seconded the motion. The sub-committee, he said, were directed to get tenders from three persons, and it was thought desirable to obtain native talent if they could. Messrs. Cottier & Co., of London, and Messrs. Alexander White & Son, of Liverpool, were applied to for designs, and afterwards Messrs. Jeffery & Co., of Compton House, applied to send in designs. They said they had artistic talent of the highest order, and they were therefore allowed to tender. The result was then before the council. The divisions upon the different designs resulted in Messrs. Cottier's being adopted by five votes to one. Some persons objected on account of the darkness of the tone, but it was sought to give as much reflected surface as possible by the free use of gilding.

Mr. R. R. Minton moved that the tender of Messrs. J. & W. Jeffery & Co., for £800l., be accepted, in place of that of Messrs. Cottier & Co., for £600l.

This amendment was carried by a majority of one.

Mr. Melly moved that the question be deferred for another six months, for the reason that the ratepayers at this moment were not able to bear the expense. This was carried by twenty-six votes to fifteen.

Mr. Fairhurst moved that Messrs. White's designs be accepted; fourteen voted for, and twenty-eight against it. Mr. Melly's amendment having become the substantive motion, it was agreed to, so that the subject of the decorations is now postponed for six months.

CHURCH-BUILDING NEWS.

Reigate.—The church of St. Luke, South Park, Reigate, has been consecrated. The style is Gothic, of the fourteenth century. The church contains nave with south aisle, chancel with south aisle, and vestry, with organ-chamber over; but the north side and west end are temporarily enclosed with timber framing, plastered and weather-tiled, in contemplation of future enlargement. The walls are built of local freestone, with Bath stone dressings, and the roofs covered with brown tiles finished with ornamental red crestringes. Internally, the walls are stuccoed, and have Bath stone dressings. The roofs are constructed with Baltic timber exposed to sight, those over nave, chancel, and organ-chamber being close boarded on the rafters, and those to aisles plastered between the rafters. There is a temporary porch at the north entrance, and also a small bellcot, with bell at the west end. The seats, the whole of which will be free and unappropriated, are low open benches of red pine, stained and varnished, and will accommodate 254 adults and forty-eight children. The chancel sittings are of pitch pine, varnished, and will seat eighteen chorists; the reading-desks are also of pitch pine. The floors are of wood under the seats, and the passages in the nave and aisle are of plain red paving tiles, the paving in chancel being in Godwin's tiles, both glazed and unglazed, of various colours, laid in patterns. The communion-table, which is of walnut wood, stands on a raised platform, and there is a Caen stone credence on the north side of it. These and the carved oak pulpit, organ, lectern, font, candle corona, needle-work altar-cloth, and other works, are all special gifts. The lighting is done by candles, the standards or brackets to pulpit, desks, lectern, and chancel seats being of polished brass; but in the nave they are only of iron, of an inexpensive character, for temporary use. The church is heated

by hot-water pipes under iron gratings. The cost of the building, including sittings, is about 2,500l. Mr. John Lees, of Reigate, was the architect; and the builder, Mr. W. Carruthers, also of Reigate, who commenced the works about the middle of April, 1870.

Gunwalloe.—The restoration of Gunwalloe Church, says the *Cornish Telegraph*, is now approaching completion. The early roof discovered by Mr. Sedding, in examining the church, has been copied in the new work. So far the restoration has, through the scarcity of funds, been rigidly confined to the necessary repairs to the building.

Heanor.—The Church of St. John the Evangelist, Aldercar, parish of Heanor, has been consecrated and opened. The church is in the Gothic style of architecture, and has a spire near the east end, with one bell. The length of the edifice, inside, is 70 ft.; breadth, 24 ft.; and it is calculated to seat 250 persons. It has been built of Mansfield stone, by Messrs. Fisher, of Mansfield; Messrs. Stevens & Robinson, of Derby, being the architects; and was fitted up for gas by Messrs. Shaw, of Riddings. The church is in the parish of Heanor, but in the extreme north-eastern portion of it, so as to accommodate as well the inhabitants of the outlying districts of Codnor and Ironville. There is attached to it a burying-ground, part of which only has been consecrated, the unconsecrated portion being at the disposal of Dissenters. The total cost has been calculated at about 1,500l.

North Benfleet.—The ancient church of North Benfleet has been reopened, after undergoing restoration. The cost has been about 1,000l., nearly the whole of which has been defrayed by the rector. The architect was Mr. G. E. Street, and the builder Mr. R. Saunders, of Maldon.

Tamworth.—The parish church, which has been partially restored and reseated, has been re-opened for divine service. This church dates back to the time of the Normans, and is probably the third erection on the site. The Norman parts remaining are the north and south walls of the central tower, a door and window on the south side of the chancel, and the wall eastward of them below the string-course. The main part of the present fabric is of the fourteenth century. The works recently executed have been made under the direction of Mr. W. Butterworth, architect; the contractor being Mr. Wood, of Derby, and have been limited to the interior, with the exception of rebuilding the south door of the nave, and south wall of the vestry. The pews on the ground floor have been replaced by open seats; the west gallery and portions of the north and south galleries have been removed; the large window re-opened and glazed; and the plaster and whitewash removed from the walls and pillars. An apparatus has also been fixed for heating the church. The organ (the principal parts 200 years old), has been reconstructed. The contracts for the restoration amounted to 3,310l., and the extras to 520l., making a total of 3,830l. Two of the windows have been reconstructed and filled with stained glass, the east window (representing the twelve Apostles), as a testimonial from the parishioners and others to the late vicar, the Rev. Dr. Millar (now vicar of Cirencester), and a window in the south transept to the memory of Mr. John Harding, formerly of Bonehill, in this parish. It represents the "Adoration" of the infant Christ.

DISSENTING CHURCH-BUILDING NEWS.

Dewsbury.—Trinity Congregational Church, Dewsbury, has been opened for divine service. The low ground on which it is situated detracts somewhat from its appearance. The basement floor contains the schoolroom, 50 ft. by 44½ ft.; lecture-room, 30 ft. by 22 ft.; infants' class-room, 24 ft. by 14 ft.; with four smaller class-rooms and kitchen. There are separate yards on each side of the building for boys and girls. These are approached from the Halifax-road by a flight of stone steps and from the Wellington-road by a side street. There are four separate outer entrances to this floor, two being provided through side lobbies to the schoolroom, the other two being for the class and lecture rooms. There are also two separate communications by staircases to the ground-floor and gallery, and a minister's staircase to the vestries. Internally the ground-floor consists of a large vestry, 29 ft. by 14½ ft., and a minister's vestry, 14½ ft. by 11 ft., with lavatories, &c.; also the body of the

church, which is 87 ft. by 50 ft., with two side wings containing the entrance vestibules and staircases to galleries and schools. The approaches to this floor are three in number, the two principal entrances being from the Wellington-road, by flights of stone steps to the vestibules, and the other from Halifax-road by a level landing to the vestries, &c. A gallery is continued round the entire church, supported on ornamental cast-iron columns, the front being divided into compartments by pilasters, and filled in with panels of ornamental perforated iron-work on scarlet ground. The body of the church and the gallery will afford sitting accommodation for 1,000 persons. The seats have shaped stall-ends and leaning backs, and the whole of this and other woodwork in the church is of red deal, stained and varnished. There is, instead of a pulpit, an elevated platform, with staircase on each side, surrounded with ornamental iron balusters supporting a mahogany handrail. The ceiling of the church forms a semi-ellipse, being 37 ft. from the floor in the centre, and divided longitudinally by projecting panelled and moulded ribs into eight bays. These again are subdivided laterally by five similar moulded ribs, making in all forty compartments, each of which is panelled and enriched at the angles. The curve springs from a moulded and enriched cornice, through which the projecting ribs pass to a distance of 4 ft. down the wall, and terminate on moulded and foliated pendants. The style of the architecture is Italian. The principal front is towards Wellington-road. The central portion projects from the main wall, and is surmounted by a pedimental cornice. The main feature in this front is a triple-light window, divided by Corinthian columns, supporting the arched and canopied head of the central light, which is 25 ft. high and 8 ft. in width. The two side lights are square-headed, and the space below the eills is filled in with ornamental balustrading. On each side of this central portion, and recessed from it, are two other windows of similar proportions, but varied design, and over them runs the main cornice, crowned by perforated ornamental stone balustrading, finished at the angles with panelled pedestals supporting pointed urn terminals. On either side, and flanking this main portion of the front, are the side wings, containing the entrance, vestibules, and staircases to school and gallery. The whole of this front and the wings are constructed of tooled ashlar, from the neighbourhood of Huddersfield, and the remaining external portions of the building are faced with pitched Elland Edge wallstones, with dressings of Huddersfield stone. The church windows are continued in one length through the gallery. The Halifax and Wellington road frontages have boundary walls, surmounted with ornamental iron railings, with gates of similar design at each of the three entrances. The cost of the entire building, including fittings, &c., is about 8,000l. Messrs. John Kirk & Sons, of Huddersfield and Dewsbury, were the architects, under whose superintendence the works have been carried out. The foundation stones of three new buildings (two places of worship and a school), have been publicly laid here. One of these is a chapel for the Baptist body. The structure is Gothic in style, and will comprise nave, vestries, aisles, tower, and spire. The cost is estimated at 3,000l., two-thirds of which is subscribed. The second stone-laying was at Ravensthorpe. The building forms a set of schools, which are to belong to St. Saviour's Church. They will comprise large room, 52 ft. by 20 ft.; infants' school-room; 35 ft. by 20 ft.; class-rooms, vestibules, &c. The style is to be Gothic simply treated, and in keeping with that of the church. The cost is set down at 1,100l. The third ceremony was that of laying the first stone of a chapel at Batley Carr, for the Wesleyan Methodists. The building will be Italian in style, and the cost is estimated at 2,500l.

SCHOOL-BUILDING NEWS.

Leicester.—The third school belonging to this district is now completed. The new school is situated in Chester-street, under the shadow of the church, to which building it has been made to harmonise both in design and material. It is Early English in design, and is built of Mount-sorrel granite, relieved by red brick—moulded and plain—and by white stone dressings. It contains a large room, with high-pitched roof, stencilled between the timbers, and a convenient class-room for younger children. Mr. Joseph

Goddard was the architect employed. This is the third Church day-school erected in St. Matthew's district of Leicester (two of these schools having been built within the last three years) with ample accommodation for from 1,000 to 1,200 children.

Sittingbourne.—At a meeting of the committee appointed to take the necessary preliminary steps for the erection of new national schools for the district of Holy Trinity, Sittingbourne, about a dozen tenders were opened, but it was resolved that no tender should be accepted until the next meeting. About 900*l.* have already been promised in aid of the movement. The site for the schools, valued at 250*l.*, will be given by the Rev. G. S. Simpson and Mr. Percy Simpson.

Elmslett.—A new school recently erected in this place has been formally opened. The school is situated in the centre of the village, on part of the rectory grounds. The architect was Mr. Barnes, of Ipswich; and the builder, Mr. Welham, of Hittleham. A residence for the teacher is attached.

Henley.—The Poor-Law Board has sanctioned the building of schools and dormitories at the Henley Union for 100 children, with residences for the master and mistress. Plans have been prepared by Mr. F. Haslam, and it is expected that tenders will be invited shortly.

Leek.—A boys' new school for the schools connected with St. Luke's Church, which were erected about twenty-five years ago, is about to be built. An eligible site in Queen-street was purchased, at a cost of about 180*l.*; the contract for the building is upwards of 700*l.*, and the cost of fittings, heating apparatus, and other extras, raises the total estimated expenditure to about 1,100*l.* The new school, the stone of which has been laid, will be a one-story building. It will comprise the school-room, a class room, front and back porches, a storey for the heating apparatus, and apparatus for tea meetings, lavatory, &c. The conveniences and other out-offices will be placed away from the main building in one corner of the playground, which will have an area of about 650 square yards. The inside dimensions of the school-room will be—length, 60 ft.; width, 26 ft.; height at eaves, 14 ft.; height in centre, 23 ft. All the external walls will be hollow and of red-pressed bricks. The walls inside are faced with red and black bricks in pattern. The school-room will be lighted by six 2-light windows on the side, two at the back, and a large 3-light window in one gable end, and a 4-light in the other; these windows having transoms and sill-strings of stone, and plain stone cuspings in the recessed arches. There will be, in addition, two circular traceried lights in gables in the roof on the west side. All the woodwork in the interior will be exposed and wrought, and stained and varnished. The buildings will be warmed by the warm-air apparatus of Messrs. Haden, of Trowbridge. The architect is Mr. Sugden, under whose direction Messrs. Nadin, Matthews, & Johnson, of Leek, will execute the work. The new building will accommodate 200 boys. The present school will be converted into an infants' school and class-room. In order to secure the Government grant, which would probably have been about 150*l.*, the committee would have had to materially narrow the width of the building as at present proposed, and render it much less suitable for evening meetings, entertainments, &c. After deliberation, they determined that it would be advisable to adhere to their plan, although by so doing they lost the Government grant.

Ravensthorpe (Dewsbury).—On Shrove-Tuesday the foundation-stone of a building to be used as day and Sunday schools, in connexion with St. Saviour's Church, Ravensthorpe, was laid. The building, which will have its principal entrance to Church-street, will be in the form of the letter T, and will contain a schoolroom, 52 ft. 6 in. by 30 ft.; an infants' school-room, 35 ft. by 20 ft.; a class-room, 16 ft. by 14 ft.; together with vestibules and passages, and separate entrances on each side. There will be large playgrounds on either side for boys, girls, and infants, all of which places will be approached from Church-street. The principal school-room is to be 16 ft. high. The roof-bindings will be dressed and chamfered, and partly exposed to view, and the ceiling divided into five compartments by four of these bindings, which will be stained and varnished, and supported on moulded and carved stone corbels. The ceiling of the infants' school-room will be the same height, with partially exposed roofing similar to the principal school-room, but divided into four

compartments. The whole of the internal woodwork is to be of red deal, stained and varnished. The style of the architecture will be Gothic, simply treated. The principal feature in the front of the structure will be a central gable, containing a triple-light window, and surmounted by a turret. The entrances are to be at the back of the principal wing of the building, one of which will enter through a triangular porch into the boys' school and class-room, and the other into the girls' and infants' school-room. The building will be constructed of hammer-dressed Elland Edge wall stone on the outer face, and tooled local ashlar dressings, and it has been so arranged that it may at any future time be conveniently enlarged by the addition of another wing, 52 ft. 6 in. long and 20 ft. wide. The various rooms will be warmed by means of gill-stoves placed beneath the floor, and the whole will be lighted and ventilated on approved principles. The designs have been prepared by Messrs. John Kirk & Sons, of Huddersfield, and Dewsbury, architects, under whose superintendence the works are being carried out. The cost of the structure will be about 1,100*l.*

Halsted.—The first stone of a new school has been laid here.

Books Received.

THE current number of the *Art-Journal* (a very interesting one) says,—“The parish church of the pleasant and sequestered Surrey village, Chaldon, has recently been under repair. During the operations, the workmen engaged in cleaning the plastered walls discovered, at the western end of the edifice, signs of an ancient painting, which at length developed itself into a large fresco, 10 ft. in height, and about 18 ft. in breadth. The subjects represented are souls in purgatory, their descent into it, their deliverance from it, and their reception into heaven, each being divided from the other by horizontal bands of geometrical pattern. The date of the work has been fixed by some members of the Archaeological Society to be of the eleventh century, or early in the twelfth; and it is stated that the Society proposes to give some account of it in their next publication.”—“Penny Statutes for the People. Kent & Co., Paternoster-row. No. 1. Married Women's Property Act, 1870. No. 2. The Pedlars' Act, 1870.” As “ignorance of the law excuseth no man” there is much need for penny statutes for the people. This, therefore, is a good idea, and it is to be hoped will be well carried out. The Contagious Diseases Act, the Truck Act, the Vaccination Act, and such-like, ought to be widely distributed in a cheap and popular form, such as this. The series is edited by Alagar Hay Hill, Barrister-at-Law, and annotated up to date by a staff of legal writers.

Miscellaneous.

Barton's Patent Recording Telegraph.—This consists of two plain revolving dials, each having a double groove at the rim to admit of an endless cord or rope, also a handle and a finger or indicator; and these are connected by an endless band of steel wire rope or any other fitting material. Upon this endless band or rope are fixed hanging swivels or holders, into which any kind of message written on ordinary paper or any other material, or a sealed missive if necessary is inserted. This done, the sender, A, simply turns the revolving dial until a small bell above the same gives the alarm, which by doing so announces that A's message has reached the receiver, B. Should B at the other end wish to send an answer back to A, he proceeds in the same way as A did at starting, the arrival of B's message to A being similarly announced by the ringing of a bell. If preferred, the messages can be sent from one department or office to another through tubes. If not thought desirable to send written messages, numerals or letters of the alphabet can be used instead, each numeral or letter of the alphabet representing some pre-arranged order or message for the day. If preferred, previously prepared messages—before the duties of the day commence—can be slipped in spaces around the dials instead of using numerals or alphabetical signs. Other applications of a similar apparatus are suggested.

* We are obliged to repeat, what we have often said, that the Median wall paintings found in our churches are not necessarily fresco work.

The Wellington Monument for St. Paul's.—Last week, some further correspondence was published on the subject of the Wellington Monument in St. Paul's. At the time we last spoke of this matter, a letter was sent to Mr. A. Stevens, from the solicitor to the Department, who was instructed to take the necessary measures to enforce the rights of the Crown. Thereupon Mr. Stevens wrote an appeal to Mr. Gladstone, stating that the First Commissioner contemplated “a great injustice,” and that the proposed course would prejudice the result as a work of art, and not secure any advantage to the public purse. No answer to this appeal appears in the published correspondence, but the solicitor's letter had the effect of causing Mr. Stevens to send down to St. Paul's all the finished marble work. Matters appeared to have remained in this position until the 24th of October, when Mr. Stevens was threatened with a suit at the instance of the Attorney-General. This Mr. Stevens said he had not the means of defending; he, therefore, resolved to give up possession of the model and materials of the monument. He was next ordered to discontinue any works in St. Paul's, and then the First Commissioner considered what he should do respecting the claim of the Crown against Mr. Stevens for the money he had received beyond what was due to him under his contract. He suggested that Mr. Stevens should memorialise the Treasury on the subject, and stated the resolve of the Board of Works to insure the completion of the monument by some sculptor of established eminence.

Selby Abbey Church.—A movement is being made for the purpose of replacing in the east window of this venerable pile the remarkable stained glass which formerly belonged to it. It appears that the right to repair this window rests by law in the receiver of the great tithes (Lord Londesborough). Some years ago, as the window was in a very shattered state, Mr. Petre, the then lay-rector, took out the lower part, intending, at his convenience, to restore and replace the original glass. The late Lord Londesborough had the glass taken to Grimsdon for his inspection, where it remained some time; and eventually it was sent back, probably with the idea of being faithfully restored, had his lordship lived; and it now remains in boxes, in the south aisle of the nave. According to Mr. J. Fowler, of Wakefield, the glass is of singular value, and belongs to the fourteenth century. He says,—“Certainly there is nothing in York Minster, which we always, with justice, regard as a mine of exquisite glazing, to compare with this window.” The window represents “The Root of Jesse,” or the genealogy of our Lord; and it possesses several special points of interest. It is to be hoped that the effort now being made will be successful.

Subways in the City.—Mr. Haywood, in his report on Street Tramways, mentioned in our last, makes a suggestion worth consideration. He says,—“There can be no doubt that the tramways will have to be disturbed at times by the gas and water companies, and that when such is the case much more inconvenience will ensue both to the companies and the public than at present is the case; indeed, those companies are in the City likely to prove the source of great inconvenience to the tramways, and this, under other circumstances, points to subways as the remedy. It seems probable that in the course of a short time the gas company lighting the City will pay its maximum dividend of 10 per cent., after which its surplus profits must go towards a diminution in the price of gas, and it is worthy of consideration whether such surplus could not in the public interest be best employed in the formation of subways, so that the opening of the street surface might be obviated afterwards.”

Knightsbridge Barracks.—A deputation has waited upon the Chancellor of the Exchequer, and urged him to proceed with the Bill, of which notice had been given, for the removal of Knightsbridge Barracks. Mr. Lowe assured the deputation that he was taking all necessary steps for the demolition of the barracks, which, if not pulled down, would cost the Government a considerable sum for repairs.

White's Club House, St. James's-street. This property has been sold by auction. As an investment, it appeared that the rental was 2,100*l.* per annum for eleven years, when the lease to the club expires. The sum realised was 46,000*l.*, the purchaser being Mr. H. W. Eaton, M.P.

The Alhambra. Profits.—The irrepressible Alhambra appears to be indebted to the licensing (or, in their case, the unlicensing) Middlesex magistrates for an increase of prosperity and profits, during the past half-year. The case resembles somewhat, in this respect, that of the coffee-hall in the Adelaide Gallery, to which they refused a music-licence some years ago,—for what precise reason it is hard to say, unless it were that this very temperate and well-conducted, though crowded, resort of respectable and intelligent people, for tea and talk, was open as a coffee-room, or *café*, without music, on Sundays, and stood opposite a church, the congregation of which made use of it for coffee, wine, and other refreshments. However, the refusal of the music-licence, which, by the bye, had been freely granted under a previous occupation, when *posés* *gustiques* and strong drinks were in the ascendant, not only did no injury to it, but saved the great cost of music, and seems to have decidedly benefited it. The report of the Alhambra directors for the half-year ending the 31st of December last has been issued, and states that the number of visitors during that half-year had been 417,369, as against 376,991 in the corresponding half-year of 1869, showing an increase of 40,369. The gross receipts have been 41,928*l.* 15*s.* 4*d.*, and the gross expenditure 32,505*l.* 2*s.* 4*d.*. The difference between these sums represents the net profit on the half-year's working,—viz., 9,423*l.* 13*s.*, being 1,507*l.* 19*s.* 8*d.* in excess of the amount of profit realised in the corresponding half-year of 1869. A dividend is recommended at the rate of 25 per cent. per annum, free of income-tax, for the half-year, carrying forward a balance of 2,252*l.* Four years of this sort of management thus suffices to repay every shareholder his capital. It is said the Alhambra has got a theatre-licence, but will go on much as it was before the dancing-licence was taken away.

Steam Cultivation.—At a recent exhibition of the process of steam-ploughing, at Stowe Dastle, the engine at work was a 12-horse power portable. The maker claims for it several specialities. The winchless, which is the principal feature of the apparatus, is an invention of Mr. Hayes who has patented it. It has been described by the *Engineer* as one of the most ingenious combinations of mechanism in use. Its great advantage is, that when the cultivator reaches the headlands, the mere turning of a handle by the engine-driver throws the strap on to the opposite pulley, and the work goes on continuously without stopping or reversing the engine. If it should be necessary to stop the cultivator at any point, the belt is thrown on a loose pulley occupying a central position between the working pulleys, the engine not being interfered with. There is also an arrangement by which the anchor-men in the field can stop the cultivator if all of them are out of sight of the engine-driver. The cultivator was one of Mr. Hayes's, and it is said to have broken up the ground in first-class style.

Meters for Water Supply.—A paper has been read at the Royal Scottish Society of Arts on Water Meters, as in use by Water Companies, and Design for simplifying and cheapening their construction," by Mr. John Reid, F.R.S.S.A., Engineer and Manager of the Edinburgh and Leith Gas Company. Mr. Reid at some length explained the functions of the water-meter, and some of the difficulties attending their construction. He described a meter of his own invention so far as regarded the movement of the piston. This movement he likened to what takes place when turning a card over on one edge on a table,—sliding it back to its original position,—turning it again in the same direction on its opposite edge, and so on as before. A projecting part of the central spindle gives action to a registering index outside the instrument.

The Engineer of the Cheltenham Waterworks Company.—We are pleased to hear that the Cheltenham Waterworks Company have presented their engineer and manager with an honorarium of 100 guineas, in recognition of the valuable services rendered by him in the designing and construction of the new waterworks at Tewkesbury, under the powers of their last Act of Parliament.

The "Captain."—It is stated at Portsmouth that an attempt is about to be made by Mr. Griffith, a civil engineer, to raise the *Captain*, which foundered off the coast of Spain on the morning of the 7th of September last, but that he will receive no aid from the Government.

Newspaper Press Fund.—At a special general meeting, on the 4th inst., the committee reported that the accumulated capital of the Fund is now 5,500*l.* The roll-book comprises in the aggregate 239 members, 166 of whom are resident in the metropolis, and the remaining 73 in the provinces. At present the advantages of the fund are restricted to the subscribers to it. It has been suggested, and we think wisely, that the time has come when, in order to maintain for the Fund the sympathy and aid of the general public, some little change might be made in this respect. A committee has been appointed to consider the question. Mr. Godwin (in the chair), Lord Houghton, Mr. Mould, Mr. Finden, Mr. Hyde Clarke, Mr. Charley, M.P., Mr. Gruneisen, and others, took part in the business of the meeting. At the close it was announced that the Right Hon. the Earl of Carnarvon had consented to preside at the annual dinner to be held at Willis's Rooms on the 13th of May.

The New Schools.—In the Commons Mr. Hick asked the Vice-President of the Council why it was made a condition in new schools that, in order to be entitled to a building grant, they should not exceed 20 ft. in width; and, since it was found both inconvenient and difficult to comply with such condition, whether he would be disposed to modify it. Mr. Foster replied that this condition had been made by the Education Department after very considerable inquiry. He could hold out no hopes of modifying it, for two reasons. First, as building grants had come to an end, this was scarcely the time for making any alteration. Secondly, they did not consider it to be an advantage to have the schools wider; and, as so much a square foot was paid, the Education Department could not undertake to pay more public money than was necessary.

The Bridge over the Stour.—Tenders have been sent in for the bridge over the Stour, to communicate with the projected canal wharf, New-road. Eighteen plans and specifications were sent in from all parts of the kingdom; but as the council said nothing about the limit of cost, these vary in expense from 480*l.* to 3,000*l.* From the eighteen, those by Mr. George B. Ford, of Burslem, have been selected; and the work will be commenced forthwith. The wharf will be in the immediate neighbourhood of some of the largest mills in the town, viz., Messrs. Brinton & Co.'s, Messrs. Dixon & Sons', Messrs. Morton & Son's, Stour Valley (Earl of Dudley's), Mr. Green's, Messrs. Watson & Naylor's, &c., and will be of immense service to manufacturers and merchants.

Kencott Parish Church.—In the chancel of this church on the south wall there is a monument set in a wooden case, with oak folding doors, like a triptych, to close over all and protect it from injury. It is to the memory of Richard Colchester, of Westbury, co. Gloucester, D.C.L., who died Sept. 11, 1643. Also to his wife Elizabeth, daughter of Sir Hugh Hammersley, Kt., Lord Mayor of London, by Mary, daughter of Baldwin Derham, of Derham, co. Norfolk. In the head of the Norman door of this church is a bold carving of Sagittarius, with the letters "Sagit."

Portland Breakwater.—On Saturday last, at noon, according to the *Times*, the operations connected with the construction of the Portland Breakwater were brought to a close by the depositing of the last stone, without the slightest display or ostentation, Mr. Coode, the engineer, in-chief, being present at the time. We have not heard whether there is to be any formal ceremony. The gales of the last five or six months, many of which have been unusually severe, have not done the slightest damage to the work. It may therefore be regarded not only as finished, but safe.

Sale of Site of Newgate Market.—Messrs. Winstanley & Horwood last week submitted for sale by auction, at the Mart, the site of Newgate Market, possessing two frontages of about 134 ft. each to the east and west, and two of about 87 ft. each to the north and south. The site contains about 10,100 square feet. It realised 20,000*l.* It is to be hoped proper arrangements have been made for the reservation of roads.

Metropolitan Buildings Act.—We understand that the Metropolitan Board of Works will bring in a Bill, with a view to a new Act, very nearly similar to the Bill read last session and withdrawn.

The New Home and Colonial Offices.—On Lord J. Manners asking the First Commissioner of Works, in the Commons, when it was intended to remove the block of houses between Parliament-street and King-street, facing the new Home and Colonial offices, Mr. Ayrton said a portion of the block of buildings referred to was in occupation as offices. The whole block could be pulled down when the new Home and Colonial offices were erected. A portion of the back had already been pulled down. Great inconvenience and loss would occur if the houses were all to be pulled down at once. In reply to a further question, Mr. Ayrton said there was no Act of Parliament which directed that the land should now be applied to public purposes. It was, however, competent to the Government to do what was necessary to secure proper approaches to the new offices. Those approaches would probably be best made by keeping the land enclosed.

Serious Accident at a Circus.—An accident, resulting in the death of two men and serious injury to five others, has occurred at Adams's Circus, in the course of erection in the Wholesale Market at Bolton. The building, which is in the form of a parallelogram, is of wood, and is being built by Mr. James Rigby, of Bolton, from the plans of Mr. Harrison. The sides of the circus were finished, and workmen were engaged putting on the roof; and while this was being done the whole mass of the roof fell into the body of the circus. Eight men were working below at the time, and two of these were killed by the falling beams, and three others seriously injured.

The Windsor Surveyorship.—The candidates for the office having been reduced to nine, and one of these having retired from the contest, the following presented themselves before the Board:—Mr. Byrne, Windsor; Mr. T. V. Davison, Gerard's Cross; Mr. Jennings, Lewisham; Mr. Nicholson, Luton; Mr. H. O. Smith, Croydon; Mr. Weaver, Leicester; Mr. Creane, Brackley. The voting then took place with this ultimate result:—Davison, 11; Byrne, 7. Mr. Davison was then duly elected. There were fifty-nine candidates.

Royal Albert Hall.—The programme of the State opening on the 29th inst. has been issued. An address will be read by his Royal Highness the Prince of Wales. Her Majesty will make a reply, and formally open the Hall, which will be announced by trumpets and a Royal salute in the Park. A cantata, composed expressly by Sir Michael Costa, will be performed by full orchestra and chorus of 1,000 performers. After her Majesty has quitted the Hall, a grand miscellaneous concert will be given, to be conducted by Sir Michael Costa.

The Trades Movement.—The operative joiners in Ayr, to the number of 60 or 80, have struck work, in consequence of the employers' refusal to accept their offer of beginning work at an advance of a farthing per hour at present, and another farthing three months hence. They now demand the advance originally sought, of a halfpenny per hour. It is believed that the masters are to stand by their original offer of a farthing advance unconditionally, and that the workmen have expressed a desire to have a friendly conference, in order, if possible, to come to an amicable arrangement.

Art Prizes, Crystal Palace.—The directors offer prizes for "the best pictures of the English and foreign schools, to be exhibited at the Crystal Palace on and from the 1st of May, 1871, and during the continuance of the International Exhibition in London." The prizes for the English school will be:—For the best historical or battle picture, in oils, 40*l.*; for any other figure subject, in oils, 35*l.*; for landscapes or sea-pieces, in oils, 30*l.*; for the best water-colour drawing, irrespective of subject, 25*l.* Foreigners will receive medals in lieu of money prizes.

Memorial Fountain of the late Mr. Joseph Payne.—The Metropolitan Board of Works have informed the Secretary to the Drinking Fountain Association that they are not prepared to accede to his application that a fountain, in memory of the late Mr. Payne, should be placed upon the Embankment.

The Proposed Drinking-Fountain in Smithfield.—The Markets Improvement Committee of the Corporation have selected eight of the designs for the new drinking-fountain in Smithfield from which to make their final choice.

The Dilapidation of York Minster.

Those who are acquainted with York Minster will remember the south transept, which is the work of the thirteenth century, and was erected by Walter de Grey, one of the archbishops of York. It has been for some time surmised that this portion of the building was in such a dilapidated condition as to require early attention, in order to insure its preservation. The dean and chapter have consulted Mr. G. Street, of London, who has made an examination of the south transept, the result of which was to prove that the conjectures above alluded to were well founded. An appeal to the county for funds is probable.

Prevention of Rust.—Dr. Craze Calvert states that iron immersed for a few minutes in a solution of carbonate of potash or soda will not rust for years, though exposed continually in a damp atmosphere. It was believed long ago by soap and alkali merchants that the caustic alkalies (soda and potash) protected iron and steel from rust, but that the components of these salts preserved the same property as they do in a caustic state now. It does not seem to matter whether the solution is made with fresh or sea water.

"Safes."—In Lord Enfield's reply to Colonel Sykes, with reference to the destruction by fire of the Consular Buildings at Shanghai, reported in the Parliamentary intelligence, he said that the wills and other valuable documents were preserved in a safe. We are asked to mention that the *Shanghai Courier*, of December 24th, 1870, stated that they were preserved in two of Milner's safes; and that the titles and bills of sale, which were in a common iron safe, were all destroyed.

Report on the Sanitary Condition of Ross, Herefordshire.—Dr. R. T. Thorne has reported on the sanitary state of Ross, where fever and diarrhoea have been prevalent. Dr. Thorne shows the great necessity for sanitary improvement, and recommends various remedial measures, especially as regards waterclosets and cleansing of privies and midden heaps, thorough sewerage, and water supply; the appointment of a nuisance inspector, and a medical officer of health, &c.

Society for the Encouragement of the Fine Arts.—On the 2nd inst. a lecture was given in the Society's Rooms, 9, Conduit-street, "On the Common Elements of Beauty in Race, in Georgia, Circassia, the Holy Land, and Britain," by Mr. Hyde Clarke, in which the author brought forward a theory of the principle on which a general standard of beauty in art has been accepted in classic times and in the modern age. Dr. Dresser presided.

Avon Intercepting Sewer, Bristol.—We understand this important work has been entrusted to Messrs. Neave & Fry, who have lately finished extensive drainage works at Portsmouth. The contract embraces about 8,000 yards of brick sewers, varying in size from 3 ft. high by 2 ft. 6 in. wide to 7 ft. 6 in. in diameter. The works will be commenced immediately, and are to be completed within eighteen months.

St. Peter's Church, Clerkenwell.—Messrs. Lavers, Barrand, & Westlake request us to say, with reference to the west window of this church, described in our columns as "from their hands," that they "merely executed the work from a design sent to them, and are therefore not responsible for it."

St. Edmund's, Salisbury.—The mosaic rosettes here was designed and executed by Messrs. D. Bell & R. Almond, under the direction of Mr. G. F. Scott, B.A., and not by Dr. Salviati, as stated.

The Institution of Surveyors.—The next meeting will be held on Monday, March 13th, when papers on "Tithes and Tithe Commutation" will be read by Messrs. W. Sturge and J. Oakley.

TENDERS.

For main drainage works, Avon intercepting sewer district of Bristol. Mr. F. Ashmead, C.E.:

Moore	£45,734 0 0
Mercerweather	13,623 0 0
Warburton	38,445 0 0
Blinkhorn	36,331 0 0
Baker	30,161 0 0
Storkey	35,298 0 0
Kyan & Co.	30,918 0 0
Jones & Jepson	30,179 0 0
Perry & Co.	29,195 0 0
Furness	29,354 0 0
Neave & Fry	29,839 0 0

For Congregational Chapel and School, Thames. Mr. W. F. Cooper, architect. Quantities not supplied.—
Cooper.....£1,607 0 0
Holland.....1,505 0 0
Spicer.....1,425 0 0
Wells (accepted).....1,119 10 0

For New Wesleyan Chapel, North Woolwich. Mr. R. Hoole, architect:—
Wright.....£236 0 0
Kelly.....786 0 0
Hobson (accepted).....780 0 0

For rebuilding No. 23, Holywell-street, Strand. Mr. T. H. Rowley, architect. Quantities supplied by Mr. J. T. Green:—
Sharpling & Osle (accepted).....701 0 0

For fixtures at S. Luke's Infirmary, Wards. Mr. H. Saxon Snell, architect:—
Bamford (accepted).....£130 0 0

Accepted for three shops, at Blackburn. Mr. G. T. Truett, architect:—
Calvert (bricklayer).....£723 0 0
Patterson (Mason).....1,100 0 0
H. & A. Duckworth (Carpenter and Joiner).....1,025 0 0
Jepson & Listerwood (Plasterer).....265 0 0
Ward (Plumber).....285 0 0
Ashcroft (Slater).....36 1 3
Bellhouse & Co. (Ironworks).....41 10 0
Davies (Bellhanger).....31 0 0

For additions to Borrowstone, Kincardine O'Neil, Aberdeenshire, for Captain Hart. Mr. G. Truett, architect:—
MoAndrew.....£1,139 8 0
Garrie.....1,100 0 0
Henderson.....1,060 0 0
Warrack & Daniel.....1,012 0 0

For nine warehouses, Monkwell-street, City, R.C. Mr. H. Ford, architect. Quantities supplied by Messrs. Hovenden & Heath:—
Gammon & Sons.....£14,919 0 0
Williams & Co.....14,877 0 0
Tongue.....14,875 0 0
Pritchard.....14,812 0 0
Stimpson.....14,316 0 0
Bleate.....14,330 0 0
Ferry & Co.....14,237 0 0
Dove, Brothers.....13,887 0 0
Nightingale.....13,875 0 0
Brown & Robinson.....13,875 0 0
Crabb & Vaughan.....13,813 0 0
Conder.....13,077 0 0
Brass.....13,034 0 0
Myers & Sons.....12,985 0 0
Hill, Keddell, & Waidman.....12,858 0 0
Scrivenner & White.....12,745 0 0
Henshaw (accepted).....12,653 0 0

For a rectory at Croydon, Surrey. Mr. J. Berney, architect:—
Holridge.....£2,170 0 0
Roberts.....2,140 0 0
Crabb & Vaughan.....1,950 0 0
Wright.....1,950 0 0

For alterations and additions to Elizabeth House, Hampstead, for Mr. H. Smith. Mr. W. Norris, surveyor:—
Williams & Son.....£1,116 0 0 Deduct.....£142
Hayworth.....1,055 do.....117
Boden.....1,010 do.....120
Roberts.....999 do.....145
Till.....900 do.....115
Sawyer.....839 do.....99

For St. Faith's schools, Maidstone. Mr. E. W. Stephens, architect:—
Hammond.....£1,306 0 0
Pickett & Taylor.....1,230 0 0
Clark & Son.....1,093 0 0
Bridge.....1,083 0 0
Grinstead.....1,077 0 0
Vaughan.....1,075 0 0
Holway.....1,064 0 0
Antcombe.....1,060 0 0
Cox, Brothers.....1,050 0 0
Aard.....1,045 0 0
Clement & Walls.....1,040 0 0
Wright, Brothers, & Goodchild.....1,015 0 0

For public-house, Queen Victoria-street, Mr. Merriek, architect:—
Crabb & Vaughan.....£1,805 0 0
Olden.....1,837 0 0
Weber.....1,715 0 0
Colts.....1,740 0 0
Eade.....1,745 0 0
Sharp.....1,687 0 0
Wicks, Bangs, & Co.....1,637 0 0
Ellis.....1,649 0 0
Petram.....1,563 0 0
Pater.....1,600 0 0
Ball.....1,587 0 0
Culham.....1,593 0 0
Blackmore & Morley.....1,563 0 0
Lacey.....1,550 0 0
Stem.....1,532 0 0
Eaton.....1,532 0 0
Marion.....1,530 0 0
Warn.....1,500 0 0
Ingram.....1,495 0 0
Hurst.....1,469 0 0
Watson.....1,480 0 0
Rooney, Brothers.....1,455 0 0
Lambey & Co.....1,425 0 0
Marr.....1,395 0 0

For alterations and repairs to five houses in Croydon-road, Peuge. Mr. P. D. Tuckett, surveyor:—
Ferrar.....£270 5 0
Hoare & Postlethwaite.....200 0 0
White.....188 0 0
Shapley & Webster (accepted).....183 0 0
Diplock.....110 15 0

For alterations and additions to premises in Deansgate, Manchester. Mr. Sherwin, architect. Quantities supplied:—
Statham & Sons.....£1,340 0 0
Witter.....1,130 0 0
Terra.....1,169 0 0
Ratcliffe.....1,107 0 0
Wilson.....1,103 0 0
Herd & Radie.....1,100 0 0
Cardwell.....1,095 0 0

For ornamental cast-iron fronts and revolving steel shutters:—
Clark & Company.....£229 5 0

For the erection and completion of three houses at Brooklands. Mr. Sherwin, architect. Quantities supplied:—
Davidson.....£1,043 0 0
Ratcliffe.....980 15 0
Winter.....975 0 0
Herd & Radie.....958 0 0
Latham.....950 0 0
Cardwell.....915 0 0

For the erection and completion of a ragged school and Working-men's Church, Lombard-street, Deansgate, Manchester. Mr. Sherwin, architect. Quantities supplied:—
Wade, Brothers.....£250 0 0
Herd & Radie.....1,820 0 0
Statham & Sons.....720 0 0
Winter.....720 0 0
Wilson.....713 0 0
Herd & Radie.....688 0 0
Cardwell.....655 0 0

For new building in St. Paul's-churchyard. Mr. Henry S. Legg, architect:—
Hill.....£2,164 0 0
Brass.....1,971 0 0
Coote.....1,890 0 0
Conder.....1,838 0 0
Patman & Fotheringham.....1,887 0 0
Elkington.....1,764 0 0
Colls.....1,743 0 0

Accepted for offices at Kidsgrove, Staffordshire. Mr. G. B. Ford, architect:—
Booth.....£498 16 0

Accepted for schools and teacher's house at Milton, Stoke-on-Trent. Mr. G. B. Ford, architect:—
Mop.....£287 0 0

For first portion of alterations to Bedford Hall, near Newcastle-under-Lyme. Mr. G. B. Ford, architect:—
Bradbury.....£235 0 0

Accepted for woodwork in House at Chesterton. Mr. G. B. Ford, architect:—
Bennett.....£120 0 0

Accepted for houses at Chell, near Tunstall. Mr. G. B. Ford, architect:—
Bennett & Co.....£480 0 0

For main sewerage works, for the Township of Sale, Cheshire. Contracts Nos. 4, 5, 6, and 7. Mr. A. G. McBeath, C.E.:—

Contract No. 4.	Contract No. 5.	Contract No. 6.	Contract No. 7.
£5097	£2775	£2320	£1306
Jewitt & Nicholl.....	3735	1800	1700
Naylor, Brothers.....	3500	2012	1501
Taylor.....	2537	1916	1371
T. & W. Meadows.....	2710	1301	1106
Hartley.....	2320	1299	986
Thames.....	2245	1234	932
Gilbert & Sharp.....	2121	1183	933
W. J. Worthington.....	2135	1187	936
Davies & Hammett.....	2016	1111	979
Kirkley.....	1965	1160	920
Woodlenden.....	1721	1081	897
Jeffreys (accepted).....	2062	1511	1175
Hudson.....	2523	1870	...
Duckworth.....	...	1480	...
Lee.....	...	...	...

For alterations and repairs to eight houses, at Sutton. Mr. P. D. Tuckett, surveyor:—
Ashby.....£738 0 0
Foster & Ferriss.....312 0 0
Hoare & Postlethwaite (three houses only).....175 0 0
Shapley & Webster (accepted).....291 0 0

For the erection of schools and class-rooms in connexion with the Wesleyan Chapel, Mostyn-road, Brixton. Messrs. J. Tilling & Son, architects:—
Hill & Sons.....£2,137 0 0
Henshaw.....1,891 0 0
Shurmer.....1,799 0 0
Myers & Sons.....1,784 0 0
Thompson.....1,780 0 0
Shepherd.....1,735 0 0

TO CORRESPONDENTS.

Forward—Col. R. C. G. F. A. H. S. B. J. N. E. V. L. B. W. W. L. R. M. & Son. W. J. M. M. J. L. S. M. M. J. S. T. H. J. L. F. O. F. R. M. C. L. F. R. S. A. W. F. P. S. B. T. L. H. T. & Son. J. E. R. C. T. F. R. H. C. R. O. G. & Y. W. N. Not an architect.—Banned out—C. L. E. G. M. F. D. T. Improve the parts shown, if old work are of the end of the thirteenth or beginning of the fourteenth century. The upper part tower would seem to be modern.—J. H. (in 1870) On Lines and Cement, in our next.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily published.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

VOL. XXIX.—No. 1467.

Architecture and Music.



HE nature and significance of the artistic relationship existing between different branches or languages of art is a subject which has received more attention from German than from English critics; belonging, as it does, to that class of metaphysical speculation with regard to artistic

principles which has always had a peculiar attraction for the German intellect, and has furnished opportunity for discussions and dissertations often more remarkable for length and subtlety than for any practical value to be deduced from them. The national and not altogether unreasonable prejudice among Englishmen against mere theorising ought not, however, to preclude the recognition that there is really a high interest for the mind in considerations of this nature, which is apt to be somewhat unduly overlooked among us; and that if the mere speculative interest of such a subject is not held sufficient excuse for introducing it here, it may be further urged that a comparison between two different art languages,—a consideration of the points in which they seem to affect our apprehensions in a similar manner, though through different media,—may tend to establish a clearer idea as to the real object and stand-point of the special arts in question. On this ground, therefore, it is scarcely necessary to apologise to our readers for saying a word upon the points of resemblance between the two arts named above, which are often, as if instinctively, classed or compared together, especially by architectural writers; but about the real relationship of which there seems nevertheless to be a good deal of misapprehension and confusion of ideas; to be attributed partly, perhaps, to the fact that while a large number of architects, theoretical and practical, have that kind of general appreciation of the sister art which leads them to take interest in it, very few have what can be called an artistic knowledge of it, derived from any degree of systematic study.*

The theory which regards the various branches of art as only so many languages for one sentiment,—so many forms under which the same spirit of beauty is made manifest,—receives tacit recognition even in our ordinary speech. It is almost trite to observe that we habitually apply the terms literally belonging to one art to characterise the productions of another; that we speak of the "tone" of a painting, the "colouring" of a piece of orchestral music, &c. But this relationship of the arts may be regarded in several different ways. There is an "organic coherence," as it has been termed, between different forms of art, and the manner in which their productions affect our senses, which rests entirely on scientific grounds, and is capable of mathematical demonstration. The similar proportions of the vibrations which in colours and in sounds affect the eye and ear respectively

with a sense of "harmony" and concord, afford, perhaps, the most familiar illustration of this mechanical relation between different arts, in itself very suggestive, but with which we are not specially concerned here. Then there are purely emotional resemblances in the effect of different works on the mind; as, for instance, when we say of such a picture as the magnificent *Salvator* recently exhibited at Burlington House ("Rocky Landscape and Hermit") that it reminds us of Beethoven; a remark which would be perfectly just and intelligible, at least to those who were so constituted as to realise its meaning. But when we class one entire form of art with another, as having special resemblances closer than exist between either of them and any other art, we mean something different in kind from either of the relations just illustrated; something less precise and mathematical than the first, but more definite, and less dependent on the special sensibilities of individuals, than such a mere emotional similarity of effect as in the instance just alluded to. How are we to define this, in the case especially of the two arts which we have observed to be so often mentioned as closely analogous?

The fact seems to be that, in all points wherein two distinct forms of art are felt to be in any degree analogous, a comparison is instituted, whether by a logical process or by intuition, between the nature and degree of the phonetic power of such arts; the manner in which each affects our intellectual perceptions, and the definite or indefinite nature of its speech. Looking at the subject in this light, we see at once that one striking point of resemblance between music and architecture is that these two alone, of all the higher arts, are not "phonetic" at all, in the sense in which that word has been most frequently used by recent art critics,—i.e., they are not capable of communicating any fact or fixed idea, or even of illustrating it, except in a very general and indefinite manner. The comparison is made, of course, with regard to instrumental music, which is the pure form of the art, music "married to immortal (or mortal) verse" being, in fact, a combination of two arts. Architecture and music alike, then, are restricted to *expression*. Each has within its scope a very wide, perhaps an almost unlimited range of expression of feeling; each can impress us with the idea of massive grandeur and stability, of gaiety or of gloom at will, and in a hundred differing forms and shades of feeling; but neither can go beyond the limit which separates vague and general expression of feeling from distinct and precise enunciation of fact or sentiment. These two arts are removed one degree back, if we may so speak, from the plane of intellectual vision, in comparison with the arts of painting and sculpture: they affect us more widely and generally, less definitely and circumstantially, than those last-named arts. Now, this is no unimportant point to bear in mind, in estimating aright the value and position of our own art. A theory has been put forth of late years, by critics of a certain school, which would deny to architecture any recognition, as a mere building art; which would regard the art of architecture as consisting solely in the application of sculpture and colour to buildings, not in the building itself at all; and much high-flown sentiment has been talked, both by writers who ought to have known better and by those who could not be expected to know better, about the insufficiency of mere proportion and outline and grouping to satisfy the mind, without the addition of imitative sculpture and painting. Now (not to mention other arguments), the objection may be disposed of at once, and the "phonetic" critics convicted out of their own mouths, if it be remembered that this inability to express facts or definite ideas characterises, in precisely the same degree, the art of music, the position of which among the highest and

most important forms of art no critic, so far as we are aware, has ever ventured to dispute: so that here, at least, a comparison between the capabilities of two forms of art-expression lends us some practical assistance in determining the status and value of one of them, or, at least, in guarding us against undervaluing it, on illogical or uncritical grounds.

Without attempting at present to show how complete a misconception of the objects of art is involved in the idea of estimating the importance of any branch of art mainly by its phonetic power, or ability to convey definite intelligence to our minds, we may proceed to remark that, though we have alluded just now only to the degree in which music and architecture are alike characterised by certain supposed deficiencies, if we come to compare the positive as well as the negative characteristics of the two arts, there is ample ground for establishing a relationship in kind as well as in degree, the consideration of which is not wholly uninteresting or useless. The most marked characteristic of music is *rhythm*,—the recurrence of an accentuation at marked and equal periods. It is this which, in conjunction with its employment of a regularly divided scale of sounds of appreciable pitch, distinguishes the art of music from what has been sometimes rather unhappily termed the "music of nature," the effect produced by sounds which are pleasing to the ear without being rhythmical or arranged in fixed proportions in regard to their vibrations. The analogy in architecture is almost perfect. What regular division in *time* is to music, regular division in *space* is to architecture. The repeated Greek column and intercolumn, the repeated Gothic buttress, the marking off of heights by string-courses, the symmetrical arrangement of windows,—all this is the rhythm of architecture; and as it is by regular accent that we define music, so it is by regular spacing and symmetrical disposition of parts that we distinguish the architecture of man from the natural scenery amid which it is placed: for nature, in her general aspects at least, is never regular; and when we find stones ranged in orderly rows, with even spaces between them, then, whatever may be the defacement that time and weather have wrought on them, do we unhesitatingly conclude that,—

"Here in old time the hand of man hath been."

Pictures and sculpture (when independent of building) do not, it is scarcely necessary to point out, exhibit this regularity of rhythm; approaching more nearly to the imitation of nature, they partake also of the freedom and irregularity of nature. A point in the treatment of design in architecture or music may be instanced, again, as illustrative of their resemblance in principle,—the necessity, namely, that we are under in each art, of providing a definite and well-marked *stop* to movement of line in any special direction. To instances: our cornice, which furnishes the boundary to the vertical height of the building, must, to satisfy us, be more than merely a single bounding line; not only do we project it, mould it so as to present several horizontal alternations of light and shadow, but we must have a second smaller cornice under it, too (*the tertia*), to break the impact on the principal cornice, and give the first check to the vertical ascendancy, before it becomes finally set at rest by the heavier lines of the main cornice. Where it is only one story that has to be stopped, the eye is contented with a single small string-course. So, as it has been observed, in the Doric column, a single indented line at the necking would not be sufficiently decisive to stop the numerous and strong vertical lines formed by the fluting; we must have four or five of those cross-scoring in succession to form our astragal, and make a decisive termination to the vertical lines. And when we turn to music,

* The architects, however, taken *en masse*, know more about music than the musicians do about architecture: so much so we may safely maintain on behalf of our own "guild."

what is the meaning of the prolongation of the primary harmonies of the key at the close of a long piece? We can close a single phrase or passage of a few bars satisfactorily with a single chord: but when we come to the close of (for instance) Beethoven's C minor symphony, what is the meaning of the prolongation of the same fundamental harmony through the last twenty-nine bars, including the repetition at the close of the same identical chord five times, with intervals between, before the final rest on the long chord which closes the whole? This is precisely the same thing as the repetition in architecture of lines in one direction to stop those in another direction. In the symphony we have gone through many gradations of form and proportion, many variations of rhythm and of treatment, we are at last approaching completion, but we must crown the edifice; abrupt cessation on the "tonic harmony" of the key will not serve the purpose, we must have this harmony repeated and repeated, until it completely dominates and overpowers the recollection of all the variations of treatment that have preceded it, and is felt to be a sufficient bound and conclusion to so long and elaborate a composition. This is, in short, the opposing line of the cornice staying further progress; every preceding passage in the composition has led naturally to something further, but this persistent repetition of the full chord of the key leads to nothing; it is manifestly the end, and is fully conclusive. And a little examination of the subject will show that as, in architecture, the grander and more massive the style of design, the more marked must be the termination of the composition; so it is in music. A light aerial fanciful composition may finish abruptly, or run off to a point, so to speak; but wherever there is in the music stateliness and dignity of movement and expression, there invariably we find the composer has recognised or felt the necessity for strong and repeated bounding lines at the close. Nor are the subordinate divisions of architectural composition without their precise counterpart in the art of sound. In every extensive and regularly constructed composition we find, about one-third from the commencement, a marked and complete close (indicated commonly by a double bar on the paper), separating the first part of the movement, in which the main features of the composition are set forth, from the second, in which they are elaborated and further worked out. The analogy here is perfect: the double bar marks what would be the first important horizontal stage of the architectural composition, dividing the comparatively plain and simple ground story of the design, where its main features and treatment are indicated, and on which all the rest depends, from the more ornate principal stage of the composition, where the artist is at liberty to play with his design more, and introduce ornamental features which would be out of place in the basement of his composition. So complete is the æsthetic parallelism here, that we have only to substitute terms of time for terms of space, and the same general principles, and even much of the same nomenclature, would be applicable in both cases.

Such are one or two of the salient points in which the arts of architecture and music appear to run parallel,—points of resemblance which may be perceived and admitted even by those who suffer under the affliction lamented by Charles Lamb, of "having no ear," and which in fact distinguish these as the arts which speak to us through the medium of proportion and symmetry in Space and in Time respectively. Such a resemblance obviously rests on quite different grounds from the rhapsodies about "frozen music," and other such Manchesterian reflections, which we sometimes meet with. There are, nevertheless, other important similarities of a somewhat more indefinite nature; and could we reckon on a majority among our readers to whom such reflections would be of interest, we might go a step further in the metaphysical direction, and point out how essentially constructive an art is music; how, like architecture, it has its laws of constructive truthfulness of expression; how it is bound to the maintenance of certain general proportions and relations of parts, not to be overlooked or foregone without injury or destruction to the composition: how a musical composition, like an architectural, must have its solid basis, its structural lines, and finally its lighter ornament, which in detail is more or less independent of the general design; which, indeed, has sometimes been left to the performer to elaborate and

invent at pleasure;* just as we occasionally leave a skilful decorator or carver to exercise his discretion on detail, provided he interfere not with our leading design. We might indicate, too, how similar in its general tendencies has been the course run by each of the two arts, though by no means chronologically coincident; for the life of music has been short indeed compared with the hoar antiquity to which architectural monuments carry us. But in the earlier efforts of musical art the clearness of melodic line, the symmetry of harmonic construction, and the almost total absence of passion or of varied colouring of effect, forcibly remind us of the classic age of architecture; and even the choruses and organ-fugues of Handel and Bach, written when the art had attained a consciousness of its powers, have more affinity in feeling with Greek than with Gothic art. So in the transition from this older style to the "romantic" school of which Beethoven is the typical name, we may trace, as in architecture, the struggle for free and forcible expression, the rebellion against precedent; and in the great works of the modern school we find the same æsthetic characteristics as in Gothic architecture,—a passionate earnestness, a defiance of rules and precedents, an exuberance of colour and ornament sometimes totally disproportionate. It must be added too, we fear, that in the works of some of the most recent musical "prophets" in their art we find only too precise a reflection of the disregard for meaning and symmetry, the wilful disproportion of parts, and the putting forth of novel ugliness for originality, which characterise some of what is called modern Gothic architecture. Such considerations, though productive of much matter for reflection, it would be out of place to push into detail here. We will rather conclude these few suggestions with one of a practical nature. Amid all that has been said from time to time, in the way of comparison between music and architecture, we scarcely remember to have seen any indication of an appreciation of the practical effect which the late birth and perfecting of so important an art as music should have upon the forms and structure of some of our largest buildings. The single exception we can recall is in some remarks and suggestions on the construction of music-halls appended by Mr. Ferguson to his "History of Modern Architecture." In former times the plan and construction of different classes of buildings sprang out of the necessities for which the buildings were erected. As we know, there is little of this now: our churches, for instance, are scarcely ever built in accordance with the real requirements of congregations; it must be confessed, indeed, that we seem to have much difficulty in settling what those requirements are. But the invention of the art of music, the only entirely modern art (unless we class photography among the arts), and the recent and constant efforts that are being made to organise musical performances on a grand scale, form a new condition, demanding from the art of architecture a suitable provision to meet it. The taste for gladiatorial show among the Romans left us the amphitheatre: is it to be said that the taste for great public entertainments of so much nobler and so unique a class is to leave behind it no sign on the architecture of our day, in the shape of buildings specially provided for ensuring the highest possible musical effect, combined with architectural beauty? There has been little done in this way as yet; our large town-halls and public concert-rooms, built in some cases (as at Leeds, Birmingham, Liverpool) on purpose to supply the want just named, are simply large and handsome rooms; they might be intended for any other purpose besides music-rooms; there is no evidence of their being designed with a special reference to a scientific provision for acoustic effect: some of them are directly injurious thereto, and where they succeed it has been by accident. It may be said that buildings constructed with such an end only in view could not be made architectural; that any proper provision for acoustic effect must of necessity involve the adoption of forms inimical to architectural effect, the omission of features hitherto supposed to be essential thereto. But what is architecture for, and what is the calling of an architect, but to provide an ornamental and artistic manner of meeting new conditions in

* The performer, however, in such a case, would scarcely think of claiming to be regarded as the composer of the piece. Unfortunately we are not without instances of the claim, equally reasonable, on the part of decorators, to the whole architectural credit of a work.

public and private life, and (consequently) in public and private buildings? We hear much talk of the want of something new in our architecture: let us, among other things, take up such new subjects as this; let some member of our profession see if he cannot invent an interior which shall assist the effect of musical performances, while offering at the same time an architectural design such as to satisfy the eye and mind, and he will have done something for his generation, and have established one new and very desirable connexion between Architecture and Music.

COLONEL SCOTT, R.E., ON LIMES AND CEMENTS.

THE remainder of Colonel Scott's first lecture* was devoted to a consideration of those substances which were frequently present along with carbonate of lime in various limestones, or which had been at different times used as substitutes for lime in building. Thus we have already seen that carbonate of magnesia yields, when deprived of its carbonic acid, a substance which has been used for hydraulic purposes in India owing to its very low degree of solubility; hydrate of lime being nearly seven times as soluble as hydrate of magnesia. It is to the presence of certain clay matters in the lime that we owe its most important qualities; these clays consist principally (as shown in the table, p. 140, ante) of the silicates of alumina and iron, together with small quantities of the silicates of the alkalies, &c. When lime and siliceous are mechanically mixed, and allowed to remain together at ordinary temperatures even for months or years at a time, little or no change takes place, but if lime and siliceous, intimately associated together as they are in the grey chalks, and in many clayey limestones, are subjected to a red heat, a chemical change takes place resulting in the production of a material which, on the addition of water, will form a silicate of lime. Siliceous acid, however, has a much greater affinity for several bases than for one, so that this combination takes place much more readily in the presence of alumina, oxide of iron, &c., when so called double silicates are formed, and these double silicates give to the lime some of its most important properties. If we examine the silica contained in a sample of burnt clayey limestone, we shall find that its condition has been greatly changed, and in lieu of being insoluble in acids, as it was before calcination, it has become a freely soluble and gelatinous mass. This jelly-silica, when present in lime, renders it, when treated with water, capable of setting quite independently of the action of the atmosphere; for in lieu of hardening gradually as carbonate of lime, such times as the above will set as hydrated silicates of lime. Limes which contain a high percentage of this silica, as, for instance, the so-called Roman cements, are even capable of setting under water. Speaking of sulphate of lime, Colonel Scott showed that plaster of Paris resulted from a partial dehydration, by means of heat, of the gypsum or plaster-stone. If this burning is carried too far, the whole of the water is driven off, and we obtain the anhydrous sulphate, which will not again set on the addition of water. The extent to which the burning should be carried is judged by the workman wholly by the colour of the material, and its appearance when broken; and it is such, that three-fourths of the water it contains must be driven off, leaving a substance having the formula $\text{CaO}, \text{SO}_3, \frac{1}{2} \text{H}_2\text{O}$. Owing to its great solubility, the plaster of Paris is quite unfitted for external work.

With this latter substance he might terminate his remarks on the materials themselves. He has spoken of three classes of limes, namely, the pure oxides of calcium, which, on the addition of water, formed soluble hydrates, which could never harden properly, except by the aid of the carbonic acid gas of the atmosphere, and he had shown that even this hardening could never penetrate to any great depth beneath the surface; secondly, of the compounds of lime, alumina, iron, &c., with silica, in which the siliceous acid was brought by the calcination into such a condition that on the addition of water it would run into combination with the lime, giving rise to insoluble hydrated silicates; thirdly, of the sulphates which, when properly prepared, combined with water to form hydrated sulphates, but were, owing to their solubility, unfitted for anything but inside use. Colonel

* See pp. 140, 158, ante.

Scott then reverted to the chemistry of his subject, and asked his hearers to bear in mind the following facts,—first, that all chemical substances have always the same composition. Carbonate of lime, whether in the form of Carrara marble or white chalk, had exactly the same proportions of oxide of calcium and carbonic acid; secondly, if one substance unites with another substance in more proportions than one, these different proportions will always be in a fixed ratio to one another being multiples of the first. Thus, one part of carbon and one part of oxygen symbol CO, equivalent $6+8=14$, combine to form carbonic oxide (the blue flame which is emitted from the burning coke in our fireplaces), but one part of carbon, 6, combines with two parts of oxygen, 16, to form carbonic acid gas, which has consequently an equivalent of 22. Thirdly, when you have ascertained the proportions in which certain substances unite with each other to form compound substances, you will then know the proportions in which these substances will unite among themselves. Lastly, having ascertained the combining proportions of simple substances in compounds, we shall always find that these proportions are according to their chemical equivalents which we have previously obtained.

Colonel Scott then stated that the calcination of pure carbonate of lime was a very simple operation, merely requiring time, and that carbonate of lime is infusible except in an atmosphere of carbonic acid gas, so that unless the heat is too suddenly applied, no injurious effects can ensue from overburning. If the heat is too suddenly applied, however, so as to cause a great evolution of carbonic acid gas, it might sometimes be possible to form a fused crust or external layer preventing the escape of the gases from the interior of a large lump of stone. The burning of plaster generally takes place in large ovens somewhat resembling bakers' ovens, and requires, as we have already seen, great nicety. At 212° half of the water contained by the gypsum is driven off, and the whole of it goes at 272° , so that the requisite temperature is just a mean between these extremes, leaving a quarter of the original amount of water.

Perhaps the most important point, and one very little attended to, was the degree to which the poor or hydraulic limes should be burnt, for here we have several things to consider. If the burning were only just carried far enough to drive off the carbonic acid, we should get a lime having a powerful affinity for water, but with little or no tendency to combine with the silica after the addition of the water. If, on the other hand, the calcination was effected at too high a temperature, we should fuse the lime and silica into a slag or clinker of the silicate, formed in a vitreous way, having no tendency to slake or combine with water, and therefore of little or no use to the builder. But if the heat had been carried to just the right point, we should get the whole of the carbonic acid driven off, and the silica brought into that condition in which, on the addition of water, it would run into a solid mass with the lime, thus forming a silicate in the aqueous way. The proportion of clay in a limestone might generally be regarded as an indication of the amount of heat it should undergo. Limes containing a high percentage of iron and alumina, as, for instance, Roman cement-stone, required to be burnt at a very low temperature, for fear of fusion; while Portland cement, in which these substances were present in much smaller quantities, would stand a much greater heat, without the formation of slag. Portland cement, to be properly burned, requires to be carried to what might be called a state of incipient fusion. In this condition, it became very dense, and weight was thus a fair, though not always a reliable, test for Portland. Hydraulic lime for use by slaking ought to be burned "tender" (i.e., not overburned); for if the heat is too great, small portions will be fused, and will not "fall" on the addition of the water, and these hard particles, by subsequently becoming hydrated, will inevitably endanger the stability of the work. The difference between a hydraulic lime and a cement is often misunderstood. Colonel Scott stated the difference to be this,—a cement is a substance which unites with water, and slakes or passes into the hydrate in one operation; a lime slakes first, and combines with the silicic acid, or sets subsequently. The slaking of lime was a matter on which much had been said, and written. Most authors spoke of three methods of procedure. Firstly, by the ordinary mode, or sprinkling with water, and

then covering the heap up with sand; secondly, by immersion, which consists in dipping the lime in baskets into water, until the hissing ceases; and thirdly, by spontaneous action, or spreading the lime out in thin layers, so as to absorb the damp from the atmosphere. The opinions of most of the authors he had consulted were so varied that he thought that little reliance could be placed in any of them. His own view was that in the case of the hydraulic limes, the only ones which were fit for use, the best plan was to sprinkle with water, and cover them up well with sand, to keep in the steam for at least twenty-four hours, when the harder or more inert particles would stand a chance of getting thoroughly slaked. The quantity of water consumed by different kinds of lime in slaking appears to vary greatly, some taking six gallons to the bushel, others only two.

The next question to be considered, and one which Colonel Scott said was of much less importance than was generally believed, was the amount of sand to be used in making mortar. The idea was very general that limes were improved by sand, though this is by no means the case. This notion, no doubt, arose, in the first instance, from the observation of lime used as stucco. If a very plastic, fat mortar with a small quantity only of sand is used for this purpose, it would, in drying, very likely shrink, and show ugly cracks. The same lime with a larger proportion of sand would not only dry more rapidly, and appear harder, but it would also be free from cracks. The only danger in increasing the sand would be that the "stiff" would become "short," and difficult to work, and apply to the walls. What was really wanted was the happy mean between that quantity of sand which was insufficient to prevent the cracking and that which would render the mortar too "short" to work. The common and frequently expressed notion that some action takes place between the lime and the grains of sand has very little foundation in fact, the truth being that people assume, from careless observation, that the lime is benefited by the addition of sand, and they then seek out fanciful reasons in support of their assumption. All the old writers thought that such was the case, and many of them give the most singular reasons. Vitruvius thought that, owing to the evaporation of the watery parts, the lime was left porous, and in a fit condition to receive the admixture of sand, and to unite firmly with the masonry. Perrault, who translated Vitruvius into French, said in furtherance of this doctrine, "When this property acts on the sand and on the stones, it brings out of them with time a part of the sulphurous and volatile salts which they contain, and produces between them so strong an adhesion as to form a solid and hard body." Even so good an observer as Paeley was loth to give up the traditional opinions about the beneficial action of sand. But latterly, the experiments of Colonel Totten, in America, have quite removed any doubt which might exist on this score. All his results go to prove the pure lime or hydrate the strongest material, which is weakened more and more by each successive dose of sand. As every rule has exceptions, there are doubtless cases in which the addition of sand might give greater strength to a mortar; as, for instance, in the joint between a couple of bricks fixed together one across the other (in the way used for testing mortars). In this case the gain of strength would be owing to the more ready admission of the carbonic acid of the atmosphere through the pores of the mortar, which would be more open-grained than that made without sand. This could manifestly not apply to the mortar used in thick walls; but it does not seem improbable that, apart from all chemical reasons, the application of so plastic a material as lime paste between the grains of sand might give considerable mechanical adhesion. This, together with the cohesion of the particles of lime amongst themselves, and the possibility that the fracture of a mortar-joint might take a longer time, owing to the interlacing of the grains of sand, would all tend to render a joint made with sand and lime apparently stronger than one made with lime alone.

The best kind of sand for mortar-making was also a disputed point, though all writers concurred in thinking that it should be clean. Perhaps, all things considered, a sand having several varieties of sizes of grains was better than a fine even-grained sand, and sea-sand should never be used with pure limes, or for plastering. In certain classes of work the sand

is sometimes replaced either partially or entirely with Trass or Puzzuolana. Both these substances result from volcanic action, and contain large proportions of silica in that condition in which, on being mixed with lime in the presence of water, a hydrated silicate of lime is formed. Equally good results may be obtained from the use of the calcined and ground shales of this country, many of which are similar in composition to the Puzzuolana, and, with a little knowledge, might have been substituted for these costly materials imported from abroad. The invention of Portland cement has, however, nearly put an end to the use of these substances, as it gives infinitely better results.

Colonel Scott then described the plans usually practised for calcining lime, and spoke of the two chief methods. First, by means of continuous kilns; and, second, by the use of intermittent kilns. He also pointed out the system of firing by means of interstratified fuel, and by employing the flare or flame only of the coal or wood. He showed how far ahead of us the Germans and Americans are in their fuel-saving kilns, and pointed out in what way he considered the generality of kilns might be improved. In reference to the selection of limestone for use, Colonel Scott pointed out that only such limes as yielded a clayey residue on the application of muriatic acid, were really suited for the purposes of the builder, and he showed the way in which a simple practical analysis of any lime might be conducted by first separating the silica, then the iron and alumina, and, lastly, estimating the lime and magnesia.

Speaking of the lax way in which some architects wrote their specifications, he mentioned that he had found in "Donaldson's Specifications" in one case the "proper quantity," and in another "the usual quantity of sand," also that people frequently wrote "Halling or Merestham lime," as if these two qualities were identical. "Lias lime," too, was often specified without giving the locality from which it was to be procured. He observed that limes, even from the same district, varied so much in quality that he was convinced that the only true way for architects to get a good article would be to specify the amount of silica, say 10 per cent., they required; and this plan he had actually prevailed upon the War-office authorities to adopt some years back, though he believed that it had now fallen into disuse. The lecturer maintained that limes were but little damaged by exposure to the atmosphere, and that the hydration by simple exposure was merely anticipating the action of the labourer on beginning to make his mortar. He then spoke at considerable length on the preparation and use of Roman and Portland cement, and pointed out the dangers which might arise from requiring too high a test for the latter. To secure the amount of strength often insisted upon by engineers, cement manufacturers were in the habit of so much reducing the quantity of clay as to endanger the subsequent stability of the work.

LECTURES ON ARCHITECTURE AT THE ROYAL ACADEMY.

BY MR. E. M. BARRY, R.A.*

It is now time to pass to the consideration of what architecture really is, and what is its domain in the realm of art. It has already been seen that for historical purposes no art can be its superior, but this is only its archaeological aspect. To claim its right position, it must have aims and aspirations higher than those of imitating the glories of the past. Architecture must elevate into an art the science of building. It must add a charm to the expressions of the exigencies of life; it must make the structure of the mere builder "a thing of beauty, and a joy for ever." It must not disdain the present time, and turn to other ages for its delights. It must not allow itself to lag behind the progress of science, and be considered impracticable in an age of exigent scepticism. The majestic buildings which our art has produced, are connected with man's highest thoughts, and his noblest aspirations. Veneration for the dead, the consolations of religion, the stirring activities of public life, are all more or less associated with architecture. Surely an art with such advantages, ought to be true to herself, and advance with no uncertain steps. What principles, therefore, are to be considered the chief guides of architecture?

When the savage conceived wants beyond those of a mere hut of shelter, or a tent on the

* See p. 182, ante.

desert, he began to build a more solid structure. He desired *permanency*, and a gradual advance from wood to stone was the result. The individual becoming merged in the community, more extended social wants were the result. A king or governor of some kind, became the visible centre of authority. Common action for common objects and against common foes, begot a feeling of interdependence which ripened into the patriotic sentiments of a nation. At this time architecture was needed. New wants required new modes of satisfaction, but the old cravings were the same. In their new buildings, kings, priests, and people desired above all things permanence, and no art which failed in this essential could satisfy the longings of their soul. A monarch of boundless power, with crowds of submissive slaves for subjects, with no law but his own pleasure, must still have felt the instability of human life, the bitter drop in his cup. "Thus far shalt thou go, and no further," was a law against which he instinctively rebelled. To this feeling we owe the Pyramids and other Egyptian works. The Pyramids are the most stupendous monument of the power and impotence of man;—power, which piled up that amazing heap of stones in the wilderness; impotence, to do more than utter an unavailing protest against the decrees of Heaven. The Pyramids have, of course, no claim to artistic beauty. Their imposing effect on the mind is solely due to that feeling of comparative permanence which was the dominating idea of their builders. The power of the one over the many, the tyranny and misery which must have accompanied their erection, are among the histories illustrated by their wonders of the world. Passing from the Pyramids to other monuments of Egyptian art, it will be found that the quality already referred to was never forgotten. The hypostyle Hall of Karnak is justly considered one of the most beautiful, as well as the most interesting, of architectural remains. By the time this was erected, the senses of its builders had become sufficiently educated to require beauty. The Pyramid had nothing of this quality, though they had in a high degree that of permanence. At Karnak, permanence and beauty are displayed in a happy combination, though, as in all similar buildings, the former takes the lead. The columns are so thickly planted, that the glance shows them to be more than sufficient for any structural needs, and the eye loses itself in the mysterious recesses of these mighty colonnades. The central columns being larger than those beyond, appear even larger than they really are, from this artistic contrast; and though beauty is far from absent, the main effect produced on the spectator is that of solidity, and size,—in other words, permanence. As religion played its great part in the affairs of men, it was natural that the chief structures of the day should be devoted to sacred purposes. Here, again, the same object was sought. To prove to man his own insignificance, to illustrate the power and endurance of a Supreme Being or Beings, no symbol was so effective as a gorgeous temple built in defiance of Time, to last for ages. Here again beauty was not necessarily absent. On the contrary, it was often displayed in a high degree; but the all-important desideratum was as before that of a significant permanence. The Jews, on their return from their Assyrian captivity, and always more or less under the influence of their old land of bondage, may probably have been impressed with these ideas, when they undertook the rebuilding of their much-loved temple. When the Apostles desired to excite our Lord's feelings of wonder and admiration they called his attention not to the beauty of the building, but to the size and quality of the stones of which it was constructed. In so doing they doubtless referred with exultation to its strength and solidity, and rejoiced in its apparent permanence. The *quasi* rebuke of their Divine Master in the prophecy that not one stone should be left on another, is a commentary sad and instructive on that never-to-be-satisfied craving for permanence, which is proved by their original remarks. Perhaps the most significant proof that this was the ruling principle of Egyptian architecture is found in their rejection of the arch. There is little doubt that this was not the result of ignorance. In the tombs of Beni-Hassan and elsewhere arches are found, although they are not built as arches, but are cut out of the solid stone. The Eastern distrust of the arch is expressed in the well-known saying, "An arch never sleeps;" and it must have been from this conviction, that the Egyptians deliberately set it aside as a principle of

construction, and adopted the solid trabeated style which characterises their work. The result has, in some measure, justified them; for, while the temples of Egypt have suffered from violence only, and seem still destined to last for thousands of years, it would be difficult to find a single arched building without some signs of constructive defects. In the works of the Greek architects, the same principle which is under consideration was a leading rule of conduct. The abundant supports of the Parthenon, the rock-out base and the level lines of the cornices, are all suggestive of repose and permanence, and the low pitch of the Greek pediment, and its ornamentation with sculpture, forbade the idea of thrust. The Romans, in borrowing from Greek art, were not satisfied with a horizontal construction. The arch had become familiar long since to the Eastern world. Arched forms, wedded to Greek outlines, was the ideal of the Roman architects; and from that day to the present arched buildings have been the rule. The influence of the arch on the aesthetics and construction of our art is too great a subject to be dealt with now; but it may briefly be described as an attempt at power at the expense of repose. It introduced difficulties of stability unknown, or, at least, not experienced before, and gave rise to a variety of constructional expedients of the highest skill and ingenuity. At the same time the true artist recognised always the necessity that his work should assert its permanence. Accessories were called in to accomplish this end. Terraces and rusticated basements gave a solid base to the superstructure; towers and buttresses were added to counteract the ever active warfare of the insidious enemy within; and everywhere in true architecture do we find the recognition of permanence as one of the essential principles of the art. Passing now to another point, it is desirable to consider what other qualities are necessary to true architecture. Beauty being the essence of art, its presence may be looked upon as decisive in the works of the sculptor and the painter. It must also be present in that of the architect, but something more is wanted. His efforts will surely be condemned if not presided over by the principle of convenience. We have seen how architecture arose from the necessities of mankind, as the first simple wants of warmth and shelter expanded into the more elaborate requirements of the State and the individual. To study the requirements of convenience, and to adorn the useful with beautiful and appropriate ornament, is therefore the duty of the architect. It is his place to consider how by the arrangement of masses and outlines artistic beauty and chiaroscuro can be obtained without the sacrifice of practical convenience. The combined result will be the triumph of his art, and without such combination failure must ensue. Works are seen every day, particularly engineering structures, which must be assumed to be convenient, as they possess no other merit, but these can in no sense be termed architecture. On the other hand, buildings may be found of much beauty, the pride of their architects, but which must be condemned if tried by the law of convenience. It is the duty of the true architect to so practise his art as never to forget common sense. His buildings should be expressive, and his architecture consistent with the purposes to which the structures are devoted. A church should not appear like a theatre, a palace like a prison, and so forth. This will be so readily admitted that the reiteration of such principles will, perhaps, be questioned as unnecessary. But, in truth, the principle admits of much more extended application. True ideas of fitness would proscribe many favourite and fashionable practices, and would subvert many cherished ideas. There are those who appear to consider it the highest aim of architecture to construct a church so that it might seem to have been erected in the thirteenth and not in the nineteenth century, or a concert-hall that might have been a temple in the palmy days of ancient Greece. Such things can only be considered triumphs of archaeology. In this architectural aspect they are constructional falsehoods. They sin against truth and convenience, and though they may suit the fashion of the day, a real progress of art must be impossible while such principles are in the ascendant. In the times of which we have taken a hasty review such practices were unknown. If it may be that the Greeks were indebted to the Egyptians or their predecessors, they at least did not directly imitate them; and the amount of controversy on the subject, if it

proves nothing else, bears witness to the real artistic originality of this wonderful people. Truth and convenience have always been the guiding principles of real architecture, and at no time more so than in the Middle Ages. In a Gothic cathedral we have the fullest expression of the art of the day. We may suppose it to be the product of many intellects, working under the direction of one architect as commander-in-chief; but with all who co-operated convenience was paramount. The clergy laid down the rules appropriate to the purposes for which the church was built. The choir, chapels, and aisles must be of the dimensions required for use. Everything was to have its purpose and be in its right place. We may be sure no columns would be tolerated to intercept a necessary view because they had been so used elsewhere, under different circumstances, hundreds of years ago. The same principle of convenience made itself felt throughout. The master mason, the cunning artificer in iron and wood, fell equally under its sway, and the result has been the production of works which are a source of joy and pleasure to each succeeding generation. There can, indeed, be no more mischievous assumption than to suppose that in architecture convenience and art are foes and irresconcilable. Such a doctrine is condemned by the experience of all ages, and could only be put forward from ignorance. Art is the true instructor of the people in refinement, and all that elevates the senses. The painter and the sculptor share this high mission with the architect, but the latter has a privilege beyond. He has not only to think of the works of the State, and the palaces of the rich,—the arrangement of cities, and the provision of healthy, convenient, and artistic houses for the poor are within his province; and in bringing his art to bear on these matters, he has the proud satisfaction of feeling that he is serving purposes of real public utility, and is adding to the happiness of his fellow-creatures. The principle of convenience, as well as that of permanence, must, therefore, never be wanting in real architecture; but to these must be added beauty. Without this our buildings may be triumphs of science, but they will not be works of art. The question of how such a combination is to be effected is the difficulty, as its solution is the glory, of the architect. To attempt to secure it by loading a structure with so-called ornament is the most fatal, as it is the most vulgar, of fallacies. Indeed, the very word ornament is too frequently misused, so as to convey the impression that it is synonymous with beauty. A building, however, may charm us from its proportion with grandeur of its outline, and masses, apart altogether from considerations of what is termed ornament. I know nothing more beautiful and impressive than the interior of Westminster Abbey in the dim twilight of a winter's afternoon, when there is not light enough to discern more than the main features of the structure. The fine proportions and exquisite symmetry of the building suffice in themselves to strike the mind, and to fill it with the sensation of present beauty. It is no doubt true that in a perfect work art-decoration must be considered indispensable, but there is this difference between decoration and beauty of proportion, that without the latter nothing can please, while it is possible to recognise beauty in an architectural work which is deprived of the advantages of the former. It may be questioned whether this principle has of late years been sufficiently recognised. A passion for ornamental detail has often seemed to obscure the true principles of art, and when we have looked for the indescribable charms of symmetry and proportion we have been asked to be content with carelessly-planned and over-decorated ugliness, seeking to disarm criticism by calling itself "picturesque." But, though proportion may be the first quality essential to beauty in our art, it is not of course sufficient in itself. It must, as we have seen, be supplemented by beautiful and appropriate ornament. The architect must go hand in hand with the sculptor and the painter. In this country, for various reasons, the latter have scarcely ever a fair chance, and the architect has had too often to lament over consequent incompleteness in the realisation of his conceptions. To diffuse nobler and juster ideas on this subject would be a work worthy of this Academy. In such an event we should cease to tolerate any art but the best, and the bareness of the interior of St. Paul's and our public buildings would no longer be matters of national reproach. And such hopes are not altogether visionary. Were it not

for the salutary rule which forbids reference to living persons, names might be mentioned of artists honoured within these walls who have given, and are giving daily, practical proofs of this view of the importance of their principles. The first steps are not easy, and their disinterestedness is often their only reward. The more honour to those who tread the difficult path, and are contented to rejoice in the honour and glory of their art. But while contending for the fraternal union of the painter, the sculptor, and the architect, as essential to the production of perfect architecture, it must not be forgotten that the architect must in this case be "*Primus inter pares*." The decoration of the structure must not interfere with the principles of his design, and there must be a general willingness to sink self-assertion, and co-operate in the production of a perfect whole. If it be rightly forbidden to speak here of the living, it may perhaps be permitted to allude to one whom this Academy still freshly deplores, and who has left us some striking examples of mural art. I mean the late Daniel Maclise. Unselfish and ever true to his art, he has left his monuments in the Royal Gallery at Westminster. We can now only too late regret that but for discouragements which might have been avoided, we should have had a completed series of noble paintings where now two grand fragments alone exist to adorn his memory. The introduction of sculpture is again a subject on which the architect should have a decisive influence. Disregard of scale is but too frequent when this is not the case. Thus that which is intended as an adornment becomes the defacement of the work. The sculpture injures the architecture, and the latter the sculpture, and the result is failure. Gibson's fine group in the small chamber behind the House of Lords may be here referred to. Placed in a room of moderate dimensions, and in a position where it cannot be seen to advantage, it can only rouse feelings of regret that a place more worthy of its merits has not yet been allotted to it. A position on the staircase at the end of Westminster Hall, with some arrangements for controlling the light, might probably be found more worthy of the importance of the subject and the genius of the sculptor. Time does not allow the further illustration of these views; but many instances to the point will doubtless occur to you. If I plead earnestly for the controlling power of the architect, it is from no wish to magnify his office, but from a conviction that it is the only mode of avoiding confusion. No architecture can be really perfect which does not receive the support of its sisters Sculpture and Painting; and no fashion of building can be commended which imposes on them unworthy rules, and rejects their highest perfection. We cannot doubt that these were the convictions and practice of the Medieval architects, and an enlightened adherence to their principles would put an end to anything like an unintelligent copying of their defects. Whatever the architecture of the future is to be it is clear that it must be consistent with the display of the sister arts in their completest state of development. Is it too much to hope for such a consummation, or to look forward to a time when this employment of the fine arts allied to the marvellous progress of science will again produce masterpieces of architecture for the delight and instruction of an enlightened world? In the meantime we may be sure that a new style will never be discovered by talking of it. It must arise, if it is to come, naturally from the wants and requirements of the time. To force these requirements into an artificial and, perhaps, retrograde channel is not the province of the architect. It is his part to study and guide them by his knowledge and artistic genius, controlled by common sense. Architecture, if pursued on other principles, claiming to dictate when it should be content to follow, may find itself left dreaming on the bank, while the great stream of human progress rolls on ever deepening and ever increasing in its way to that mysterious goal when all things finite must find their solution. It should be for us, gentlemen, to avoid such illusions, and, while studying the glories of the Past, not to lose sight of the wants of the Present or the promises of the Future.

Metropolitan Board of Works: Leicester-square Improvement, &c.—The Select Committee on these Bills has been appointed, to consist of Lord Elnoch, Mr. Cowper-Temple, Dr. Brewer, Mr. Locke, and Mr. Goldney.

PROPOSED ANNUAL CONFERENCE OF ARCHITECTS.

THE committee appointed to re-consider the scheme for an Annual Conference of Architects at the Institute, have sent up the following suggestions:—

"That the Conference be held during the last week in May, i.e. (for the first year), on Monday, the 22nd of May, and the two following days.

That the President of the Institute shall preside.

That papers shall be read and discussions promoted on the plan adopted at other annual gatherings of the same kind.

That minutes of the Conference shall be kept by the Institute, and that the proceedings shall be published.

That the time be allotted as follows, but subject to redistribution:—

1st day, Monday.—1 p.m. General opening meeting: a brief Presidential address to be read and discussed.

8 p.m. Ordinary general meeting of the Institute.

2nd day, Tuesday.—1 p.m. Professional Practice and Education. 8 p.m. Archaeology and Art.

3rd day, Wednesday.—1 p.m. Construction and Science. 7 p.m. Public dinner, at which the President will briefly review the proceedings.

N.B.—Supplementary meetings will be held on Thursday by adjournment, if required.

That all persons attending the Conference, unless by special invitation, shall be practising architects.

That each architectural society in the United Kingdom be invited to send a delegate to represent it officially at the Conference; and that other members of such society, being practising architects, be invited to attend the Conference in their private capacity.

That due notice be given of the subjects proposed for discussion.

That the invitation of foreign architects be left to the council of the Institute.

That public notice be given of the Conference by advertisements, so that persons desirous of being present may apply by letter, either to the secretaries of the Institute, or to the secretaries of local societies, for cards of admission.

That as an exhibition of practical drawings (unframed) be held during the Conference.

That two honorary secretaries be appointed to superintend the arrangements necessary for each subject or section, viz. professional practice and education, archaeology and art, construction and science, practical drawing, dinner arrangements."

This scheme was brought before a special general meeting of the Institute, on the 13th inst., and the consideration of it was adjourned till Monday next.

THE OFFICERS OF THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

JUST too late for our last issue, we received for publication a copy of the following letter from the President of the Institute:—

"77, Great Russell-street,

Thursday Evening, March 9th, 1871.

My dear Donaldson.—On my return to town this evening I find your official letter of yesterday, placing unreservedly your resignation in my hands (as President of the Institute), and requesting that your name may be withdrawn from the list of Fellows. I can only say that I receive this communication with much regret, and, I may add, much surprise; for although you may mistrust the policy of the change I have suggested in the administration of the Secretary's Department in the Institute, you might even be disinclined to continue your valuable services as Honorary Secretary for Foreign Correspondence, I cannot understand why you should feel impelled to withdraw your name as a Fellow; and it is as difficult for me to comprehend how you can suppose for one instant that any 'humiliating subordination' for yourself was ever contemplated by me, or by those who share my views, and desiring to concentrate responsibility in the home work of the Institute.

You should not suppose that because we exercise conscientiously our judgment as to the best means of adding to the efficiency and life of our Institute that we are forgetful or unmindful of what you truly describe as 'most earnest services and unswerving duty during six-and-thirty years.' I believe they are universally acknowledged, and I believe it would be very generally gratifying that you should continue to act as our Secretary for Foreign Correspondence, an office that may be held in perfect independence of the Secretary who takes charge of the home duties, and therefore in no way 'subordinate' to him. Such an arrangement works most effectively in the Institution of Civil Engineers, with which I have had the honour of being associated for many years, and have seen its successful results. There the name of the Honorary Secretary takes precedence of the paid Secretary, as I had anticipated yours would do in our case. The duties and responsibilities are distinct, and, as you so clearly put it the other night, the labours consequent on the duties of Honorary Secretary for Foreign Correspondence are, I am confident, as much as should in reason devolve on one who resigns *honorary services*.

Let me correct an error into which you have fallen with regard to my proposition to the Institute. I never, for an instant, proposed 'that the present Assistant Secretary should be raised to the office of Chief Secretary, and should have the sole control and management (under the Council) of the affairs of the Institute.' I do, however, wish that Mr. Eastlake, who now practically has the labour of our Institute, who solicits our Transactions, presides at our meetings, and who carries on the bulk of the correspondence, should have the whole responsibility and credit of the work he does, and should be spared the unnecessary labour and waste of time in constant reference to the Honorary Secretaries. I believe it will be for the interests of the Institute that the paid Secretary (and I know no one who could perform those duties more efficiently than Mr. Eastlake) should be independent of any other person than that of the Council; and feeling this strongly I have thought it my duty to submit the question to the judgment of the whole body, even at the painful cost of appearing to differ from one for whom I have invariably had the greatest regard and respect. To the decision of the

members on this question I shall most cheerfully bow, and if your view should be upheld, will co-operate as cordially as ever under the existing régime.

I remain, my dear Donaldson,

Yours very faithfully,

THOS. HENRY WYATT, F.R.I.B.A.

T. L. Donaldson, esq., &c., &c., &c."

At the special general meeting held on the 13th instant (adjourned from the 6th instant), the president, Mr. Thos. H. Wyatt, having offered a few preliminary remarks, invited further consideration of this subject. A prolonged discussion ensued, sixteen members speaking, and during which an amendment was proposed to the effect that the question should stand adjourned for the present. But the amendment, having been put to the vote, was lost. It was ultimately

Resolved—"That there be two secretaries of the Institute, elected annually, one of whom shall be paid salary as the council may, from time to time, determine, and that the word 'assistant' be omitted from Section 8 in the bye-laws."

Attention having been called to Professor Donaldson's proposed resignation as Honorary Secretary for Foreign Correspondence and retirement from membership, in consequence of his having apparently misunderstood the nature of the official change contemplated, it was unanimously resolved:—

"That this meeting has received with great regret the resignation of the late Honorary Secretary for Foreign Correspondence, and with still greater regret, the announcement of his proposed retirement from the Fellowship of the Institute. It trusts that he may be induced to reconsider that proposal, and that the Institute may long retain the affectionate sympathy and active co-operation of its well-known and greatly respected ex-president, Professor Donaldson."

We earnestly hope so too.

GUILDS OF TRADE AND TRADE-UNIONS.

SOME misconception still exists among all classes of society respecting the nature and working of trade-unions. Legislation, without proper representation and inquiry beforehand, is as bad as conviction and judgment on mere circumstantial evidence.

A modern trade-union is simply a body of workmen banded together by a declaration (not an oath) to protect the common interests of their trade, and to assist their brother members in procuring employment for those of their body out of work. There are other collateral duties attached, but they all converge into the primal one,—the general support of their order. Great abuses have crept into the government of trade societies as they have crept into associations of a higher social status, and it is not to be wondered at.

Lack of education is ever productive of ignorance, and ignorance is the fruitful parent of mischief. If at the period when Julius wrote his scathing letters, or when the great Chatham guided the policy of the British Government, a national system of education had been adopted, compulsory in its operation, England would have been saved millions of money, and possibly her national debt, if not wiped out, would now be reduced to very modest proportions. War, however, took precedence of art and manufacture, and this very spirit of resentment, whether in vindication or aggression, was carried into private life, and became the rule and guide of private actions.

Where the code of honour was upheld by the bullet instead of an appeal to the laws of the land, and where steel supplied the place of statute, the example could not be otherwise than a pernicious one. The industrial classes in a society so constituted could not fail to draw conclusions as to how best they could vindicate their own rights, which for good or evil were dropping without the pale of the law, save when they openly and violently came into collision with it by exceptional circumstances.

Had our workmen been technically educated at the commencement of the century, the combination laws of 1825 would not have been needed. The creation of machinery was so sudden, and its progress so rapid in its application to various manufactures, it could not do otherwise than effect a commotion and consternation among workmen. Before the age of railways our workmen were more localised, more prejudiced, and, as we have already stated, more ignorant, from the want of facilities.

The spirit of old trade guilds was strong in the hearts of our workmen when the first machine-made article startled them from their day-dreams. The weaver could never believe that

the day would arrive when the cunning of his hands would fail to earn in six days, of four or five hours each, the miserable pittance of 10s., or that a steam loom loomed in the distance, destined to beggar him, though to benefit the many. The tailor ridiculed the idea of a sewing-machine. Pegged and riveted work, with the materials cut out by machinery, were, in the eyes of a son of Crispin, a madman's freak; the shoemaker would work on in the same way always, and live a life everlasting. The building trades never imagined a change. Mortising, tenoning, and moulding by machinery were never to take place; and if attempted, we were told, the attempt would result in failure. All these things and sundry others, in different trades, having been both attempted and accomplished, in a partial way, woke up our artisans to resist their perfection and successful application. Here we see the first law of nature at work; and so long as it partook of a legitimate self-preservative action no fault could be found, though the mistake was to be regretted. Combination is unity, and union is strength; but union may be both lawful and unlawful. A trade-union *per se*, whether as it existed in the last century or in the present, was not illegal, so far as its objects could be defined by its general rules and declaration. The cause of much of the evil in the modern trade-unions is traceable to the exclusive privileges that formerly attached to the olden trade guilds. Many of these exclusive privileges were the result of charters. All our ancient guilds of trade had special privileges accorded to them, and nearly all were fortified by kingly or queenly charters.

The seventeenth century witnessed the extinction or weakening of some of these privileges; the eighteenth century saw the abolition of more; and the present century, with its mighty free-trade enactments, followed by minor Acts of abolition of monopolies, changed the whole face of British society. The guilds of trade may be traced back to the walled towns and communes or boroughs of the Middle Ages; indeed, they had existed anterior to this. They have undergone many modifications from their original organisation. From being guilds of masters and workmen, they gradually became in modern times commercial and political bodies; and though retaining distinctive trade names, the majority of their members never learned the "mystery of the craft" to which as members they laid claim. In London many of these ancient trade guilds exist as City companies, retaining and using the proceeds of grants and bequests intended for far different uses than those to which they are at present applied. They are wealthy; but they have ceased to influence the question of capital and labour, or to effect by their position or privileges the relations of employer or workman.

To be a "freeman" of London or Dublin formerly was a distinction much sought after, and the parent who intended his son for a carpenter, bricklayer, mason, or so forth, was anxious to apprentice him to some employer who was a member of those old City Guilds of Trade. When his apprenticeship was served, the boy was a man and a "freeman," with the means of obtaining a vote into the bargain.

Modern trade-unions possess no such political privileges. The application of machinery to trade purposes begat, some years ago, a violent opposition in several quarters of the kingdom. The workman, with his local prejudices, looked upon the innovation as his certain doom, and that of his children. We all know by experience that the state of transition produced terrible suffering and hardship among mechanics of all kinds, and even this state of transition cannot be said to be as yet ended.

To frame laws to crush out an evil, without first examining the cause, is both unwise and ungenerous. The effect of a grievance is always worse than its cause; and if the Governments of bygone years had been more careful in their legislation in the matter of trade bodies, the violence that often disgraced their management would have been rarely indeed witnessed. One scabby sheep, it is said, infects a whole flock, and one "stirring stick"—i.e., firebrand—among a body of artisans often brings down ruin and shame upon all trade-unions in general. This ought not to be; and it would not be if the trade-union to which an evil doer belonged at once repudiated their member, or called upon him publicly to resign.

If the law is just in its provisions, it must certainly effect improvement. To pass an Act to abolish combination among workmen would

be as foolish as to frame a law rendering partnership illegal. To get the highest price or salary obtainable for his labour or service is the right of every man. To enforce a higher rate by threats or intimidation is illegal; but if, on the other hand, it can be procured by a moral incorporation of spirit and an embodied passive resistance, it is fair and legitimate.

If we look to the building trade, we find that, when hands are scarce, the trade-union is in the habit of arranging for a notice for a rise of wages. If not acceded to at once, it was the practice to "strike." A "strike" often resulted in a "lock-out," and both were the occasion of bitter animosities, loss on both sides, and generally suffering and want on the side of the workmen.

A "strike" is legitimate, and nowise criminal as a last resource, but it is at the same time a sort of foolish madness, and capable of engendering sufficient elements of mischief to render it at any moment criminal. The continuance of a "strike," to whichever party it can be fairly attributed, is little less than criminal. A "lock-out," that is, when the employers take their workmen by the forelock without seeking counsel with them personally, or by agents, may be equally reprehensible.

The duration of a strike or a lock-out may be circumscribed within a very narrow limit, but the satisfactory conclusion of a strike can only be effected by concessions on both sides. A persistent annoyance by "picketing," or threats on the part of workmen, has often been connived at, though not openly sanctioned. In this, trade-unions have been wofully remiss. Letters of marque, so to speak, were verbally granted to certain Franco-tireurs of the body. They were not commanded to do acts of violence; but they were allowed to follow their own bad fancies, without any rules of guidance. Thus smashings, burnings, slatings, picketings, and, lastly, "ratting," grew out like hideous excrescences from some trade-unions, and rendered penal enactments a necessity. The Combination Laws of 1825, in their original and in their amended form of the 22nd Vict., and the Trade-Union Protection Fund Act of 1869, have all been productive of harm.

The original Act begat dire evils, notwithstanding that it existed as a dead letter, and could seldom be satisfactorily enforced. A trade-union has heretofore been in the curious and anomalous position of being both within and without the pale of the law. Its members could be punished for molestation or for anything looking like conspiracy, or that could be sworn to as likely to lead to a breach of the peace. The words "obstruction" and "molestation" are, however, very vague and elastic words; and forms of obstruction and molestation may partake of an indefinite number of forms. A workman may be dogged, his tools may be stolen or hidden, or he may be hooted in the public places, by the agents or sympathisers of those on strike. He may receive such annoyance as would impress him that giving up his job, and making "tracks" to some other locality, would be conducive to his personal safety; and he may be forced to act according to these convictions. How are his obstructors to be punished? They may be boys or women, and Billingsgate and dirty water may be made to supply the place of open and violent outgelling.

The new Government Bill will certainly be a step in the right direction. It will redress a real grievance on the part of workmen. It will recognise their unions as lawful, and protect their funds against defaulting officers. Adopting a form of registration, in future, which is optional with the trade-societies, will exempt them from the operation of the Company Acts, and they will be released from the liability of winding up provisions. By the Act of 1869, if they had deposited their rules with the Registrar of Friendly Societies, they were entitled to the benefit of the 24th section, which enabled them to prosecute defaulting officers; by the new Bill they will cease any longer to benefit by this Act, but the trade-unions will on registration under the new Act obtain the same power, or corresponding advantage. The Board of Trade will in future be the registrar. There are several advantages proposed by the new Bill, some of them, probably, doubtful in character. A trade-union can in future sue and be sued, by the society's officer,—he can sue for his salary, and the society for his defalcations if any. A trade-union can also, under registration, in future hold land by perpetual succession, such as a site for its premises, or whereon it may carry on business relating to its proper functions.

There are certain contracts "tainted with illegality," which, if the trade-unions enter into, will not be enforceable at law. A difficulty may arise here in determining how far these peculiar contracts may be in restraint of trade. The new Bill by its provisions in a special way will be applicable in its working to control the misdeeds of employers as well as the workmen: both are protected, and both can be punished, by its clauses. The acts which are made punishable may not be criminal in themselves, but they will be adjudged criminal when they are proved to be committed in coercion of any employer or workman in pursuit of his trade or employment. The new Bill supplements the general provisions of the law for punishment of riot, assault, libel, &c. Under the 6th George IV., offences of coercion, obstruction, and so forth, were made subject to summary jurisdiction by two justices in petty sessions, with appeal to quarter sessions. The new Bill will act in a similar manner, and the extreme punishment in such cases is three months' imprisonment with hard labour. Trade-unions are defined by the new Bill to be such even when they may be only casual or temporary combinations, and the clause that relates to this definition will equally protect a non-unionist, a unionist, or an employer, who would be liable to indictment under the old Combination Acts.

We have already said that we consider the new law a decided improvement as far as it touches a very vexed question. It does not grapple with all the difficulties; it does not obviate future disputes, but it heals old sores, removes some long-standing abuses, and brings both the employers and the workmen to a certain level, where, by the exercise of a little common sense, ripened by experience and the blessings of education, they may honourably and mutually sign an armistice, that counsel may be taken for a more permanent peace. Simple arbitration in future, honourably conducted, may effect all that is required. Mutual concessions are indispensable on each side, and Education.

ARCHITECTS' BENEVOLENT SOCIETY.

On Wednesday, the 8th instant, the twenty-first general meeting of this society was held at the House, in Conduit-street. Mr. George J. J. Mair (in the absence of Mr. Sydney Smirke, R.A., the president, who was prevented attending by indisposition), having been elected chairman, read the report, which entered into several comparative statements as to the funds and expenses of the Society, and the gifts made to applicants, and again urged the claims the Society had upon the more general support of the profession, concluding with expressing the thanks of the Society to the Royal Institute of British Architects, for allowing them the use of their rooms for its meetings. The chairman, before moving the adoption of the report, also made some impressive remarks upon the limited number of members of the Institute who gave their support to the Society, and which he regretted to see had claims made upon it from all parts of the United Kingdom, as well as from the metropolis; and further that many of the applicants had had good reason to suppose their position would have never been such as to cause them to apply for the assistance this society was founded to give.

Messrs. C. C. Nelson, Edward T. Anson, John S. Phené, Wm. Moseley, D. Mocatta, Wyatt Papworth, and several other members of the Society, suggested, amongst various projects, that if the rules had permitted it, a statement of the number and particulars of the cases which had come before the council, would probably have the effect of inducing the profession more generally to subscribe to its funds. Ultimately a resolution was come to, that a copy of the report and a letter of invitation to join the society, should be sent to each member of the Institute whose name did not at present appear on the list of subscribers to this Society.

The hon. secretary stated that twenty-five applicants had received gifts last year, and several cases were obliged to be scantily relieved, owing to the paucity of the funds at the disposal of the council.

The audited report of Sir Wm. Tite, the treasurer, having been read, the meeting elected Sir M. D. Wyatt trustee, in the place of the late Mr. P. Hardwick, R.A.; Messrs. D. Mocatta, George J. J. Mair, Rowland Plumb, J. Hayter Lewis, and Edward Martineau on the council, in the place of the five retiring members; and Messrs. H. Jarvis and Charles Fowler as auditors for the ensuing year.

Donations were announced of one guinea each from Mr. Alexander Peebles and Messrs. Lander & Bedels, and 5l. 10s. from Mr. Phené, 5l. from Mr. Mair, 3l. 3s. from Mr. Wyatt Papworth, and 5l. from Mr. D. Mocatta.

Votes of thanks to the treasurer, council, auditors, chairman, and hon. secretary, concluded the business of the meeting.

ROCHESTER CASTLE COMPETITION.

The members of the committee appointed to decide on the prizes to be awarded to the successful competitors for the best plans and designs for laying out the grounds surrounding Rochester Castle as a public park and pleasure-ground, assembled at the Guildhall, on Friday, the 10th inst., to make their final award of the prizes. Fifty plans and designs were sent in for the decision of the committee, many of them possessing points of merit. After a consideration of the whole of the designs the corporation and committee awarded the first prize of 40l. to Messrs. Barnett & Hook, whose design was marked "Norma;" the second prize, also of 40l., was awarded to Mr. William Gay, whose plans were marked R.; and the third prize of 20l. to Mr. John Drake, who selected for his motto "The Garden of the Medway." The work of laying out the grounds will be at once proceeded with.

PAVILION FOR THE WIMBLEDON CAMP.

SOME of our readers may remember that the Duke of Cambridge announced at a recent meeting of the National Rifle Association that they had determined to erect a restaurant at the Wimbledon Camp. Already the matter has progressed so far, that at a meeting of the committee held last week the plans for the proposed building, prepared by Mr. W. Young, of Exeter Hall, were finally approved.

The building, which is now being carried out, is a pavilion constructed mostly of wood, and will cover an area of upwards of 40,000 superficial feet. It will contain a bar about 200 ft. long by 40 ft. wide; a second-class dining-room, capable of dining 600 persons; a first-class dining-room for half that number, and waiting and retiring rooms, &c. A canteen, about 80 ft. by 20 ft., will form a separate pavilion.

Along the front will be a verandah about 200 ft. long, constructed with semicircular intersecting ribs springing from upright posts. The main pavilion will be roofed in eight bays, and covered with striped and fringed canvas. Two octagonal turrets at each end of the front elevation will accentuate the wings, and a centre portion will be carried up higher than the general height of walls, forming a balcony over the verandah. On the side elevation an octagonal turret will terminate the ends, and in the centre will be a square one. The gables which will project on the front elevation will be finished with ornamental barge-boards, and will cross at the apex in a V form.

As the buildings will have to be taken down at the close of the Camp Meeting, and re-erected each succeeding year, the method of construction is adapted to facilitate this necessity. The walls will be made in sections of a uniform size, to be put together with bolts, and the parts will, as a rule, be interchangeable.

It is proposed to colour the whole building in distemper, and to have it picked out and stencilled in parts.

ALL SAINTS' PARISH CHURCH, HERTFORD.

DRY ROT.

The floor of this church, which was resealed in 1866, has been attacked by dry rot, and on the 6th inst. a vestry meeting was held in the church, to ascertain how far the architects and builders employed on that occasion were liable. Mr. Joseph Clarke, who is what is called diocesan architect, a modern creation of very dangerous character, had been instructed to examine the state of the floor. His report was read, and a slashing report we are told it was. A highly respectable landowner in the county writes to us to complain of it. He says, if it were intended to frighten the whole parish and exasperate them against their late architects, it must be deemed a success, and he condemns it as going purposely to the very extreme in its statements. According to this correspondent, the report insinuates that no dry-rot existed when

the church was resealed, that there is very little ventilation, that the whole floor must now be cleared away, not "a fragment" of the present wood-work must be reused, the church must be sealed at once and "not reused for six months." He maintains that much milder remedies might be successfully applied, and he uses terms with reference to the object of the report which we do not care to repeat.

The churchwardens appear to be somewhat of our correspondent's opinion, for they reported at the meeting in question that they do not consider that it will be either desirable or necessary to carry out the sweeping recommendations in the report, at an estimated expense of 700l.; that they are of opinion that the dry-rot can be thoroughly eradicated by taking up the sittings and the flooring wherever the dry-rot fungi shall be found, by replacing the defective joists and floor-boards with good seasoned timber; by thoroughly saturating the whole of the woodwork (new and old) with vitriolic acid, and by covering the soil under the flooring with quick-lime, to prevent any further germination of the fungi, arrangements being made to secure admission of air; and that the works can be properly executed by removing a portion of the sittings and the flooring, and replacing them week by week, so that the church may be open for divine worship on Sundays. Ultimately a committee was appointed to look into both reports, for the purpose of recommending one or the other for adoption.

TENDERS THAT REQUIRE EXPLANATION.

SOME recent differences between the tenders of respectable contractors for the same work, reported and commented on in our pages, have excited much surprise throughout the country, as, for example, in the case of the foundations for the proposed Law Courts. But these pale, and must hide their diminished heads, before a list of tenders sent in a few days ago to the Local Board of Sale for sewage works, Mr. A. G. McBeath being the engineer. The tenders were for four separate contracts, and the highest two and lowest two of a dozen sent in for the whole stand thus:—

Jewitt & Nicholl.....	£11,568	3	1½
Naylor, Brothers.....	9,346	0	0
At. Wolfenden.....	4,655	0	0
Robt. Jeffreys (accepted).....	4,232	0	0

In other words, the amount of the highest tender, which is calculated to the niceness of 3s. 1½d. (mark the 1½d.), is 2½ times that of the lowest. The same quantities were supplied to all by one surveyor, Mr. Joseph Cummins, and the difference does not result from any accidental wholesale mistake, because it runs through all the separate contracts. Thus, for the first of the four contracts, Jewitt & Nicholl tender at 5,097l. 14s. 2½d., while Robert Jeffreys puts it down at 1,722l.; and in the third of the contracts, the lowest amount is 867l., the highest, 2,329l. 0s. 10½d. Surely, in the interest of all parties, of contractors as well as the public, we are justified in again asking—nay, bound to ask—for some explanation of such differences, which are nothing short of shameful.

FLUE PIPES.

SIR,—I shall be very thankful to you, or any of your correspondents, for information on the subject of flue-pipes for chimneys. I find, so far as I have inquired, a great difference of opinion about them, some saying that the soot is continually coming down in small quantities, and also that chimneys so constructed generally smoke. That these defects should be found where the flue-pipes are glazed inside I can quite understand; but I am told that they occur also where this is not the case. This is an important question to many, and just now especially so to

ONE BUILDING A HOUSE.

MID-LONDON COMMUNICATION IMPROVEMENTS.

NEW STREETS, AND UNDERGROUND RAILWAY, LEICESTER-SQUARE, &c.

ABOUT two years ago, Mr. Henry Bidgood, the St. James's member of the Metropolitan Board of Works, put forth a long-conceived project for effecting a more direct communication between the north and south parts of the metropolis *via* Charing-cross, by the formation of a new street, 60 ft. wide, continuing

Tottenham-court-road straight through Soho to Leicester-square, and thence by the western end of the National Gallery to Trafalgar-square.*

For the promoting of this project, Mr. Bidgood succeeded in forming a committee, consisting of a limited representation of the vestries of the parishes more immediately affected by the proposition, viz., St. Ann's, Soho, St. James's, St. George's (Hanover-square), St. Giles's, and St. Margaret's and St. John's, Westminster. And this body, in meetings at the vestry-room of St. Ann's—under the chairmanship of Mr. Bacon (Sewell & Cross) and the secretaryship of Mr. Allen, jun., solicitor, of Carlisle-street (vestry clerk of St. Ann's)—having taken up, diligently prosecuted the matter.

It will be recollected that the National Gallery building at its western end adjoins on the houses of Pall-mall East, and in the rear of the latter on some small tenements forming one end of a court (Marlborough-court—a sort of little rookery). At the public exhibition of the designs of the competing architects for the rebuilding of this edifice, several of the drawings, showing, as they did, a return to the main façade at this part, but with ornamental western frontage—and more particularly noticeable in this way was the elevation drawing of the favourite set (E. M. Barry's)—conclusively indicated that the Government had (and very rightly so too) intended that the edifice at this part should stand isolated. A consequent inference from this being, that a considerable width of open space would be provided at this side of the intended new edifice by purchasing and pulling down the buildings that now occupy the ground there. The committee, on turning over the circumstances of this incident, and regarding the building of a new National Gallery still a settled thing,—were led to think that this obtained space, instead of being merely a railed-in courtyard, might be utilised to the formation of a street to skirt the flank of the building closely; in the manner of the south side of the New Foreign Office.

It was suggested too, that, in consideration of the vastly enhanced grandeur the national edifice would acquire by being, on another of its sides, given elevation on a leading thoroughfare, as well as the accessibility of the institution greatly increased, the Government might be reasonably expected to so far co-operate in the new street project as the undertaking,—on the sufficient understanding that the street would afterwards be completed by the Metropolitan Board of Works,—to advise the taking of a grant for the purchase of so much of the present adjoining properties, extending from Pall-mall upwards to the length in that direction of the proposed new National Gallery site (that is, the northern end of the barracks block), and to a width sufficient for conversion to a street. On the other hand, again, it was thought that, with such a concession obtained,—a concession, be it observed, by which a considerable portion of the cost of the formation of the street would be borne by the National Exchequer,—the project, it was thought, would so commend itself to the Metropolitan Board as to insure its immediate adoption and prosecution. An effort, however, put forth to bring about this seemingly desirable and equitable arrangement resulted in failure. The matter being put to Mr. Ayrton, Her Majesty's First Commissioner of Works, in a deputation, the hon. gentleman, after a courteous attention to the application, gave, in reply, no hope of any co-operation in the project by that department, alleging that it was not the intention of the Government at present to erect a new National Gallery of the kind that had been contemplated when the designs which the deputation had referred to were called for.

Consequent on this disappointment, the project of the New-street was on the point of falling through, when a new impulse was given to the effort by the coming forward of an offer by the promoters of a railway to go halves in the outlay in buying up possession of the properties on the greater part of the route, and the laying out of the street line ready for the builder, in consideration of being allowed to make their railway under the carriage-road of the same.

The railway interest here referred to, and of which Messrs. Toogood, Parliamentary agents, and Mr. J. Wolfe Barry, engineer, were the official organs on the occasion, is the company that five years ago obtained an Act for the making of a railway from the Camden station

* A similar line of road had been marked out in these pages.—Ed.

of the London and North-Western Railway to Charing-cross, to be an underground work, and, through a great part of its length, a street formed above, the latter to be presented to the metropolis gratis. The enormous extra outlay, however, which the last-named condition in its fulfilment involved, making it most obvious that the undertaking would not pay, the construction of the line had to be abandoned. And now the party, in the event of the Metropolitan Board being induced to give sanction to the scheme, on the principle of joint expenditure, as before stated, would be willing to introduce a Bill into the next session of Parliament, for liberty to make such deviation from the line originally proposed as would make the same fit in with the proposed new street.

The terms of this offer being acquiesced in by the committee, the two parties thereupon united, the case being thenceforth proceeded with on the understanding of equal partnership. And in due course the scheme completed is placed before the Metropolitan Board, a deputation, in which the M.P.s. for Westminster and other influential persons took part, attending on the presentation.

The probable expense of acquiring the properties on the railway partnership parts of the route, after deducting the "set off" by the proceeds of the sale of building sites, has been estimated by the railways' surveyor, at 400,000l.; and the Metropolitan Board has now under consideration a memorial from the Company, praying the sanction of the Board to the scheme, and to contribute one-half the cost of so much of the outlay as is rendered necessary by the proposal to form the new street. The Bill seeking legislative sanction of the work, under the title of the "Euston, St. Pancras, and Charing-cross Railway," is now in Parliament, and has passed the second reading.

The railway division of the project is primarily (as before intimated) the formation of a connecting link between the systems of the London and North-Western Railway, from its terminus at Euston-square, as also the Midland at King's-cross, and the South-Eastern at Charing-cross, by means of an underground line.

The starting-point may be considered to be the west side of the Midland Terminus, where, from junction with its (the Midland's) low-level line, it strikes off in the westerly direction. At Euston-square, the connexion with the London and North-Western joins in, by means of two branches, one coming from either side of the Euston Terminus. The line thence proceeding in main, and touching the Gower-street Station of the Metropolitan Railway (where it will have a station, with exchange communication), crosses at once, at the point of their intersection, under the Euston-road and Tottenham-court-road, and, at a lower level, the Metropolitan rail. From hence it bears round to a southerly direction, and passes down in the rear of the houses of the west side of Tottenham-court-road throughout its length, and crossing Oxford-street just east of the Oxford Music-hall, falls into the line of the proposed new street near the junction of Crown-street, reaching Leicester-square by Leicester-place; then curving to the east in its course through the square, and dropping to the line of Hemming's-row and Chandos-street, bends round by the north of St. Martin's Church, and passes under the Strand midway between Villiers and Buckingham streets. From this point, by a practical gradient running obliquely over Villiers-street, the level of the South-Eastern Rail is reached towards the viaduct end of the terminus.

The total length of the line, inclusive of the short branches, is two miles and a half. There are to be intermediate stations—all of which are to be open to the upper air—at Gower-street, Goodge-street, Oxford-street, Leicester-square (north side), and the Strand (north side). It is to be sought, also, to run into the Metropolitan Extension Railway, which passes under the Thames Embankment, to be effected by means of a branch on a practical incline, striking out eastward at the point of the emergence from the Strand; by which, it is said, the Bank Station of the last-named line would be placed within a twelve minutes' passage from Oxford-street, or ten from Leicester-square.

The new street division of the scheme—and to which more particularly this paper must be considered to have reference—is comprised in three parts; and, for convenience of reference here, will be distinguished as Section 1, Section 2, and Section 3 (see annexed plan). The

first and principal piece (Section 1) is the line from Tottenham-court-road to Leicester-square,—a cutting of 650 yards run, driven indiscriminately through an entirely built-over district, the railway, as previously intimated, being beneath it through its entire length.*

The section No. 2 is the line traversing east and west, and is in effect a revival—suggested by the railway partnership—of a metropolitan communication improvement sought to be effected ten years ago, viz., a new street for continuing Piccadilly *via* Coventry-street directly to the line of the Strand *via* King William-street†.

According to the present scheme, the same thing in effect will now be accomplished by the mere formation of a short bit of new street, of less than 100 yards' run, extending from the west end of Hemming's-row to the south-east corner of Leicester-square (a work, too, which the railway partnership embraces), thence to be connected with Coventry-street by the roadway being made to strike right across the square, it being assumed, as regards the Hemming's-row part of the line, that that thoroughfare will be widened by the setting back of the frontage of the buildings about to be erected on the site of the St. Martin's Workhouse there, for the interesting enlargement of the National Gallery. On this line, also, from Leicester-square to St. Martin's-lane, the railway will be beneath. The importance of this section of the work—considered even by itself—can scarcely be over-estimated. By it the western approach to the City, *via* Piccadilly and the Strand, assumes a direct line, and effects a saving in distance between the Piccadilly-circus and the point of the confluence with the Strand (Agar-street) of some 300 yards as compared with the present devious route of Charing-cross,—a distance equal to the length of the Haymarket or Waterloo-place; with a gradient in no part of the line exceeding 1 ft. in 150 ft., as against 1 ft. in 35 ft., which the Haymarket or Waterloo-place gives throughout their length. And, furthermore, the quantity of traffic it would draw off from the West Strand would materially tend to ease the inconvenience constantly occurring at that spot, particularly at the train times of the great railway termini there.

Section No. 3 is the short space of street from Leicester-square, down to Trafalgar-square,—a continuation of the main line (Section 1), with which it is proposed to be connected by a roadway being made straight across the square.

But as the railway partnership does not apply to this section, and the Government, as before stated, making no sign of co-operation, and it being the understood practice of the Spring-gardens Board to decline the taking up for execution recommendations coming in this way, unless accompanied with the assurance that part only of the cost of the work is to be a charge on its funds, i.e., metropolitan rates, the going in for its formation had for the time to be set aside. But as the great end sought in the original projection would,—by the line of New-street, thus stopping short at Leicester-square,—be but imperfectly attained, it will be obvious that if the design for that portion passes for execution, the same as regards this piece must necessarily soon follow.

And it may yet be that the Government,—on the other portions of this project assuming a more positive reality,—may be induced to come forward with a contribution in aid of the work, even though no alteration in the National Gallery edifice at that part is to take place. The priceless value of the public treasures in that way, surely makes it worth something to the nation for the Gallery containing them getting set free of the numerous now incumbering tenements here, and relieved from the danger of fire being communicated from this direction, which the introduction of a street here would effectually do.

With even a moderate contribution from that source, the formation of this section of the project would be rendered a by no means heavy affair; which a slight glance into the circumstances of the route proposed for it, discloses. Thus from the south side of Leicester-square to Trafalgar-square is under 200 yards. St. Martin's-street is in the direct line. By adapting the line of that street, and utilising the west side of it, and merely setting back the range of the east side (the latter composed of properties, with trifling exception, of very inferior class),

two-thirds of the length of the new street is accomplished. The remaining sixty yards,—i.e., from the lower end of St. Martin's-street,—would be a cutting through, first, a stable-yard; secondly, the blind end of a court (the before-mentioned Marlborough-court); and, thirdly, through into Pall-mall East, for which the first three houses of that street would perhaps be required.

The approach thence to Charing-cross being the fine piece of street-way,—the west side of Trafalgar-square. And thus would be completed a main arterial line of thoroughfare, direct, commodious, and uninterrupted, entirely crossing Mid-London, and calculated especially for facilitating the intercourse between the vast populous districts of Pancras, Kentish Town, Camden Town, Hampstead, Highgate, &c., on the one side, and Westminster and the further-off southern districts on either side of the Thames on the other; and secondarily, by the divergence at Leicester-square to the line of Piccadilly, between the said northern parts and the western districts, South Kensington, Brompton, and Belgravia.

The desirability of embracing the opportunity here presented of getting this new street,—and in its thus complete form,—cannot admit of a doubt, practicable as the whole work is, under the attending circumstances, at an expense so moderate as compared with the outlay on any of that score or so of kindred operations executed on London during the last half-century; yet promising results, in degree of usefulness, inferior probably to none of them.

As respects Leicester-square, too, it may be observed that for a period extending back through, at least, the last generation, the enclosed portion of this square has been uninterruptedly a public nuisance—a seeming reflection on metropolitan local self-government action. But so positioned appears to be the place as respects ownership rights as to render the existing powers of the local authorities inoperative to its bridging about of any amelioration in its disgraceful condition. And now we are promised,—which promise fulfilled would be a greater evil still,—that the ground is to be built upon! An opportunity is, however, here presented of turning the unseemly waste to account in a manner which, whilst importantly contributing to the facilitation of public traffic, the open space will be preserved, and the place made ornamental.

To that end, in the general scheduling of the properties to be taken for the line of the street and rail, the enclosure of Leicester-square has been included, and any right that may be found to attach to the place will thus, at some price or other, be bought up.

Surely the bare fact of the long-continued total disregard of ownership obligations in respect to decent maintenance of the place, and patent to all London, must give the claimant a sufficiently low standing before either Parliamentary committee, or compensation jury, to ensure the getting possession of the place, a by no means difficult or costly affair.

By what has been propounded in the course of the foregoing it will be seen that a roadway connecting both of the proposed lines of new street would cross Leicester-square diagonally, intersecting near its centre, giving a triangular-shaped space on each of the four sides of the square. The former,—in width uniform with the carriage-way portion of the new streets,—would be pitched or macadamised as the said streets. The latter, it is suggested, should be handsomely paved over in slabs of various coloured stones set in geometric patterns; or in similar ornamental style in asphalt; or, it might be,—taking into consideration the remarkably public position the place is, and the very centre of London,—that these spaces should receive high architectural or statutory adornment. The Orange-street pumping establishment hard by, which could conveniently give the necessary water supply, suggesting also fountains after the manner of Trafalgar-square. In the carrying out of the details of any such lay-out it will probably be seen that the place would be rendered more effectively ornamental by an enlargement of the area to be so treated, practicable by adding to the present enclosure the space now occupied by the paved footway next the railings; and perhaps a slice might be spared from the carriage-ways also, since on these (at least, on three of them) there will be no traffic when the new crossing roads are brought into use. In any case, however, one condition must be observed, that all be open so that the public may freely traverse the place in every direction.

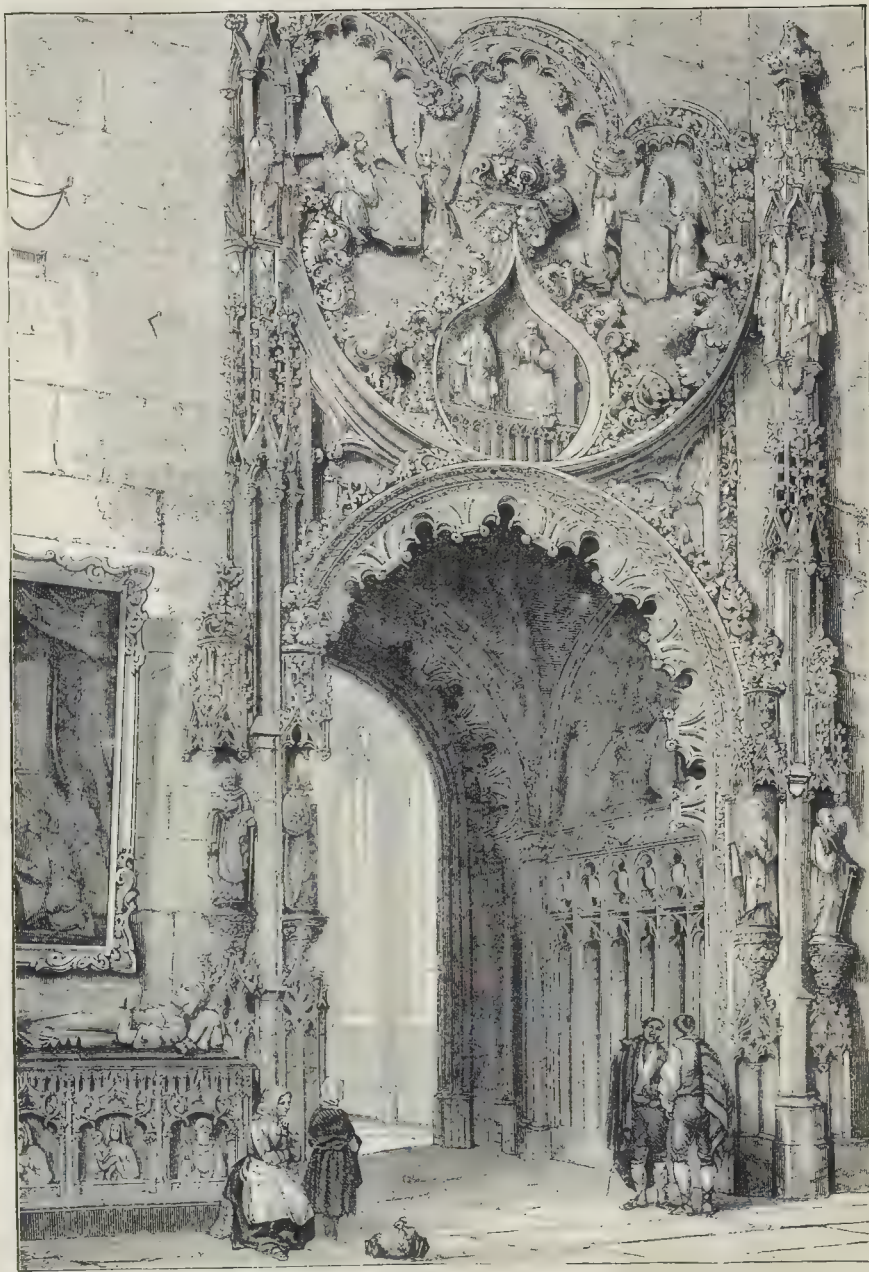
F. C.

* As respects this street, the annexed plan shows only the point of its junction with Leicester-square.

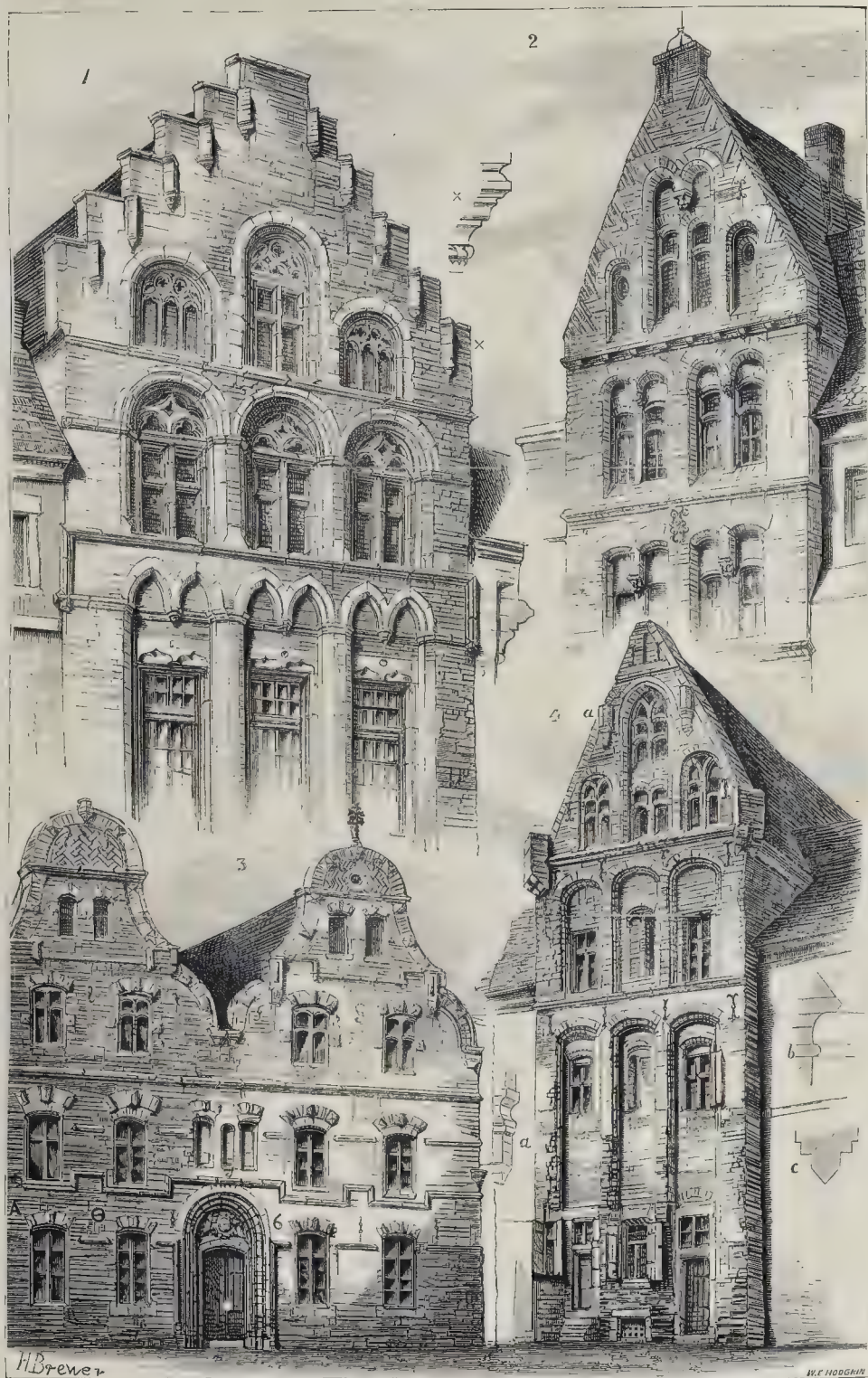
† See *Builder*, Jan. 26, 1861.

PLAN OF PROPOSED MID-LONDON STREET IMPROVEMENTS TO BE MADE IN ASSOCIATION WITH THE CONSTRUCTION OF AN UNDERGROUND RAILWAY





GATEWAY OF THE CATHEDRAL, SEGOVIA, SPAIN.



DUTCH DOMESTIC ARCHITECTURE: ROERMOND AND VENLOO.

"SPANISH PICTURES DRAWN WITH PEN AND PENCIL."

THE book just now published under this title is remarkable for the number and excellence (as a popular work) of its illustrations.* With such an outlay as the publication must have incurred it will require a very large sale to make it remunerative, and this the organisation of the Society that issues it, and the merits of the work, will doubtless secure for it. It is very agreeably written, and conveys a vivid and correct impression of the aspect and manners of the country. The writer is forcibly struck, as every observant visitor must be, with the contrast between the past and the present of Spain, the evidences everywhere observable of its energy and greatness in former centuries and of a base and ignoble present. The cause of this degeneracy he finds in the blighting despotism of the Papacy, beneath which all freedom and courage perished. A change has been effected, reaction has set in, and a defiant infidelity threatens to take the place of the bigoted superstition. Thousands, however, he asserts, have become Protestants; and in a sober, rational, religious freedom there is yet hope for Spain. A very few years ago some English engineers of our acquaintance who met on a Sunday to read the Bible and say their prayers together were imprisoned and persecuted: now the Protestant congregations are in many places in excess of the accommodation provided for them. The second chapter of the book, "Paris to Madrid," includes a very interesting account of the Basque Provinces, by Miss E. J. Whately. The third chapter is devoted to Madrid, the Escorial, and Segovia, from which we are enabled to reproduce, as a specimen of the illustrations, a view of the entrance to the Cathedral at Segovia. Our author has very little to say about architecture,—too little!—and in this, as in other cases, gives no account of the building. It was commenced in the year 1525, and is one of the large class of over-adorned cathedrals built in Spain about that time, when the church was rich and powerful. They are remarkable rather for elaboration of ornament than for excellence of general design, and are to be found only in Spain. Segovia is a particularly interesting city, of most ancient memory. Pre-Roman, Roman, Gothic, and Moorish remains are to be met with. The Alcazar, a stronghold of the Moorish rulers, and the Aqueduct attributed to Vespasian are things to be seen. The latter lofty structure is described as being "constructed of granite blocks, about 2 ft. square, which are hewn and fitted with such admirable accuracy that they are put together without mortar or cement of any kind." Very few of the blocks have fallen away.

The Escorial is about 35 miles from Madrid. "It stands with a vast sweep of barren moor in front, which stretches away into the distance, in almost endless undulations. Behind it rises a range of hills, of noble height and form, dark and savage in the foreground, till, as they recede into the distance, they melt into a tender, delicious blue. The scenery is like that of the highlands of Scotland. A young Scotchman, resident in Madrid, told me that he used to run over to the Escorial as often as he could get away from his duties in the city; it reminded him so much of 'his own home.' But nowhere in Great Britain have we a line of snow-clad peaks like the Sierra de Guadarrama, which form the northern horizon. The serrated edges stand up clear and sharp against the sky, and seem, in the keen, pure air, as though they were only a few miles away. Mr. Sala speaks of it as a 'background of mountain scenery, more beautiful and sublime than any I have seen out of Mexico.' In this he probably exaggerates *more* *vero*. But he is certainly nearer the truth than the ordinary run of tourists, who go on repeating the same hackneyed description of the surrounding country, as though it had neither grandeur nor interest. Beauty it confessedly has none, but the scenery round Balmoral is not more grand and wild, and Balmoral has no chain of snow peaks in view."

It affords a striking illustration of the immense size of the Escorial, that even in such a situation as this it looks massive and imposing. An ordinary palace would be dwarfed into insignificance in this waste of moorland and mountain. The stern and severe simplicity of its architecto-

ture, almost entirely without decoration or ornamentation of any kind, is in harmony with the scene, and adds to its impressiveness. One cannot, however, suppress a smile at the aptness of the description, that "it is like Newgate magnified a hundred times, with the cupola of Bethlehem Hospital on the roof."

It was built by Philip II., and was finished about 1580. A well-known picture, by Rubens, now in the collection at Longford Castle, near Salisbury, gives a striking idea of the desolate grandeur of the site.

"Spanish Pictures," will, doubtless, induce some more of our travelling countrymen to visit it before the year is out.

DUTCH DOMESTIC ARCHITECTURE.

ROERMOND AND VENLOO.

ALTHOUGH not so rich in ancient domestic architecture as Belgium or Germany, Holland still contains many excellent examples of old brick houses of the sixteenth and seventeenth centuries. At Dordrecht we find street after street of picturesque gables,—in fact, this town has been not inaptly called the "Dutch Nuremberg." Delft also presents good examples of "gabled fronts;" but the most interesting specimens that we have seen are at Roermond and Venloo: so we have selected four examples from these two towns for illustration. We are inclined to think that none of the four examples given are of an earlier date than the end of the fifteenth century, although two of them (Nos. 2 and 4) have a very much earlier appearance. In fact, when we first saw the houses represented in sketch No. 2, we were, for a moment, almost led to believe it to be a work of the thirteenth century; but a closer examination of the details distinctly proved it to be of no earlier date than quite the end of the sixteenth century. Nor is this uncommon; for in many parts of Holland there are buildings, especially church towers, of the sixteenth century that are quite Romanesque in character. The tower of the Protestant church at Velemen, near Bois-le-Duc, is a curious example of this style, so thoroughly Romanesque in appearance that only a very careful examination of the detail will convince the antiquary that it is a very late, instead of a very early building.

Holland possesses very few examples of Early Domestic architecture; in fact, the only specimens we know of earlier than the fifteenth century are two wooden houses at Bois-le-Duc, which are said to date from the thirteenth century, and if not quite so early as that they are certainly not later than the beginning of the fourteenth century. They are both in a very perfect condition, and are remarkably interesting from an antiquarian point of view, but as they are of no great service to the practical architect of the nineteenth century, we have not given an illustration of them.

Our example No. 1 dates from the end of the fifteenth century, and is built of brick and stone, brick only being used for the walling; all the ornamental portions being executed in a warm sandstone. The basement story of this interesting old house has, unfortunately, been altered within the last few years. This example is from Roermond.

No. 2 is also from Roermond, and forms one of a series of very similar gables adorning the high street of that quaint old town. Unlike the former example, brick is here used for every purpose, even for the mullions and transoms of the windows; and it will be noticed that all the transoms are arched, as, of course, they would not have sufficient strength if built of small bricks without this arrangement. Roermond contains many other examples of domestic architecture of the sixteenth and seventeenth centuries, and has also a cathedral and two churches.

The cathedral dedicated to St. Christopher is a large cruciform building, with very deep transepts, which, together with the chancel, are apsidal in their terminations. There is a lofty square western tower, crowned with the everlasting bulb spire. The aisles of the choir are the same height as the choir itself; but the nave has a large clearstory. About a century ago every scrap of tracery was removed from the windows, but it is all now being replaced, from the designs of Mr. Cuyper. This church is the seat of a Roman Catholic bishopric, established in the sixteenth century, suppressed in 1802, and re-established in 1850. The fittings of the church are miserable, and are to be entirely reconstructed by Mr. Cuyper.

The church of St. Mary, called the Minster Church, is a much more interesting building, of the Romanesque period. It consists of a nave and aisles, with lofty western transepts and narthex, eastern transept with a dome, and four towers; but as we shall describe this church, or give an illustration of it, in a future number, we will say nothing more about it at present.

The third church in Roermond is partially used by the Calvinists and partially used as a barn; and, we regret to have to say it, the latter portion has been far less ill-used than the former, which is simply a conglomeration of lofty pews, galleries, and whitewash. A new entrance doorway has been erected in the eastern bay of the apse, the pretentiousness of which is only equalled by its ugliness and utter unsuitableness. Why an architect should perpetrate the absurdity of putting a twelfth-century French Gothic doorway into a Dutch church of the fifteenth century, we are at a loss to conceive; and, to make the matter worse, this wretchedly-designed portal is entirely carved out of large blocks of granite.

Of the two examples of domestic architecture which we give from Venloo, fig. 4 is by far the most interesting. It is entirely of brick, without a single atom of stone used in its construction. It probably dates from the end of the fifteenth century, though the simplicity and boldness of the tracery in three windows in the gable would almost induce us to ascribe to it an earlier date. Venloo contains many other examples of domestic architecture, but they are chiefly of a later date, and much in the same style as our example No. 3, which is rather more curious than beautiful. However, it is an interesting example of a building of the seventeenth century, and bears upon it a date viz., 1611.

Venloo contains seven churches only, two of which, however, are used for religious purposes, the other five being all desecrated. The Catholic parish church (fifteenth century) is very large and striking. It consists of four naves, all the same height, and nearly the same width. It is all vaulted. The arch-moulds are continuous from the bases, and there are no capitals. Three of the naves end in apses to the east, and the fourth has a large blocked-up east window. The tracery has been removed from most of the windows, but is now being carefully replaced, and the windows filled with glass in grisaille. The church contains a very fine cinque-cento font and cover of beaten brass, good fifteenth-century stalls, a Renaissance high altar of black and white marble, remarkably fine in its way, a curious old Calvary, and a number of good brass candlesticks of the sixteenth century. The church is entirely of brick, except the windows, columns, and vaulting-ribs.

Round the churchyard are some remains of the old fortifications, with great circular bastions. They are works of the earlier portion of the sixteenth century, and are erected in "Flemish bond;" and we wish to call notice to this fact, that these bastions, and the similar ones at Roermond, are the only examples of Flemish bond we have met with on the Continent of an earlier date than the end of the seventeenth century; and here the Flemish bond is only used where the building assumes a circular form, which is to be accounted for from the fact that it is excessively difficult to turn a circle in what we insist upon misnaming "English bond."

The Protestant parish church at Venloo has been so atrociously ill-used that, whatever beauty it may at one time have possessed, has now entirely disappeared. It is apparently a building of the commencement of the sixteenth century; but the square nave, with its ash windows, dates from the last century; and nearly the whole of the ancient chancel is occupied by a huge gallery. The tower also has been modernised.

Two of the desecrated churches are interesting. One of them consists of a nave and aisles, the same height, all vaulted, with the arch-moulds turned in red brick. There is no tower, and the western end is adorned with mosaic patterns in red and black tiles. The other is of exactly similar plan, and has windows of three lights, with the tracery all in brick. It is probably not earlier in date than quite the end of the sixteenth century, but is curious from the fact that no stone at all appears to be used in its construction. We were not able to see the interior of this singular building, as it is used for a military store. The other three desecrated churches are too much mutilated to be of any particular

* "Spanish Pictures drawn with Pen and Pencil." By the Author of "Swiss Pictures drawn with Pen and Pencil." With Illustrations by Gustave Doré and other eminent Artists. London: The Religious Tract Society.

interest, though one of them (evidently a Dominican church) is of great size and fine proportions.

THE TRADE SOCIETIES CONGRESS.

On Saturday last the delegates concluded their deliberations at the Portland Rooms, Foley-street, Marylebone. Mr. George Potter, on taking the chair, adverted to the deputations from Birmingham and Halifax that waited upon Mr. Bruce on Friday, the 10th inst., remarking that the right hon. gentleman's concessions and admissions to these influential employers made the case against the 3rd clause of the Trade-Unions Bill much stronger for the employed. With a clause so worded as to be open to the objection of "extreme vagueness," and yet "having to be interpreted by magistrates who had neither a legal appreciation nor education," what would become of working men? He suggested that the committee to whom they had confided the question should have their hands strengthened. Mr. Lloyd Jones (Manchester Fustian Cutters) thought it would be worse than folly, in the present state of things, to attempt to fight the battle in Parliament, where the strength of their opponents lay. Their course and duty should be to take up strong ground outside the House of Commons, leaving the responsibility of what was done in Parliament to the members themselves, but repudiating altogether the imputations cast upon working men by this clause. Ultimately, it was resolved unanimously to empower the committee appointed to watch the progress of the Bill through both Houses of Parliament to use every legitimate means to secure the rejection of the 3rd clause, and the incorporation of such amendments in the other clauses as were requisite and necessary to meet the wishes of the Congress; and further to empower them to convene another general Congress of delegates from all centres of industry in the United Kingdom, if they should find it to be necessary, with a recommendation to working men to hold meetings on the subject in every part of the country. Various other resolutions were carried in like manner, the three first proposed from the chair,—viz., that the Congress could not separate without recording its opinion that primary education should, without delay, be applied to every child, and technical education opened to every person connected with the industry of the country; that the attention of the Government should be called to the fact that commissioners appointed to inquire into questions affecting the condition and treatment of working men never include members of their own class, and that, with a view of making such inquiries more satisfactory, working men should always form part of these commissions; that the members of the Congress took upon themselves the duty of urging their constituents to promote industrial partnerships, and to use their united capital for the purposes of self-employment; that the present taxation of the country, both imperial and local, were enormous and burdensome, and required readjustment, so that income and property should bear its fair share, and the burdens on labour be proportionately reduced; that the waste lands of the country should be utilised for the benefit of its unemployed labour; that there ought to be direct representation of labour in Parliament; and lastly, that the international fraternisation of labour was a matter of the most vital consequence to the interests of the industrial classes and the welfare of society at large.

An address to the trades-unions, drawn up by Mr. Lloyd Jones, and embodying the views and resolutions of the Congress on the application of arbitration and conciliation to trade disputes, was approved, and ordered to be printed and circulated. In the meanwhile, Mr. Rupert Kettle has undertaken to draft a Permissive Bill to give legislative sanction to the principle wherever the masters and men are willing to adopt it. It was arranged that the next annual Congress should be held at Nottingham, on Monday, in the second week of January, 1872.

On Thursday the delegates were entertained at dinner by Mr. Plimsoll, M.P., and on Saturday by Mr. Edward Jenkins, barrister-at-law. On Saturday evening a *conversation* was given by the members of the London Artisans' Club and Institute to the members of the Congress. The company was not so numerous as expected, in consequence of a number of the members of the Congress having been obliged to leave London previously.

The two deputations which waited, by appointment, upon Mr. Bruce, to represent certain objections entertained by employers of labour to certain provisions of the Trade-unions Bill, and who were accompanied by Mr. P. H. Muntz, M.P., Mr. G. Dixon, M.P., and Colonel Akroyd, M.P., consisted of members of the Birmingham Chamber of Commerce, members of the Builders' Association, and several gentlemen from Halifax. Mr. Thomas Lloyd (Birmingham) suggested that the third clause of the Bill required amendment; that it would be much better to leave out the definitions of "molestation and obstruction." In explaining what was meant many methods of molestation were left out. Mr. Bruce said the great objection to the words was their extreme vagueness, and their having to be interpreted by magistrates who had neither a legal apprehension nor education. It was not necessary that every sort of molestation should be punished by law; but his object had been the removal of the just cause of complaint. Mr. Tonks, of Birmingham, called attention to the absence of any explanation or provision with regard to what masters might do to their men; and the penal clauses, also, were not wide enough. Mr. Bruce said the only way masters acted was to send round a "black list." With regard to what was and what was not to be molestation, great difference of opinion had existed. He did not see that two men quietly watching a house for the purposes of a strike should be indictable. Mr. Matthew Smith, of Halifax, suggested that it should be expressly provided that workmen should not interfere with masters, so as to limit the number of workmen they employed. Mr. Bruce saw no objection to introduce a word into the clause having that effect. Mr. Wright pointed out that workmen were forbidden from hiding tools only, but the hiding of a man's coat would create quite as much annoyance. Mr. Bruce said the clause could easily be altered so as to include all a workman's property. In the course of some further discussion, Mr. Bruce said members of union clubs knew quite well that the primary object was trade, and the subscriptions were for enforcing their interests, and that being so, it would be impossible to treat them as friendly societies.

An important meeting of the Yorkshire Master Builders' Association was held on Monday, in the Leeds Town-hall, to consider the provisions of Mr. Bruce's Bill on the above subject. The meeting was presided over by Mr. Thomas Whiteley, of Leeds. Mr. W. Longley, of York, secretary to the association, read an elaborate report and comment on Mr. Bruce's Bill. The opinion of the meeting, expressed in the resolutions adopted, was that the measure of the Government was unsatisfactory, and not calculated to promote a good feeling between employers and employed, and that efforts should be made to induce the Government to introduce the recommendations of the Royal Commission with regard to compulsory registration, separation of funds, and the enforcement of contracts. The resolutions are to be forwarded to the London and Liverpool Builders' Associations and to the local secretaries of the Yorkshire branches, with the view of securing their influence in support of the views of the association. Mr. Barry, of York, took part in the proceedings. Messrs. Bellerby, Shafto, Weatherley, and Longley, of York, were placed on a committee to carry out the resolutions adopted.

THE SANITARY STATE OF NEWLYN.

A REPORT by Dr. Buchanan, on nuisances in the parish of St. Paul, Newlyn, near Penzance, gives strong corroboration of what has been said in the *Builder*. At Newlyn village, says this report, the great majority of the houses are unprovided with any convenience, and excrement has to be thrown away somewhere, generally over the cliff, where it is seen lodging along with other house filth. In parts of this village the cottages are so packed together that there is no room for a privy. The vestry having had its attention called by the Lords of the Privy Council to the state of the parish, continues the report, has appointed a surveyor "to make the necessary plans for sewers and water-supply," has covered in (without any particular advantage) certain channels; and has directed a cart to go round the villages of Newlyn and Street-an-Nowan twice a week to carry away house-refuse. It appears from the above that the sewer authority contemplates a watercloset system as the means of ultimately disposing of

excrement in the populous parts of the parish, and that it is meanwhile carrying out in other directions such work as it regards as immediately practicable. This action of the Board is, the reporter thinks, in the right direction, but no part of it is yet up to the point of efficiency.

THE TRAMWAY SYSTEM AT GREENWICH.

About three months since a short length of the Pimlico, Peckham, and Greenwich Tramway, from Blackheath-hill to New Cross-gate, was opened for traffic. On Saturday last another short section was opened with considerable ceremony from Greenwich-road to East Greenwich. A fair amount of business will probably be secured by the proprietors of this line when it is opened throughout, which will be at a remote date, judging from the slow progress made hitherto; but at present there is not much more to depend upon for dividend than curiosity traffic, and a few casual pick-up passengers, as New Cross-gate, East Greenwich, and Blackheath-hill, are not, in themselves, localities to which many persons can desire to be conveyed. There is a curious piece of engineering at Deptford Bridge upon this line. For a considerable length the line is double, but the trams are laid so close together that the cars cannot pass each other; one of them has either to wait for the other, or to "back," if it meets a car within a certain space. The passengers who use the cars speak very favourably of their roominess and comfort, but travellers by the ordinary omnibuses and other vehicles complain bitterly of the rattling and jolting they suffer from the granite paving of the tramway company.

ACCIDENTS.

Fall of a Platform.—At the town-hall, Lowestoft, 360 Sunday-school scholars, with their teachers, were on a platform, when its supports gave way, and the whole number were precipitated to the floor, a distance of several feet. None were killed, but many were severely bruised. Fortunately, the choir was standing when singing.

Fall of a House at Yarmouth.—The inhabitants of Row 132 were much alarmed the other day by the sudden fall of a house. It seems that a widow occupied No. 27. The house was her own property, and for some time past it had exhibited unmistakable signs of caving in. A builder was consulted, and he was to have commenced the work of repair, but was saved the trouble by the collapse of the whole of the back part of the premises. Many of the houses in the row are in a most risky condition.

Fall of a Face, Board at Manchester.—An inquest on the body of James White has been held. It appears that deceased was walking along Bridge-street, when a face-board, running along the edge of the roof of the houses numbered 43 and 45, fell upon him, and killed him on the spot. The board in question was described by one of the witnesses as having been erected for the purpose of making the building look higher than it actually is, and also to give it a more noble appearance than it would otherwise present. It consisted of a piece of Quebec pine, about 89 ft. long, 16 in. high, and 8 in. thick, and was in a very rotten condition. At the time the accident occurred there was a strong March wind blowing. Mr. J. G. Lynde, the city surveyor, expressed his conviction that wooden cornices ought not to be allowed to exist for two reasons, viz., they were liable both to fall and to fire. He said the corporation had no power to prevent them being erected, even in the case of new buildings. The only suggestion he could make was that such cornices should be properly secured, and that they should be subject to periodical examination. In his opinion, wooden cornices were the most dangerous structures existing in the city. In the present case, had a person looked at the board in front, he thought he would have discovered the insecure state of it. After a short consultation, the jury returned a verdict of "accidental death," at the same time strongly censuring the agent of the property for neglecting to have the board properly inspected, and concurring in Mr. Lynde's suggestion. The coroner differed with the jury on the point of censure, and sent them back twice to reconsider their verdict. The jury, however, refused to alter their decision, and the coroner consequently recorded it.

Fire at Holker Hall.—A fire has produced

30,000*l.* worth of damage at Holker Hall, Cartmel, the seat of the Duke of Devonshire. The fire was discovered by Lord Frederick Cavendish, brother of his grace, in his dressing-room. The whole house was soon as fire, and farmers and others in the immediate locality came flocking to the spot. The engine on the Holker estate was speedily to work, but the supply of water at hand was by no means plentiful, the only sources being the fishpond on the lawn and a well in the rear of the building. Soon the whole building was in danger. The right wing was destroyed. In this part of the mansion were the many valuable pictures and the costly library. Efforts were made to save as many volumes, family relics, portraits, statuettes, &c., as possible, and soon the lawn in front of the conservatories was covered with heaps of valuables, thrown indiscriminately together, and costly carpets were spread over the rescued property to save it from a pouring rain. Fully one-third of the mansion has fallen a prey to the fire.

THE GOVERNESSES' INSTITUTION.

The foundation-stone of a new asylum for aged governesses has been laid at Chiselhurst, on a site purchased by the Governesses' Benevolent Institution. The situation is near the old church, and the building will lie on the north side of the road leading from Chiselhurst Common to St. Mary Cray and Orpington. The style, as designed by Mr. Matthew Wyatt, son of Mr. T. H. Wyatt, is Elizabethan, the low pitch of a row of separate cottage dwellings being relieved by a gable front and porch to the centre house, which is to be occupied by the lady superintendent. When complete, the asylum will form three sides of a quadrangle, consisting of 24 separate dwellings, each of which is designed for one annuitant and her servant, and will comprise four rooms, kitchen, scullery, and the usual offices. A verandah will shelter the front entrances, and a roadway will run round the rear for the convenience of the tradesmen supplying the inmates with goods. The cost of the 24 houses is estimated at 15,000*l.*, a contract for the erection of the first half having been taken by Mr. Tongue, of Plumstead, for about half that sum.

THE ADULTERATION OF FOOD AND DRINK.

A PAPER on legislative measures for preventing such adulterations has been read by Dr. Letheby to the Social Science Association. Dr. Letheby would limit the application of legislative measures to the use of unwholesome substances,—permitting wholesome mixtures to be sold, provided they are clearly designated at the time of sale, by means of a proper label. There should, he considers, be a public analyst appointed by the local authority, in exactly the same manner as the gas examiners are appointed under the recent Metropolitan Gas Act, and he should make the analysis of articles brought to him by the inspector, or by any other purchaser who has taken the necessary precautions to preserve the identity of the article, and this should be sealed by proper regulations. In all cases of adulteration, or of mixtures in fraud of the public, his certificate should be forwarded to the local authority, who should immediately send a copy of it to the dealer, and it should be regarded as *prima facie* evidence of adulteration or of fraud; but the dealer should, in case he thinks himself aggrieved by the certificate, have the power of appealing to a central authority, as the Board of Trade or the Excise, who should refer the matter to a chief analyst, whose decision should be final and conclusive, and the expense of this should be defrayed by the parties in default. In case of a certificate of adulteration from the local analyst, or from the chief analyst on appeal, the local authority should be required to prosecute the matter before a justice in the way provided for in the Act.

In course of the discussion which followed, Dr. Letheby defended his somewhat modified strictures against adulteration.

"A large number of things now in great consumption [he remarked] could not be supplied in the necessary quantity if in their pure state. There was not butter enough in Europe to supply the wants of Europe. If, therefore, what had been proposed were to take effect, butter would fall only into the hands of a few, and this at fabulous prices. Fat must be used with butter, but do not let tradesmen sell common fat for good fat. Then there were many articles that, in a pure state, were not useable.

Take cocoa: a great part of it was fat, and the mixing of it with farinaceous matter was a necessity, and they must permit it. A similar principle applied to wine, mustard, and other articles. Where things were mixed without danger to the public health, he would give the power to do it."

"Fat must be used with butter." But what sorts of fat? It was said, not long since, that "fat" was got from Thames mud, and "used with butter;" and this we know, that in Holway, on a recent occasion, butter was got out of three rival shops, each sample of which tasted strongly of fish. Elsewhere in London the same thing occurs. Whence could this fishy taste have come? What has butter, even mixed with "fat," commonly so called, to do with fishy taste? *Per se*, a fishy taste implies no "danger to the public health." Can it be proved that even fat from Thames mud is dangerous to the public health? And if not so, would Dr. Letheby have us to submit to the adulteration of butter with fat, when the fat is got from Thames mud? As for the adulterations of all sorts of alcoholic drinks, the concoctions of many such adulterations are simply wholesale poisoners, and ought to be subjected to all the penalties of wilful poisoners, over and above those due to public cheats. They imitate the effects of intoxicants by using toxicants, or poisons, which undermines the brains of their victims, and drive them into lunatic asylums? What do such villains not deserve?

THE PENALTY OF DELAY.

Bolton v. Barker.—In this case, tried at Swansea County Court, the plaintiff was Mr. Bolton, of St. Helen's Works, Swansea, and the defendant an architect, residing at Hereford. The action was brought to recover the sum of 40*l.*, which the plaintiff had paid to the defendant for a set of tracings of villas, at Llandrindod. The money was paid on the 25th of April, 1870; but the plans were not delivered until the 14th of January last. The plaintiff now sued to recover the 40*l.*, on the ground that time was the essence of the contract; that value had not been received for the money paid; and that the delay of nine months was unreasonable. The case was gone into very elaborately, and judgment given for the plaintiff for the amount claimed. Mr. Smith was for the plaintiff, and Mr. Clement Jones for the defendant.

ROYAL ITALIAN OPERA, COVENT GARDEN.

THE appearance of Mr. Frederick Gye's programme shows the advent of spring, and in itself gives promise of "Spring's" delights. The season will commence on the 28th inst. with "Lucia di Lammermoor," with Signor Mongini as *Edgardo*, and Madlle. Sessi as *Lucia*. Signor Mongini, fighting against difficulties and considerable opposition, is now an accepted favourite, and his return will be warmly welcomed. The season will be made memorable by the retirement of Signor Mario, who, for twenty-three out of the twenty-four seasons of the Royal Italian Opera, has sustained the position of principal tenor, and in that position delighted the public. His parallel is not yet above the horizon. Madlle. Patti and Madame Pauline Lucos will sing during the season, and M. Faure and Signor Graziani. In addition to other operas of the well-known large *répertoire*, "La Donna del Lago," "La Juive," Auber's delicious "Les Diamans de la Couronne," and "Le Astuzie Femminili," are in the list: there seems every prospect of a delightful season. Some concerts will be given in the too-little-used Floral Hall, under the superintendence of Mr. Benedict.

ARCHITECTS AND THE '71 INTERNATIONAL EXHIBITION.

SIR,—You ask, somewhat naively, why is it that the architects of the day are so slow to send in, for the world's show and view, specimens of their artistic skill? The simple reason is that architects decline to sharpen the razor sedulously prepared by the South Kensington authorities for the severance of their own throats. Surely you cannot have forgotten that the architectural drawings, got together with infinite pains, and the assistance of the Institute of Architects, for the last International Exhibition, at Paris, and entrusted to the same authorities, were hung not even together, but on the backs of pieces of furniture, scattered about the building. When

invited again on this occasion to take a similar task on themselves, the Institute requested some guarantee, in the shape of the appointment of their president on the committee of the International Exhibition, against a repetition of such treatment. This request being refused, is it likely that members would act otherwise than I have done with the invitation-papers with which they have been pestered by the Department,—namely to consign them at once to the waste-paper basket? Pray, sir, do not you turn round upon our continually abused profession for not lending a hand to the building up of the South Kensington scheme, which is, and has always been, to damage architects, and set up Royal Engineers in their place. The very structure we are asked to help in furnishing is intended to prove to the world that it can do well without us. Rather let us regret that influential architects should have lent themselves to act on the committee of selection, and trust that their labours may, at any rate, be light. After the action taken by the Institute, as a body, I cannot but think that all its members should have abstained from an opposite one; and it is cheering to find that generally, it would seem, they have done so. F. R. I. B. A.

SICK WARDS FOR ST. LUKE'S WORKHOUSE.

THE new wards behind the workhouse of St. Luke's, Middlesex, are now completed. We are informed that the wards in question are intended to be occupied exclusively by women. They will accommodate 450 patients. There are eight wards, and the cubic space provided for each bed is 750 ft., in accordance with the requirements of the Poor-law Board. Messrs. Crabb & Vaughan undertook the work for 10,089*l.* The construction of the drains will involve an outlay of 1,200*l.*; but all things considered, the total cost of the works will not exceed 12,000*l.* Mr. H. Saxon Snell is the architect. It is stated almost as a merit that in the building the beds are ranged opposite to one another along the internal walls in each ward, leaving a central gangway between; that the windows are in the external walls at either end, and the current of air between them is, therefore, down the central gangway; any draught from the glass being harmless. As it is stated that another block of such buildings is to be erected, we think it desirable to say that this arrangement, by which the air supplied to patients is made to pass over other beds from end to end, is, to our minds, exceedingly objectionable, and should not be repeated. The cost of the buildings, including architect's commission and other contingencies, is put at 27*l.* per bed.

FIRE AND TRAP DOORS.

MR. E. O. SYMONS's letter on this subject, contained in your last Number, induces me to send you the suggestion that movable wooden step ladders should not be used for the purpose of communicating with these doors. In London I have surveyed hundreds of houses for dilapidations, and having occasion to inspect the roofs, have in the majority of cases found that the movable wooden ladders were missing from the traps, and were on the basement story, having been removed by the servants for domestic purposes.

Ladders to trap-doors should be of light wrought-iron, firmly built, or casked into the brick walls. If made to be movable, the probability is that when required for escape from fire they are nowhere to be found. A. H.

METROPOLITAN RAILWAY SURPLUS LANDS: COMPETITION.

OUR readers are aware that a large number of plans for laying out the building estates belonging to the Metropolitan Railway Company, were submitted to the company, in reply to offers of premiums for the best schemes, and set forth in four lists shops in Craven-road, close to the Praed-street station of the company. The drawings have been open to the public during the present week, and will probably remain so for a short time. The plans for each separate estate are hung together, and although a large proportion of them seem very common-place affairs, young architects and others will find the examination and comparison of them an interesting and useful study. Ten

premiums have been awarded in the following manner:—

Smithfield Estate: Mr. F. A. Klein, 100 guineas.
Barbican Estate: Messrs. Willson & Aldwinckle, 70 guineas.
King's Cross Estate: Mr. A. M. Ridge, 50 guineas.

Clerkenwell Estate: Mr. T. C. Sorby, 50 guineas.

Farringdon-road Estate: Mr. Bassett Keeling, 50 guineas.

Edgware-road Estate: Mr. F. A. Klein, 50 guineas.

Prasid-street Estate: Mr. T. C. Sorby, 50 guineas.

Linden-grove Estate: Mr. H. Elliott, 50 guineas.

Camden-hill Estate: Mr. C. J. Richardson, 50 guineas.

South Kensington Estate: Mr. H. Elliott, 50 guineas.

BIRMINGHAM ASSIZE COURTS COMPETITION.

We are requested to print the following letter which has been addressed to the Town Clerk of Birmingham:—

"In Re The New Assize Courts.

Sir,—My attention has been directed to a paragraph in the *Birmingham Morning News* of the 11th inst., stating that one of the architects submitting competition drawings for your proposed New Assize Courts has adopted the exceptional course of sending lithographed copies of his designs to every member of the Corporation.

The intention of this course is clear on the face of it, viz., to endeavour to obtain an unfair advantage over others who have a higher sense of honour or respect for professional etiquette, and a direct insult to the members of the Corporation whom he thereby insinuates to be open to such a means of influence, and whose favourable vote he thereby seeks to procure.

Now, sir, some twenty gentlemen not resident in Birmingham, trusting in the honour of your Council and the judgment of your referees, have laid before you carefully-considered designs for a public work of magnitude and importance, and we have a right to demand a fair field and no favour.

I would submit that any course not consistent with honourable practice and fair dealing, should *ipso facto* eliminate the designs whose author adopted such a course. Your Council determined that designs should be submitted under motto; the names of the local architects are already publicly quoted, and another tries to intrude his designs upon your Council, whether they wish or not: I would, therefore, further submit that the "secret system" should be discarded, and the names attached to all the designs, that we may each get the benefit of our productions. (Signed) THOMAS CHAS. SORBY."

SLATE CISTERNS.

Sir,—Will Mr. R. Williams kindly explain why slate cisterns cannot be made of slate made from *basaltes rock*, and oblige
 FONT ET FRANK?

INJURIES FROM ROAD GRAVEL.

An action against a Wansted builder has been decided at the Exchequer Assize. It was an action (Birchell v. Ingram) for the recovery of damages for injuries sustained by plaintiff's wife, and for expenses in consequence of both being thrown out of a trap by its running over a heap of gravel negligently left, as alleged, by the defendant, a builder at Wansted, in the County of Kent.

Plaintiff laid the expenses at 75s., besides a medical man's charge. The defendant had offered to send his own medical man; placed a man with a lamp after the accident for the remainder of the night; and paid for the conveyance being repaired.

The defence was that the plaintiff contributed to the accident by driving at a rapid pace, and by pulling the wrong rein when the horse, as alleged, shied. The damages were also described as excessive, and the action was an attempt at extortion.

The jury found for the plaintiff—damages, 23s.

THE SLUMS OF WHITECHAPEL.

At the meeting of the Whitechapel District Board of Works, on Monday, attention was called to a recent article in the *Builder*, on the Homes of the East of London. The paragraph especially considered was,—"In Anne-street, Wentworth-street, Goulston-street, Bell-court, Fryingpan-alley, Petticoat-square, Cox's-square, and many of the blind courts abutting and adjacent, the slum we encountered was intolerable, not in shoddy, but in barrowful, scattered all at. The backyards of the houses were also in a foul condition. Cox's-square was one dunghill—one inner arcum of abomination. It would seem that the backyards here, wherever there are any, were literally emptied out into the middle of the square."

The Sanitary Inspector of the north district (Mr. Richard Wruck), after recapitulating the statements made in our pages, observed, "I have to report that the above-named streets and places are cleaned regularly every day, and that the houses in Cox's-square that have yards of sufficient size are provided with dustbins; those that have not are provided with a public bin in one corner of the square, which is emptied every day. In addition to this, three more public bins have been recently erected in that locality."

Mr. Gladding said he did not wonder that strangers who were accustomed to the more well-to-do quarters of London, found on visiting the East of London, much to

disgust them; and this was especially likely to be the case if they saw the neighbourhoods colonised by Irish people. The streets referred to in the article were of this kind—they were mainly occupied by poor Irish, and their habits formed one of the most obnoxious difficulties with which sanitary authorities had to deal. Speaking from long experience, he could say that the people would not use means provided by the sanitary authorities, to ensure cleanliness. In all these places there were public dustbins, which were emptied by the contractors every day. The fact was, that the courts and alleys to which allusion had been made were the types of many others, where the people had neither the common sense nor the decency to put the refuse into the receptacle specially made for it; but preferred to throw it anywhere, or even if they went so far as the public dust-bin, they preferred to cast their sweepings by the side of the receptacle rather than into it. For this state of affairs sanitary authorities could not be fairly held to be responsible; all they could do, and this was what the Whitechapel Board had done for years, was to endeavour to obviate, as much as possible, the evils courted by the inveterate uncleanness of the people.

CHURCH-BUILDING NEWS.

Cheshington (near Kingston-on-Thames).—The church here has been reopened by the Bishop of Winchester, after enlargement, by the addition of a new south aisle and a porch. The architect is Mr. T. G. Jackson, of London. The nave walls are too low to admit of the construction of a stone arcade between the nave and the new aisle, and the piers have therefore been formed of coupled shafts of timber, from which braces spread in three directions, to carry the wall-plates and the trusses of the aisle-roof. These piers are moulded, and made of old oak of a fine dark colour. The aisle-roof is of fir, which has been neither stained nor varnished, but retains its natural colour. The walls are of flint rubble, with a brick lining, built hollow, and bonded to the flint with Jennings's vitrified bricks; and the dressings are of Box-ground stone outside, and Mertham stone inside, with moulded oak lintels to the heads of the windows internally.

The porch is chiefly of oak, in half-timbered work, the timbers being large, and the intervals filled with patterns stamped in plaster. Three dormers have been inserted in the roof of the nave, which part of the church was very dark. The passages of both nave and aisle have been laid with Godwin's plain red tiles, with narrow black borders. The chancel has been paved with Messrs. Powell's new opaque glass, which has hitherto been seldom used, but which, from its great durability and picturesqueness, and from the unlimited facilities it affords for variety of colour and design, may be favourably compared with the best-known materials for pavements. Notices of this material have appeared in the *Builder* on several occasions. The contractor was Mr. R. Durnell, of Brasted, near Sevenoaks.

Durham.—St. Cuthbert's Chapel-of-Ease, erected at Framwellgate Moor, near the city of Durham, from designs by Mr. T. C. Eady, has been opened for divine service. The foundation-stone was laid by the Very Rev. the Dean of Durham, in May last. The chapel will accommodate 150 adults. The plan consists of nave, 42 ft. 6 in. by 21 ft.; chancel, 21 ft. 3 in. by 21 ft.; organ-chamber, and vestry. The pulpit, reading-desk, communion-table, and chancel-stalls are executed in Dantzic oak. The style of architecture is Early Geometrical English Gothic, with open timber roof. The nave is lighted with candle-standards formerly in the Cathedral, and the chancel with a large corona. In the centre of the frontal of the altar-cloth is a cross, 17 in. in diameter, of crimson and gold silk, a *fac simile* of the jewelled gold cross found in the coffin of St. Cuthbert, now in the library of the Cathedral. The chapel is warmed by Haden's hot-air apparatus.

South Brent, Devon.—During the restoration of South Brent Church, some interesting Norman remains, hitherto concealed by plaster and modern stone and wood work, have been brought to light. There was a curious old structure at the south-west end of the church, adjoining the tower, which, for the last two or three centuries, at least, has been used as a vestry. This building possessed a semicircular-headed doorway at the south end. The taking down of the west gallery disclosed an arch of Norman construction in the east wall of the tower; and the more recent removal of the plaster from the inside of the tower, below the belfry, has brought to light an arch of the same style and period in each of the other walls. All are blocked up with comparatively modern masonry. The exterior of the tower has been partially restored, and, with the exception of the upper stage, is found to be altogether Norman. After a careful examination of the masonry the architect, Mr. Hine, Plymouth, has come to the conclusion that it was the

central tower of a cruciform Norman church, of which the curious building on the south side was one of the transepts. What is now the lower-arch, opening into the present nave, was formerly the chancel-arch. Belonging to this early structure is the font of red sandstone, with mouldings and carving of Norman character.

Wolstanton.—The New School-Church at Longbridge Hays has been opened for divine service. Longbridge Hays is a hamlet on the slope of the hill near Bradwell Wood, in the parish of Wolstanton. The cost of the school-church, which is centrally situated, has been about 550l., of which a little less than 50l. remained to be obtained before the opening services. The building will seat 180 persons, and will accommodate 125 children for educational purposes, being 42 ft. by 20 ft., with a class-room, 16 ft. by 14 ft. Mr. Lewis, of Newcastle, was the architect, and Messrs. Bennett & Cooke, of Burslem, have completed the work of erecting the building.

Books Received.

"**TRADE-UNIONS and Public-houses:** a Letter to the Home Secretary. By Jas. Samuelson, Longmans, Green, & Co." In this letter, the author, while enjoining Mr. Baco's Bill as excellent, points out various advantages on the side of the masters, and disadvantages on the side of the men, involved in the public opinion and the practice of courts of law,—as, for example, that what is conspiracy on the part of the workmen, when they combine to support their order, is not conspiracy on the part of the masters, when they combine in the very same way to support their order. The chief purpose of the letter, however, is to urge the doing of something to discourage the resort of combined workmen to public-houses, and to encourage the movement amongst the workmen themselves, in various parts of the country, but especially at Liverpool, to do away with this abomination.

—In the *Quarterly Journal of Science* Mr. Flaxi Smyth sets forth his views concerning "The Great Pyramid of Egypt," and promises more. Mr. H. C. Sorby, in a paper on "The Various Tints of Axtamal Polage," brings science to the aid of art.—Messrs. Routledge & Sons have commenced the reissue, in thirty-eight monthly parts, of their "Shakespeare," edited by H. Stantton, including John Gilbert's well-known illustrations.—The same publishers have also commenced the reissue, in the same form, of their "Illustrated Natural History," by the Rev. J. G. Wood. The value of this work as a popular history is fully admitted.—The *People's Magazine* (published by the Society for Promoting Christian Knowledge) is very safe reading, as well as entertaining. The current number contains a pleasant admixture of fiction and fact.—"Little Folks" is a new cheap serial (from Cassell & Co.), intended, of course, for the children. It is full of pictures, and has a good feature,—that of leading its child-readers to supply words to pictures given of historical events.—The same publishers have commenced the issue of an "Illustrated History of the War between France and Germany."—We can but mention "The Civil Service History of England" (Lookwood & Co.), intended, we need scarcely say, for examination candidates and public schools.—"The Essentials of Geometry, Plane and Solid," with shorter demonstrations than in Euclid, by J. R. Morell (Griffiths & Farran), is adapted for students preparing for examination and for technical classes.—The *School Board Chronicle* is taking a better shape than it had at first, and may be made a valuable periodical. What about the London School Board itself? There has been too much talk,—some of it very poor talk,—and the public is growing fidgety and suspicious.

Miscellaneous.

Furniture in the Approaching Exhibition.

We have seen, by invitation, a number of elaborate specimens of decorative furniture, since forwarded to the Exhibition building, South Kensington,—for example, some by Messrs. Collinson & Lock, of Fleet-street; but as these have yet to obtain the sanction of the Committee of Selection, and therefore may or may not form part of the Exhibition, it is thought undesirable to go into particulars. All in good time.

France and the Exhibition of 1871.—France has at last put in an actual appearance at Kensington, the French Commissioner, M. De Somerrard, has arrived, and a large number of exhibits are on their way to it, if they have not positively arrived in this country. Messrs. Chaplin & Horne have received intimation that their services will be required for the unloading of five or six steamers freighted with valuable exhibits. Before the war, and before the siege shut up Paris from the rest of the world, all the arrangements were made, and a large number of articles were got together. Now that the war is happily over, the authorities have with promptness commenced pushing forward with great activity the preparations that have been so unfortunately delayed, and a large number of artists and eminent *industriels* met and addressed to the Minister of Agriculture and Commerce a letter decrying themselves ready, at any sacrifice, to sustain the reputation of France in the arts of peace, and to reply to the marks of sympathy addressed by the English people and the British Commission. Some of the most interesting exhibits in the French section will be those that have been completed in Paris during the siege. Carpenters are busily at work erecting the necessary stands in the annex which has been erected at the expense of France, and in otherwise getting it ready for the use of French exhibitors.

The Proposed Enlargement of Brighton Workhouse and Industrial Schools.—A special meeting of the directors and guardians has been held, for the purpose of opening tenders for making certain alterations and additions to the Workhouse and Warren Farm Industrial Schools. Mr. Richard Patching tendered the resignation of his seat in consequence of his son having sent in a tender. Mr. Alfred Morris (clerk to the Board) said that during the time he had been connected with the Board, nearly twenty-seven years, he had never known an instance in which a member had formally resigned. He found no power given to the guardians by the Local Act to accept the resignation; but he saw nothing to prevent Mr. Patching retiring from the Board. The letter tendering the resignation was entered on the minutes, but no further action taken in the matter. The following tenders were then opened:—Workhouse: Mr. J. T. Chappell, Westminster, 7,185l.; Messrs. Blackmore & Howard, Brighton, 7,470l.; Mr. E. B. Patching, Brighton, 7,500l.; Messrs. G. Cheesman & Co., Brighton, 7,080l. Industrial Schools: Mr. Chappell, 2,698l.; Messrs. Blackmore & Howard, 2,781l.; Mr. E. B. Patching, 2,800l.; Messrs. Cheesman & Co., 2,680l. The tenders of Messrs. Cheesman & Co. for both works, were unanimously accepted.

The Lacy Memorial.—A stained glass window has, during the past week, been placed in the parish church of Newark-upon-Trent, to the memory of the late Mr. J. P. Lacy, as a memorial of the energy, zeal, and ability by which, for more than half a century, he faithfully and eminently fulfilled the duties of his medical profession, and as a just acknowledgment of his public and private worth. The many friends whose subscriptions have contributed to the satisfactory carrying out of the memorial, having finally decided upon the adoption of a stained glass window, the work was entrusted to Messrs. Hardman & Co., of Birmingham. The north-east chancel window, of six lights and tracery, was selected. The subject occupying the two centre lights is the "Agony in the Garden," thus connecting this window with the adjoining east window, which contains a number of leading incidents in the life of Our Lord. The subjects in the other four lights have been chosen with reference to the peculiar character of the memorial, viz., to a medical man. They are as follows:—Dexter light, Our Lord healing St. Peter's mother-in-law; the adjoining light, the healing of the woman with an issue of blood; sinister light, healing the blind man; and in the adjoining light, healing the centurion's servant.

Wages by the Week or Fortnight.—For some time past the men engaged at the various works in Newcastle have been agitating with a view to receiving their wages every week instead of being paid once a fortnight, and the workmen employed at Messrs. Hawthorn's works to the number of about 1,200 came out lately on strike in consequence of the masters not at once agreeing to pay the wages weekly. The strike, however, has since terminated, the masters consenting to pay wages weekly.

The Artisans' and Labourers' Dwellings Company.—The fourth annual meeting of this society has been held at Radley's Hotel. A numerous company of shareholders and their wives partook of tea, according to their custom. After music and songs, a public meeting was held, at which the Earl of Shaftesbury, one of the arbitrators of the company, presided. The secretary read letters from noblemen and gentlemen who expressed very cordial interest in the welfare of the company. A hundred new houses have been erected in the past year, and the additional shares taken by the friends of the company will, it is expected, enable 200 houses to be put up this year. The houses become the property of the tenants, and the sanitary and domestic arrangements, according to reports of commissioned inspectors, exceed those of any dwellings in the kingdom, both as respects cheapness and completeness. The capital of the company has risen during the year from 15,000l. to 26,000l., its members, 1,250, being an increase of 290 during the year. Six per cent. is paid on share capital, besides carrying upwards of 400l. to a reserve fund.

The Royal Society.—General Sabine's first *conversation* for the season, held on Saturday, the 11th inst., was numerously attended, and the rooms displayed a considerable gathering of works of art and scientific instruments. Special interest was excited by a series of experiments shown by Dr. Norris, on attraction of cohesion, illustrating the physical principles concerned in the formation of rouleaux in the blood, and in the passage of the corpses through the walls of the minute blood-vessels, without rupture of the latter. Mr. Edwards (of Edwards & Kidd) explained the heliotype, a process by which photographs are printed in printers' ink at a common printing-press. During the *conversations* he explained the process at some length to a considerable number of persons, and showed that prints may be produced as readily as by the ordinary method on the printing-plate, and with an assistant showed the process in operation. Mr. J. Anderson Rose sent a series of engraved female portraits of historical personages, which formed an interesting supplement to the historical portraits that gentleman lent for exhibition at the President's *soirées* last season. Mr. Joseph Durham sent a charming group, of small size, "A Syren and the Drowned Leander."

The Working Men's Club Union at the British Museum.—A large party of workmen visited the Greek and Roman antiquities at the British Museum on the 11th inst., under the guidance of the keeper of the department, Mr. T. C. Newton. On the two preceding evenings he had introduced the subject to the visitors by describing the history and principles of Greek and Roman art in its relation to the character of the people, their customs, literature, and religion. At the conclusion a prize for the best notes on the lectures was offered by the Working Men's Club and Institute Union, under whose auspices the lectures were delivered. That society has arranged for similar visits on Saturday afternoons, with a view of providing a popular exposition of the contents of the national museums.

Relics of the Great Elk Era (r).—Near Winchester, an interesting discovery has recently been made on the farm of Mr. Wiseman, of Wonston, who, on some land not far from the race-stand, had a long barrow or mound, which required removal. It was thought, says the *Hampshire Independent*, that it probably contained the remains of some painted Briton, but vast quantities of animal bones were found in it, all of the deer kind, the character and size denoting small animals as well as bones so vast as to be elk-like. One of the skulls measures 13 in. between the bases of the antlers. Had it been a small quantity of similar bones, or mixed with sheep, horse, or ox bones, a Druidical sacrifice might have been a not absurd theory in explanation, but the size, the quantity, and variety present obstacles to accepting it.

Widening of Knightsbridge-road.—At the Westminster District Board of Works, on Saturday, it was decided to memorialise the Metropolitan Board of Works, requesting them to introduce a clause into one of the Bills before Parliament to enable them to widen Knightsbridge-road from the extreme end of the barracks. A very wise step.

The Ipswich Surveyorship.—Mr. Edward Buckham, the Maidstone surveyor, has been unanimously elected by the Ipswich corporation as their surveyor, at a salary of 2,000l. a year.

Interesting Discovery in Lichfield Cathedral.—A wall painting has been recently discovered at the east end of the south side of the choral aisle, a portion of the edifice which is thought to have been a chapel dedicated to St. Chad. The existence of other illuminations in the immediate vicinity of the picture would fix it as a specimen of the art in the thirteenth century. The subject is the Crucifixion, the centre figure being Christ upon the Cross. The groundwork is of a greenish tint, studded with white stars. The predominating colour of the drapery of the figures is a lightish red, the Cross also being of that colour. In some of its details the painting is curious, if not grotesque. An inscription in doubtful characters can be traced on the wreath.

New Bank at Gateshead.—The business of the branch of the National Provincial Bank at Gateshead having greatly increased, the company have resolved to build a new bank on vacant ground in High-street, in front of the new town-hall. It will be Italian in style, and the dimensions are,—frontage in Swinburne-street, 54 ft. 6 in.; frontage in high-street, 32 ft. 3 in.; and the elevation, 36 ft. 6 in. to the top of parapet. The front will be of stone, and, besides containing a banking-room of 48 ft. by 27 ft., and other rooms, there will be a residence for one of the principal officers. The architect is Mr. John Gibson, of London; the contractor, Mr. Joseph Elliot, of North Shields; and the clerk of the works, Mr. William Glover. The erection of the building has been commenced.

Strong Words.—Last week the Rev. H. S. Brown, of Liverpool, lectured to the young men of Bootle on the "Savagery of English Working Men." Having, to his own satisfaction, and, apparently to that of his audience, drawn a Utopian picture of Scotland, he proceeded to say:—

"How different was the conduct of some of the working men of this country to that of the poor shepherd. Why, some of them earned 8l. a week at a forge, who had not a bed for their wives and children to lie upon, but who, nevertheless, kept a dog, and fed it upon port wine and mutton chops! There were no greater savages in creation than the English working men. He did not say this of all the working men; there were exceptions. But he did not know any working men so brutish as the working men of England. They were not to be compared to the working classes of Scotland."

The National Gallery.—Sir E. Peel's collection of pictures by old masters is the most important addition to the National Gallery that has ever been made, and is second only in interest to the foundation of the institution. There are seventy pictures, many of historic fame, and all of unquestioned authenticity and quality. The price is to be, it is understood, about 70,000l., or on the average of 1,000l. a picture. By means of the seventy paintings, not fewer than twenty-one masters, some of whom rank below only the highest, are now represented in the national collection, where they were before unknown. The most important item of the whole is Rubens's "Chapeau d'Espagne."

Sheffield Architectural and Archaeological Society.—On the 8th inst. the usual monthly meeting was held in the rooms of the society at the School of Art, Mr. William Bragge in the chair,—when Mr. J. D. Webster read a paper on "Masons' Marks." The object of the paper was to trace the origin and meaning of these signs, and to show that they had no immediate connexion with Freemasonry. After the paper, the chairman, in the course of some remarks, said he believed masons' marks were not used exclusively by stonemasons, but by every trade carried on during the time when such signs were most commonly used. What evidence did he give?

Tunbridge Wells Corn Exchange.—After considerable delay the Corn Exchange has been re-opened. That delay is not attributed to the architect, Mr. Henry H. Cronk, or the builders, Messrs. Willcombe & Oakley, as a difficulty was experienced in obtaining a good foundation, and the old town sewer which ran under one of the walls had to be diverted. The business is now carried on in a room 62 ft. in length by 43 ft. in width and 39 ft. in height. It is lighted by means of a partially glass roof, supported by very handsome ornamental wrought-iron trusses. The cellar is nearly 1,000 superficial feet. There is a store-room 33 ft. by 15 ft., and a large shed having folding doors 32 ft. by 16 ft.

Royal Polytechnic.—Professor Pepper is delivering some interesting and useful lectures on Astronomy, as his custom is during Lent. The lectures are of course abundantly illustrated.

Improvement of Buxton.—The first annual meeting of the shareholders of the Buxton Improvement Company, Limited, has been held in the Court-house, Buxton, Mr. W. H. Robertson presiding. There was a numerous attendance of shareholders. The report and balance-sheet having been read, the chairman referred to the history of the company. They were providing for the public a central hall, capable of seating 400 or 500 people, a pavilion walk of 120 yards in length and 22 ft. in width.—Mr. Brinsley Marlay said that, in his opinion, there had been an unnecessary waste of money in the gardens. The report, however, was adopted.

Patents for Inventions.—A Bill to amend the laws relating to patents for inventions, brought in by Mr. Hinde Palmer, Mr. Mundella, and Mr. Thomas Hughes, has been printed. It proposes that three special Commissioners of Patents shall be appointed, before whom all investigations and inquiries respecting the granting of patents shall be conducted, and who shall have power to make all necessary rules and regulations. At any time after the date of any letters patent the patentee or person claiming through him, may apply to the Commissioners to have his invention registered as an indefeasible patent.

Architects and their Assistants.—A correspondent complains that some architects not merely require their assistants to find their own colours, "but take the liberty of using them themselves." Further, that they will not even supply Indian ink for the office work, and he wants to know what materials assistants are really bound to provide. We are disposed to think this is a matter of arrangement between parties with which we ought scarcely to meddle.

Presentation to a Builder's Foreman.—Last week the workmen engaged in restoring Chester Cathedral presented Mr. Robert Tibbs, one of the builder's foremen, with a timepiece on the occasion of his marriage, as a mark of their esteem. The presentation was made by Mr. Frater, the clerk of the works, and was acknowledged by the recipient, for whom three cheers were afterwards given.

The Reigate Surveyorship.—The Highways and Works Committee of the Town Council of Reigate having recommended the appointment of an assistant to the surveyor, Mr. Hornbrook, at 60l. a year, a discussion took place, and it was finally resolved to refer the matter back to the committee for further consideration.

Mr. Thomas Willement, F.S.A.—We mention with great regret the death of this gentleman, which took place at Davington Priory, near Faversham, on the 10th inst. Mr. Willement, who was one of the pioneers in the modern production of stained glass, was in his 85th year. We may find an opportunity to speak of his career.

Visit of Trades' Delegates to the Royal Albert Hall.—On the termination of the Trades' Congress, on Saturday, the delegates remaining in London proceeded to the Royal Albert Hall, where they were met by Mr. E. Hall, who conducted them over the building, and afforded explanations as to the objects of international exhibitions.

Society for the Encouragement of the Fine Arts.—On Thursday, March 23rd, a lecture will be delivered by Mr. Wyke Baylies, F.S.A., on "Hobgoblins in Poetry and Art; or, the Beauty of Truth;" the Hon. Alexander McArthur in the chair.

"Far Ballon Monte."—Messrs. Letts & Co. have published a *fac simile* of an interesting balloon letter from Paris, which some of our readers may like to obtain, as a memento of the late war, and of the use made of balloons.

Society of Biblical Archaeology.—The inaugural meeting of this society is to be held on Tuesday, 21st March, at No. 9, Conduit-street, at 8.30 p.m., when an address will be delivered by Mr. S. Birch.

Art Union of London.—We would draw attention to the advertisement of the Art Union of London, in our present number. The subscription-list will be closed at the end of the month.

A Long Belt.—Messrs. Hepburn have just made some of the largest belts for machinery that have ever been turned out: one is 120 ft. long by 2 ft. wide double thickness.

The Hyde School of Art.—The committee decided to open this school for pupils on the 16th inst. The cost will amount to about 150l. The room will do for the present, especially for the younger branches; but if the school takes the position it ought to take, more extensive apartments and studios will soon be required.

TENDERS

For Saverne Hospital, for the Marquis of Ailesbury.	
Mr. G. G. Scott, architect. Quantities by Mr. J. Lee:—	
Woolridge	£3,400 0 0
Blackwell	3,380 0 0
Fulcher	3,147 0 0
Nightingale	3,147 0 0
Booth	3,080 0 0
Bull & Sons	3,054 0 0
Jackson & Shaw	2,980 0 0
May	2,980 0 0
Dove, Brothers	2,950 0 0
Roberts	2,570 0 0

For schools to be erected in Church-street, Mile-end New-town. Mr. T. Chatfield Clarke, architect:—	
Axford & Whillier	£2,276 0 0
Turner & Sons	2,197 0 0
Brass	2,188 0 0
Coleman	2,160 0 0
Colls & Son	2,158 0 0
Asby & Sons	2,157 0 0
Myers & Sons	2,085 0 0
Pritchard	2,077 0 0
Henshaw	2,050 0 0
Emor	2,036 0 0
Scrivener & White	1,972 0 0
Hill, Keddell, & Waldram	1,929 0 0
Accepted.	

For villa residence, East-hill, Wandsworth, including a small conservatory. Mr. James Newman, architect:—	
Spearing & Stewart	£1,021 5 0
Rhodes & Co.	873 10 0
Tyerman	873 10 0
Nias	858 0 0
Blackburn	850 10 0
Kent	837 0 0
Spicer	835 0 0
Aries	818 0 0
Beavall	810 0 0
Gooding	805 10 0
Grover	803 0 0
Williams	781 0 0
Capps & Hilsom	769 0 0
Nightingale	779 0 0
Collins	777 0 0
Hurst	772 10 0
Atkinson	770 0 0
Gough & Lawton	762 0 0
Hearn	753 0 0
Stevenson	754 0 0
Peaskett & Taylor	650 0 0

Accepted for gas retorts, purifying-house, &c., Woodside, Leavenworth, for St. Pancras Parish:—	
Ross	£1,185 0 0

For residence, at Hampstead, for Mr. M. H. Bompas, M.A. Messrs. Spalding & Knight, architects:—	
Riddle	£1,355 0 0
Roden	1,608 0 0
Patman & Fotheringham	1,598 0 0
Cowland	1,546 0 0
Gammon & Son	1,533 0 0
Wicks, Bange, & Co.	1,487 0 0
Carter & Sons	1,477 0 0
Mann	1,475 0 0
Scrivener & White	1,438 0 0
Woods (accepted)	1,395 0 0

For mission-hall, at Kentish-town, for Mr. J. D. Allcroft. Messrs. Spalding & Knight, architects:—	
Riddle	£2,800 14 0
Mann	725 0 0
Gammon & Son	709 0 0
Patman & Fotheringham	699 0 0
Woods	695 0 0
Carter & Sons	691 0 0
Cowland	680 0 0
Scrivener & White (accepted)	629 0 0

For building warehouse, 23, Bovis Marks, St. Mary Axe. Mr. H. H. Collins, architect. Quantities supplied:—	
Henshaw	£1,430 0 0
Richardson	1,233 0 0
Cohen	1,200 0 0
Newman & Mann	1,145 0 0
Merritt & Ashby	1,129 0 0
King & Sons	1,115 0 0

For decorative works at St. John's Wood. Mr. H. H. Collins, architect:—	
Booth	£2,235 0 0
Mellier	1,490 0 0
Gulwos	1,396 0 0
Kershaw (accepted)	1,100 0 0
Clarke & Mannoch	987 0 0
Gall	970 0 0

For decorative works at Greenwich. Mr. H. H. Collins, architect:—	
Paine	£335 17 0
Wetton	215 0 0
Cohen	192 0 0
Cox	189 0 0

For the erection of schools and residences at the Henley Union. Mr. Frederic Haslam, architect:—	
Weyman	£2,280 0 0
Corby	2,185 0 0
Hamilton & Harrison	2,163 0 0
Willm	2,100 0 0
Crook & Ward	2,059 0 0
Sadler	1,920 0 0
Clements (accepted)	1,880 0 0

For rebuilding two houses in Jermyn-street. Mr. Albert K. Gough, architect. Quantities by Mr. Thacker:—	
Macey	£4,345 0 0
Phillips & Son	4,850 0 0
Tilson	4,780 0 0
Colls & Sons	4,687 0 0
Holland & Hauser	4,519 0 0
Thompson	4,340 0 0

For the erection of lace dressing-rooms, Queen's-road, Nottingham, for Messrs. Charles Cox & Co. Mr. Robert Berridge, architect. Quantities supplied by Messrs. Hovenden & Heath:—	
Hare	£28,500 0 0
Hill, Keddell, & Waldram	8,423 0 0
Tyram	8,307 10 0
Dennett & Co. (accepted)	8,205 0 0

For new cemetery, Guisborough, Yorkshire. Mr. R. G. Smith, architect, Hull. Quantities supplied by Mr. G. W. Runwell. The tender of Mr. J. Renard for 2,327l. 17s. was accepted for building the two chapels, mortuary chapel, lodge, and offices; and that of Mr. Young, of Sunderland, for laying out the site, draining ditto, and building fence walls.

In tenders for public-house, Queen Victoria-street, "Eade, 1,745l.," should have been *Heath*.

TO CORRESPONDENTS.

Erratum.—At the meeting of the Builders' Clerks' Benevolent Institution, Mr. Waldram offered to give two guineas to the successful candidate, not the "successful," as printed. Not an Architect.—H. H. S., P. Co.—C. J. P. S.—W. F. M.—S. B.—W. G.—C. S.—W. P.—W. Y.—P. G.—W. P. S.—W. G.—C. B. O.—J. R.—J. M. H.—Mr. G. Y.—W. T. R.—G. J. P.—H. R.—J. C. P.—W. R.—A. E.—F. H.—T. G.—P. T. H.—G.—H. M.—T. E.—H. E. W.—W. H. (would depend on circumstances).—A. H. (next week).—A Subscriber (next week).—Sanitary (next week).

Royal Scottish Academy (next week). We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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CONTRACTS.

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and OTHERS.—The Directors are prepared to receive TENDERS for the ERECTION of an ENGINE-SHED and other BUILDINGS at Welbourn. Persons desirous of Tendering may inspect the Drawings and specification, and obtain a copy of the quantities, upon application at the Engineer's Office, Midland Railway, Derby, on and after the 21st inst. Tenders to be forwarded to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than **FOUR p.m. on MONDAY, 3rd APRIL** next. The Directors do not bind themselves to accept the lowest or any Tender, nor to pay any expenses on receipt of any of the same.—By order, JAMES WILLIAMS, Secretary, Derby, March 14th, 1871.

TENDERS required for **WORK to be done in FINISHING FIVE HOUSES at Twickenham.**—F. ALLEN EDWARDS, Architect, 52, Coleman-street, E.C.

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The Builder.

VOL. XXIX.—No. 1468.

New Burlington House; and the Learned Societies.



Our illustrations this week will explain the mode in which the long-veiled question of the appropriation of the site of Burlington House, purchased by the nation many years ago, has been finally settled and completed.* The site in question extends from Piccadilly to Burlington Gardens, having a frontage to each of about 200 ft. and a depth between them of about 580 ft. The old mansion, which still remains, stands at a distance of about 225 ft. back from Piccadilly, and had, when purchased, a large courtyard in front, on either side of which were subordinate wing buildings with the well-remembered Quadrant colonnade extending between those wings and the gateway

in Piccadilly, the whole inclosed on that side with a lofty brick wall, which, although somewhat architecturally treated, had a rather gloomy effect on this busy thoroughfare.

The buildings shown in our illustrations occupy the site of the colonnade and the wing buildings above mentioned, and forming three sides of a quadrangle, will surround the new entrance courtyard, which, in the shape of an oblong square, 120 ft. wide, and nearly 200 ft. deep from Piccadilly, will replace the old courtyard.

The view shows the new façade towards Piccadilly, the most peculiar feature of which is the grand central archway into the courtyard, which will, we believe, be the largest archway in London of the sort, being 20 ft. clear width, and about 32 ft. high.

The façade of Old Burlington House (now the Royal Academy of Arts) will be fully seen from Piccadilly through this archway, and is to have an additional story added to it to assimilate it to the height of the new buildings.

The history of the appropriation of this site is so curious, and so illustrative of the peculiar mode in which our public buildings and public lands are treated so frequently, that it deserves a few words. In 1857, as most of our readers will remember, occurred the great competition for architects, open to all the world, for the rearrangement and reconstruction of the public Government Offices inaugurated by Lord Llanover (then Sir Benjamin Hall), the First Commissioner of Works. That competition, however, only resulted, after long delay and much warm discussion, in the commission for the Foreign Office being placed in the hands of Mr. Gilbert Scott by Lord John Manners, who had succeeded Sir Benjamin Hall as First Commissioner of Works. Mr. Scott, however, only stood third in the com-

petition for the Foreign Office. The first premium was awarded to Messrs. Coe & Holland, and the second to Messrs. Banks & Barry, who, with Mr. Scott, were well known to the public, while Messrs. Coe & Holland had not that advantage. The matter being referred to a Parliamentary Committee, it was decided that, passing over Messrs. Coe & Holland, the Committee considered the merits of Messrs. Banks & Barry's design (Classical), and that of Mr. Scott (Gothic), to be so nearly balanced that they left it to the Government to decide between them, and the nomination was given, as above named, by Lord John Manners just before he vacated office, to Mr. Scott, who was, however, afterwards induced under Lord Palmerston's Government, which then succeeded, to give up the Gothic design which had gained him the appointment, and to erect the present building.

On the re-accession of Lord John Manners to office, when the question of the appropriation of the site and buildings of Burlington House came under discussion in the year 1859, he gave the appointment of architects to the buildings which might be arranged to be erected on this site to Messrs. Banks & Barry, as some recognition of their claims in the Foreign Office competition. Accordingly, in that year Messrs. Banks & Barry were instructed to prepare a plan for buildings covering the entire site, which were then intended to comprise a new Royal Academy, the University of London, a Patent Office much enlarged, and to be connected with an extensive museum of patented invention for public reference, and also accommodation for at least six of the principal learned and scientific societies, who, it was considered, by past usage had acquired claims to be lodged at the public expense. This was effected by Messrs. Banks & Barry, after somewhat lengthened negotiations with the Council of the Royal Academy, who were to erect their portion of the buildings at their own cost, and under the direction of their own member, the late Sir Charles Barry, and after negotiations with the governing bodies of the several societies. The design consisted of two spacious quadrangles communicating with each other, and having arched gateways in the centre of the façades to Piccadilly and Burlington-gardens; thus connecting all together internally, and giving a thoroughfare through the building from the one to the other. By this plan the Royal Academy would have had allotted to it nearly the whole of the Piccadilly façade, and the whole side of the first quadrangle on the western side of it.

Architecturally speaking, this appropriation of the site would have been much finer than what has actually been done, as it would have formed a very important structure in size, and have been harmoniously treated throughout. It involved, however, the removal of Old Burlington House, and the sentimental ideas of its architectural importance and beauty were allowed to set aside this arrangement.

Subsequently, in the year 1863, it was proposed by the Government to remove the national collection of pictures from Trafalgar-square, giving up the whole building there to the Royal Academy only, and to construct a National Gallery on the Burlington House land. Messrs. Banks & Barry were therefore again instructed to prepare plans for this arrangement. They did so accordingly, proposing a series of galleries *en suite*, occupying the whole area from the present mansion which was to remain, to Burlington-gardens, where there was to be an important façade, intended to contain the necessary administrative and official accommodation. The screen-wall to Piccadilly was to be replaced by a handsome open railing, and the colonnades and the old building would have been made the access to the new galleries, which in extent of wall-space lighted wholly from above, would

have provided for any increase in the national collection for many years to come.

Again their plans met with the approval of the trustees of the National Gallery, after most careful deliberation, and also of the Government; but the vote for carrying this scheme into effect was refused by Parliament, partly on the same grounds as before, viz., the much-feared interference with the architectural glories of Old Burlington House; and then, again, an opportunity was lost of forming a really grand public building, bearing something like proportion to the national picture galleries of other countries.

At last, in the year 1865, it was proposed to reverse the above scheme, and that the National Gallery should remain in Trafalgar-square, and that the Royal Academy should have a lease for 999 years, at nominal rent, of the centre portion of Old Burlington House, with about half the garden in the rear, on which latter area they should erect new galleries and schools, at their own cost, and under the direction of their member, Mr. Sydney Smirke, the access to the same being through the old building, which was to accommodate the administration.

The rest of the gardens extending to Burlington-gardens was to be given as a site for the University of London, and their new edifice has been erected accordingly, as our readers know, under the direction of Sir James (then Mr.) Pennethorne.

The wing buildings, the colonnades, and the wall to Piccadilly were to be removed, and Messrs. Banks & Barry were instructed to prepare designs for the erection of the buildings now in progress, which are to accommodate six of the learned and scientific societies, viz., the Royal Society, the Linnean Society, and the Chemical Society, who have hitherto occupied Old Burlington House, and the Society of Antiquaries, the Geological Society, and the Astronomical Society, who occupy at present parts of Somerset House. Arrangements having once more been made with the governing bodies of each society, as to the accommodation they considered would be necessary for them respectively, to meet their growing needs for some time to come; and the plans having been finally approved by the Government and Parliament, the foundations of the present buildings were commenced in November, 1868; the lowest tender sent in for them, viz., that of Messrs. Trollope & Sons, for 10,865*l.*, being accepted. On the completion of this contract, tenders were invited for the superstructure, the lowest of which, for 128,803*l.*, proved to be that of Messrs. Mansfield & Price. After some modifications and omissions, intended to form the subjects of a future contract, their tender, as altered, was accepted, and they commenced their work in October, 1869.

It will be seen that Messrs. Banks & Barry have adopted a design of pure Italian architecture, of which there have been but few examples lately in London; and, taking as their key-note the general features and proportions of the façade of Old Burlington House, which was to form one side of the quadrangle, the architects have endeavoured to blend it with their new composition, with sufficient similarity of design to effect this, but with more finished details. It has been arranged that so soon as the new accommodation shall be given to the three societies now occupying Old Burlington House, that building shall be wholly made over to the Royal Academy, with the proviso that the Academy shall, at their own expense, heighten their building by the addition of an upper story.

The portions of the buildings for the use of members of the several societies are arranged on two floors, of which the lower or ground floor is represented by the accompanying plan. On the upper floor are situ-

* See pp. 226, 227. In a previous volume of the *Builder* will be found a plan of the new building for the Royal Academy, and view and plans of the London University building.

ated the libraries of the several societies,—except that of the Geological Society, which is on the ground floor,—each fitted with galleries, and lighted from the roof as well as at the sides. The Geological Society has its museum on the first floor,—a handsome apartment, 53 ft. by 34 ft. and 31 ft. high, with two tiers of galleries, and it may be hoped that the possession of such good opportunities for the display of specimens will lead the members of the society and others to enrich their collection, and thus make the society's labours still more beneficial to the public than at present.

The Royal Society has on the first floor a noble suite of reception-rooms, available for the annual *soirees* of the president, and a library which it is computed will give room for nearly 35,000 volumes, enabling it to continue what it now is, one of the most perfect scientific libraries in the world. The libraries of the Linnean and Antiquarian societies are very spacious, and all of them two stories in height, with internal galleries.

The resident officers of the Royal Society, the Linnean Society, and the Society of Antiquaries have their apartments on the first and second floors of the building, in convenient relative positions to the scene of their daily labours.

Great convenience is anticipated to scientific men from so many of the learned and scientific societies being placed in close proximity, as it naturally is the case that many individuals are members of several societies, and the meetings of several being held on the same days, members can readily pass from one to another. It was indeed suggested at one time, that one or two large meeting-rooms only should be provided to be used by arrangement in common by all societies, and that thus other scientific associations might also be accommodated in the building. It was, however, finally considered by the societies themselves, that from the differing organisation of each, and the differences of the means at disposal of each, such a scheme would be attended with much difficulty, and each body therefore will now be self-contained in divisions of the building specially appropriated to it alone.

While the present engravings have been in preparation, we regret to find the contractors, Messrs. Mansfield & Price, have been obliged to suspend payment, and the works at Burlington House have been temporarily stopped, though from the statement made in the House of Commons by the First Commissioner of Works a few nights since, we are glad to learn they will be very soon resumed, and that in about eighteen months, there is reason to hope, the several societies will be placed in their new and handsome apartments, to take a fresh start, we trust, in the career of usefulness, which has earned for them the privilege of being lodged at the expense of the nation.

We add a few particulars of the various societies, beginning, of course, with

The Royal Society,

which was founded by royal charter in the year 1662. This is the oldest scientific society, with a conscriptive history, in Europe, and after having fostered natural philosophy for 200 years, during a portion of which time it was the sole depository of the inductive knowledge of this country, it still stands at the head of the science of the world. The origin of the society may be traced back to the year 1645, for about that time several learned men, among whom were Drs. Wallis, Goddard, Ent, and Glisson, and Mr. Haak, who resided in London and were interested in the progress of mathematics and natural philosophy, agreed to meet once a week to discourse upon subjects connected with their favourite pursuits. The meetings were held sometimes at Dr. Goddard's lodgings in Wood-street, sometimes in Cheapside, and on other occasions in Gresham College. In 1648 and 1649 several of the supporters of these meetings became connected with the University of Oxford, and instituted a similar society in that city. Several of the members of this philosophical society came to London in 1659, and held their meetings at Gresham College, where they were joined by such other associates as Lord Brouncker, John Evelyn, and others, but, owing to the political troubles of this year, they were not long continued. In the following year, however, the meetings were revived, and on November 25, 1660, it was agreed to constitute a society, when, in accordance with this resolve, a president, secretary, and registrar were elected, and the president so chosen was Sir Robert Moray. At

the restoration the society was incorporated under the special patronage of King Charles II., who exhibited some interest in philosophical inquiry; and his support caused science to become for a short period a fashionable pastime. The king, who was patron, and the Duke of York and Prince Rupert, who were Fellows, often attended the meetings of the society, and watched the experiments which were prepared for their entertainment.

The list of the first Fellows is a brilliant one, and contains the names of Robert Boyle, Matthew Wren, Sir Konelm Digby, Sir William Petty, Isaac Barrow, John Dryden, besides those we have before mentioned. The signatures of all the Fellows, from Charles II. to the latest elected, are preserved in the vellum charter-book of the society, which is a treasure of the greatest interest.

The number of the presidents of the society, from Lord Brouncker, the first after the incorporation, to the present distinguished occupant of the chair, General Sir Edward Sabine, is thirty, and the list contains the names of Sir Christopher Wren, Samuel Pepys, the great Lord Chancellor Somers, Sir Isaac Newton, Sir Hans Sloane, Sir John Pringle, Sir Joseph Banks, who presided for forty-one years, Dr. Wollaston, Sir Humphrey Davy, the Duke of Sussex, the Earl of Rosse, and Sir Benjamin Brodie. The list of secretaries is specially rich in great names, such as Bishop Wilkins, John Evelyn, Robert Hooke, Dr. Huxley, Sir Humphrey Davy, Sir John Herschel, and many more.

During the two centuries of the society's life, it has occupied several dwellings. First, at Gresham College; then at Arundel House, which was lent by Henry Howard, afterwards Duke of Norfolk; and again at Gresham College, where the society remained until 1710, when it removed to Crane-court. It continued here, in its own house, until 1780, when apartments in the newly-built Somerset House were provided for it; and in these it remained till the removal, in 1857, to its present location in Burlington House.

Charles II. presented the society with a silver gilt mace, which is still placed upon the table whenever the council or society meets, and without which no meeting can be legally held. This mace was for long supposed to be the "banble" that Cromwell so unceremoniously ordered to be taken away from the table of the House of Commons, but Mr. Weld unobscurely proved that it was made expressly for the society by command of the king. Another benefactor was Henry Howard, who presented the Arundel Library, which is still in the possession of the society; but the museum of antiquities and curiosities was presented to the British Museum when the apartments at Somerset House were found to be too contracted for its reception. The society still possesses several relics of Newton; as the sun-dial which he cut in the wall of his father's house, when he was a boy; the first reflecting telescope made with his own hands; and the original mask of his face, taken by Rouilliac.

Besides a fine library, which is specially rich in scientific transactions and journals, the society possesses a large collection of portraits of the presidents and distinguished Fellows, painted by Van Somer, Lely, Dobson, Kneller, Reynolds, Lawrence, and other great artists.

The meetings of the society take place once a week, from the third Thursday in November to the third Thursday in June. A record of these meetings is published in the octavo Proceedings, and a selection of the best papers is printed in the quarto Transactions. These last were first printed in 1665, under the title of "Philosophical Transactions, giving some Account of the present Undertakings, Studies, and Labours of the Ingenious in many considerable Parts of the World," and the series now extends to 160 volumes.

The society has at its disposal four medals, in the distribution of which it is able to mark its appreciation of scientific investigations and distinguished discoveries. The first award of the Copley medal was made in 1781, and of the Rumford medal in 1800 to the founder himself (Benjamin Count Rumford), for his various discoveries respecting light and heat. In the year 1825, George IV. communicated through Sir Robert Peel his intention "to found two gold medals of the value of fifty guineas each, to be awarded as honorary premiums under the direction of the president and council of the Royal Society, in such manner as shall by the excitement of competition among men of science

seem best calculated to promote the objects for which the Royal Society was instituted." The two first medals were awarded in 1826 to John Dalton and James Ivory. William IV. and her present Majesty have continued the gift of these Royal medals, and they are, therefore, annually awarded. Besides these, the society undertakes the distribution of the annual grant of 1,000*l.* which is voted by Parliament to be employed in the Kingdom, and it also performs the office of scientific adviser to the Government on the various difficult questions that arise in the public departments.

The total number of Fellows, including fifty foreign members, was reported at the last anniversary meeting on November 30, 1870, as 537.

The Royal Society have strong claims on the powers that be by reason of their having been the scientific advisers of the Government for more than 200 years; and the accommodation allotted to them will enable them to carry on their work with greater advantage than heretofore, and facilitate the use of their valuable library by the Fellows. Their meeting-room, of convenient dimensions, will be, as we have said, on the ground floor, and the library, a large and lofty hall, on the first floor; and we understand that due provision has been made for the growth of the library and of the society in the planning out of what may be regarded as their permanent home.

The Society of Antiquaries.

This society was founded by Archbishop Parker in 1572. The members met at the house of Sir Robert Cotton for twenty years. They applied to Elizabeth for a charter and a public building. It is supposed their hopes were frustrated by the Queen's death. James I. took umbrage at some of its proceedings and dissolved it. It would appear, however, to have existed on the sly and in the shade during the seventeenth century, for in Ashmole's "Diary" we read of the "Antiquaries' feast on July 2, 1659," probably their annual dinner, which we regret to say has now fallen into desuetude.

In 1707 we hear of their resuming their meetings in a more public form, and under the presidency of Le Neve. With him were associated William Stukeley, Humphrey Wanley, Roger Gale, Vertue, Brown Willis, and many others well known to fame. The minutes of the society commenced in 1717, and in the same year they resolved to issue the first of that great series of prints which grew up into the work known as the "Vetusta Monumenta." We may here mention that the society has quite recently issued some *fasciculi* of great interest in completion of the sixth volume of this valuable collection.

In 1751 a royal charter of incorporation was granted to the society. In 1776 the King gave orders, when Somerset House was rebuilt, that the society should be accommodated with apartments in the new building. The whole of the fittings were put up at the expense of the Government, and in 1781 the society was formally inducted into possession of their new apartments by Sir Wm. Chambers, acting on behalf of the Government. When the Royal Society moved to Burlington House, some changes were effected as to the actual rooms occupied by the society. In 1866 a scheme was submitted to the society by her Majesty's Government for accommodating the society in Burlington House. To this scheme the society acceded, not without some reluctance, and only on the understanding that adequate accommodation should be provided, and that the expense of the fittings should be borne by the Government.

It is earnestly to be hoped that the installation of the society in its new quarters will be the commencement of a new era of usefulness and distinction. The services which the society has rendered are patent to the world. The Transactions of the Society can only be compared with the *Memoirs of the Académie des Inscriptions et Belles Lettres* for range and depth. Among the more recent and public services rendered by the society, we may mention the restoration of the Chapter House at Westminster, which was undertaken mainly at the instance and through the zeal of the society, and the preparation, now approaching completion, of a List of Sepulchral Monuments in England and Wales which ought to be placed under conservation. It is a standing reproach that no annual grant is made to this, as to the Royal Society. Such a grant

would give the society a recognised status, and would make it a valuable referee in all cases where the due preservation of national monuments is at stake.

The Linnean Society.

The Linnean Society was founded, in 1788, for the study of natural history, more especially that of the British islands, and was incorporated by Royal Charter in 1802. It was the earliest offshoot of the Royal Society, the separation taking place with the ready assent and concurrence of the parent body, it being felt that natural history was a science of sufficient extent and importance to demand the entire attention of a distinct society. The infant society was warmly aided by the then president of the Royal Society, Sir Joseph Banks, to whom it was indebted for pecuniary assistance, and for large additions to its library and collections.

From an early period of its existence it took a high station in the world of science, and it stands now, as it always has done, at the head of the natural history societies of the United Kingdom, and on a level with the most distinguished of similar societies abroad.

Its Transactions extend to twenty-seven copiously-illustrated 4to. volumes, and form unquestionably the most important series of memoirs on natural history which this country has produced. In addition, it has now for many years published an 8vo. Journal in two sections, Zoology and Botany, where those papers appear which have less need of illustration.

The library and collections of the society are very extensive, including those of Linnaeus (invaluable in themselves, and in illustration of the works of the great Swedish naturalist), which, together with the additions made by its founder, Sir J. B. Smith, were purchased by the society, in 1829, for 3,000*l.*, and the extensive herbarium of Indian plants, manifestly presented by the Court of Directors of the East India Company in 1832. The library, which is one of the richest in the kingdom in its special department of natural history, includes, besides many costly illustrated works, acquired, from time to time, by purchase or donation, a valuable collection of the publications of the principal academies and societies at home and abroad, of which constant use has been made in the preparation of the invaluable Catalogue of Scientific Papers, now publishing by the Royal Society, with the aid of a grant from the Government. The members of the society are entitled to borrow books from the library, which is also accessible, for purposes of reference, to authors and naturalists duly introduced.

The funds of the society are, with the exception of a very small return, in proportion to the outlay, from the sale of its publications, wholly derived from the contributions of its Fellows, to whom the Transactions and Journal are distributed without further payment.

In the cost of printing and illustrating these publications, in the necessary duties connected with the preservation of the library and collections, and in providing suitable accommodation for them and for the meetings of the members, not only were the whole of its funds completely absorbed, but the society was, for a long period, seriously cramped in its operations. When, therefore, in 1856, the Government offered to put the Royal Society in possession of the main building of Burlington House, on the understanding that suitable accommodation therein should be assigned to the Linnean and Chemical Societies (other scientific societies then and still located in Somerset House having declined to move), the Linnean, although it had recently renewed, for a long term, its lease of the house in Soho-square, formerly the residence of Sir Joseph Banks, thankfully availed itself of the liberal proposal; which, in the first place, promised to place its library and collections in a building where the danger of their destruction by fire, — a loss irreparable, — would be greatly diminished; and, secondly, by the relief to its funds, from the large amount previously paid in the shape of rent, would enable the society, as it has since done, to devote itself, with additional energy, to the purposes of its institution, and to add largely, by the increased frequency of its publications, and the further augmentation of its library, to the advantages which it offers to its members and to the scientific world.

The Geological Society.

This association was established in 1807, and incorporated by Royal Charter in 1826. In 1828, the late Sir Robert Peel, then Secretary of the

Treasury, assigned to it the apartments in Somerset House which it at present occupies, and the society entered upon its tenancy at Michaelmas in that year. Previously it occupied a house in Bedford-street, Strand. The charter says:—"Whereas the Reverend William Buckland, B.D., Arthur Aikin, esquire, John Bostock, M.D., George Bellas Greenough, esquire, Henry Warburton, esquire, and several others of our loving subjects, being desirous of forming a society for investigating the mineral structure of the earth, and having for promoting such investigation expended considerable sums of money in the purchase and collection of books, maps, specimens, and other objects, and in the publication of various works, the said William Buckland, Arthur Aikin, John Bostock, George Bellas Greenough, and Henry Warburton have humbly besought us to grant unto them and unto such other persons as shall be appointed and elected fellows of the society, as hereinafter is mentioned, our Royal Charter of Incorporation, for the better carrying on the purposes aforesaid." And a charter was accordingly granted, Dr. Buckland being appointed first president. The early publications of the society consisted of Proceedings in 8vo., and Transactions in 4to.; of the former four volumes were published, and of the latter twelve volumes in two series (of five and seven). The Transactions ceased in 1856, but in 1845 a quarterly Journal, 8vo., had been started, and has been carried on ever since. Up to the end of last year twenty-six volumes were published. The society also publishes Mr. Greenough's Geological Map of England. The society possesses an extensive library, and a museum consisting of fossils, minerals, &c.; the collection of foreign fossils being particularly interesting. We believe the arrangements for their accommodation are all satisfactory as far as the rooms are concerned. The chief anxiety is, as with other societies, to get the library and museum fittings (bookcases, cabinets, and so forth) regarded as part and parcel of the Government bounty, and we trust that they will not be disappointed. England owes much to science.

The society at this time consists of, fellows, 1,163; honorary members, 3; foreign members, 39; foreign correspondents, 40; in the whole 1,245.

The Royal Astronomical Society

was founded in the year 1820 by the exertions of the Rev. Dr. Pearson, Mr. Francis Baily, and other gentlemen at that time eminent in the science of astronomy, its objects being "the encouragement and promotion of astronomy." We need scarcely add it has been eminently successful in carrying out these objects, having published thirty-eight volumes of "Memoirs," and thirty volumes of "Monthly Notices," which are held in much estimation both by English and foreign astronomers. The society at the present time consists of 510 fellows and 44 associates, and has invested some 8,400*l.*

The remaining body located here is,—

The Chemical Society.

This was founded in 1841, and incorporated under royal charter in 1848. Its objects are defined to be, "the promotion of chemistry and of those branches of science immediately connected with it, by the reading, discussion, and subsequent publication of original communications."

The society holds fortnightly meetings during eight months of the year, and publishes a Journal in monthly numbers. Its management is vested in a president and a council, chosen for the most part annually by ballot. The president at the present time is Dr. Williamson, F.R.S., professor of chemistry at University College. The society numbers more than 500 members, and its present apartments are quite inadequate to its accommodation.

We would gladly make these accounts more complete, but have already exceeded the space at our disposal.

THE SANITARY CONDITION OF CERTAIN PARTS OF WINDSOR.

WHILE the whole kingdom is associating with Windsor thoughts of a happy marriage, and good and loving wishes, which we most heartily and loyally re-echo, it happens to be our duty to speak of the Royal Borough in connexion with some facts of an entirely different kind. We have before now had occasion to say that neither the external aspect of Windsor nor its

internal condition is what it should be. The visitor to Windsor on a first occasion will have his or her preconceived ideas of the condition of this historic place somewhat rudely shaken. On entering the town by the approved modern mode, the railway, and ascending the hill towards the castle and guildhall, the traveller, before he reaches its summit, is conscious that Windsor can claim little credit for cleanliness, and that a smart shower of rain would prove a refresher; without, however, being positively able to point out any particular defect in the appearance of what is evidently the business locality of the borough,—for is not this the High-street? Moreover, an inward feeling arises that water may be a scarce commodity, and that a few buckets of this essential article, together with the application of a stiff broom, would improve the face of affairs,—the thought arising from an air of untidiness, from the dusky appearance of the houses, and the dusty state of the pavements.

We have long had doubts as to the condition of the lower localities, and concerning the general health and sanitary condition of the inhabitants, and went to them the other day to be satisfied.

From inquiries put with this view, it transpired that Windsor has recently passed through the fiery ordeal of an epidemic in the shape of small-pox; and, indeed, the complaint is yet prevalent, as we can personally vouch.

We trust that Windsor is not behind the age with respect to a knowledge of the advancing principles of sanitary laws, although their application is apparently lax. Proper provision for effective ventilation of sewers is of primary importance, as are also the sound construction of house-drains, the effectual trapping of all inlets to such from within the dwellings, and due ventilation from without of all water-closets.

We are led to these remarks from the unmistakable odour of sewage gas developed on entering some of the middle-class houses, sufficiently strong to produce nausea and headache in those unaccustomed to breathe such air. Nevertheless, the occupants stated that their drains and traps were perfect; and so it would appear they thought. Certainly one may blunt the organs of perception. However, not even those who have become accustomed to this—shall we say normal—atmosphere, are immune, and for neglect all will in time have to pay the penalty.

Our perambulation brought us eventually to "Bier-lane" and its offshoots, where certainly the gloom that overspread the locality was accordant with the name, which we could not resist incidentally connecting with the last obsequies of man. The information noted was to the effect that an examination of this neighbourhood would reveal the general sanitary condition of those parts of the town inhabited by the lower orders of society, and that whatever might be discovered hereabouts would be but a specimen of the rest. We sincerely hope, however, that in this there is a mistake; for we cannot believe there are in the borough of Windsor many such abominations as we witnessed hereabout.

Entering the first court descending Bier-lane, that known as "Garden-court," and which is reached through a narrow passage between the houses fronting the lane, we noticed the oppressive impure air. Current and due circulation of the first essential of life appeared difficult: the place is almost completely shut in, the houses forming three sides of a quadrangle, whilst the fourth side is taken up by a high wall opposite to the entrance.

The court contains fewer than thirty houses; and from the evidence of those who suffered, something like twenty-five cases of small-pox have here occurred since the commencement of the outbreak last autumn. Some houses have had four cases, and others fewer. Indeed, in one family, alone, inhabiting but the third part of a house, there were five cases; every member was stricken, and one child died! An examination of a number of these houses revealed their deplorable unsanitary condition. We give a few details noted on the spot.

In most of the houses two or more families were living. The rooms were low in ceiling, close, dirty, and with an ill-smelling atmosphere. The back-yards, with an area of less than half a dozen square yards, and enclosed by high walls, were foul and reeking. The closets were without water. The cesspit drains,—one to each yard,—were all defective, and were emitting gas and putrid volatile organic bases. The people did not complain particularly of the stench at the time, excepting in some few

instances: it was their ordinary atmosphere; but they said that "after rain the smell was very strong." We agree with them, and add, very deadly in such confined spaces.

We select one house as a sample: those concerned may know that it is No. 15, being one of eleven.

This is a dwelling consisting of three rooms, one above another. The basement room is occupied by a labourer and his wife, and is used for all purposes, for living and sleeping, as are likewise the other rooms. Its cubical space is about 700 ft., and the height of the ceiling is under 7 ft. 6 in. The back yard,—less in area than 4 square yards,—contained a closet without water, a cesspit drain without trap, and was loathsome to a degree through escaping gases. The middle room, in capacity a little over 600 cubic feet, was close and oppressive; it was occupied by a man and a boy, and the height of the ceiling measured 6 ft. 7 in. The upper room was simply stifling; its capacity was under 600 cubic feet, and the height of the ceiling about 6 ft. 7 in. In this place were confined four human beings, consisting of husband and wife, with two growing lads. One child had recently died, and under the present conditions death will not be long before visiting the place again. In this one little garret are stored all the food and possessions of this family, and here are performed the functions of living and of sleeping! No wonder that the candle burns dimly and the fire is dull, for there is an absence of that oxygen which is the life of the fire as well as the tenants. It need scarcely be added that the doors at each end of the stairs are kept scrupulously closed!

The court was further polluted by the contents of a common midden, upon which are cast the usual slops, with the excreta, and the garbage and ashes. Its size appeared about 15 yards in length. The contents of the midden were described as being left to accumulate several yards high before removal. Recently it had been cleaned out, and at the time of our visit contained not more than a load or two of rubbish, but the odour of decomposing matter was painfully evident.

Of the water-supply to this court, derived from a single pump, we can say little, although any well will be open to serious suspicion, sunk in a porous subsoil in such a reeking locality.

The characteristic appearance of the dwellers in this court, with some exceptions, so far as we could judge, included paleness of face, sunken eyes and cheeks, and particularly difficulty of breathing. Impure air, and frequently insufficient food,—some families, whilst speaking of the kindness of Mr. Mason, the mayor, or ex-mayor, declared that for weeks they barely existed, and that sometimes they were for one or two days entirely without food!—are fast spreading havoc amongst this population, and no longer is there wonder that five-and-twenty cases of small-pox should occur in about as many houses.

Red Lion-row, comprising fifteen houses, is in many respects superior to Garden-court; still it is far removed from a satisfactory condition. The back yards are more spacious, but still with the objectionable non-water closets, and the same characteristic unpleasant vapours pervade the place, arising from untrapped drains and small heaps of garbage. The dwelling and sleeping rooms are unhealthily low; the basement rooms being 6 ft. 9 in. in height, and the upper rooms about 6 ft. 4 in. and 6 ft. 5 in. One sleeping-room is of a measure of less than 350 cubic feet. In this court were several cases of small-pox.

Another locality in this ominous lane, known as Collins's-buildings, contains thirteen houses: two cases of small-pox are reported as occurring, one adult dying from the disease. These houses have no back yards, sinks, nor drains; most of the slops are conveyed to the closets, yet too much is thrown in front of the buildings, where it sinks into the ground, supplying the well-pump, there being one to the row. The water of this well presented the appearance of dilute soap-suds. The drains in the court are defective, as evidenced by the odour issuing from them, and the tenants complain that in wet weather the smells are very strong. Four closets, without water, do duty for these thirteen cottages, and are divided upon each side of the court at one end. Two of these closets were brim full and choked: the smells were such as to render it advisable to beat a hasty retreat. The others were in a little better working trim, but nevertheless were powerfully odorous, pointing to defects.

The rooms in these houses also were small,

and with low ceilings, but from the absence of internal drains, were much sweeter than in the other places referred to. Having arrived thus far, it is time to ask the question, does not the Windsor Local Government know of such plague-stricken and epidemic-disseminating abodes? Does it not know that the poor inhabitants are gradually but very surely descending into premature graves? And that, through the telegraphic agency of sewers, there is direct communication between the poor and the wealthy, between the high and the low, and the lower and the higher parts of the town? And that as the aqueous sewage descends by gravitation, so does the gaseous sewage ascend, and thus is the circuit complete throughout the ramification of sewers?

Disease and epidemics are by these means surely conveyed to all classes; the putrid volatile organic matter of the sewage, mingled with vast numbers of seeds and germs, are conveyed with the gases of decomposition, and effect an entrance into the dwellings of all where there exist defective drainage and defective ventilation.

Equally important is the necessity of pure and wholesome water, for impure varieties are amongst the most prolific sources of disease, conveying into the system germs and putrid substances that act as specific poisons!

These remarks are made in good faith, and for the advantage of the town of Windsor, and we ask that they should be accepted in a proper spirit.

At the same time we express a hope that the Board of Health, with the assistance of their surveyor, who is, no doubt, a good sanitarian, will earnestly take in hand these rookeries, and speedily bring about a better sanitary arrangement.

"THE CRITERION" COMPETITION.

Our readers will remember that at the end of last year, Messrs. Spiers & Pond, invited fifteen architects to submit designs for building a large tavern and restaurant, on a plot of land in Piccadilly, extending to Jernyn-street, at a cost of about 20,000*l.* (afterwards raised to 25,000*l.*), exclusive of decorations and fittings. They offered 150 guineas for the first best, 100 guineas for the second, 75 guineas for the third, and 50 guineas for the fourth, all the rewarded designs to become their property. The author of the selected design, if employed to carry it out, was to receive, in lieu of premium, 1,000*l.*, for which he was also to supply drawings for the decorations.

The fifteen designs have since been submitted, and the selection has been made, with the assistance of Mr. Clark, of the firm of Pain & Clark; the

First premium having been awarded to Mr. T. Verity;
Second to Mr. Phéon Spiers;
Third to Mr. E. Power; and the
Fourth to Mr. A. Evers. An examination of the drawings leads us to the belief that the competition has been most fairly decided. There can scarcely be two opinions as to the propriety of the position of the first, second, and third designs; and though we should be disposed, on artistic grounds, to place the design sent in by Mr. Walford before the one chosen as No. 4, it is quite possible that careful examination of the various essential points of arrangement desired would justify the decision. Nevertheless, Mr. Walford's elevation is very clever. The chosen design will make a fine building; it is ably planned and most carefully set forth in a number of drawings that include sketches for the coloured decorations of all the principal rooms.

A deeply-recessed arched doorway in the centre of the Piccadilly front admits to an elegant vestibule. The grand dining-saloon adjoining it is to be 71 ft. by 35 ft. The restaurant will be capable of accommodating 200 persons, and will be entered from the right of the vestibule. An entrance on the left will lead to a fine buffet, 120 ft. long, with convenience for dining in front of the counter, as well as at it. There will also be a divan for smokers. Hair-dressing and shampooing saloons form part of the design, and an apartment will be devoted to telegraphic purposes; so that, amongst other conveniences, parties dining in the establishment will be enabled to ascertain what seats may be obtained at the various theatres, and at once to secure them. Suites of rooms will also be available for literary, artistic, and scientific clubs. The Minor Hall for lectures, concerts,

and similar purposes, will be in the basement, as stipulated. On the first floor will be the Grand Hall, capable of dining 500 or 600 persons, with separate kitchen and other arrangements, to assure promptitude of service. To economise space some bed-rooms are ingeniously formed round the base of the dome.

The second set of drawings well deserve their position, and although not absolutely successful on the present occasion, are calculated to advance the interests of the designer. The basement is exceedingly well planned; but in seeking to obtain there the greatest possible accommodation, the mistake was committed of raising the principal floor-level several feet above the street-level, and thus necessitating the ascent of a number of steps to the vestibule and buffet. The interior of the great hall is very artistically designed, but is perhaps a little overdone.

In No. 3 design the basement would seem to be excavated to the depth of 40 ft. below the street pavement: whether or not this would be practicable we are not prepared to say. With all this, however, the Minor Hall can scarcely be considered very satisfactory. The ground-floor plan is very good. No. 4 design provides apparently only one kitchen, and shows some other weaknesses in the planning.

The arrangements for light and air (a difficult matter), the position of staircases, the provision of means for cooking in various parts of the establishment, and facilities for effective "service" everywhere were amongst the main points the proprietors had to consider in "placing" the drawings. Some of the designs,—one by Mr. Phipps, for example,—must have been put out of court at once on the question of light. Another by giving up the Piccadilly frontage to the shampooing department, and so turning the who's establishment into a dashing hairdresser's shop. Messrs. Elliott, Cree, & Varnard gave a bold elevation. Messrs. Hill & Paraire were not very happy in their design; nor can we say anything better as to that by Messrs. Ordish, Edgar, & Crossland. The designs may all be described as to style under the general terms, Italian with French modifications.

HOW BEST TO SPEND A QUARTER OF A MILLION OR MORE.

We mentioned recently that a benevolent individual was prepared to expend some 30,000*l.* in the erection of a lunatic asylum for the benefit of the lower middle class, and we have reason to believe he is proceeding to carry forward that purpose. We have now authority to state that this same gentleman, who desires at present no personal publicity, is prepared to devote for public and useful purposes a sum equal to that given by the late Mr. Peabody, so soon as he can satisfy himself as to the best means of effecting this, so as to do the greatest public good, and to avoid the risk of pauperising classes who might not in their present position be eligible recipients in public opinion for such a gift. We applaud this enlightened anxiety so highly, and feel so strongly the importance of the great problem he is anxious to have solved, that we throw it before our readers, and invite to it the serious consideration of thoughtful minds, who, without personal consideration, may feel desirous that so noble an intention should be carried out in the best possible manner. Every worthy suggestion that may reach us shall be weighed.

DRINKING FOUNTAIN, SMITHFIELD.

The committee met at the Guildhall on the 17th inst. for the final consideration of the selected design, which bore the motto "Peace," and was submitted in competition with other designs, as already mentioned by us. Mr. Francis Butler, the successful competitor, was present, and explained the details of the proposed structure. The design was approved, and instructions were given for the preparation of the working drawings.

The principal feature or idea of the structure is a statue of Peace, wearing the "wheaten garland," and standing upon an orb, with wreaths of flowers around her feet. At the base of the orb are arranged four basins of granite, in which jets are to play. Beneath these are four drinking-bowls of white Sicilian marble. Above the central statue rises a dome-like canopy, supported on four angle piers, upon which, under small canopies, will be placed figures representing Temperance, Faith, Hope, and Charity.

The arms of the City are shown in the four faces or pediments of the design, above which rises the dome: upon the summit of this is placed a small temple, crowned with orb and cross. The four arches which spring from the piers will be filled in with wrought ironwork in varied patterns.

The original estimate for the fountain (which is approached by a flight of steps) was 1,200l., but the central statue is now to be in bronze, and the total cost will be nearly 1,400l. The ground is already being dug out for the foundations.

The design second in favour was, we understand, that sent by Messrs. Wyon. This, like the selected design, was included in the six we named for choice.

THE ARCHITECTURAL DRAWINGS: ROYAL SCOTTISH ACADEMY.

It is subject of complaint that architecture is not popular, and that great apathy on the part of the public is shown as to the progress of an art which so intimately concerns every individual. Looking at the drawings here exhibited, this needs hardly be matter for surprise; for neither as pictures nor as designs is there anything to create a spark of enthusiasm. It is with feelings of deep regret that we leave the "North Room" without retaining a pleasing recollection of any architectural design there exhibited, save one. The design in question is No. 999, "New Head Offices in Renfield-street, Glasgow, for the City of Glasgow Assurance Company," Peddie & Kinnear, architects. There is nothing superfluous about the building, it is characterised by a business-like propriety combined with gracefulness of proportion and elegance of detail. In their Italian designs this firm never use the orders for merely decorative purposes; where pillars are used, as in the arading of the principal floor in this instance, they have a duty to perform, and are a constructional necessity, and the effect depends entirely upon the fenestration and the main cornice. This, we take it, is the right course to follow if truthfulness be an object worth aiming at, and it is only by persevering in such a course that progress can be made.

There are few old churches left in Scotland to restore, and it would have been well if those few had received no other attention than what was necessary to keep them in repair. One of the best preserved and finest examples is St. Michael's, Linlithgow, a drawing of the interior of which (No. 842) is given "as proposed to be restored," by Mr. R. Matheson. This building is now used as the parish church, and the forms of Presbyterian worship will not permit of a return to the original arrangement; the alterations, therefore, are not in the nature of a restoration, except as regards the removal of galleries, and umbrous pews, and the substitution of suitable benches, &c. The pulpit is placed in advance of the apse. It is an octagon supported upon a pedestal, and does not seem suited for its isolated position, having much resemblance to a gigantic drinking-cup. In noticing the designs for new churches, it may be well to state at starting that they are all Gothic of the thirteenth century type. No. 841, "Free St. Andrew's Church, Harwick," J. T. Rochhead, shows a tower and square spire; the body of the church, which is apparently fitted up with galleries, being lighted by very small coupled windows. No. 860, "United Presbyterian Church to be erected at West Calder," James Fairley, is a small and unobtrusive village church with a neat spire. No. 902, "New Parish Church, Lamlash, Arran, for his Grace the Duke of Hamilton," Messrs. Pilkington & Bell. The perspective in this drawing is so foreshortened that we cannot make out the general outline of the structure, but we see that the main gable and spire exhibit less of that excessive straining after effect which was characteristic of the designs of this firm than any former production of theirs. No. 1,000, "New Free Church, Viewforth, Edinburgh," is another design emanating from the same source, although the name of only one member of the firm is attached to it. It shows a still greater moderation in regard to the peculiarities referred to. The principal feature is a boldly-designed tower,—a feature most appropriate to the locality, where several tall chimneys would militate against the effect of a spire unless it were of extraordinary height; besides, it may be remarked that many spires have been erected in Edinburgh lately, but no

towers: so that this will prove a pleasing variety. The "View of the Robertson Memorial Church," R. Morham, jun. (984), hardly does justice to the building it represents, which is now approaching completion. It is characterised by breadth and simplicity of parts; the exterior is a faithful echo of the internal arrangements altogether highly creditable to the architect, whose first realised design it is.

No. 1,026, "King's Park United Presbyterian Church, Dalkeith," by R. Thornton Shiells, is a fair example of a form of Dissenting church now in general use,—a parallelogram, having a spire at one side and a steep-roofed projection at the other side of the main gable. The spire, which is the principal feature, is simple and well proportioned. No. 815, "Congregational Chapel about to be erected at Dalry, Edinburgh," Alexander Heron, is another building of the same kind, but execrable both as to detail and proportion; the manner in which buttresses are stuck here and there is curious, and evidently not required for constructive purposes.

No. 1,094, "Interior of Church of St. Andrew, Kelso," R. Anderson, has the usual arrangement of aisles, clearstory, and chancel; the detail is unexceptionable, and presents no peculiarities calling for remark. No. 868, "Mural Monument, Glasgow," William Leiper, depends for any beauty it may possess upon a sculptured group; the architectural part is of an extremely severe Gothic cast. Mr. Leiper also exhibits "Cornhill, Mansion of Mr. Alexander Kay" (No. 938). It is French Gothic in style; the upper range of windows is treated in a peculiar and very unsatisfactory manner. No. 950, "New Burgh Hall, Patrick," is of a so decidedly modern French cast as to suggest the idea of its having been borrowed from a recent publication.

No. 927, "Broadstone House," by Mr. David Bryce, is in the style invariably adopted by that gentleman for a country mansion,—the Scottish baronial,—and exhibits his usual arrangement of towers, gables, and turrets. No. 928, "Livelylands House, Stirlingshire," J. Dick Peddie, is in the same style, but not so satisfactory: gables, oriels, and turrets are crowded together so as to produce a very confused effect.

No. 935, "Fragmentary Design for New University Buildings, Gilmore Hill, Glasgow," J. T. Rochhead, is a classical monumental pile of the Corinthian order. The arrangement is effective, and the details and proportions are correct; a dome which forms the central feature does not dominate enough. No. 939, "Residence of James Oliver, esq., Hawick," by the same architect, is a commonplace Italian suburban villa. No. 940, "Villa at Redcar, Yorkshire," William Nicholson, has gables with projecting roofs and oriels, such as one sees every day. No. 921, "Mansion House recently erected in Forfarshire," C. G. H. Kinnear, is of the Early Renaissance French chateau style, very graceful in composition, and not overladen with detail. The roof of the principal tower is happily treated.

No. 920, "Perspective showing proposed Site for the Prince Consort Memorial, Chambers-street, opposite the Museum of Science and Art," David Cousin, is the most artistically got up architectural drawing exhibited; it is evident, however, that the artist is not an Edinburgh man, else he would not have introduced Hansom cabs into the street. The arrangement suggested is most satisfactory. In the range of buildings opposite the entrance to the Museum, an open space is formed, backed by a semicircular screen wall. In the centre of this space the sculptured group is placed. Such an arrangement would give dignity to the monument, and show at a glance that the site had been prepared specially for it. The details are, however, hardly up to the mark. The screen wall has a continuous frieze under a shallow cornice, which is surmounted by a balustrade, a feature quite out of place in such a position: a rich cornice is what is wanted to give a proper finish to the wall head; a balustrade there is an unmeaning excrecence. We would also venture to hint that in the new buildings such features as pilasters running through several stories may be dispensed with, and decorated construction be used in place of constructed decoration. The opportunity for architectural effect here is a fine one, and requires careful consideration. No. 966, "Bruntsfield-crescent, in course of erection," Mr. David M'Gibbon, architect, is composed of gables and oriels repeated. The use of a broken skyline in the situation is commendable, but some of the details are very ugly, such as the great yawning arched doors without dressings, surmounted by unnecessary corbels.

Several of the designs submitted in competition for the memorial fountain to be erected in the West End Park, Glasgow, are exhibited; if the selected design is not vastly superior to all of them, the good folks of St. Mungo had better let it alone.

A DESCRIPTION OF THE ALEXANDRA THEATRE, OF LIVERPOOL, AND ON THE CONSTRUCTION OF THEATRES GENERALLY.*

I HAD originally intended that the title of this paper should be "On the Construction of Theatres" only; but after further consideration I changed it to its present one, as I thought it would be more interesting to my fellow members to have the description of a theatre I have built, by which I could more practically illustrate my ideas, and point out the advantages or defects which my experience may have taught me.

I would also here remark that I shall as far as possible confine myself to such points as my special experience has taught me, avoiding altogether the literature of the theatre, as well as those strictly architectural portions of design or construction with which, doubtless, every member is so well conversant. The most convenient plan will be to take our subject under various heads, of which the following are perhaps the most important:—

General Arrangement:—Entrances and Exits for Audience.—Heights of Tiers for Boxes.—Line of Light.—Construction of Stage.—Mechanical Arrangements of Scenery.—Painting Room and Scene Docks.—Accommodation for Managers and Artists.—Workshops for different Departments, viz., Property Maker, Carpenter, Gasman, and Metal-worker.—Lighting of Auditorium and Stage.—Lime Light.—Water Supply.—Heating, Ventilation, and Decoration.

First, then, as to general arrangement. In forming the first idea I tried to avoid what I consider to be a defect in most of our best theatres; even Drury Lane, with all its magnificence, has this defect specially marked, a certain coldness and want of comfort in the entrances, staircases, and passages. I therefore tried to assimilate my plan to that of an ordinary mansion, with its entrance-hall, staircase, ante-room, and grand saloon, so that once having passed the entrance, we should be in a suite of rooms instead of again entering cold passages and corridors. I have thus attempted to carry out this idea. Firstly is a carriage-drive, leading into the crush-room, of ample size, to the right; the audience is conducted by the grand staircase, 10 ft. 6 in. wide, into the foyer or ante-room, through which all *must* pass, thereby avoiding a cold useless room, merely attached to the theatre, and thence at once to the "salle," the French term, which I shall use in preference to "auditorium." The corridor is here merged into what are usually termed the boxes. I adopted this plan first at the Prince's Theatre, Manchester; the advantages are many, a greater freedom of circulation, a space obtained for standing-room on crowded nights, and a more elegant appearance. I am not sure that this plan would answer in the metropolis, as there is not that privacy in entering the private boxes which I think a London manager would consider most desirable.

The theatre proper is on the first floor, by which plan a large amount of valuable space is gained, a most important point, considering the present value of land; it prevents draughts; the gain also is great in the stage, which I shall enter more fully into when treating of that portion of the theatre. The only disadvantage is the necessary extra number of steps to the various parts of the house. The first point of consideration in commencing to work out the plans was the width of the opening of the proscenium. The advantages in making it larger (it is only 28 ft.) would have been a greater capacity in the salle, as naturally the circles would be larger, and a corresponding grander effect would have been obtained; but I think this is far more than balanced by the disadvantages in this, a provincial theatre. A large theatre, when not filled, looks very cold, and naturally has a chilling effect upon the audience; and as there are generally as many poor nights in a year (and, unfortunately, sometimes more)

* By Mr. Edward Salomons. Read at the ordinary general meeting of the Royal Institute of British Architects, held 20th March; Mr. E. P. Anson, vice-president, in the chair.

as good ones, this should be taken into consideration. Then to get the same effect with numbers on the stage, a large opening requires so many more, for instance: where Drury Lane would require at least a ballet of twenty-four, one of sixteen, or even twelve, suffices in the Alexandra, and probably by the general public the difference of numbers would not be appreciated; and so throughout with supers, &c. This, of course, applies also to scenery, &c., which requires to be so much less, which not only is a saving in material, but also in the labour of working; the largest cloths in a theatre in England, at Covent Garden, where they are 70 ft. by 50 ft., while at the Alexandra they are 40 ft. by 28 ft.; and although not double the size, I am sure they cost at the former twice as much, with working, as at the latter. The opening of Covent Garden proscenium is 50 ft. It is also very desirable to have a small stage for comedies, farces, and other light pieces, where the audience should be able to see distinctly the facial play and finer points of acting, which would be lost on a large stage. I am sure, if the Prince of Wales's company, admirable as it is, were transported to Covent Garden, the great perfection of the acting would be lost. The opening of the Prince's Theatre, Manchester, is 26 ft., and this I thought too small for the purpose which the directors had in view. Having settled this point, the next was the consideration of the form of the fronts of the circle. In my opinion the most perfect form would be a semi-ellipse, with its long axis parallel to the curtain line. This, however, practically would not do, as the number which such a formed theatre would hold would be too few; therefore a modification must be made; and, taking all circumstances into consideration, convenience, number of audience and beauty, the horse-shoe, and its various modifications, is, in my opinion, undoubtedly the best, although I have recently built a theatre of novel form, and which, when treating of the line of sight, I shall more particularly refer to. In this case, being rather pinched for space from back to front, I may say that the curve formed itself, as I had to a great extent to be ruled by the formation of the ground, and it was desirable to get as many rows of seats as possible. One peculiarity is, the pit does not extend under the boxes. This, after mature consideration, was decided upon by the directors, who, I may here remark, were some of the leading gentlemen of Liverpool, whose object in building the theatre was not gain, but to have a handsome and luxurious house, worthy of the town. The pit being the best part of the theatre, they said they would devote that part of the house to those who paid the most, and therefore the pities were promoted to the tier above the dress circle. This did not naturally meet with their approbation; and it was afterwards found desirable to devote a portion of the stall space to them, and the theatre is now so, although at opera times, and other special occasions, the original arrangement is adhered to. I need not here enter into a dissertation on acoustics, a science which doubtless all here are as well, and perhaps generally better, acquainted with than I am. I can only say that the natural form of a theatre is the best adapted for sound, and to make success certain, it is only necessary to use wood in the ceilings and wall linings.

Entrances and Exits.—The paramount importance of providing ample entrances and exits, with easy staircases without winders in all public buildings, is, no doubt, duly estimated by you; still, I should like to make a remark or two on this head in connexion with the theatre. In all cases, I think, the place of exit and for entrance should be the same, because as soon as ever an alarm takes place the audience naturally rushes to the door by which it entered. These should be of ample size. The staircases of the Alexandra are not, I regret to say, all I should desire, although perhaps larger in proportion to the number of the audience than any theatre in England. It is, however, more in arrangement than size that they are defective, and to this I was compelled by want of space. You will perceive that the pit, circle, and gallery stairs are in the same staircase, 6 ft. 6 in. wide. There are good landings, but there are also some winders that should not be; these were a necessity in consequence of the above-named arrangement. I do not think in any case there should be a flight of more than four or eight to ten steps without a landing. I find the following a good rule for the width of staircases; for any number up to 100 the staircases should be not less than 4 ft., with an additional foot for

every 100 persons. Thus, suppose a gallery to hold 700 people, the stairs should be 10 ft. wide; in the Alexandra, I consider the gallery stairs about 2 ft. 6 in. too narrow, as it holds the above-named number.

No one can be insensible to the importance of providing properly for the escape of an audience, whether from actual danger or from panic; and the more so, as it never seems to have been satisfactorily settled how to prevent, or at least mitigate, the headlong rush and trampling which have so often occurred on these occasions. No doubt a wide passage is much better than a narrow one, where a large crowd of persons are all moving rapidly along together; but then, the larger the aperture the more danger there is of the stream being overtaken and forced into a heap of fallen bodies by the pressure from behind, which, having no means of resisting the force, can only succumb to it, as in the fearful tragedy at Santiago. To prevent this, I propose to divide the passage into parallel sections, by barriers 2 ft. 6 in. apart, which would allow two persons abreast, and about 3 ft. 6 in. high; so that every one could, all the time he was moving, have a support to lay hold of, and would only have to sustain the weight of the one or two immediately behind. For the same reason, but in a greater degree, the staircases should be divided in the same way.

In planning the front of the house, care will be required in the position of the money-takers and checkers, so that they may have proper access from the treasury behind, and be under the immediate control and inspection of the manager while the audience is coming in, so that any pilfering or other irregularities may not be easily carried on.

The manager's room should be within easy access of the stage and the offices and rooms in connexion with it, but its situation should be private; for there is no man whose privacy is less regarded, and he should therefore be out of the immediate reach of casual visitors and idlers. In the Alexandra it is placed just between the green-room and front of the house; so that, should occasion require his attendance at either end, he would be close at hand.

In consequence of the dress-circle being nearly on the level of the stalls, and there being only two tiers above, I had less difficulty than usual with the height between the tiers. It is of course desirable that there should be as much head-room as possible between each tier, not only for the sake of appearance and comfort, but also for ventilation. It must, however, be borne in mind, that the higher they are the greater the number of steps required, and as the back of each tier is necessarily the highest part, owing to the slope that is required to give the proper line of sight, this height is still further increased; so that in arranging the several tiers due regard must be paid to these essentials, as well as to the class of house intended and its requirements.

The line of sight is the next most important point that claims our attention. The simple rule I have adopted, can be best explained by reference to the diagram; of course the object to be attained is a full view of the actor on any part of the stage, and if he can only be seen when near the floor or footlights, he naturally can be seen on any other part of the stage.

If a line be drawn from the points C, D, and E,—that is, the front steps of each tier to the point A, where the floor of the pit meets the stage,—we shall have a line in each case which the points of the steps must touch. Now, as the eye of an average man is 4 ft. 2 in., when sitting, from the floor, it necessarily follows that the spectator can just see the point B, which should be about 4 ft. from A, and therefore the foot of the actor, and consequently the whole person, but as we get towards the sides of the theatre the line gets shortened, and hence the great difficulty of seeing, which we so often experience in theatres. But if we adopt the same rule and form another section, and draw a line from each point as before, from G, H, and I, to F, the centre of the stage, we shall find the risers increased very much, so that where perhaps a riser in the second tier may be in the centre of the house, perhaps 12 in., at the side it would probably be 2 ft. Even this would not enable the spectator to see the actor if on that side of the stage nearest to him; but as it is impossible for any but the first row to see any one immediately under him, the best must be made of the circumstances, and I consider it in practice sufficient if an object can be seen at two-thirds of the stage: thus the line should be

drawn to a point K instead of F; and here is the advantage of having private boxes, for the public is satisfied in a box if two only can see properly, whereas every one expects, and ought to have, a full view in open seats. To assist the line of sight I have in this, as well as in other theatres I have built, instead of letting the tiers run horizontal, sunk them towards the proscenium, in the case of the Alexandra, to the extent of 1 ft. 9 in.; thereby the spectator being nearer the stage the line of sight will form such an acute angle; there is also the advantage of giving those sitting at the sides, and consequently who have to see over a greater number of heads, a better opportunity of seeing.

To assist the spectator to see as much above the stage as possible, instead of bringing the raking beam down to the front, there is a casting from the column; thus the spectator would see much more of the stage than if the beam came down to the point M; another advantage is, that the front of the boxes need only be about 3 ft. deep, which gives great lightness to the appearance of the house.

The great difficulty is in getting a proper line of sight, when there are a number of rows of seats, six or seven, or even eight and nine, as is sometimes necessary, to get accommodation for the requisite number of people. It suggested itself that a rectangular form would give the best sight; I therefore, in a second-class theatre, which I erected in Manchester a few months ago, adopted this shape. And the result, as far as a large number of the audience having a first-rate view of the stage, is most satisfactory; but the form is anything but elegant, and the appearance is cold and cheerless. I might say that want of time (the theatre was built in six weeks) and limited funds were other reasons that induced me to adopt this form.

The all-important subject of construction of stage, in which I include all those parts that are necessary for the working of the scenery, &c., stands next in our list: to enter thoroughly into this subject would take me beyond my prescribed limits. I will try, however, to point out the most important features and points that are necessary to be observed. I may say I do not approve of the English mode of working scenery. I object most strongly to the general use of flats, and consider that the Continental theatres are far in advance of ours in this department. Here, unfortunately, we have to contend with the ignorance of stage carpenters and managers; and their prejudices in favour of old stereotyped forms and antiquated mechanisms are so rooted that it is almost useless to attempt any change, as it is sure to end in their making all the obstacles they can where difficulties appear, and creating them where they do not exist. I have been told often by managers that I am not practical;—my theory was very nice;—that they agreed with me that the grooves were most unsightly things;—but they knew that the theatre could not be worked without them. And when I have answered by telling them that in the Continental theatres such things as grooves are not known, my only response was, perhaps, a shrug of the shoulders. I think, then, that all scenes that are not practicable should be painted on a cloth. The word cloth in stage parlance signifies any scene touching the stage, not strained in framework, and worked either by roller or pulled straight up with battens top and bottom. What can be worse than the way in which we see a landscape scene constantly put on the stage, at Drury Lane for instance? First, the two flats are pushed forward in the vain hope that the upright joint (very often a bad one, and plentifully bedaubed with the dirty finger-marks of the scene-shifters) will meet without being seen; then a border has to be lowered to make up the necessary height and mask the grooves and border lights; then the side scenes or wings have to be pushed on to make out the requisite width. Here we have four joints all perfectly visible, whereas, if a cloth had been used we should have had none, for the size of the cloth would be just equal to the five pieces, named above, put together; there is, besides, a great saving in expense of wood framing, less time is taken in painting, and one man does the work of five. I am supported in this view by Beverley Crivier, Telbin, and all our great scene-painters who constantly regret the difficulties they have to contend with. Covent Garden is the only theatre I know in England with the stage constructed on this principle, and the finest scenic effects are got there. The height from the stage to the gridiron floor should be double the height

of the cloth; and the Prince's Theatre in Manchester, the first theatre I built, was the first one in England in which this could be done. Now the size of these cloths must be decided by the architect, so that the flies, gridiron floor, should have their proper relative position, and the painting frame be of the proper size. The opening of the Alexandra proscenium being 29 ft., the cloths should be 14 ft. wider, or better, 16 ft., that is, 43 ft. to 45 ft. wide, but for want of width I could only get them 42 ft., and the height is 27 ft. The flies are, therefore, 43 ft. apart, and the height from stage to gridiron floor 54 ft., thus allowing the cloth to be taken straight up of sight without folding; a great economy is thus gained in the working and space.

It is a great defect at Covent Garden, where the cloths are 50 ft. high, that they have to be taken up in three folds, an arrangement which must of course require a multiplicity of ropes and bittens, an increase in the wear and tear of the scene, besides taking up three times the space,—a point of great importance. When the Alexandra was opened, there were no grooves either for flats or wings, the wings being worked on movable ladders as at Covent Garden, and the necessary framed pieces and flats for interiors and other practicable pieces were worked in a panoramic groove, that is, a framed piece out of sight, which could be let down in grooves for these framed pieces to slide in; but, I believe, about a year since they altered this arrangement and went back to the old system. They still, however, have as many scenes as possible on cloths, which is in itself a great gain. The height of these wings and flats I fixed at 19 ft.; the depth under the stage should be sufficient to allow these pieces to sink out of sight. The width of each flat is 14 ft., and sufficient space should be allowed on each side to draw these off, with an ample passage beyond. It economises the working of the stage, the men do not get in each other's way, there is more room to remove and place properties, and therefore less chance of their being broken and damaged, and the dresses of the actors, and more particularly the actresses, are not so liable to be spoiled. In this respect the Alexandra is deficient, although better off than in most theatres. Beyond this, again, on each side there should be some docks of sufficient depth to take a flat: for the reason above stated this could not be done. Drury Lane is very well planned in this respect.*

THE MACCLESFIELD NEW TOWN-HALL.

The new parts of the edifice are nearly completed. This new portion stands on the site of some old shops, and there has been an architectural adaptation of the new part with the old. The principal frontage of the hall is now transferred to the Market-place, where it extends a length of 120 ft.; a portico, immediately opposite the end of Chestergate, being the principal feature. The general façade of the building, as seen from the Market-place, is Grecian Ionic in style, with such adaptations as are rendered necessary by the modern requirements of the building. The long Grecian line is broken up by pilasters and the projection of the portico. It was at first proposed to erect a tower over the entrance portico, but as that would have added considerably to the 6,000*l.* for which the contract was originally let, the idea of a tower was subsequently abandoned.

The carpentering and joinery have been carried out by Messrs. Neill, in pitch pine. The gasfitting and the fitting-up of the laboratories have been under the superintendence of Mr. Davies, of Waters-green.

In addition to the new work, a good deal has been done in the way of alteration and improvement of the old building.

The contractors for the whole of the work are Messrs. Robert Neill & Sons, of Manchester, their sub-contractors being Mr. Charles Frith, Macclesfield, for the masonry and brickwork; Mr. Robert Davies, Macclesfield, for the plumbing, glazing, and gasfitting; Messrs. Kitchen & Brown, of Manchester, for the ironwork; Mr. Harwood, for plastering and painting; Mr. Behan, of Manchester, for the French polishing in the decorative department; and Mr. Barrow, of Manchester, for the slating. Mr. James Fleisher, foreman to Messrs. Neill, has had charge of the execution of the work, which has been accomplished without accident. The whole has been

completed according to the designs, and under the superintendence, of Mr. James Stevens, of this town and of Manchester, architect.

THE SOCIAL CONDITION OF MERCHANT SEAMEN.

A PAPER on this subject, by Commander William Dawson, R.N., has been read before the Social Science Association, and printed in their sessional proceedings. In this paper he shows, to some extent, why it becomes necessary to restate, for the tenth or twelfth time during the last five years, the social and physical disabilities of seamen, and why nothing new can be put before the public until the old complaints are corrected. The social condition of the merchant navy, however, he remarks, is not wholly dependent on legislation, but results in a yet greater degree from the dereliction of all moral obligations on the part of many employers and officers, whom a wholesome public opinion should castigate into decent behaviour. Crews are changed almost every voyage, and hence owners have no interest in favour of sailors, who are merely a necessary appendage to the wrong side of their account-books. Most of the maladies of seamen, under whatever name they may be registered, proceed from their vices, or from the defiance of all sanitary science in their food, water, housing, or clothing, and are, so far, preventible. We have ourselves treated of the sanitary condition of our sailors, especially with reference to berths, ventilation of ships, &c. Commander Dawson points attention to a rather serious state of things, politically considered. The Board of Trade returns show that there are upwards of 20,000 foreigners navigating British ships, exclusive of colonial vessels, whilst the Royal Naval Reserve, the *élite* of our British-born merchant seamen, numbers only 14,799 able-bodied men, out of the 30,000 voted by Parliament, so few are there in the merchant navy possessing the requisite moral and physical qualifications. Thus, instead of rearing up defenders, we are training, for the German empire, in its present or future development, seamen fully equal to our own best men, who may be employed hereafter to sweep the British flag from the seas, and land a conquering army on our shores.

AN ARCHITECT'S ACCOUNT DISPUTED.

In the Coventry County Court, before a jury, the case of W. Langley v. James Eaves was a claim for 49*l.* 17*s.*, being the balance of an account due to plaintiff, and which he alleged was made up of the following sums:—41*l.* 17*s.* was the balance of 5*l.* 17*s.* due at 5 per cent. commission on the outlay for the building of a concert-hall for defendant, the cost of which was 1,037*l.*, and a further 5*l.* due for extra services, in attending workmen, ordering materials, &c., for work for defendant, thereby making up the amount claimed to 49*l.* 17*s.* The defence was that there was a verbal contract made by defendant with plaintiff for 20*l.*, for his services in drawing plans and superintending the building. 10*l.* had been paid on account, previously to the summons; 10*l.* besides had been tendered, and which had been paid into Court after the summons was served. Evidence was taken on both sides, and a verdict for the full amount was given for plaintiff.

HOUSE OF COMMONS.

The East-end Museum.—Mr. C. Roed asked the First Commissioner of Works to explain the causes of delay in completing the Museum of Art and Science in the East of London, for which a vote of 20,000*l.* was taken in 1867; and whether an assurance could be given that it would be opened without further loss of time. —Mr. Ayrton replied that a vote had not been given for 20,000*l.* Three or four years ago an estimate had been laid upon the table for that amount, and a small vote was taken on account. Since then small sums had been voted from year to year for the purpose of carrying on the building. This practice of granting small sums yearly he did not approve of, for it was merely intended to take away attention from the largeness of the aggregate sum. The consequence of this custom in the present instance was, that a comparatively small work had taken a very long time to execute. He intended to ask the House this year to vote the whole of the sum necessary for the completion of the Museum, which he hoped would be finished about three months after the money had been voted.

Ancient Archaeological Remains.—Captain Dawson-Damer asked the Home Secretary whether his attention had been drawn to the destruction of ancient camps and remains such as those situated near Dorchester, Oxfordshire,

and Wimbledon Common; and, if so, whether he could recommend any means, by law, or otherwise, of protecting them, such as that adopted by France, for instance, where a sum of 60,000*l.* per annum was voted for their preservation; and if he had received any statement or petition to that effect from the Archaeological Society.—Mr. Bruce said he had received a petition on the subject from the Archaeological Society, but could not promise that funds would be provided out of the public purse for the preservation of old monuments. He had written to the society, assuring them that he would be happy to co-operate with them in any other way.

LECTURES ON ARCHITECTURE AT THE ROYAL ACADEMY.

BY MR. EDWARD M. BARRY, R.A.*

In my last lecture I dwelt mainly on the general principles which must of necessity govern the practice of architecture. It was necessary to glance at its past history for their right appreciation, and to inquire how far we are justified in referring to the past as our guide to the future. The main interest to us of these inquiries lies in the influence they may have on the work of the day, and the prospect of those future glories of architecture of which we may be permitted to dream. Here this inquiry may be pushed somewhat further. The tendencies of modern thought, as affecting architecture, may be considered. The influence of its past history must also claim our attention, and the great question of its future development is one that cannot be passed over. In dwelling on the essential principles of true architecture we found they might be classified, perhaps somewhat roughly, under the heads of Permanency, Convenience, and Beauty. These heads may be sub-divided, but they will, I think, be found to include all that is really essential. Vitruvius specifies seven qualities on which the Greeks insisted,—solidity, convenience, order, disposition, proportion, decorum, economy,—but these will be found to range themselves under the three heads above referred to.

The facilities which modern science has afforded for observation and research have introduced a spirit of eclecticism in art which is responsible for not a few extravaganzas. Thus we may see huddled together modern buildings which are almost literal copies of old structures, and which seem to relinquish as a thing to be ashamed of all claim to be the work of our own day. And yet we have no reason to be thus disdainful of our epoch. It seems but the other day that we were told that, supposing some natural catastrophe to destroy the dwellers in India, the only remains of English rule would be some empty provision-tins and champagne-bottles. Now, besides works of irrigation, a complete system of railways is nearly finished, and will soon extend from one end of India to the other. At home the rapidity with which the results of experimental science have been applied to the comfort of the people has been little short of marvellous. In 1829 the Rocket engine of Robert Stephenson won its prize in the competition. Now we have in the United Kingdom more than 15,000 miles of railway, with 8,000 locomotives, and upwards of 600 millions sterling invested in railway property. Abroad a similar activity has prevailed. Every country, including even Turkey and Egypt, has now its railways, roads, and other engineering works. They have been carried over heights till lately inaccessible save to the chamois, and the last triumph of piercing the mighty Alps is all but consummated. It is less than thirty years since† the *Great Western* first crossed the Atlantic, and now steam-vessels are reckoned by hundreds. Engineering has been as active afloat as on shore, and it is not many months since its last great nautical triumph was celebrated by the great ones of the world at the opening of the Suez Canal, uniting two seas. When we consider the geological theories of the world's antiquity, giving millions of years as a permissible theory, it is impossible not to be struck with amazement, and even awe, as we reckon up the achievements of only thirty or forty years,—all leading in one direction,—all adding to the power of man over matter,—all securing for the many, advantages which were till lately the exclusive heritage of the few. If we are tempted, as we often may be, to grieve over the apparent decay of real art-feeling, and the exaggerated

* To be continued.

* Second lecture, delivered March 16th, 1871. See p. 199, ante.
† A.D. 1838.

utilitarianism now in fashion, it is desirable to bear in mind, on the other hand, the real progress that has been effected by science, in parallel, but not necessarily divergent lines. It is true that no such progress has been made in art; and for this the earnest devotion of the intellect to what have been deemed more pressing exigencies may perhaps be one reason. But there can be no reason why architecture, at any rate, should suffer, save, perhaps, for a time, from the abundance of the means placed at her disposal. The great works I have referred to have almost all included structures for which architecture has a special vocation. It is indeed to be regretted that too many of them have been carried out without regard to this circumstance, and that, in consequence, some of the great triumphs of science are destitute of the charms which our art might have bestowed upon them. At the same time, it is only right to say that architects might find much to learn from the works of our great engineers as to those qualities of truth, solidity, and fitness, with often a resulting beauty, which are required in a perfect work of art. London Bridge has always appeared to me a remarkable example of the successful application of these principles; and we owe this fine work [at present happily undisfigured by additions] to an engineer, the late Mr. George Rennie. Old London Bridge, with its narrow pointed arches and roadway encumbered with shops, had doubtless a picturesque effect, but even in these days of revived Mediævalism, I suppose no one would suggest its restoration. It had served its time. When it was built it was no doubt the best bridge that could be done, but the modern engineer could have no scruple in removing it, for he knows he can do better. If you will look at the diagram I have prepared of this bridge, you will see that there is not in the design a single superfluous feature. The arches are as large as was necessary, the abutments are plain rusticated piers, the outwaters are placed where they are required, and the whole is crowned by a plain parapet for the protection of foot-passengers. But for the section of a few mouldings which show a Grecian contour, one might say that the designer had never referred to any past style. The necessary construction of massive stones is slightly accentuated by means of rustics. It would be difficult to add or subtract any feature without injury to the whole, and we thus have a work which owes its success to its having been designed on true scientific principles.

Railways, steam navigation, and telegraphs having occupied, as they have done, the attention of all classes in recent times, the engineer has somewhat encroached on the architect, and this had been very much due to the course taken by the latter. He has been too often looking backwards while the others were looking forwards. He has been dreaming of an impossible recurrence to by-gone modes of thought, while the engineer has pressed boldly onwards to conquer the future. The consequence has been, that the progress of their day has found an illustrator in the engineer, rather than in the architect. But this is, as I have said, only an occasion for temporary anxiety as regards the interest of our art. Architecture has ever based its greatest successes on true and convenient construction; she has always known how to snatch a new grace from external difficulties, and it can only be a momentary want of appreciation of facts that has allowed one leaf of her chaplet to fall to the ground. Now that the first necessities of engineering have been satisfied, there is an evident tendency to turn to art for its aid and counsel; and when we consider the necessarily large scale of the works of an engineer, we shall see what scope for grand architectural effect is afforded by them. As regards the employment of iron, and a scientific construction therein, there will, however, be found great difficulties for the artist. Considerations of permanency and solidity must govern his work. On the other hand, exact calculations of necessary strength are the rule of the engineer. The work of the architect must not only be strong enough; it must also possess such an evident reserve of strength as must satisfy the unlearned; and it must display that reserve which is the result of obvious abundance. So much has been said and expected of iron architecture, that it is worth while to consider this question. Without any disparagement of the Crystal Palace at Sydenham, it cannot be rightly termed a work of architecture. An ephemeral character is stamped upon it, depriving

it of all claims to permanence. It does not exclude cold, heat, or rain. It cannot, therefore, be said to be convenient; nor is it beautiful, except as a conservatory, although it is doubtless the finest greenhouse in the world. The construction arouses in us a certain surprise and admiration; but this very circumstance tends to rob us of the confidence which should be felt at once as to the sufficiency of a work of architecture. Beautiful, therefore, as this important specimen of iron construction may be in a certain sense, it cannot rank as a work of architecture, nor can it settle for us the architecture of the future. It is, however, important for the architect to bear in mind that the resources of his art are capable of almost infinite application; and I have placed on the table a small model, which explains some suggestions by my late father, which he offered to the directors before the erection of the present building. He proposed, by the balance of the chief masses, and by the introduction of domes at the intersection of the glass roofs, to improve the sky-line, and to confer on the work a better architectural character than it now possesses. The directors approved the design, but declined to adopt it, because of the additional expense, which, if I recollect rightly, was about 20,000*l*. They then proceeded to lay out about a million and a quarter in the building and gardens. Thus the opportunity was lost of adding immensely, and at small comparative cost, to the grandeur and attractiveness of the building, both externally and internally, as regarded its architecture.

The Crystal Palace, therefore, is not likely to prove the introduction of a new style of architecture. Tried by the principles of permanence, convenience, and beauty, it must be deemed wanting, and must be content with a humbler part. The large iron roofs so common nowadays must be tested by similar considerations if they claim to rank as works of art. The contrast between them and our finest old work of Westminster Hall, for example, what can be said of the iron roofs of our railway stations? It is a circumstance suggestive of the recent origin of these constructions and the rise of modern engineering, that I have been unable to find an example of a large iron roof which I could bring before you without infringing the prohibition of criticising the work of living persons. I have therefore asked my brother * to draw me such a roof as he would think it right as an engineer to propose if called upon to do so. He has adopted without hesitation a space of 300 ft. By its side I have placed a diagram of the roof of Westminster Hall.

I am, of course, aware that a strict comparison is not fair; for Westminster Hall was built as a part of a royal palace, and our stations are erected for strictly utilitarian purposes. I do not therefore press the contrast as ornamental details, but will content myself with pointing out the evident reserve of strength in the one case, and the obvious niceness of calculation in the other. In so doing I am only speaking aesthetically of the apparent qualities of the two roofs, for it might possibly appear from scientific calculations that such appearances are, in truth, fallacious, and that the iron roof is the more stable of the two. It is only important for our present purpose to bear in mind that architecture requires repose, effects of light and shade, and an evident reserve of strength as well as beauty, all which qualities are, as a rule, wanting in our recent iron constructions. Moreover, the scientific peculiarities of iron, place a practical difficulty in the way of the architect. Expanding and contracting with changes of temperature, iron is never at rest, and but for precautions taken by means of rollers or otherwise, it has ever a tendency to destroy the building in which it is used, and like the spreading oak described by the poet, to "draw danger down upon the head it promised to defend." But without indulging in visionary hopes of a new iron architecture, we must remember that the architect of to-day, having this new element of power in his hands, has placed upon him a corresponding responsibility. He is able to do without an effort what was difficult if not impossible before. While this adds, however, in one way to his power, it often involves him in new difficulties. He is, for example, frequently called on to deprive his work of its natural foundations by carrying the heavy superstructure on iron beams, for the sake of obtaining

the greatest amount of convenience, or light and air. This is no doubt, the cause of the somewhat threatening construction of this subterranean apartment. It must be the duty of the architect not to reject the assistance of iron, but to endeavour so to master the principles which limit its artistic application, as to retain the aid of a good servant, while resisting its undue pretensions as those of a bad master. Now that mankind have discovered the facilities which the use of iron has conferred upon them, it is idle to suppose that they will long rest satisfied with any form of a useful art, such as architecture, which distracts and neglects it. Difficulties such as I have touched upon doubtless exist; but for the architect the first thing to do is to understand, the second to conquer them. Architecture, with its requirements of covering internal spaces with domes and vaults, has everything to gain from the scientific progress of engineering. The architect and the engineer, indeed, ought hardly to be considered members of different professions. In consequence of a separation to be deplored, opportunities have been lost for the display of architecture on a scale grander than has ever been seen, and works have been erected with a disregard of artistic propriety which may almost be termed cynical. I am anxious to do justice to the works of engineers where they have been successful as works of art. There are, however, some examples which we may try as Christians to forgive, but which as artists we can never forget.

We may now briefly consider some of the types of building which we have inherited from our forefathers, and which have influenced us so powerfully in our work of to-day. With our warm admiration of the noble remains of the piety and artistic power of Mediæval times, it is almost a difficulty to us to believe that but a short time back they were regarded at best only with antiquarian curiosity, and the very word "Gothic" was a term of reproach. The remarkable movement which has rescued our churches from decay and churchwardens, and has covered the country with restorations, has laid artists under a lasting obligation, though it may have introduced dangers of its own. It is certainly remarkable that it has been reserved for a time impatient beyond precedent of prescription and ancient rules, to stand forth in history as the age of architectural restoration. Conservatism in architecture has seemed a wonder in an age of active democracy. We are apt to forget the modern origin of this conservative feeling. In the Middle Ages it was unknown. In any English cathedral may be seen the work of different times, each with its peculiar details and design, which enable the educated observer at once to classify them. There was then no hesitation in pulling down a church in order to replace it by another built in the fashion of the day. In the walls of our ancient churches elaborate fragments of the earlier work are found built in without regard to their original position, and used as mere building materials. In other cases, as at Winchester Cathedral, the original building was actually cased and hidden from view by the application of the forms thought at the time to be the best, because the newest. It is the same through all the varieties of the style,—Norman, Early English, and Decorated,—all gave way each in turn to its successor, till the last was merged in the Transitional and the Perpendicular of the fifteenth and sixteenth centuries. From that time to the recent revival, other forms of architecture have been in the ascendant. It is fortunate, indeed, that in this interval our predecessors have neglected, and have not imitated our Mediæval principles, by pulling them down in order to rebuild them in the fashion of their day—the fashion, perchance, of the Georgian era. But, however much we may rejoice to have been spared this misfortune, the contrast between the hesitating timidity of to-day and the unquestioning boldness of the Mediæval architects, is both instructive and suggestive as to the state of our art. Every change in style was based on common sense, and much of the history of all times may receive elucidation from their architectural remains. Thus, in the thick walls of the Norman or Saxon castles, we see evidence of the lawlessness of their day. Security being paramount to all other considerations, we are not surprised at the smallness or inconvenience of the domestic accommodation when contrasted with the arrangements required for defence. We may, however, well appreciate the manner in

* Mr. John W. Barry, C.E.

which the necessities of the latter are made to add a charm to the architectural effect. As society became more settled, castles ceased to be built. The Church arose as the predominant power. Cathedrals, churches, abbeys, and religious houses were scattered throughout the land. The heavy forms of the Norman work were found not to be sufficiently plastic, and as convenience required their abandonment, they were set aside as a matter of course. Glass became less scarce, and windows were therefore enlarged. The invention of stained glass pushed this enlargement further and further, till churches seem to have been designed specially for its display; as, for example, some of the finest French cathedrals with their exaggerated clear-voies. Increased skill in construction led to the employment of larger arches, and the pointed arch took undisputed possession of Gothic architecture. Masonry advanced step by step to such daring constructions as the vault of King's College Chapel at Cambridge, or the spire of Strasburg Cathedral. The advance in domestic buildings was not less marked, though we have necessarily fewer examples remaining to us than of the more solid public edifices. Such ruins as Fontaines, Rievaulx, Kirkstall, and others, indicate the power of the Church, and enable us to estimate the immense influence it must have had on architecture, and, indeed, on all the relations of public and private life. The advancing power of the Crown may be traced in such buildings as Hampton Court Palace, unwillingly surrendered by Wolsey to his sovereign, while the collegiate buildings at Oxford and Cambridge record the increasing importance attached to education, as well as the improved order of the time, which rendered such establishments possible and safe. Time would fail me to carry out this argument in all its details, but the above indications may, perhaps, suffice to show how convenience has guided architecture, rejecting time-honoured forms whenever they clashed with its dictates, and leaving as a result its history in stone of each social or artistic change. In carrying out the details of its work Medieval architecture always followed similar principles. Each material was employed for the purpose and in the position for which it was most fitted. Common sense presided over the works of the mason, the smith, the carpenter, the glazier, with a result which, while sacrificing no essential, has given us monuments of art which must be the admiration of this and probably all future ages. With the revival of classical literature, and the Reformation, came the Renaissance; and during the transition we find architecture influenced, as usual, by the external circumstances of the day. The stately Elizabethan homes of the gentry spoke of new habits and new wants. The home of an English gentleman was no longer to be of necessity his castle. The old feudal relations of lord and vassal were exchanged for the more modern and kindly intercourse of landlord and tenant, which, in England at least, has had inherent strength enough to survive the revolutions that elsewhere have levelled all before them. In the houses of the Elizabethan and Jacobean period are to be found all that was then considered essential to comfort and convenience, with abundance of light, and no lack of stateliness. The architecture is often a strange medley of Gothic and classical forms, combined often with bad taste, but almost always with a certain picturesque quality. It is also peculiarly English, and has perhaps not always had justice done to it. Some of the best specimens of this transitional style may be seen at Hardwick Hall, Wollaton House, Burleigh, and the original portions of Crewe Hall, in Cheshire. With details refined and purified, the architecture of this time might present much for our study and consideration. It was not, however, destined to a long duration. Learning for its details now on the Gothic of the past, now on the revived classic forms in which enthusiasts thought they had found the style of the future, it finally succumbed to the Renaissance of Inigo Jones and Sir Christopher Wren. At this distance it is possible for us to look back fondly on the middle ages. Their troubles, oppressions, and asperations are things of the past, and to us are as if they had never been, while their architecture is with us still ever admired and appreciated. The men of the Renaissance thought differently. The times that had just passed away for ever they regarded with horror. The judicial murders of the Tudors, the power and arrogance of the clergy, the fires of Smithfield, were to them recent and terrible

facts. A reformation in religion appeared to lead naturally to a change in the architecture which they associated with the memory of past troubles. Resolved for the future to withstand priestcraft, they seemed to have found new allies in the classic philosophers, poets, and ages, whose teaching could now, thanks to printing, be everywhere disseminated. From this time to the present classical literature has guided education, and classical forms have been more or less the rule of modern architecture at home and abroad. Few can venture to say what is to be the rule for the future. One thing, however, must be remembered, namely, that though we may copy the forms of the past, we cannot live the lives and think the thoughts of those that are gone. There is a gulf between us which no imitative architecture can bridge. We may despise the nineteenth century, but we cannot help belonging to it. It is for the true artist to seek perfection with his eyes fixed on the future rather than on the past.

In the works of Jones and Wren we may look in vain for any traces of Gothic feeling. Wren, it is true, did occasionally attempt Mediaeval design, as is shown in his western towers of Westminster Abbey, but here he probably worked, as other architects in the neighbourhood have been obliged to do since, under some sort of compulsion. What he would have done if free to act may be surmised from the course actually taken by Inigo Jones at St. Paul's. Here he added an elaborate Corinthian portico to the Gothic church, with the evident intention of ultimately pulling down the latter and rebuilding it in the Classic style. We must feel grateful to any one who may have saved Westminster Abbey from such a catastrophe, but we may see in this thoroughness the same feeling which prompted the Mediaeval architects to remove without scruple the work of their predecessors. To Inigo Jones and his companions it seemed that no change could be too complete. To the rising Puritanism of the day, "old things had passed away, all things had become new." The same ideas had spread elsewhere, and England was only following the lead of more advanced foreign nations. France, Germany, and Italy had all adopted the Classical revival, and, with few exceptions, practise it to this day. Ecclesiastical feelings have largely influenced the architectural as they have, indeed, all other movements in England; but, apart from this circumstance, the revived forms of the Renaissance have been generally adopted by the laity. How far this may undergo a change it is premature and unprofitable to discuss at present; but when we find certain forms of building adopted by millions of deliberate choice and from considerations of fitness and convenience, weighty reasons may be thought to exist for such a conclusion. In the present state of our art confusion may seem to reign for a time, but we may be sure that the future of architecture must be determined in the end by the dictates of common sense. It was from this consideration that I insisted in my last lecture on the necessity of that general appreciation for art which can only be looked for from extended education. Architects are often controlled by those who know and care nothing about art. In private works this is natural and not perhaps improper; but our public architectural history gives us many examples of national loss springing from such conduct on the part of our authorities. Who has not grieved over the loss of Wren's grand plan for rebuilding London? Two centuries have passed since the Great Fire, but the Embankment which he planned is not yet completed, though millions have been spent on it instead of the thousands which would have sufficed in his days. Who can picture to himself the grandeur he intended, with its spacious quays lined with noble public buildings (including, as some have supposed, the Halls of the City Companies), and think without regret of the present state of the embankment, disfigured and mutilated for want of a comprehensive plan for building along its line, and in its neighbourhood. It is, indeed, no slight testimony to Wren's genius and foresight, that he should have been able to lay down so clearly the principles which we have at length carried out, although imperfectly. His fertility of resource and his activity were, however, wonderful. Besides St. Paul's, he was the architect of fifty-seven churches; the Monument, the palaces of Hampton Court and Winchester, the Royal Hospitals of Chelsea and Greenwich, the works at Westminster Abbey; the theatre at Oxford; other theatres in Drury-lane and

Salisbury Court; the library of Trinity College Cambridge; besides many other works, public and private. His son may well write,—"All those works form such a body of civil architecture as will appear rather the production of a whole century than the life and industry of one man." For all the above works he received a salary of only 400*l.* a year; namely, 200*l.* for St. Paul's, 100*l.* for the churches, and 100*l.* for Westminster Abbey; and it is stated, that "he was content with this small allowance, always preferring the public service to any private ends. The "public service" however, is not usually very generous in its rewards to artists or men of science, and the only public allusion to Wren's services which I have been able to find, is a clause in an Act of Parliament of the 9*th* year of King William, which suspends payment of one moiety of the surveyor's salary until St. Paul's should be finished. The Act naively states that this was done, "thereby the better to encourage him to finish the same with the utmost diligence and expedition." He was afterwards superseded when eighty-six years of age.

Whitehall Palace, again, only now exists as a fragment. The present Banqueting-house is, indeed, not one-fortieth part of the original design. Had the latter been carried out, the question of our public offices would probably have been settled for ever, and a modern prime minister would not have had the opportunity of forcing his taste on a reluctant architect. By the kindness of Mr. Scott I am enabled to show you the block plan of the new public offices now just completed and in progress, and to contrast them, as to size and extent, with the plan of Whitehall originally proposed by Inigo Jones, which is drawn to the same scale. It will be remembered that, in 1857, before anything was done as regards new public offices, Sir Benjamin Hall, the then First Commissioner of Works, called for a competition for a block plan according to which the new buildings should be erected, so that a grand and comprehensive scheme might be laid down at first, and gradually worked out. This competition took place, and a plan was chosen. What has since happened may be told in the words of the present president of the Royal Institute of British Architects, in his opening address to that body. In this address Mr. Wyatt says,—

"That part of the Government Offices, comprising the Foreign and Indian Offices, is at last complete, and a new contract has lately been entered into for the completion of another portion, the Home and Colonial Offices. In this great work, timidity and indecision seem to have largely prevailed. The prize block plan for laying out the Government Offices (in the competition originated by Sir Benjamin Hall) has been disregarded, the new buildings seem to have no connexion with the other public offices as regards style or position, they have been done piecemeal instead of dealing boldly and at once with the whole group, wasting money in the tenancy and occupation of inconvenient and detached offices, now rented at heavy rates, and giving increased value to adjoining properties, which will ultimately have to be purchased."

I have already called your attention to Wren's great plan, which dealt mainly with what is called the City, and I may perhaps refer, without impropriety, to a plan almost as comprehensive for the improvement of Westminster, to which in the last years of his life my father devoted much time and study. He often said that though he felt the end of his own work was fast approaching, he was anxious to leave as his legacy to the public a record of the ideas which had long been working in his brain. In 1857, accordingly, he made his plan, and sent it to the competition. He was not a competitor, nor could the plan be considered competitive, being much more extensive than the conditions prescribed. His object was only to put his views on record, in the hope that such of them as were valuable might prevail in future times in the hands of others. The plan which is now before you is sufficiently intelligible, and there is the less reason for me to describe it, as you will find a detailed explanation of it in the published "Life of Sir Charles Barry." Much has been done since this plan was proposed; and it can now never be fully carried out. Parts of it, indeed, may even yet be realised, particularly the completion of the Houses of Parliament, on the approaching demolition of the Law Courts, at Westminster Hall. But the time for carrying out the whole plan is gone for ever, and it must ever remain as "an architect's dream" of what might



NEW BURLINGTON HOUSE: THE HOME OF THE LEARNED SOCIETIES.

Plan of Ground Floor

have been done for Westminster. In days when it is too common to blame architects for all the national shortcomings in respect of our art, it is allowable to point out that there has been no lack of grand ideas and noble suggestions by its professors, and that the chief responsibility rests with those who, unable to comprehend them, adopt, with reference to public improvements, a niggardly hand-to-mouth policy, convenient perhaps for the moment, but in the end indecisive, unsatisfactory, and extravagant. We have an example of this result in the case of the National Gallery. Erected less than forty years ago, it is already condemned. Its architect was so hampered by financial considerations that he cannot be fairly held responsible for this result. His reputation is, indeed, sufficiently established to render us assured that with suffi-

cient means at his disposal he could have given us a building more worthy of the nation, and the case only remains on record as a new warning, probably to be disregarded like so many others, that parsimony is not economy, nor a well-considered liberality, extravagance.

It is essential to the production of great works of art, whether of architecture, painting, or sculpture, that confidence should be placed in the artist, and a fair opportunity accorded to him of worthily carrying out his conceptions. We have seen what was the kind of encouragement meted out to the great architect of St. Paul's, and while on this subject I cannot omit reference to our largest modern work, the new palace at Westminster. As to its claims as a work of art it would be unseemly for me to speak, and unfruitful to criticize. I may, perhaps,

however, be allowed to say that I leave those claims without misgiving to the judgment of posterity. But on the amount of interference, discouragement, and undeserved censure, against which the architect struggled, I have some right to speak as one who knows. Who has not sympathized with the great architect of St. Paul's shamefully treated in his old age, or has not felt a burning shame at Pope's sad lines,—

"While Wren with sorrow to his grave descends,
Gay dies unpension'd with a hundred friends!"

There is a name to me more sacred than Wren's, that recalls sad thoughts of a vigorous maturity discouraged, if not disheartened, and suddenly cut off by care before it had even commenced to lapse into old age.*

* The conclusion in our next.



B. S. L. Y. DEL.

NEW BURLINGTON HOUSE, PICCADILLY.—MESSRS. BARKS & BARRY, ARCHITECTS.

[See p. 217, ante.]

T. HENNINGSON

THE CENSUS OF 1871.

ANOTHER preliminary stage of the important work of numbering and describing the people, houses, and buildings, of the United Kingdom has been passed during the week. On Monday next another important stage—the delivery of schedules to the occupiers—will be entered upon; and on Monday week the culminating duty will have to be performed of collecting the filled up schedules. The present week's business has consisted of the signing of the agreement, by which appointed enumerators are bound, under a penalty, to discharge their duties faithfully; to receive their schedules, their enumeration book, and their instruction and memorandum book. It is stated above that houses and buildings will be enumerated and partially described. Every inhabited house will, of course, be so indicated, and the facts stated as to whether the house is occupied by one family or more than one, or by lodgers in addition to the responsible occupier.

The particulars concerning houses must be filled in by the enumerator when the schedules are delivered, including the road, street, number or name of the house or building; whether a private house, shop, public-house, church, chapel, school, cottage, or other building as thus:—

		Schedules left.	Schedules collected.	Notes.
No. 12, King-street...	Tailor's shop	1	1	
13, King-street...	Public-house (Marquis of Lorne)	2	2	
14, King-street...	Private House	1	1	Toilet (a person in charge).
Queen's-place	Baptist Chapel	—	—	
No. 1, Princess-street	St. George's Schools	1	1	Schoolmaster's House,—part of building. Recently built.
2, Princess-street	Uninhabited	—	—	
3, Princess-street	Private House	2	2	
The Rectory	Three houses building	—	—	
Prince's-place	Private House	1	1	
	Mechanics' Institute	1	1	Housekeeper and family live on the premises.

The enumerator's book must state how many schedules he has left at every inhabited house visited, and how many he has collected. Houses "to let," and houses building, must be entered and so described. Churches, chapels, public-houses, and public buildings of all kinds, are to be noted, as also premises occupied as offices, or for other business purposes, that are uninhabited at night. In addition to these particulars, the enumerator must fill up the headings of every page of his memorandum-book with the town, village, or hamlet, local Board, or Improvement Commissioners' district, and the ecclesiastical district to which the returns relate. He must also enter notes in his memorandum book as to the inhabitants of the district temporarily absent, and the inhabitants temporarily present,—a rather onerous and difficult duty, not very likely to be carefully performed. He must also take cognizance of persons who, on the night of the 2nd—3rd of April, sleep or remain in barns, sheds, caravans, tents, on door-steps, under arches, in the fields or woods, or in the open air. To assist in tabulating this curious information,—some other assistance will be needed for collecting it,—a schedule is provided in the enumerator's memorandum-book, in which the stray waifs of humanity,—the houseless and homeless,—are to be summarized.

The allowances for census work have been published recently in a Parliamentary paper. The superintendent registrars are to be allowed 61s., and 2s. for every 1,000 persons, properly enumerated, over and above the first 10,000 in each district; the registrars are to have a fee of 41s. and 1s. per 100 for every 100 over 1,200; the enumerators are to have a fee of 11s., and 2s. 6d. per 100 for all above 400 enumerated. In populous districts, the metropolises, for instance, the extras, especially with superintendents and registrars, will probably exceed the fees, and the enumerator's extras will also make it better worth expending his labour and time upon the important work. It has been published that an increased scale of allowances has been made on this occasion of census-taking, but if the work is done faithfully and intelligently, the fees will be fairly and well earned. Take the case of the enumerators, for instance, the rank and file of the census army: they attend first at the registrar's office, forming a "sweet crowd" of from 50 to 100 persons, who are not to be insulted by saying that "motley's their only wear," character, or appearance; there they are in a small room and a narrow lobby, to wait their turn for an hour, it may be, till they are called in

and accepted. They are next required to attend and "sign the agreement," when a similar detention occurs. The next attendance is to get their instructions, enumeration book, and house-holders' schedules—scene repeated. Next to deliver schedules, and keep a record of every schedule delivered; if occupier absent or unable to answer, and no one in the house capable of supplying the information needed, the enumerator must "call again." Having completed his delivery, the enumerator must, on April 3rd, collect his schedules, find some lost, others blank, others manifestly wrongly filled up; he must supply duplicate forms, fill up the blanks correct, as well as he can, evident errors, and having completed his collection, must copy every item in the whole of the schedules into his enumerator's book, adding more or less copious notes of his own. Having done all this, he must send in, before the 10th of April, all his books and papers, and his claim for payment, which for a district numbering, say 600 inhabitants, will amount to 11. 6s. sterling, a rate not in excess, "not to put too fine a point upon it," of that at which some other kinds of public work are paid. We trust care has been exercised to obtain the services of efficient men, and all must hope that the work may be really well done.

however, is by no means the case. As illustrative of this fact, a short narrative of the state of affairs since the close of the Commission inquiry, existing in the city of Glasgow, which has become a head-quarter of trade-unionism, will resolve any doubts.

Shortly after the New University buildings there were commenced, the union stonemasons in the employment of the contractor insisted that all the non-union masons should, on pain of dismissal, be compelled to join the union ranks. The contractor stubbornly resisted this arrogant demand, and a prolonged strike on the part of the unionists was the consequence. Ultimately, by energy and perseverance, the contractor succeeded in setting the union at defiance. These buildings are now, so far as masonry is concerned, all but completed, and consequently the workmen were necessitated to seek employment elsewhere. Owing, however, to these men having continued their employment at the University buildings in the face of the trade-union interdiction, they are compelled, on obtaining employment, where the union has the power, to pay a heavy fine for permission to labour. About the same time, the iron-moulders of Scotland were locked out by their employers in consequence of similar obstructive demands on the part of their trade-union. After a prolonged and severe contest, the employers succeeded in breaking the power of the union. And the workmen had to return to their labour poorer, if not wiser, men. Notwithstanding the result of the iron-moulders' struggle, the arrogance and assumption of others of these unions have in no way abated. Last year, in the month of March, at the instance and under the pressure of their trade-union, the joiners of Glasgow inaugurated a gigantic strike throughout the city for the reduction of the hours of labour from fifty-seven to fifty-one hours per week. After the expenditure of floods of coarse and inflated oratory, the sending of deputations and delegations without number—got up, like the showman's exhibitions, regardless of cost—to their reluctant, refractory, and recalcitrant fellow-workmen, they ultimately succeeded in dragging into the maelstrom of the strike a considerable majority of the journeyman joiners of the city. Their success was only partial, as at the present date some of the largest employers in the city continue to work on the old system. No rational man impugns the right of any individual, or a hundred individuals, to sell just as much or as little of their time as they may choose, nor of a purchaser to buy the amount that may suit his convenience or his wants. But what is impugned is the claim set up by trade-unionists of their right to dictate, to men who may differ from them, the terms and conditions on which these men shall sell their own labour. Perhaps in the case of this joiners' strike it would be wrong to say that any actual physical force was used to compel any man to join the ranks of the strikers, but that an amount of pressure and intimidation scarcely removed from physical force, and that to an incalculable extent, was used is beyond controversy. Most working men, and joiners are no exception to the rule, are, from their habits and defective education, peculiarly liable to this species of influence. This influence, moreover, is effective in a vastly increased ratio where large numbers are employed in workshops together. Comparatively few have the education to expose and refute the specious fallacies put forward by platform orators, and still fewer have the moral courage to resist the insistence of the zealous and unreasoning mob of followers, who spare no means, from the very closest approach to club law to the use of the foulest and most opprobrious epithets, to obtain their object. Twenty-seven of the largest employers in the city, who continued their work on the old system, found men to work for them who could cordially agree to their conditions, have since the strike been going on with more or less annoyance from the "new lights." It seems, however, that such defiance of rule is no longer to be tolerated. These workmen are no longer to be permitted the freedom of their own will to make such a bargain with their employers as may suit their own views; accordingly a resolution has been passed at a meeting recently held, that the "ten-hour shops" should be dealt with. An agitation has been re-organised, and the spirit of the association have received instructions to intervene between these benighted ten-hour-per-day workers and their employers. A most vigorous attempt, supported by the whole power of the "trade" (every one knows what this means), is forthwith to be made to compel these twenty-

TRADE-UNIONS BILL.

SIR,—As a matter of justice I ask space for a few observations on the part of non-union men. The Government proposals in regard to trade-unions are now fully before the country. This legislation is professedly undertaken with the view of affording to these associations relief from certain legal disabilities under which they have not due protection for their funds and other property, as well as for amending the law generally affecting trade combinations. There can be no doubt that funds contributed by any body of men for the promotion of a common object permitted by law should be protected from the peculations or dishonesty of the managing officials or others just as the property of private individuals or trading companies is protected; and also that the right of operatives or others voluntarily to enter into combinations or co-partnerships for mutual aid and protection in their business or other legitimate affairs should be legally recognised. It is important however, that, while all due rights and liberties should be guaranteed to trade-unions, care should be taken that the rights and liberties of individuals who may choose to remain outside the trade-union pale should receive due consideration. This is all the more important, as the influence exercised by organised combinations in our Parliamentary elections and otherwise is such as may lead to the claims made on their behalf receiving a greater amount of legislative support than legitimately belongs to them.

After a very careful perusal and consideration of the provisions of the Bill, it will be evident to impartial persons that the safeguards for the protection of individual rights and liberties are inadequate to meet the necessities of the case.

The third clause, which is exciting so much opposition among extreme trade-unionists, is not quite satisfactory, inasmuch as the "motive" for trade-unionists "tamely following" obnoxious individuals in the streets or elsewhere, which might be thought self-evident, requires to be proved under the Bill. That protection by the law of such individuals as may desire to sell their labour on their own terms, and independent of trade-union dictates, is imperatively demanded, may be seen by a very cursory examination of the evidence on this subject laid before the Trade-union Commission. That exposure of the oppressive nature of trade-union action, it might be thought, would have put an end to such practices. Such,

seven workshops to conform themselves to the dictates of the imperial union. It has also been resolved, with a view of prostrating the employing class, that in all workshops where union men may be in a majority, all non-unionists must be forced to join the union, under a threat that on refusal a strike will be resorted to to compel the employers to discharge the refractory individuals. The simple relation of these facts speaks volumes, and proves unmistakably that trade-unionists have given up none of their pretensions to freedom of labour. It is of the last importance, *pro bono publico*, that every man should have the most unrestrained freedom to conduct his affairs, whether labour or anything else, on such conditions as are most convenient, profitable, and pleasing to his own mind. The Imperial Parliament of the United Kingdom, the repository of the power and majesty of the nation, would, if asked thus to limit individual liberty, scout the proposition with contempt. Why, then, should a mob of artisans, half educated only even as regards the three Rs, be permitted to restrain the liberty of men who are, to say the least, as well educated as the best of them, and as able to judge correctly of what is most to their own advantage. Individuality is the greatest element in human happiness, and the birthright of every Englishman, and the pride and boast of every great and free people. It is for the common weal that the rights and liberties of all its constituents should be conserved; that no class or party should be permitted to domineer over, to fetter or restrain any individual in the conduct of his trade or business, such restraint being to the public injury. In particular, care should be taken that no legislation, under a specious pretence of removing indefensible disabilities and legal ostracisms at the imperative demands of impartial justice, be merely outrages on justice in her own temple. It deeply concerns a great industrial and commercial community like ours, that thousands of our labouring population should not be deprived, on any pretence whatever, of that greatest incentive to patriotism and love of their country and her institutions—a perfect confidence in the protection of their liberty and property by the law. There is no property so completely a man's own as the labour of his hands, and it ought to be perfectly and completely in his own control. But sweeping and favourable to unionists as the changes in the law by this Bill are, the unionists are by no means satisfied. Nothing, it seems, but an entire monopoly and control of the labour-market and of the labourers will meet their views. It seems that some of them are prepared rather to lose the amendment of the law than have any legal hindrance imposed on them from "threatening, intimidating, and outraging" those who choose to differ from them or remain outside the trade-union pale. Are the operative classes of our country prepared thus to abandon their personal freedom, the liberty to think and act for themselves? Are our employing class, whose interests and rights are equally important and sacred, willing to allow third parties to come between themselves and their workpeople, and determine the hours, the price, and the men at which and by whom work shall be done? Will Parliament consent so to modify the provisions of this Bill to meet the views of the so-called leaders of the working men as to place the industry of the kingdom under the management and at the disposal of trade combinations and their interested officials? It would be not only undesirable, but wrong by law, to prevent any body of men from forming a combination for the promotion and protection of their own interests, if they so choose, or to subject them to any legal disabilities for so doing. Nor can it be justly denied that much good, if also some evil, has resulted from such combinations. The same liberty, however, must be meted out to those who do not choose to join the union ranks by the most stern repression of all those coercive measures which unionists have too frequently been in the habit of using for the accomplishment of their purposes. This can only be done by declaring any strike, on the part of unionists, for the purpose of compelling others to join them, a criminal offence, and rendering men resorting to this mode of coercion liable to severe punishment; or otherwise adding a clause to the Bill, providing that whenever a strike of this nature occurs the persons (or their associations) causing it should be liable in pecuniary compensation to the individuals who may be driven from their em-

ployment on that account. Nothing less than such protection as this can be justice, and nothing but justice must be done under the sacred sanction of the law. A WORKING MAN.

ARCHITECTS AND THE '71 INTERNATIONAL EXHIBITION.

SIR,—The writer of the letter which you published in your number for the 18th of March, on "Architects and the '71 International Exhibition," has laboured, to a certain extent, under a misapprehension, and perhaps a more accurate statement of the facts as regards the unfortunate action of the Institute may cause him to reconsider his opinions on the subject of the Exhibition.

It is inexact to say that the Institute requested that their president might be appointed on the committee of the Exhibition to guard its members from unsatisfactory treatment, and that that request was refused. An application was, it is true, made, but it differed in its motive, its nature, and the reply which it received, from what your correspondent "F. R. I. B. A." has supposed. The Institute asked that as the president of the Institution of Civil Engineers was an *ex officio* member of the Commission, their president might be appointed to a similar position. The Commissioners had no power to create *ex officio* members, these being created by their charter, and I am sure no Fellow of the Institute can attend our meeting for long together without coming to the conclusion that a Royal Charter is of all things in the world one of the most difficult to alter. The Commissioners had, however, the power to appoint individuals as additional members of this body, and they offered to appoint Sir William Tite, the then president, and Mr. Beresford Hope, the then past president. This offer was declined by the Institute, though it was the most liberal offer which the Commissioners had it in their power to make, and would have secured all that was requisite in the way of a sufficient representation of architecture.

It is difficult to see how, by sending drawings to an International Exhibition—supposing those drawings are good ones—architects can, as your correspondent puts it, "sharpen the razor sedulously prepared by the authorities at South Kensington for the severance of their own throats;" but it does seem like a suicidal policy to stand aside and allow architecture to be represented in an International Art Exhibition by third and fourth rate drawings only. It is to prevent this, and to promote a really excellent exhibition of architectural drawings, such as will do credit to our profession, that the architects who are members of the "committee of selection" have consented to act, and there seems every reason to hope that this aim will be fully accomplished.

A MEMBER OF THE COMMITTEE OF SELECTION.

SIR,—If it is much to be regretted that the authorities at South Kensington should have omitted to include the President of the Royal Institute of British Architects in the committee of the International Exhibition, it is still more impolitic and very undignified in the Institute as a body, even so much as to draw attention to the circumstance, and simply childish, not to say suicidal, to resent the omission.

In the interest of the profession at large, such an opportunity for the display of their art as that offered by the Exhibition, should not have been lost.

Our patron, the public, has no interest in party piques and sectional differences, and it will not think the better of us, or our art, if we show more consideration for our personal prestige and professional punctiliousness than for the elevation of the public taste, and the credit of the British section of the International Exhibition.

Very many of my brother Fellows are equally opposed to the action of the Institute in this matter.

EDWARD C. ROBINS.

Gas in Constantinople.—The question of lighting Stamboul with gas is again under the consideration of the Council of State, and the *Levant Herald* states that the contract is likely to be given to an Anglo-Belgian company, which has already deposited the necessary caution-money.

MEMORANDUM OF THE ARCHITECTURAL COMMITTEE OF SELECTION FOR THE INTERNATIONAL EXHIBITION.

WE are requested to publish the following:—

On our first visit to the Gallery, in the Albert Hall, appropriated to the Exhibition of Architectural Works, we found that it was isolated from the other Fine Art Galleries. We, therefore, expressed our wish to her Majesty's Commissioners, that some arrangement might be made to obviate this objection, and we are happy to inform you that they have readily acceded to our request, and have arranged to make room for the architectural drawings in one of the Central Fine Art Galleries. The time for sending in drawings is extended to March 31st.

The only limitations made are, that the drawings must be in perspective, and of a pictorial character. The space, under the circumstances, will necessarily be limited, but quite sufficient, if we are properly supported, to make the Exhibition worthy of our profession.

AN ORIGINAL STYLE IN ARCHITECTURE.

SIR,—After perusing Mr. Edward Barry's excellent lecture on architecture at the Royal Academy, in which he puts forth such good advice to the rising generation of architects in the want of originality in style and design in this country at the present day,—if you refer to past ages from the earliest periods you will find that every nation had a distinct style of its own, void of the system of copying from each other, and a style of architecture suited to the climate. If you trace it down, even in this country, to the period of our magnificent Gothic structures, you will find, even at that period, the buildings were suited to the climate, whether as churches or domestic architecture. All this appears to have been forgotten by the architects of the present day, losing sight of the fact that such cities as London and others were scarcely in existence; at all events, they had not to contend with such an atmosphere as our own, polluted with smoke, &c., to contaminate the air. All this appears to have been lost sight of in not adopting a style of architecture to meet all these drawbacks, still admitting of ornamentation and correctness of style for different buildings. If the Royal Academy were to hold out a premium or medal (now they possess an efficient teacher in architecture) for the best original design for a style of building suitable to our own country, something might follow. Germany and France possess all this; then why not England, and avoid copying on all occasions? A SUBSCRIBER.

LEICESTER MUNICIPAL BUILDINGS COMPETITION.

SIR,—Having invested 11. in obtaining the plan and instructions for this competition, it may be of service to some of your readers, who may contemplate a similar outlay, to be informed that, while the instructions and premiums are rather more reasonable than usual, there is a very objectionable condition laid down, in case of the employment of any of the competing architects. It is as follows:—

"The premium to merge in the commission. The commission to be 5 per cent. on the actual outlay. This is to be the payment in full for all the services usually rendered by the architect, and for all plans, sections, specifications, schedule of quantities, estimates, detail drawings, superintendence, travelling expenses, attendances, and other matters or things arising out of or connected with the erection and completion of the building."

When due allowance is made for the surveyor's fees, expenses, and other items, which are thus sought to be included in the 5 per cent., from 2 to 3 per cent. is all that will be left as remuneration for the "services usually rendered by the architect;" and it would be more candid for the Corporation of Leicester at once to say what lower rate than the usual one they mean to offer, than, while nominally adhering to the 5 per cent., to force into it a series of matters like these, with which ordinarily it has nothing to do.

In former times, whatever evils attended the competition system, there was at any rate something worth while to be competed for. Under this arrangement, however, not only is the premium found to be a mere "ignis fatuus," by being made to "merge" in the commission, but the latter is charged with a series of deductions, bringing it to very attenuated proportions indeed. But so long as the R.I.B.A. and other

societies, whose duty is the maintenance of "uniformity and respectability of architectural practice," take no note of such things, what better can be expected? I think an energetic remonstrance should at once be addressed to the proposers of this competition, and that no architect of character should engage in the competition until this objectionable condition be removed. I hope most of your architectural readers will agree with me, and keep their pounds in their pockets and their designs within their brains, till some more worthy inducement be offered.

A WOULD-BE COMPETITOR.

THE SEWAGE QUESTION.

THE town council of Exeter being unable or unwilling to propose a scheme for freeing the river Exe from the pollution of the city, a company contemplates coming to the rescue, under the denomination of "The City of Exeter Sewage-Manure Irrigation and Farming Company." The object will be the utilisation of the sewage of the city, the flow of which is stated to exceed a million gallons daily. All this noxious outcome the company proposes to turn to good account for manurial purposes, and thus relieve the Exe of the poisonous flood that corrupts its waters and exhales in infectious vapours to the injury of the 40,000 people who live in the vicinity. The capital of the company will be invested in the purchase of freehold land for the construction of works, and a provisional agreement has been made with a landed proprietor (Lord Devon) for, in the first instance, about 500 acres of land well suited for irrigation purposes, for a term of years, as a reserve farm to remain in the company's own hands. They also offer to neighbouring landowners or tenants the opportunity of having the farms irrigated by special agreement. All the arrangements respecting the laying out of the land have been intrusted to Mr. William Hope, who will give the directors the benefit of the experience gained in his well-known Romford Sewage Farm.

PUBLIC HEALTH.

SIR,—I am anxious to gather up all the materials I can which will facilitate the preparation of a series of tracts and handbills relating to the promotion of public health in the very widest sense of the word. Such publications should, I think, be circulated by local Boards of Health with a liberal hand, especially just now.

I should feel greatly indebted to any of your readers (especially such as may be Local Board Surveyors, &c.) who would favour me with copies of handbills, &c., which are in circulation in their localities, and are likely to be useful elsewhere in the thankless task of persuading people to take precautions against infections, and to be careful about drinking polluted water, or inhaling impure air. Suggestions about the detection of adulterations in food and regulations about baths and washhouses, and overcrowdings, are also within my scope. Copies of bye-laws about buildings and nuisances would also be acceptable.

G. F. CHAMBERS,

Chairman of the Bromley Local Board.
Bromley, Kent.

"THE ARCH NEVER SLEEPS."

SIR,—This Eastern proverb has been recently quoted in one of the Royal Academy lectures in connexion with the supposed antipathy of the ancient Egyptians to the arch as a mode of construction. It seems, therefore, pertinent to ask whether there is any evidence to show that either the Egyptian or the Indian architects, or those of any other country,—knowing the use of the arch, and possessing suitable building materials,—deliberately rejected it, either from sentimental impulse or from a conviction of its want of permanent character.

The possibility of so placing a few stones that they will span a moderately wide space must have been known to all nations at all civilised, whether they found the knowledge practically useful or not. Indeed, it can only be by forgetting the known powers of such peoples as the Egyptians, the Assyrians, and the early inhabitants of Italy, that we feel surprise at their use of the arch—round or pointed—in those exceptional cases when they found it convenient to do so. If, on the other hand, their stone came from the quarry in blocks of suitable size for roofs or

lintels, it would hardly be the act of a sane person to cut the stone into small pieces,—to shape those pieces into voussoirs,—and provide strong abutments, in order to do by a round-about process what the stone in its original shape would do perfectly well.

As a question of archæology is not the absence of the arch in the larger buildings of Egypt due to the fact, that, having large blocks of stone, and knowing how to raise them, the lintel was the cheapest form in which they could be used? And is not the abstinence of the Indian architect from the use of the arch, owing to his ignorance in the matter of abutments?

So far as we know, the arched form of construction has always been recognised as the proper mode of using brick and stone of moderate sizes; and in spite of the sage proverb, so often quoted; in spite also of mistakes which have been made by Mediæval builders, it will, when properly used, sleep as soundly and as long as the lintel itself. It seems, therefore, scarcely necessary to offer up on every occasion a public apology for what has now been found so useful in construction for a couple of thousand years.

THOS. BLASHILL.

THE ATHENÆUM, CAMDEN-ROAD.

THE first stone of this building was laid on the 4th inst., by Mr. William S. Ness. The hall is to be built first; it will be about 60 ft. by 50 ft., formed by a centre part 33 ft. high, with wings irregular on plan 20 ft. high. The ceiling is semi-octagonal in section, with circular ribs of principals dividing it into five bays in its length. The wings are ceiled by arches transversely from the side of the centre part, so that the irregularity of plan is only noticeable in the lower part of the room. There will be four doors as exits, one at each corner of the room. Under the platform end of the hall will be the retiring-rooms, and a staircase down will communicate with them, as well as give direct communication underneath from one side to the other of the platform.

The building externally will be of brick, with red brick pilnch, strings, cornices, and architraves, the enrichments being of red terra cotta, Italian in style.

The contract for the hall is 1,579*l.*, and Messrs. Gough & Lawton are the contractors. Mr. F. R. Meeson is the architect.

The other part of the building, which will form the second contract, will comprise a reading-room, 18 ft. high; library and cloak-rooms on ground floor; and a mezzanine, and first floor of rooms of various sizes, as well as a basement, devoted to the keeper's residence.

LECTURE AT THE ARCHITECTURAL MUSEUM.

ON Saturday, the 18th, Mr. Burges addressed a meeting of the Architectural Association at the Architectural Museum, Westminster, according to advertisement. "On the Old Examples of Figure Carving." The speaker, at the commencement, sought to urge on his hearers that it was quite useless for them to attempt to be architects and surveyors at the same time. The practice of the surveyor, he maintained, was quite incompatible with the pursuit of architecture, which demanded the whole thoughts of the student, and could not be successfully carried out if he bothered himself with disquisitions, measuring, and quantities. The division of labour which reigned in Birmingham, where a button passed through fifty hands, was beginning to prevail in the profession, and he saw a better prospect now for the art-architect than formerly. The greater number of the buildings in the City were utterly abominable, and the cause was that they had been designed by surveyors and not by architects. Architects would be better thought of than they had been. Time was that literary men had been little cared for,—that Dr. Johnson would take his dinner at Cave's behind a screen, because of his shabby clothes;—but this was changed now, and so would be the position of art-architects. There was already a considerable demand, irrespective of buildings, for cartoons for glass, decorations, sculpture, and so on. To fit themselves for their work, the study of the figure was pre-eminently necessary. No one could be an architect without the power of drawing the figure. To obtain this power there was no royal road; they must fag for it; it could be

obtained only by work. They should take as models Greek sculpture and the human figure, and even here the most careful selection was necessary. There were very few perfect models; he had never met with but three in his whole life. The perfect figure could only be drawn by a sort of eclecticism; the enlightened artist, after studying the *genus*, would then depict the perfect individual. It was to be regretted that so little real Greek sculpture was to be found in our collections; plenty of Roman—the Venus, the Apollo, and such like,—but no Greek work. Greek sculpture differed but little from the best Gothic sculpture. The lecturer then pointed out what he considered the excellencies of some of the sculptured figures in the collection around his audience.

OPEN AREAS IN LONDON.

SIR,—It would, perhaps, do much for the improvement of the western portion of the metropolis if the site of Newport Market,—required for some of the purposes of the projected railway from the station at Camden-town to Charing-cross,—could be used for some such purposes as a station, a market for fish, poultry, &c., and the erection of a block of Peabody buildings. The property comprised within the area of Newport Market cannot be of much value, and is something worse than an architectural blotch on the map of London.

Many years ago, a correspondent of your paper suggested the formation of "parish playgrounds," and the employment of a pensioned soldier to drill the boys permitted to use such places of recreative exercise. The hint has not been lost, but still, as you then observed, "we want more room." Will you suffer me to remind you, sir, that many of the disused graveyards of London and its many suburbs would give all that is required for the purposes of drill-grounds, not only for the boys to be educated by the new school boards, but for the volunteers who every year will require the services of the drill-master.

E. T.

ALL SAINTS' CHURCH, HERTFORD.

SIR,—In reply to the observations made in your last number, I enclose a copy of my report on the "dry rot" in this church, which you could not have seen when you wrote the article. I must beg you either publish the report in *extenso*, or withdraw the uncalculated reflections you have thought proper to make, so to say imputation it contains on the character or liability of the architects who carried out the reseating of the church. On the contrary, I clearly state the work was well done, and give the causes producing the present deplorable result.

I was appointed diocesan architect of Rochester, by Bishop Murray, more than twenty years ago; it is no new office, and, I believe, one recognised in every diocese. I shall send a copy of this letter to Messrs. Smith, of Hertford, and consider the correspondence and connecting circumstances open to publication, if necessary.

JOSEPH CLARKE.

* * We cannot afford space for the report. On perusal, it seems to justify the remarks of our correspondent. If Mr. Clarke has clearly stated that "the work was well done," it must be in some other report, for he certainly does not do so in this: the impression left on the mind by its perusal is somewhat different. He may or may not be right in giving so frightful an aspect of the case, and declaring that the church must not be used for six months; but the churchwardens evidently thought, with our correspondent, that he had overstepped. As to the diocesan architectship, we did not say it was a "new office," we said it was "a modern creation of very dangerous character," and we take the liberty to restate the opinion.

WARMING APARTMENTS.

SIR,—I notice with much satisfaction in your paper the remarks of "M. H. P." on warming apartments. It is evident that open fires are anything but the most effective and economical. Would "M. H. P." be kind enough to inform us what kind and size of boiler he thinks necessary to warm, say half a dozen, rooms to about 55 deg. Fahrenheit, if the thermometer registers 20 deg below freezing point? A. HILDEBRANDT.

CHARITY BEGINS AT HOME.

SIR,—I think it would be highly desirable, now that Paris has been placed upon its feet partly by the magnificent charity of British subjects, that an end should be brought to the labours of the French Relief Committee by an act just as well as generous. I would dare to propose that the surplus funds, now amounting to some thousands, should be devoted to affording some slight modicum of relief to the deserving unemployed workmen and starving poor of London. There are hundreds of poor mechanics, with their families, in the east of London, at present in absolute want, whose tools, clothes, and household effects have either been pawned or sold, to provide them with food. A vote of 10,000*l.* or 20,000*l.*, judiciously distributed by the committee, or handed over by them to the local relief funds in the different parishes, would do an immense amount of good. The readers of the *Builder* need hardly be informed of the precise localities where this relief would be most welcome. From time to time you have given sad pictures of the misery that exists, and which has almost become chronic in the homes of our working

poor in London; and I dare to add, that in the light of the dire and appalling destitution which it is often your duty to chronicle, it will not become us, as a charitable and discriminating people, to bestow all our sympathy on objects foreign to us, when our kith and kin are really and actually starving in our midst. If the wise axiom that charity should begin at home is to get any practical application, it can now be done with a good grace. Let us be just as well as generous.

AN IRISHMAN.

* * We are firmly of opinion that it is not necessary to send any more money to France. We have done quite enough,—with small thanks.

CLAIM FOR PLANS AND ESTIMATE FOR A SCHOOL BY A BUILDER.

Edward Scoopes and Henry Chapman, builders, Needham Market, v. The Rev. William Eliot, Creeting St. Mary.

There was a claim, in the County Court, Stowmarket, before Judge Wodehouse, for 2 guineas, for preparing plans and estimate for building proposed school premises, in Creeting St. Mary.

Mr. Scoopes conducted his own case, and Mr. Pollard appeared for the defendant.

The plaintiff said that in January last he received a letter from the defendant, in consequence of which he went with Mr. Chapman to see the defendant. They found several other builders, who had surveyed with them. There was no plan prepared for them to copy from, and Mr. Eliot gave them a general idea as to the size of the building, and asked them to make the plans as they liked. Mr. Scoopes therefore wrote to Mr. Barnes, and asked him to prepare a plan, but that gentleman said the committee would apply to builders, instead of employing a proper architect and surveyor, and he should have nothing to do with the business. Mr. Scoopes showed Mr. Barnes's letter to Mr. Eliot, and told him that he would have no more to do with the matter. Mr. Eliot said, "Don't say so; you built the British school at Needham Market, and we want something like that." Mr. Scoopes then said he would try what he could do, and sent Mr. Eliot plans and estimates similar to those he had for the Needham school. Shortly afterwards, however, Mr. Eliot returned his plans, but kept the estimate, which amounted to 21*l.*, and was signed by the plaintiffs. Mr. Scoopes sent in a bill for 2*l.* 2*s.* for his trouble, and in reply received a letter from the defendant, in which he said, "I am surprised by the building committee to inform you that they consider you have no right to demand that or any other sum; but they are so satisfied with the plans you have taken to help them, they hope, if the funds are sufficient, to make you a gratuity."

Mr. Pollard referred to Mr. Eliot's first letter, and said that in that the plaintiff was invited simply if he pleased to make these plans.

The judge, without hearing the case for the defence, said he did not think Mr. Eliot or the committee was liable to pay this charge. No contract had been made, and he would order a nonsuit to be entered.

The defendant declined to ask for costs.

NEW WARDS, ST. LUKE'S, MIDDLESEX.

Sir,—In notice, in your issue of the 18th inst. that eight wards have been erected at St. Luke's for the accommodation of 160 sick paupers, to each of whom has been allowed a cubic space of 750 ft. according to the Poor-law Orders; and I presume that, in compliance with the same Order, a wall space of 6 ft. minimum has also been given.

Dividing the number of patients by the number of wards, I find that each ward must be built for fifty-six patients, and that consequently the length of each ward should be 168 ft.

We are further informed that it is claimed as a merit that the wards have windows at the ends only; so that the draught must run from one end to the other of a ward 168 ft. in length, and the stretch from twenty-six sick persons must pass over the unfortunate twenty-seventh.

I should like to read some further description of the building, and also some explanation as to the cost, which is stated to be 27*l.* per bed. For instance, does this include the administrative portion of the building—dormitory, house, workshops, laundry, &c.? Are the engine-room, hot and cold water supply, stoves, gas-warming, cooking apparatus, plumbing and painting work, architect's and clerk of works' charges included?

I shall be glad to have some further information, as it is quite certain that the cost per bed stated is not half sufficient to cover the cost of the erection and completion of the most commonly-built hospital.

AN ARCHITECT.

CHURCH-BUILDING NEWS.

Ludlow.—A church, or rather chapel, erected on the present cemetery grounds, and fronting Corve-street, has been opened by the Bishop of Hereford. The edifice stands, as nearly as possible, on the site of the old chapel of St. Leonard. It will not only be used for the burial service in connexion with the cemetery, instead of the unsightly shed at the cemetery entrance, but is also licensed for regular divine service, with an appointed chaplain. It is of the Early English style of architecture, simply treated, and consists of a nave, chancel, and vestry. It is built of stone from the neighbourhood of Felton, the gift of the trustees of the Olive estate, and dressed with stone from the Luston quarries. The eastern end, or chancel, is lighted by a triplet window, the centre being filled with stained glass, representing the Crucifixion, supplied by Mr. Hardman, of Birmingham, over which is a wheel-window. The west end is lighted by two windows, surmounted by one similar to that of the chancel, though of less size. The floor is laid with tiles, supplied by Mr. Godwin, of Lugwardine, and the roof covered

with tiles from Brosely. Two of Gurney's patent stoves supply the requisite heat. The seats are open, and, like the timbers which support the open roof, are of stained and varnished wood. Ample accommodation is afforded for upwards of 200; and the total cost is about 1,800*l.*, apart from the expense of the organ (100*l.*). The architect was Mr. G. G. Scott; the contractor, Mr. E. Edwards, Leominster; and the whole of the works have been carried out under the immediate superintendence of Mr. William Cooke. The organ, supplied by Messrs. Berrington & Son, London, has been erected under the personal superintendence of Mr. Bartholomew, organist of the Church of St. Lawrence.

Stintland.—There is a new cemetery at Holywell-green. The site chosen is immediately behind the Independent chapel and schools, commanding extensive views of the picturesque scenery of the district. The ground is about two acres in extent, and is bounded on three sides by a wall, whilst on the fourth side it is protected by a large bank, on which numerous trees and shrubs are planted. The ground has been laid out by Messrs. Horsfall, Wardle, & Patchett, of Halifax, after whose designs the mortuary chapel has also been erected. This is a small edifice, in the Gothic style, having a finial on the eastern front. At the west end there is a circular window of five lights, the latter being worked entirely in one stone. The windows are all filled with stained glass. The roof is an open one, and will be stained and varnished. The principals being supported on carved corbels. The reading desk is at the west end, and the space behind it is enclosed by an oak handrail, supported by ornamental wrought-ironwork. The seats, which are of pine, will also be stained and varnished, and there will be accommodation for from forty to fifty people. The whole works are in a forward state.

Luddenden Foot.—A new church is about to be erected here. The edifice is to be in the Early English style, having tower and belfry. It is from the designs of Messrs. Parr & Strong, of London. The various contracts have been let. Mr. Siddall, of Sowerby Bridge, is the mason; Mr. Haigh, of Style, the joiner; Mr. W. Fox, of Sowerby Bridge, the plumber; and Messrs. S. Dyson & Co., Sowerby Bridge, the iron-workers, &c. The new school built for the district, above the railway station, is now nearly complete, the roof having been put on and the windows in. It will consist of a mixed school and an infants' school.

Pedmore (near Stourbridge).—Pedmore Church has been rebuilt, all but its tower, and consecrated by the Bishop of Worcester. The old church was very dilapidated. It appeared to have been originally built of old materials from a previous building, and put together badly, as if from want of sufficient funds. There was, however, some notable work in it, including a Norman chancel-arch, and the principal doorway was of the same date, having a large stone carved tympanum, representing, in a *vesica piscis*, the Saviour in the act of benediction, surrounded by symbols of the Evangelists. These remains of Norman work have been replaced in the new edifice. The chancel-arch, however, being much too small for the new building, has been set up on the north side of the chancel, opening into the vestry and organ-chamber. Every specimen sculpture found in pulling down the building has been inserted in the walls of the interior of the tower. An old piscina has been refixed in the north aisle; the old mouldings of pillars and caps, arches, and windows have been worked in again. A coat of arms has been transferred from the east window to that of the vestry. The old font has been restored. The work has cost some 3,200*l.* Mr. Preedy, of London, was the architect; Mr. Thornton, of Dudley, the builder; and Mr. Chapman, of Stourbridge, executed the woodwork. Stone was obtained from a quarry at Pedmore and from the neighbourhood of Bromsgrove. The church consists of chancel, with vestry and organ-chamber on its north side, nave, two aisles, western tower, and south porch. The roofs are of open timber-work, trussed, and the principals resting on stone corbels, carved with conventional foliage. The aisles are each separated from the nave by three pointed arches, supported by circular and hexagonal pillars. Style, Decorated, or fourteenth century. In the chancel are two stained-glass windows (east and south), the first-named being in memory of the late Rev. T. Philpott, for sixty-two years rector of this church, and erected by his children. The

subjects represented are the Last Supper, the Passion, the Crucifixion, and other events in the life of Christ. The south window is in memory of the late T. Firmstone, of Bulbroughton, who died in 1857, erected by his widow, and depicting the Entry into Jerusalem. Both windows are by the architect, Mr. Preedy. The windows in the church are generally of three and two lights; all differ in their tracery, and, where possible, they are a restoration of the old ones. New sedilia, credence-table, and piscina are supplied to the chancel, but at present there is neither lectern nor reading desk, a temporary decoration in lieu of the latter having been arranged by ladies. A stone pulpit has been sculptured by Mr. Boulton, at Cheltenham; it has three pointed canopies, and in the niches are figures of our Lord, St. Peter (to whom the church is dedicated), and St. Paul. As the new church stands on twice the area of the old one, instead of only 140 sittings, it now contains 316, which will accommodate nearly the entire population of the parish. The seats are of varnished deal; they are all free, and none of them attached to house property.

SCHOOL-BUILDING NEWS.

Masbro'.—The foundation-stone of the new schools at Masbro', which are about to be erected in honour of the late vicar, the Rev. H. Master-White, now appointed to the Archdeaconry of Grahamstown, South Africa, has been laid by Mrs. G. W. Chambers, of Clough House. A site contiguous to the existing schools having been secured, the work of erection was commenced a short time ago. The new school will be of brick, 60 ft. long by 20 ft. 6 in. wide, facing Masbro' street, with a class-room 18 ft. by 15 ft. at the back, jutting out at a right angle with the main building. The roof will have open rafters of stained deal, and the room will be well lighted by a range of windows close under the eaves of the roof, and extending the whole length of the building. Mr. Charles Ripley, of Rotherham, is the builder; and Mr. John Burns, of Masbro', undertakes the joiner's work, including the internal fittings of the school.

The plans for new day schools in connexion with the Wesleyans have been prepared by Mr. J. K. James, of Hull, architect, providing accommodation for 200 scholars. The style is Early Geometrical; the material being red brick both outside and in, with dressings of Ancaster stone, and enrichments in black, white, and moulded bricks.

Miscellaneous.

Claim for Valuation, Hastings.—At the Hastings County-court, before Mr. W. Furner, judge, the case of Henry Tidy Devellin v. James White, a claim of 21*l.* 7*s.* for work and labour, was heard. Mr. F. A. Langham for the defendant, on whose premises a fire occurred some little time ago, and plaintiff said he was sent for to value and damage. He went over the goods, and valued the damage by fire and water at 48*l.* 9*s.* 8*d.* Defendant afterwards asked him if he did not think there ought to be a claim for damage by smoke, and a claim of 100*l.* was made. The agent of the insurance company came down, and allowed 148*l.* 9*s.* 8*d.* He then sent in his claim for seven guineas for valuation. Defendant sent five, but refused to pay more. Mr. Langham said plaintiff did not value the goods, and the 100*l.* would not have been recovered if it had not been for defendant's solicitor. The Judge, who said it was evidently an imaginary valuation, gave a verdict for the defendant.

Compressed Air Machinery in Coal Mines.—A successful application of the pneumatic or compressed air principle in the performance of the mechanical work in coal-mines is now to be seen at the Holmes Colliery, near Rotherham. Mr. Philip Cooper, mining engineer and manager, has been so far successful that water is now being pumped from the pit and coal hauled along the tramways by means of power obtained from compressed air. The air is compressed on the surface by a double-cylindered steam-engine, with 18-in. cylinders and 3-ft. stroke, with two air-compressing pumps, 20 in. in diameter and 3-ft. stroke, worked direct from the steam-engine. The compressed air is conveyed from the compressing-engine on the surface to the air-engine in the mine in 7-in. cast-iron pipes.

Small-pox Hospital in St. Luke's.—The erection of a temporary hospital for small-pox patients has been completed, and the hospital is now open. It is built upon the old burial-ground of St. Mary, Charterhouse, about midway between Whitecross-street and Golden-lane, contiguous to the mortuary and disinfecting-house. The hospital is constructed of corrugated iron, and consists of two separate buildings, one for males, the other for females, and each contains thirteen iron bedssteads and suitable clothing, the accommodation being such as to allow 1,000 cubic feet of air space for each patient. There are baths in each of the large dormitories, resting upon wheels, girded with India-rubber, so that they may be removed from one place to another without causing the slightest noise or inconvenience. There is a compartment for hot or cold water in constant supply, with drains trapped. There is another small apartment attached to each building for the accommodation of nurses, and the waterclosets are constructed upon a self-acting principle by siphonage. A reservoir of disinfecting fluid is thus made to pour its contents through a connecting pipe into the channel of evacuation. The cookhouse and laundry form detached buildings. All the arrangements have been conducted, it is said, under the superintendence of Dr. Pavey, the medical officer of health. The buildings were erected by Mr. Henshaw.

Church Extension.—At the last meeting of the Incorporated Society for Promoting the Enlargement, Building, and Repairing of Churches and Chapels, grants of money were made in aid of building new churches at Clewer, St. Stephen's, near Windsor, Berks, and Derby. St. Ann's; rebuilding the churches at Easton-in-Gordano, near Bristol; and Ettingshall, in the parish of Sedgley, Staffordshire; enlarging or otherwise increasing the accommodation in the churches at Boughton Bleas, near Faversham, Kent; Lacy-green, in the parish of Princes Risborough, Bucks; South Shields, St. Hilda's; and Syston, near Leicester. Under urgent circumstances, the grants formerly made towards rescuing and restoring the church at Abchurch, near Towcester, and towards building the church at Earl's-court, St. Matthias, Kensington, were each increased. This meeting was the last in the society's financial year, and grants amounting to 6,195*l.* have been made in it towards the erection of 32 new churches (26 of which are entirely free and unappropriated); the rebuilding of 17, and the enlarging or otherwise increasing the accommodation in 78 existing churches. The cost of carrying out the above works will have called forth from the promoters of them the sum of 281,290*l.*

Brighton.—The tenders for the workhouse and industrial schools were as follow:—J. T. Chapell, Westminster, 7,185*l.*; Blackmore & Joward, Brighton, 7,470*l.*; E. B. Patching, Brighton, 7,500*l.*; G. Cheesman & Co., Brighton, 7,080*l.* Industrial Schools: Chapell, 2,681*l.*; Blackmore & Howard, 2,781*l.*; E. B. Patching, 2,800*l.*; Cheesman & Co., 2,680*l.* It was stated that the order issued by the Poor-law Board sanctioned the expenditure of 9,500*l.* of the surplus proceeds of the Church-hill Estate sales. The sum at the bank was enough to cover both tenders. The tenders of Messrs. Cheesman & Co., for both works, were unanimously accepted. The contract for rebuilding the wall of the parish churchyard, a portion of which fell down a short time since, has been taken by Mr. E. B. Patching. The wall will be rebuilt at a less height throughout the entire length of the western side of the grounds, and will be surmounted by a light iron railing. The steam roller, the Invictor, as it is named, which the town council have hired as an experiment, has been set to work with, it is said, satisfactory results.

Portrait of Sir William Tite.—Some of our readers will be glad to learn that the portrait of Sir W. Tite, M.P., C.B., by Mr. Knight, R.A., will appear in the next exhibition at Burlington House. It is one of the finest productions of the distinguished painter;—a striking likeness, with a happy expression of vigour and kindness natural to Sir William. It has been painted by subscription from members of the Institute for presentation to the Body.

Proposed Workhouse for Lambeth.—The foundation-stone of the new Lambeth workhouse will be laid early in April by Mr. J. Doulton, the chairman of the Board of Guardians.

The Hackney Surveyor's Duties and Salary.—The Hackney District Board of Works has considered the report of the special committee as to the present duties and emoluments of the staff in the surveyor's department, in which it was recommended "That in future the whole time of the chief surveyor be devoted to the service of the Board, and that he be paid a salary of 650*l.* per annum, to include all travelling expenses; also that a junior clerk be appointed, at a salary not exceeding 25*s.* per week." After some discussion, and the disposal of several amendments, the original motion was carried, and on a division the decision was confirmed by 23 votes against 17. The recommendation of the committee as to the appointment of a junior clerk was also agreed to, and it was referred to the General Purposes Committee to invite candidates for the office and select a certain number of the most eligible to bring before the Board.

Is a Steam Hammer a Nuisance?—On Saturday week, before the Vice-Chancellor, the case of Roskill v. Whitworth again came on for hearing. This suit was instituted by the trustees and rector of the Roman Catholic Church called St. Angustin, at Manchester, and the schools in connexion therewith, against Sir James Whitworth, for an injunction to restrain the defendant from continuing to use a steam hammer in the works adjoining the church, so as to cause a nuisance to the plaintiffs, an interference with the devotional service on the week days, by reason of the excessive noise and vibration, an interference with the reasonable quiet and repose in the rectory house, in which Canon Willey and two assistant priests resided, an interruption to the teaching of the schools, and a structural damage to the church buildings and organ. The Vice-Chancellor considered that the plaintiffs had established their case, and were entitled to the injunction.

A Hindoo Temple in London.—What will the frequenters of Exeter-hall say to the erection of a Hindoo temple in the midst of Christian London? We give them fair warning that such a thing is threatened. There was a meeting of influential natives held in the State of Jounaghur (in Kattywar), a few days ago, at which it was resolved to raise a subscription for the purpose of encouraging and assisting young Hindoos who desire to go to England for the purpose of finishing their education. And a respectable vernacular paper in Bombay assures us that a temple of Hurkeshwar Mahadew is to be erected in London out of the fund, about a lac of rupees being set apart for that purpose.—*Bombay Gazette.*

Stockton-on-Tees.—The cemetery at Stockton has been consecrated by the Bishop of Durham. It is situated on the north side of the Oxbridge-lane, and about three-quarters of a mile from the town. For the purposes of a cemetery, several years ago, sixteen acres of land were purchased by the corporation, eight acres of which are laid out at present, and the remainder is reserved for addition to the cemetery as it may be required. The entrance is by a Gothic gateway, with three openings. There are two Gothic chapels and an entrance lodge. The cost of the land was 4,200*l.*; that of the chapels, lodge, fences, entrance-gates, roads, walks, &c., 3,138*l.*,—being considerably below the estimate.

St. Nicholas' Steeple, Newcastle.—A meeting of the committee of management was held in the vestry, the ex-mayor of Newcastle (Mr. James Morrison) in the chair. Tenders and designs were received and submitted for the west window, which is intended to be commemorative of the restoration of the steeple, and in honour of Mr. Alderman Dodds and the other large donors to the fund. Mr. Baguley's estimate was 150*l.*; Mr. Wailes's, 250*l.*; Mr. Barnett's, 295*l.* 10*s.* The consideration of them was postponed in order to allow the public an opportunity of inspection.

Surface Printing.—The patent of the Patent Printing Surface Company, of Buckingham-street, Strand, is for "an improved method of decorating the edges and margins of books and paper," being the invention of Mr. John Leighton, sen., who was the first to apply hard stamps to the London Post Office Directory. By this patent the edges of books can not only be decorated with illustrative prints, and patterns in colours and gold, but also with indexes denoting the page; so that a blank space may in future be utilised.

The People's Gardens Company.—The first general meeting of this company has been held at the offices, Foley-street, Great Portland-street, Mr. W. R. Warner in the chair. Mr. T. Horton, the secretary, read the report, which stated that 6,000 shares had already been subscribed for. The directors had purchased fifty acres of land at Old Oak Common, near Willesden Junction, at the price of 420*l.* per acre. Workmen are now actively engaged in preparing the grounds and erecting the necessary buildings, and the gardens would be ready for opening on the 16th of May next. In connexion with the company an academy of music had been established, and monthly soirées of the members and their friends would be held. The chairman said they had been offered 1,000*l.* more for their estate than the price at which they had purchased it. Messrs. R. Applegarth and others were elected as directors.

Iron Tubes.—In making iron tubes Mr. H. Kesterton, Birmingham, reduces pig-iron to the state of soft malleable iron by the Bessemer or other similar process, and he casts it into a hollow cylindrical ingot. He takes this ingot whilst still very highly heated, and passes it through a series of pairs of grooved rollers set in different planes—say, alternately vertical and horizontal. The first pair of rolls take the ingot, and, reducing and elongating it, pass it to the second pair immediately beyond, and this pair passes it to a third pair, and so on, until the desired reduction is obtained. Each successive pair of rolls is driven at a surface speed greater than that of the rolls immediately in front, so that, allowing for the elongation of the tube, and the reduction of the section, equal quantities of metal may pass between all the pairs of rolls, gripping the ingot in equal times. A stationary mandril passes between all the rolls, and carries a bulb at the nip of each pair of rolls.

The Equalisation of Poor-rates.—The Metropolitan Poor-rate League have just passed the following resolution, and embodied it in a petition to be presented to the President of the Poor-law Board:—That the poor-rate as at present levied in the metropolis is unequal and unjust; and, as many of the charges paid for the poor and consolidated rates are rendered necessary for the whole community, it is impolitic and unjust to tax the occupiers of houses only, but that all should contribute according to their ability." The Metropolitan Poor-rate League is arranging for a series of meetings to be convened in support of the equalisation of poor-rate charges.

Park-lane Improvement.—A further step towards this was taken by the Board of Works last week, when the materials of Sir Edward Kerrison's mansion in Piccadilly were sold by Messrs. Glaser & Sons, of Charing-cross. A few good chimney-pieces were in the sale, and realised fair prices. Lot 19, a carved statutory chimney-piece, with inlaid brass, 29*l.*; lot 25, another, and delicately carved, 37*l.*; lot 49, a carved statutory chimney-piece, with Sienna marble frieze, the shelf supported by female figures, 124*l.* The roadway is being proceeded with, and will be opened very shortly.

Proposed Turkish Bath for Newcastle. A meeting of gentlemen interested in the establishment of a Turkish bath for Newcastle-upon-Tyne has been held. The promoters had the option of two or three sites for the bath, any of which would be convenient and suitable for such an erection. The proposed shares would be 10*l.* each. Some forty or fifty gentlemen had agreed to become shareholders, chiefly in small sums, and the total amount of capital promised was upwards of 3,000*l.* It was agreed that Mr. Shotton, the architect for the Turkish bath at North Shields, should be asked to prepare plans for the Newcastle bath.

Testing Portland Cement.—The Metropolitan Board of Works have received a letter from Mr. J. E. Knollys, suggesting that it would be a great advantage to persons using Portland cement if they were allowed to send samples to be tested by the officers of the Board, and applying, on behalf of Lord Ashburton, to be allowed to send samples of cement to be so tested, subject to such regulations and fees as the Board may think fit to adopt.

Dust and Refuse.—The Camberwell vestry have decided to take further legal proceedings against those parties who cause dust and refuse to be stored in the parish, to the danger of the health of persons living in the neighbourhood.

To Detect Deodorized Rosin Oil when used in the Adulteration of Linseed Oil.—Messrs. Blundell, Spence, & Co. have published some suggestions on this matter. They say,—"Put about a quarter of an ounce of the suspected sample into an ounce vial, and add pure linseed oil till it is about three-quarters full. If the sample under examination contain rosin oil, the pure linseed last added floats on the top, the line of contact being plainly visible. If the finger be now placed on the mouth of the bottle, and the latter inverted two or three times, and held up to the light, bright wavy streaks will be observed, caused by the slow mixing of the two oils. Even 5 per cent. of rosin oil may easily be detected in this way. Place a slab of clean glass on a piece of white paper; at one end put from ten to twenty drops of a known sample of pure linseed oil; at the other an equal quantity of that suspected: to each add one drop of oil of vitriol. On the pure linseed oil a dark brown spot slowly forms; if the suspected sample contain rosin oil, a dark reddish-brown spot quickly forms, retaining its red colour for a long time, and a peculiar acum forms over it. The rosin oil used in adulterating linseed oil is half the price of the latter; it is free from smell even when heated; it has a peculiar metallic taste, which is not masked by the linseed oil. It greatly retards the drying properties of linseed oil, causes it to remain "tacky" for some time, and prevents it ever becoming "hard."

Value of Property at Bradford.—A quantity of building ground has been offered for sale by auction, at the George Hotel, Bradford, by Mr. J. Buckley Sharp. A corner plot, at the junction of New Iregate and New Tyrryl-street, containing 55 square yards, fetched 31l. 10s. per yard, being an increase of 2l. 15s. per yard upon the price at which it was sold by the corporation a short time ago. A plot of building ground, having a frontage towards Westgate and Silsbridge-lane, two plots of building land having frontages towards Clifton-street and Manningham-lane, and a dwelling-house, with outbuildings, situated at 18, Grosvenor-road, Manningham, were also offered, but were withdrawn. Mr. Sharp submitted seven plots of freehold building land, situated in Thornton-road, near Whitley-lane end, and lately formed part of the Brownroyd Estate. Some of the land has a frontage to Thornton-road. Five plots out of the seven, comprising the whole of the back part of the property, were sold at prices varying from 3s. 10d. to 3s. 8d. per yard; but the plots having the frontage to the main road were bought in. In October last, this property fetched, at a public sale, 2s. 9d. per yard.

Institution of Engineers.—The annual dinner is fixed to take place at the Queen's Concert Rooms, Hanover-square, on Saturday, the 22nd of April.

Female School of Art.—The distribution of prizes to the students will be made by Lord Elcho on this, Saturday, 25th, in the theatre of the London University, Burlington Gardens.

Society of British Artists.—The private view of the exhibition of this Society's works, Suffolk-street Gallery, will take place on, this, Saturday.

The Portrait of the Hour.—The London Stereoscopic and Photographic Company have published some capital heads of the fortunate Marquis of Lorne.

TENDERS

For works at 83, Whitechapel-road, for Mr. B. Wilton. Mr. S. W. Iron, architect:—

Waskett	£67 0 0
Crow	62 0 0
Johnson	62 14 8
Moyle	62 12 2
Wicks, Bangs, & Co.	63 0 0
F. & F. J. Wood	63 0 0
Rivett	592 0 0
Thorpe	585 12 0
Hearle	592 0 0
Palmer	575 0 0
Brown & Son	535 0 0
Ennor (accepted)	534 0 0

For rebuilding No. 1, Hadlow-cottages, Upper Clapton. Mr. James Lovegrove, architect:—

Neave	£273 0 0
Mole	342 0 0
Potter	340 0 0
Shurmer	314 0 0
Dabbie	310 0 0
High	225 0 0

For the erection of villa residences at Hamstead-road, Stratford, for Mr. Housley:—

Evans	£1,462 0 0
Rivett	1,343 0 0
Morter	1,293 0 0

For the erection of shops, &c., at Woodford, Essex, for Mr. Carter. Mr. Noble, architect. Quantities by Mr. Forge:—

Hearle	£1,833 0 0
Rivett	1,791 0 0
Morris & Ashby	1,767 0 0
Eaton & Chapman	1,733 0 0
Wicks, Bangs, & Co.	1,720 0 0
Ennor	1,703 0 0
Morter	1,689 0 0

For rebuilding the Chapel-of-Rose at Harleston, Norfolk. Mr. R. M. Phipson, architect:—

Grimwood (accepted)	£2,150 0 0
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For restoring Stradbroke Church, Suffolk. Mr. R. M. Phipson, architect:—

Grimwood (accepted)	£2,052 0 0
Grimwood (accepted)	£451 0 0

For London General Omnibus Company's Highbury Coach Factory:—

Collins	£7,153 0 0
Goodman	6,911 0 0
Blackmore & Co.	6,830 0 0
Marshall	6,770 0 0
Ford	6,749 0 0
Mann	6,745 0 0
Biese	6,743 0 0
Klips	6,518 0 0
Till	6,484 0 0
Stephenson	6,390 0 0
Beeton	6,290 0 0
Crabbe & Vaughan	6,190 0 0
Aitchison & Co.	6,145 0 0
Crockett	6,120 0 0
Eaton & Chapman	6,025 0 0
Lacey	5,740 0 0

For building the Weavers' Arms public-house, Stamford-hill, for Messrs. Taylor, Walker, & Co. Mr. Dunch, architect:—

Johnstone	£2,750 0 0
Manley & Rogers	2,655 0 0
Wicks, Bangs, & Co.	2,650 0 0
Morland & Burton	2,598 0 0
Kilby	2,574 0 0
Newman & Mann	2,546 0 0
Brass	2,485 0 0
Brown & Robinson	2,451 0 0
Shurmer	2,444 0 0
Ennor	2,375 0 0

For receiving-wards at Bethnal-green Workhouse, for the guardians of St. Matthew, Bethnal-green. Mr. Wm. Mundy, architect. Quantities supplied:—

Kipps	£2,235 0 0
Wicks, Bangs, & Co.	2,120 0 0
Blackmore & Morley	1,955 0 0
Hill, Keddell, & Waldram	1,932 0 0
Ennor	1,892 0 0
Crabbe & Vaughan	1,830 0 0
Croaker	1,775 0 0
Brown & Sons	1,733 0 0
Rose (accepted)	1,717 0 0

For water-closets and enclosure-wall at Bethnal-green Workhouse, for the guardians of St. Matthew, Bethnal-green. Mr. William Mundy, architect. Quantities supplied:—

Rivett	£282 0 0
Hill, Keddell, & Waldram	275 0 0
Garrad	266 17 0
Blackmore & Morley	250 0 0
Ennor	249 0 0
Kipps	249 0 0
King & Sons	248 0 0
Brown & Sons	240 0 0
Croaker (accepted)	240 0 0
Eaton & Chapman	241 0 0
Capps & Ritto	239 0 0
Bleasde	229 0 0
Stevenson	232 0 0

For the erection of relief offices, Camden-town, for the guardians of the poor of the parish of St. Pancras. Messrs. Richardson & Waghorn, architects:—

Kelly, Bros.	£1,843 0 0
Hyde	1,777 0 0
Manley & Rogers	1,777 0 0
Mann	1,777 0 0
Scrivenor & White	1,774 0 0
Crockett	1,769 0 0
Till	1,749 0 0
Rose	1,733 0 0
Cullum	1,733 0 0
Crabbe & Vaughan	1,728 0 0
Eaton & Chapman	1,690 0 0
Aitchison & Walker	1,597 0 0
Ball	1,557 0 0
Heushaw	1,517 0 0

For reinstating premises, 34, Whitechapel-road, destroyed by fire. Mr. S. W. Iron, architect. Quantities supplied:—

Waskett	£267 0 0
Crow	627 0 0
Johnson	627 14 8
Moyall	652 12 2
Wood, Bros.	653 0 0
Rivett	592 0 0
Thorpe	581 12 0
Hearle	582 0 0
Palmer	575 0 0
Brown & Son	535 0 0
Ennor	534 0 0

For works at 150, Old-street, St. Luke's, for Mr. J. Calver. Quantities not supplied:—

Penn, Bros.	£1,017 0 0
Hearle	1,020 0 0
Brown & Son	1,112 0 0
Crabbe & Vaughan	1,112 0 0
Garrad	1,193 0 0

For enlargement of Catholic schools at Wandsworth. Mr. H. J. Hanson, architect:—

Nightingale	£255 0 0
Adams & Son (too late)	315 0 0
Gregory	314 0 0
Gooding	290 0 0
Easton, Bros.	284 0 0
Hearn	275 0 0
Bass	240 0 0
Atkinson (accepted)	217 0 0

For erecting stabling and cottage at Watford, for Mr. Thos. Coote. Mr. W. Evans, architect:—

Manning	£388 0 0
Hasley	388 0 0
Bull (accepted)	349 0 0

For the erection of four houses, Shoeburyness, Essex, for Mr. J. Rickwood. Mr. W. Scott, architect:—

Lumley	£1,900 0 0
Darke & Co.	1,859 0 0
Wiggins & Son	1,745 0 0
Watson	1,680 0 0
Rayner	1,633 0 0
Hodge & Perry (accepted)	1,497 0 0

For the construction of about 400 ft. run of 3-ft. 9-in. by 2-ft. 5-in. whole brick sewer in Hatherley-street, Westbourne-grove, Paddington:—

Thurst & Co.	£259 0 0
Thurst & Co.	344 0 0
Turner (accepted)	234 10 0

For the erection of a new farmhouse and buildings at Blackton, Widdowcombe-in-the-Moor, Devonshire, for Mr. F. West. Mr. Evan Powell, architect:—

Woolley	£1,747 12 0
Chudleigh	1,650 0 0
Stacey & Rabbage	1,600 0 0
Roach	1,425 10 0
Edwards	1,375 0 0
Ball & Sons (accepted)	1,336 0 0

TO CORRESPONDENTS.

Disfecting apparatus.—A few particulars of a new apparatus, patented by Messrs. Fraser, Brothers, is given in the *Builder*, for February 25th (p. 154). The apparatus had been sent up to the 8th Gloucester District Board of Works, 129, High Holborn, where, perhaps, the address of the patentees may be got, if it is not in our advertising column.

A Member (we do not undertake to print a paper merely because it was read at a meeting of a society. The paper in question was mainly a compilation from our own pages. We have not space for such. G. S. (if the works are not carried out, the employer ought to pay for the quantities. Whether he could be made to do so or no would depend on circumstances. In reply to second question: it has been decided that the drawings under such circumstances belong to the employer).—E. H. (we cannot call attention to an invention of which we know nothing).—W. F. F. (note our note in type).—Saltaire Club, notice in type).—Lums and Cements (next week. No signature to letter).—O. L. R. J. H.—W. T. J. G. R.—F. A. K.—C. H. A. W. H.—A. W.—C. E. W.—J. W.—W. R.—J. C.—T. R. R.—W. P.—W. S.—R. M. P.—D.—M. W.—W. M.—F.—Messrs. L. H. S.—J. B.—W. M.—Inquirer.—F. B. F.—L. O.—G. R. W.—H. J. H.—Col. R.—B. & W.—J. D. W.—W. L. J.—R. T. C.—O. C. H.—T. H. L.—M. H.—T. G. L.—R. E. F.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

None.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

NOTICE TO SUBSCRIBERS.

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SUBSCRIBERS' VOLUMES, on being sent to the Office, will be bound at a cost of Three Shillings and Sixpence each.

Advertisements cannot be received for the current week's issue later than THREE o'clock, p.m., on THURSDAY.

In consequence of the Reduction in the Newspaper Postage, Subscribers within the United Kingdom can now be supplied with THE BUILDER direct from the Office, at the rate of Nineteen Shillings per annum, PAYABLE IN ADVANCE.

The Publisher cannot be responsible for TESTIMONIALS left at the Office in reply to Advertisements, and strongly recommends that COPIES only should be sent.

NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and not to the "Publisher."

TO ADVERTISERS.

GOOD FRIDAY.

NOTICE.—"THE BUILDER," for the week ending APRIL 8th, will be published at ONE p.m., on THURSDAY, 6th. Advertisements for insertion in that Number must therefore reach the Office before THREE p.m., on WEDNESDAY, 5th.

MR. R. B. MATHER, Architect and Surveyor, 33, Wigmore-street, Cavendish-square, W. PREPARES SKETCHES, PLANS and SPECIFICATIONS, and PERSPECTIVES for the Profession, at strictly moderate charges. Quantities accurately supplied. Appointments may be made as above, and Mr. M. will attend to any commissions with promptness and despatch.

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 DETAIL DRAWINGS, prepared by a Gentleman, of long ex-
 perience, a SITUATION as MANAGING CLERK, or a temporary
 ENGAGEMENT, would not be objected to.—Address, S. B. 3, New
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words. Plans and drawings of all kinds copied, reduced, or
enlarged, on reasonable terms, by FRY & SON, Law Stationers,
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reduction allowed if lithographed.

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A LEADING HAND WANTED on a
JOB, in London. He will be required to work with the men
and under the foreman in charge. Apply, personally, between
EIGHT and NINE, on MONDAY morning next, to the Superan-
tending Foreman, 28, Kingsland-road, E.

BOROUGH of BEDFORD.—SURVEYOR.
The Local Board of the Borough of Bedford propose to appoint a Surveyor for the Borough, at a salary of 300*l.* a year with the privilege of taking pupils. He will be required to give the whole of his services to the duties of the appointment. An office will be provided. Further information may be obtained of the Town Clerk, Shire Hall, Bedford, to whom applications for the office must be sent on or before the 30th APRIL, 1871.
THOMAS WM. PEARSE, Town Clerk.
Bedford, 22*d* March, 1871.

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WANTED, in a Country Business. A respectable active Man, accustomed to jobbing work. Must be well recommended. Employment permanent.—Apply to **W. RAFFERTY & SON, House Furnishers and Decorators, High Wycombe, Bucks.**

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WANTED, an active and intelligent FORE-
MAN for Works in which machinery is used.—Apply,
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Must be a good Grainer.—Address, stating age, qualification, and wages required for constancy, to 558, Office of "The Builder."

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SMALL JOB in London. References as to ability and integrity must be given.—Address, stating wages required, 557,

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works, St. Vincent, West Indies.
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hydrants, sluices, water pillars, and the usual fittings for water-
works, under the superintendence of the Colonial Engineer. He
will have to superintend other men, and to assist in putting the
work together personally.
Second.—A steady, sober, and competent **PIPE-LAYER**, to work

under the so-called Drennan, and to make himself generally useful as he works as may be directed.

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The Builder.

VOL. XXIX.—No. 1469.

Birmingham Law Courts Competition.

IN Birmingham Town-hall the designs, twenty-nine in number, submitted in competition for the proposed new Law Courts and Municipal Buildings, have been arranged for inspection, and have this week been open to the public. The proposed site consists of a nearly square plot of ground contiguous to the Town-hall, but at an oblique angle to the latter, and at present partly occupied by small houses. It is bounded towards the south by Ann-street, westward by Congreve-street, which divides it from the Town-hall, northward by New Edmund-street, and eastward by Eden-place, a comparatively narrow street.

The ground rises from Ann-street to Edmund-street, and the front towards the former thoroughfare, the widest of the four and nearest to the better part of the town, will naturally form the principal façade of the new building. The Law Courts are to include civil and criminal courts and their usual adjuncts, barristers' and witnesses' rooms, cells for prisoners and police accommodation, and judges' lodgings; a "Public Hall" being also required as a centre for the traffic of the building. The municipal buildings to provide mayor's reception-hall and private rooms, and accommodation for town clerk's and treasurer's offices, weights and measures, and inspector of nuisances. The separate requirements for legal and municipal business have naturally suggested to most of the competitors the distribution of the plan into two main sections, especially as the conditions required such an arrangement as would render it possible to build one portion first, independently of the other; a condition which has, however, in some cases been entirely ignored. The cost of the whole is not to exceed 120,000*l.*; and the drawings consist of plans, sections, and elevations, shaded only without colour; no perspective views being admitted. Premising that the average merit of the designs is by no means what we should have expected to find elicited by so important a competition, we will endeavour to briefly characterise them in rotation, taking them in the order in which they have been numbered by the hanging committee, omitting only one or two which do not require notice.

No. 1, "Vera," is a bad beginning, of which the less said the better. The style is a kind of Jacobean architecture of an eccentric type, the elevations and sections heavily and artistically tinted in bistre (apparently); the plan is not worth comment. If the author had spent the time occupied in painting tile patterns on the floors, in a little study of planning, he might have shown more knowledge of the first principles of the art than are here evident.

(2) "Et Juste et Vrai" is a design of the heavy Roman type of considerable merit in its way.

The main feature, architecturally, is an octagonal central hall, with an inner circle of columns carrying a lofty dome. The entrance corridor from Ann-street leads into this hall, and cross corridors connect it with the legal departments on the right and the municipal on the left. The judges' lodgings are at the south-east angle, the junction of Ann-street and Eden-place, a favourite position with the competitors, and are sufficiently near the courts; the latter are not very symmetrically planned, the criminal court lying at an awkward angle with the neighbouring portions of the plan. The angles of the main plan are worked into circles, which on the first floor contain the judges' drawing-room, town clerk's private room, mayor's parlour, &c., the mayor's whole suite of entertaining rooms forming the first-floor front towards Congreve-street. The main lines of communication are simply and symmetrically arranged, and the whole design is sensible and effective: the dome, with its arched radiating buttresses at the base of the composition, is a well-studied feature. The space between the outer dome and domed ceiling is utilised as a main ventilation outlet. The style is one, however, which, both on æsthetic and what we may call climatic grounds, we do not wish to see adopted in important buildings in this country; and the character of masonry would render it, moreover, a very expensive building. The elevations are beautifully tinted in Indian ink.

(3) "Ex pede Herculeum" is a Classic design, pretty, but feeble in general effect externally, and not at all well planned. There is an immense waste of space on the ground floor, from the employment of an entrance-hall from Ann-street, fully as large as the central public hall, making, in fact, two public halls; while the author seems to have been seized with a spirit of economy as to vertical space, which has caused him to reduce his Public Hall to a mere low chamber, with little, if any, provision for light, while the space over it is divided above into successive floors for "picture-galleries." Between these and the roof of the hall, too, are the treasury offices, which ought to be most readily accessible, placed in the centre of the first floor, and up an extra flight of steps. Other parts of the plan are better managed, but there is nothing to recommend this design.

(4) "Birmingham Coat of Arms" is, we suppose, the work of a local architect's pupil, of Classic sympathies. It consists of a Corinthian order of lofty proportions, surmounted by an attic, and with a big dome, and St. George and the Dragon on the top. We will say nothing of the plan. If the author pursues his studies he will know better some day.

(5) "Knight in Armour" is a very good plan in some respects. The Law Courts form the main block towards south and east, the municipal portion forming a longer and nearly detached block running up Congreve-street. The Public Hall is reached from the main entrance in Ann-street; beyond it are the civil and criminal courts, with the longer sides at right angles to Ann-street, and reached by the public through the civil and criminal court lobbies to left and right of the Public Hall. Between the two courts is the barristers' accommodation. The Judges' lodgings are towards Eden-place, and connected with their "retiring-room," and thence with the bench by private corridors on each side of the barristers' library. The provision of access to the courts for the Judges, without clashing with the traffic of the public corridors, is a difficult problem in the planning, which only one or two of the competitors have solved. There is a separate municipal entrance in Congreve-street, the first floor on this side being occupied by the mayor's reception-room, ante-rooms, and council-chamber placed *en suite*. The design, of which the main feature is a lofty machicolated tower and short spire over the public entrance,

is in the true "wolfish" modern Mediaeval manner, not without a certain savage and half-civilised character of its own. The decorations consist in angle-shafts and occasional wall-diaper, and (we need scarcely add) divers sculpture of men in antiquated costumes making laws and ironwork; said sculpture being in some places in three different scales, in close contiguity. Statues in chain armour act as lamp-posts at the entrance. The state of mental cultivation which can lead an architect to regard this sort of thing as appropriate for a place of business for a modern town would furnish matter for an interesting psychological study. The idea of such a portent dropped down in the middle of Birmingham, of all places in the world, is amusing enough.

(6) "Saum Cuique." The author has been carried away by an idea of symmetry in his plan which has led him totally to forget that courts of law and reception-rooms are things requiring essentially distinct treatment. He has a large central hall, from which open the civil and criminal courts on one side, and the mayor's reception-room and council-chamber in corresponding positions opposite, the whole four opening right on the hall, without even lobbies or antechambers. It is unnecessary, after this, to go into the plan any further. The exterior design is Italian, not unpleasing in general outline, but commonplace in detail. The colossal lions at the base of the tower over the entrance would effectually dwarf that feature.

(7) "Pallas Athena." This very clever design looks like the work of a young architect of real originality, but who requires "toning down" a good deal. He considers (and, we think, rightly) the junction of Ann-street and Congreve-street as the key of the position, as it is commanded by several converging streets; and accordingly places at that corner a large circular entrance-hall, crowned by a dome, as a centre to a composition of which the Ann-street and Congreve-street fronts, identical in design, form the wings. There are defects in the working out of the plan (among others, the civil court occupies part of the Ann-street front, coming up to the outer wall, which would expose it to the noise of outside traffic); but most of these might be avoided without impairing the main idea of the plan, which is a very good one. The style is Classic, very freely treated, and too exuberant in ornament. The dome is half Oriental in outline, and novel, as well as pleasing, in design, except that the ogee outline of the base appears too weak for the superstructure. The elevations are admirably and effectively etched in ink. We should regret to see this design carried out as it is, and the author would regret it a few years after; but there is unquestionable talent in it.

(8) "Let there be Light" is a Classic design, which almost escaped our notice owing to the irregularity in the numbering and hanging of the different sets of drawings, and the fact of there being two Nos. 8 in the room. (8a) "Nous verrons" is a Gothic design of some merit and dignity, but not conveniently planned; the Public Hall and courts are on the first floor, reached by internal staircases, accessible by long passages leading from opposite entrances in Congreve-street and Eden-place. This is too roundabout a way of getting to the hall; though the plan of the main floor, when reached, is very compact and symmetrical, and provides free communication all round. The council-chamber, committee-rooms, and mayor's reception-rooms form a long suite on the first floor of the principal front, marked externally by three-light plate-tracery windows; the mayor's entrance in the centre of this front is surmounted by a clock tower, with good treatment of angle buttresses, and finishing above the clock-stage with a picturesque though unobtrusive lantern. A strong and deep cornice and balustrade bind together the whole design.

More refinement is wanted in the treatment of dormers and other details; with this exception, the architectural aspect of this design is praiseworthy.

No. 9, as we conclude it to be (there was neither motto nor number attached), is a rather remarkable plan, shown only in a few imperfectly finished drawings. The author intimates that other business stood in the way of his completion of these drawings. He turns his building slightly from the proposed line of site, so as to bring the Congreve-street front parallel with the Town-hall, with which he proposes to connect it by a bridge on the main floor level, thereby bringing the town-hall *en suite* with the mayor's dining and reception rooms, which occupy this front. How advantageous this arrangement might prove on special "occasions of state" must be evident, besides the gain in external effect from placing the buildings parallel on each side of the street. The ground-plan shows a central entrance from Ann-street, leading to the public hall, running transversely across the building, the municipal portion lying on the left, while the civil and criminal courts open from it to the right, beyond which the end of the building sweeps round in a semicircle, with corridor, communicating with barristers' and witnesses' rooms, &c.; on the first-floor the barristers' library forms a circular apartment at the extremity of the semicircle, lighted by a glass dome (omitted, however, in the elevation, though shown in section). The judges' lodgings are treated as a nearly separate edifice at one corner, and the judges' approach to the courts is better contrived, for privacy and convenience, than by any other competitor. This is one of the best constructed plans we have seen for a long time, not only in that compactness and apparent simplicity characteristic of good planning, but also as it shows evidence of the feeling (now nearly extinct, we fear) for plan as the basis of design, and not as a mere matter of arrangement. It is unfortunate that the author should have thought himself bound, in making the proposed connection, to carry out the basement and "order" of the present Town-hall round the greater part of his building. The general effect would be very dignified, no doubt, but it would not be worth while to spend so much money in merely carrying out a borrowed feature, an imitation of an imitation: and the high rusticated base would run away with an inordinate sum of money. It would be quite possible to carry out this fine plan, with sufficient unity of effect, without absolutely repeating any of the Town-hall design, and the proposal is quite worth consideration.

(10) "Forward": this plan consists chiefly of corridors and staircases, and is arranged with very little regard to systematic or effective planning. The design is a quiet and unobtrusive treatment of Early Gothic.

(12) "Desideratum": a classic design with a tower and spire over the entrance, and a square central hall rising up in a mass of blocking above the rest of the composition; the side view looking, with the tower, sadly like the outline of a locomotive engine. The courts are reached across the hall, and to the right of the hall is access to a circular staircase leading to the mayor's reception-room, which occupies the whole length of the first floor to Eden-place. It would be a fine room, no doubt, but probably much larger than necessary; the hall, too, could be made a fine interior; but the plan in general is crude, and the architectural details mere rascoco.

(14) "En avant." The author has made the same mistake that we noticed in No. 6, of placing his council and reception rooms opening out of the public hall opposite the two courts,—with the same approach, therefore, for all. It is difficult to conceive how any one who had given five minutes' thought to the internal working of a plan could adopt such an arrangement. The corridor communication is well kept up in this plan, but there is very little system in the arrangement of the various departments. The motto does not well characterise the design, which is rather going backward than forward, and consists in an adoption of a tolerably ornate type of decorated Gothic; there is some new but not very successful treatment in the tower over the entrance. The large hall, with a hammer-beam roof, and a fine 7-light tracied window at the end, might be an effective interior.

(15) "In Uno." Why this motto was chosen does not appear, as the two departments, legal and municipal, are more distinctly in *duo* than in most of the plans. The latter forms a longitudinal block towards Ann-street, the Law Courts

department forming a wider parallel block facing Edmund-street, whereas there is an opening into the public hall, which is a rather narrow apartment entered on its longest side: a bad arrangement for effect. The arrangement of the blocks, which have no internal communication, is simple and compact, except that the mayor's parlour is rather too far from the council-room, as he would have to traverse the whole length of the building in passing from one to the other. The council-chamber and reception-room form the first-floor front, with an ante-room between *en suite*, over which is the tower, which forms a rather pleasing central feature, with a low spire at the top. The style is Italian of an ordinary type; the general plan may be called sensible and practical.

(16) "Town Hall" is a well-arranged plan, with continuous corridor communication all round, and a central corridor dividing the two blocks longitudinally. The courts are in the block towards Edmund-street, ranged longitudinally, with a rather small, meagre public hall between them, with entrance from that street. The arrangements for judges' jury, and witnesses' rooms adjoining the courts are convenient and compact, and the judges' lodgings, though a good way from the courts, are not so placed as to ensure a progress for their lordships through the most public thoroughfares of the building, as in many of the plans. The mayor's parlour occupies the central portion of the principal floor to the front, with a range of offices on each side, the reception-room, ante-room, and council-chamber being placed *en suite* at the back, and all lighted from above. This arrangement gets over many difficulties of lighting in a large building, but it also takes away the opportunity for the most dignified treatment of the exterior, besides robbing the principal apartments of any look-out, which is not always desirable. A great part of the basement must be very badly lighted. The design, a weak treatment of conventional modern Gothic, has little to recommend it. The author adds a "suggestion" for pulling down the present town-hall and rebuilding it in connexion with the new building as one block, removing also St. Thomas's Church opposite, to give a better view of the building. We do not think his suggestion will be carried out.

(17) "Perseverantia," in a style that may be called Anglo-Italian, shows a very well considered plan, in two blocks, the municipal buildings occupying the Ann-street front, with a short return each way, the courts in a compact block, facing north and west of the site, and the judges' lodgings occupying the remaining angle, with corridor of communication to the Courts, through the barristers' corridor. The principal floor to the front is very well arranged, with reception and ante-rooms in a fine suite, the whole length of the front, the mayor's parlour coming into the rounded angle of the building, and communicating (across his private staircase) direct with the council-chamber, which occupies the return wing. This is one of the best plans, but not one we would wish to see built, architecturally; the general design, but for the tower, conveys the impression of a monster railway hotel.

(19) "T-Square," a young design, of portentous aspect; a large octagonal central hall being crowned with an enormous octagonal cone and lantern; the general development of conical eruptions externally suggesting a volcanic agency. There are good ideas in the plan, but want of knowledge how to work them out in detail. The ventilation shafts are made a special feature in the design, with some originality of treatment.

(20) "Alpha," a plan arranged with some ingenuity, with an angle porch and tower, at the corner of Ann-street and Congreve-street, the reception-room and council-room above, forming the two retiring wings from the angle. The municipal buildings fill the rest of the Congreve-street front, the Law buildings running transversely in a wider block behind. The plan is, to work well, and the design is a reproduction of decorated Gothic features.

(21) "Quod erat faciendum." The Law Courts are in a large block to Ann-street, the municipal buildings in the rear to Congreve and Edmund streets; the front to Congreve-street continuous, but otherwise the two blocks are quite separate. The central hall between the courts, with a lofty dome, would have a fine internal effect. The reception-room, opposite the municipal entrance, is well placed and

planned as to its approaches and ante-rooms, but it is on the ground-floor, while the rest of the mayor's department is on the first floor, which does not seem a good arrangement. There is a general want of unity in this part of the planning. The style is Italian. The main features of the design have very little reference to the plan.

(22) "Si je puis." This is in the main a well-planned building, especially as regards the Law Courts, which occupy the portion towards Edmund-street, from which the Public Hall is entered on its longer side, the two courts being opposite, and a corridor communication round. The adjuncts, as judges' and jury retiring-rooms, witnesses' rooms, &c., are very conveniently arranged. The municipal entrance is in the centre of the Ann-street front, with semicircular staircases, directly opposite, leading to reception, council, and committee rooms upstairs. The mayor's parlour, on the ground floor, to the right of the entrance might have been better on the same floor with the principal apartments. The style is a quiet and simple treatment of Early Gothic, pleasing, though not striking; the best elevation is that towards Congreve-street, with projecting bays marking the judges' lodgings; this is a picturesque bit. The author thinks the high position of the site affords a tempting opportunity of having "a tower and spire visible from every part of the town." That he has succumbed to the temptation there can be no doubt on looking at his tower, which is like the cities of the Anakim, "great and high, and fenced up to heaven," and is not only disproportionate in mere size, but is treated in detail on a scale so different from the substructure as to appear to have been accidentally drawn to double the scale. We would not like to guarantee the safety of the lantern in a high wind, either. The only way to treat a tower of this size would have been to bring it out to the face of the building, at one of the angles, and treat it *from the ground* as an independent feature, as in the Houses of Parliament. A more sober hand has added, as an alternative, a picturesque tower of reasonable dimensions, the only fault of which is that it is too decidedly English in style to harmonise with the somewhat foreign character of the rest. This set of drawings has been got up with great care and labour.

(23) "Fidelitas": a plan showing want of method and system; as an instance, it is enough to mention that the reception-room, which is on the ground-floor, is entered by two doors opposite each other in the two long sides, opening directly into the end and the side, respectively, of two of the business corridors! Over the space between the courts rises a sort of round tower, ending at the top in a dome, which, from the level of the first floor, becomes simply a useless well. Part of the bottom of this well is occupied by barrows (they cannot be called "rooms") for judge and jury, which are lighted by borrowed lights into the bottom of this funnel. The drawings are well got up, and the interiors of courts and hall susceptible of pleasing treatment.

(24) "Palmarum qui meruit ferat": a simple and workable plan, as to the business department, except that the mayor's parlour is the whole length of the building from the council chamber; the reception-room is very poorly placed and provided, opening directly off one end of the main business corridor, very small, and with no possibility of being used with any other apartments but the mayor's parlour. The author adds an "engineer's plan" of ventilation, &c.; but the whole thing savours rather of being an engineer's plan. The design is Gothic, poorly treated in detail, and with no breadth or character. The tower over the entrance is used to contain an upcast ventilation shaft, with outlet at top; but its connexion with the rest of the ventilating system is not very clearly shown.

(25) "Concentration" shows two alternative plans for the courts (which are on the Ann-street side), one placing them transversely, with the Public Hall between them; the other longitudinally, back to back (the favourite position with most of the competitors), with the Public Hall adjoining in front. All the principal apartments of the building are on the ground floor, the mayor's parlour, council-room, ante-room, and reception-rooms ranging along the Edmund-street front. It would seem better to place these rooms, to which the general public have no access, on the first-floor level, and the offices downstairs. In the main, the plan seems a good one, with no speciality. The principal front shows a portico, with a lofty flight of steps,

and a dome over the central hall, treated with a knowledge of the special style as to character and detail, but showing nothing new.

(26) "Labor omnia vincit,"—even the art of designing law courts, no doubt; but "Labour" has not quite accomplished it this time. The plan differs from all the rest in arrangement; but as it is a mistake, both as regards aspect and arrangement, there is no need to describe it. The design is a primitive application of Gothic.

(27) "Forum." The plan looks symmetrical, but will not bear a close inspection. The courts are placed in the favourite position, back to back, approached from the central hall, and also from the other side by short transverse corridors leading out of a central longitudinal corridor. The judges cannot get from their lodgings to the courts except through the Public Hall or by a long hide-and-seek through two or three public corridors. The council-chamber is awkwardly fitted obliquely into one of the angles, making a room of which one end is wider than the other. The reception-room is at the angle of Congreve and Edmund streets on first floor, but with no special or marked staircase or approach to it. The design is very plain Early Gothic freely treated: like the plan, it wants distinct and marked character, though pleasing in parts; the elevation to Eden place is the best.

(28) "Maltese Cross in Circle": unquestionably the best Gothic design in the room. The drawings were hung, either by accident or stupidity, just where half the visitors who were not systematically going through the collection would miss them. The plan is not quite as good as the design: it shows the two departments perfectly separate in two longitudinal blocks, with a courtyard between; the municipal buildings in the narrower block towards Ann-street, the legal buildings towards Edmund-street. The Public Hall is entered on its longer side from Edmund-street, with semicircular staircases at each end leading to the upper floor; opposite the entrance are the two courts back to back, and, on the other side, a long longitudinal corridor dividing them from the barristers' rooms, which are next the courtyard, with a special barristers' entrance at the end of the passage from Congreve-street. The judges' house, at the north-east angle, is entered from Edmund-street by a special entrance, with a spacious hall and staircase. The main entrance and staircase is from Ann-street, with corridors leading to right and left to offices, and a suite of rooms above the reception-room in the centre, the council-room being also in connexion with these, and with a separate staircase for councillors. The outline of this plan towards the courtyard is too irregular, losing space and leaving awkward angles in the courtyard. The style is Late Gothic, of what may be termed a semi-domestic character. The internal arrangement is very well marked on the design by appropriate fenestration, and concentration of ornament; the council-chamber is shown at the end facing Ann-street by a deep projecting oriel and a gable above highly decorated by panelling. The position of the tower might be more significant; it stands over the inner porch of the public business entrance, at the angle of Ann-street and Congreve-street: such a feature should rather mark the grand or state entrance to a building; but the position is the best for effect, and the tower is a good one, rising straight up in an unbroken line with octagonal angle turrets, the clock stage being only marked by a broad band of panelled decoration near the top. The tower is crowned by an octagon lantern of really elegant and original design, carried on flying buttresses from the base of the angle turrets of the main tower. The elevations are beautifully drawn in line; and the whole design is marked by a pleasing refinement of manner, and is a credit to its author, whether the style be accepted as suitable for the present purpose or not.

(29) "Ouinhiok" is a design as *outré* as its motto. The author has hit upon the idea in No. 7, of the circular entrance-hall at the angle, but not on the right mode of treating it. He has placed the two courts parallel to each other and stretching obliquely from this angle into the plan, thus necessitating all sorts of corners and irregularities of shape. The circular hall is crowned by a dome intended to be Gothic, with little buttresses round it, and closely flanked by two towers of different sizes, one of which has no reference whatever to anything on the plan. The three would make an awful and portentous group if executed.

The designs, as we have intimated, are as a

whole below the mark, considering the object for which they have been submitted; and there are perhaps not more than half a dozen among them which are worth serious consideration with regard to this object. The want of merit, however, is not by any means such as to justify a local paper, the *Birmingham Morning News*, in its wholesale sneer at the whole collection last week, and in informing its readers that the whole of the Gothic designs were "beneath criticism, and almost beneath contempt." The journal in question would have shown better judgment and more modesty (we might say less effrontery) in refraining from such sweeping condemnation on matters on which its authority must naturally go for very little. We do not see evidence, however, among the designs that any of the leading names in the architectural profession have entered the lists on this occasion; an absence which is so far satisfactory, as it indicates that competitions, unless thoroughly well organized, are losing their attractiveness for architects; and when it is found that the big fish will no longer rise at this kind of bait, the public will probably see the necessity of adopting fairer and more rational means for obtaining the services of the profession in erecting important buildings.

LECTURES ON ARCHITECTURE AT THE ROYAL ACADEMY.

BY MR. EDWARD M. BARRY, R.A.*

HAVING now traced the changes in English architecture to the time of the Renaissance, we have seen that in each period of Mediæval times the changes which were made were such as were dictated by increased knowledge or by common sense. No Mediæval architect seems to have thought it his duty to look back and copy the work of his ancestors. This feeling dates from the Renaissance, and is to be deplored, whether Gothic churches or Greek temples are the models imitated. No age till our own has had such an extended knowledge of the history and practice of architecture. Our engineers have made us broad and easy paths for the acquisition of knowledge. The masons, or possibly the Freemasons, to whom we owe so many beautiful buildings, studied only the vernacular art of their time and neighbourhood. For them the great world outside had not yet found its Columbus, and these humble artists worked on patiently and truthfully, indifferent to what was doing elsewhere. They were in the position of a man with one eye, which he keeps steadily fixed on the object which engrosses his attention. With us it is different. With all the stores of the past laid open to us, we have far greater responsibilities. Having two eyes, we must not put out one of them. We cannot refuse, with Nelson, to see the signal which, perhaps too hastily, we disapprove. In the jarring contentions of styles and schools the real principles of art are too often lost sight of, and it is found easier to swear in the words of a master than to follow slowly and painfully the toilsome path which leads to true greatness. In considering the prospects of the future, we cannot omit taking into account the tendencies of modern thought and civilisation. Some may think that they are such as to lead us back to the thoughts and practices of the Middle Ages. If so, by treading the old paths we may arrive at the old results. If, on the other hand, it appears that mankind are more intent on the progress of the future than the revival of the past, architects will do well to note the fact and not kick against the pricks. In a scientific age architecture must have a reason to give for her doings, and cannot rest on prescription alone. We have seen in respect of works of strict engineering, as in the case of London Bridge, how satisfactory a result may be obtained by the adoption of simple forms with the aim of introducing only that which is suitable and necessary for construction. The converse is evident enough in those cases where the designers of such works have failed to realise the importance of this principle. In such examples ugly forms, half obscured by tawdry and misapplied ornaments, shock the feelings of a pure taste, and in their obvious incongruity cause us to remember nothing so much as the half-forgotten May masquerades of imperfectly-washed chimney-sweepers. What then is to be the architecture of the future? Men often dispute so hotly that they fail to observe that, while they fight, a new

foe, secret and unseen, threatens to destroy both disputants. Heated debates on the abstract rights of man have before now heralded revolutions which have trampled out the last sparks of real freedom. Religious controversies have resulted in frightful crimes, or have been a source of triumph to the infidel and the scorner. And so with architecture: while its professors contend for leaves, others may carry off the fruit; while they fight for a name, the thing itself may disappear. In addressing young students, and to them only I presume to offer advice, I would ask them not to range themselves too readily under an exclusive banner. Art is catholic, and claims all their devotion. Let them see that they do not lose its substance in following a shadow. I would ask them to examine the great examples of our art without prejudices and foregone conclusions. Let them be always as ready to recognise merit as to blame shortcomings. They should apply this rule with especial care in the case of schools of thought other than their own, for they may be sure they will never have any difficulty in finding praise for the latter. And while it is certain that a true and real criticism is a necessity and advantage for art, too much cannot be said in depreciation of the too common depreciation of the efforts of artists. It almost seems that ignorance is thought to give some censors a special claim, for how often do we not hear a more than ordinarily flippancy judgment prefaced by the statement that the speaker knows nothing about the matter? A real and generous criticism is an aid to art, but we have too often to deal with public utterances which are not criticisms, which are neither generous nor true, and which only prove that the utterer is incapable to the shame, though he may appreciate the safety of attacking the absent. We may be sure that as success was never easy, it has not now become less difficult. The road to it must lie through failures, and we have all an interest in cheering the wayfarer, which ought to prevent unseemly exultation at his stumbles. If our architecture is to be noble, it can only be the result of noble thoughts and high-minded actions on the part of those who practise it, and who are bound, therefore, in such matters as I have glanced at, to set a good example. Whether the result of our labours is to be the development of a new style of architecture, or a revival of any form of the styles of the past, may to some of us appear a doubtful point; there can be no doubt, however, that our aim should be to think for ourselves, to seek in every way perfection,—in a word, that "whatever our hand findeth to do," we should "do it with all our might."

There are certain principles which must inevitably influence the future character of our art on whatever foundation it may be placed. The architecture of the future must be *true*; it must be *original*; it must be *scientific*.

It is needless to dwell on the charms of truth in our art. To "design with beauty and to build with truth" is the first duty of the architect. The truth he must follow comprises not only fitness of materials, but appropriateness of design. He has not fulfilled his part when he has thrown together in ill-regulated confusion the various parts of his design. He must not create a chaos and call it truth. A careless obtrusion of the less important features of a building or an exaggerated prominence of uninteresting constructional facts is not art, but carelessness. The *ars celare artem* calls for more than this and demands the "capacity of taking infinite pains." I do not think there should be any difference on these points between the Classical and Mediæval schools. Both must demand truth for the architecture of the future. It is not truth, but affectation to display ostentatiously in our buildings of to-day rude features of construction which were used with perfect propriety in ruder ages, centuries ago. All shams are bad, but no sham is so despicable as the affectation of non-existent virtue. It must often, however, be a difficult question for the architect to decide where affectation begins. Our art is in its nature artificial. It has to deal with technical principles of design, and to create effects in accordance with their true application. The architect must think, while at his desk, of the effect of masses, outlines, light and shade, &c., just as the scene painter must do in his painting-room. Only the latter creates them at once, while the architect must build up his conceptions stone by stone, with a painful consciousness that, less fortunate than his brother artist, he has no power to withdraw his failures from the stage. To discriminate between the allowable resources of art and

* See p. 223, ante.

the tricky devices of charlatanry is the test of the real artist. It is not to be taught or communicated,—it is the touch of genius which no academy can give. Truth in construction is much, but it is not the whole duty of the architect. He must be sure his construction is good, simple, and beautiful. It is not good if it ignores scientific knowledge. It is not simple if it rejects economy and fitness; and it can never be really beautiful when it fails to satisfy us under these heads. The display of the inner constructive features of our buildings may be carried too far, and, like other hobbies, may be ridden to death. We have all shivered under open roofs because the architect has prided himself on showing the timbers. We have perhaps experienced the misery and bad health which are caused by damp walls because in making his building "picturesque" the architect has thought more of himself than of our comfort. Sir Christopher Wren has been much blamed for his construction of the dome of St. Paul's. As you are aware, the outer dome is not the same as the inner, and there is a space between the two occupied by a brick cone, which supports the lantern and cross on the top. The reason for this arrangement is that Wren was well aware that in no other way could he hope to obtain a dome which would be satisfactory as regarded both its exterior and interior. It may safely be affirmed that not one in a thousand who admires St. Paul's does so the less because of this expedient, while it is certain that the external beauty of the dome (perhaps the most beautiful in the world) would have been altogether lost if its height had been reduced so as to fit closely on the lower interior. At St. Peter's at Rome, where the space between the two roofs is much less than at St. Paul's, the dome itself is scarcely visible from the piazza in front of the church, while St. Paul's towers over London to the admiration of us all. It would have been unfortunate for the metropolis if Wren had been influenced by a pedantic adherence to a supposed principle of truth, and had denied us this splendid specimen of his genius. In the spire and roofs of a Medieval cathedral we have features to which quite as great objections may be urged as against Wren's dome, for they are in both cases false roofs, not indicating the internal construction. No one, however, I should think would have anything but praise for those who have given us the exquisite beauty of the spire at Salisbury Cathedral, or the effective high roofs which cover the groins of our great English churches. The truth is that the rules of our art must in all cases be governed by common sense, and that truth in architecture, as in other things, does not necessitate rudeness or repulsiveness.

Originality, again, must be subject to similar laws. If we hope for originality in the architecture of the future, the careful study of the past must not be neglected. Our originality must be based on knowledge and not on ignorance. It must not proceed on the supposition that the wisdom of our ancestors is folly and their strength weakness. While opposed to slavish imitation, it must ever be content to learn. A new style will not start, Minerva-like, at once perfect from the brain. Indeed, the notion of a new style is not likely to be suddenly realised. Every change of style has arisen gradually from the new wants and new ideas of successive generations. The difference, for example, between Henry VII.'s Chapel at Westminster and the Norman nave of Peterborough Cathedral is great indeed; but we can trace the gradual modifications which led, little by little, to an almost total change. So must it be in the future. We may possibly fix the basis of our point of departure. It is impossible for us to foresee its future development. The scientific progress, and the enlarged wants of the day, must of necessity influence our architecture, and the world will as little go back for our bidding as the sea at the order of Canute. While yielding to none in hearty admiration of Medieval architecture, I cannot but counsel the student not to neglect other sources of study. The noble monuments of Greece and Italy should never be neglected by him. Let him notice how naturally the masterpieces of sculpture and painting combine with the perfection of architecture, and let him be sure that, however much we may rightly value originality, there can be no true architecture of the future which does not provide for such perfect combination. A careful study of antiquity is as necessary as it ever has been, and perhaps even more so, from the special circum-

stances of the day. The student must work for himself with pencil and rule, and not suppose that anything but honest hard work will ever lead to greatness. It is necessary nowadays to insist more than ever on the value of sketching, as the multiplication of photographs seems to engender an unfounded belief that they may be accepted as a substitute. This is not so, and no student can be too indefatigable in exercising his faculties as sketching alone can do. Originality, indeed, is not to be obtained by rule. It is the rare gift of genius. Even genius, however, must be guided by common sense. The fire on our hearths, if not restrained, will destroy us, and so even genius itself must recognise some control. The forms of the past may be our guides for the future, the language in which we may express our own thoughts [and ideas]. Only they must not be our masters. We may use them as a starting-point; they must not be our all in all. We must strive for good work, honest and true, and originality may perchance come to us when we are not thinking of it. We must make our buildings as expressive, beautiful, and convenient as the masterpieces of old, and we shall then cease of necessity to copy them wholesale. If I may refer once more to Wren, I would ask you (unfashionable as I know the advice to be) to study attentively some of his London churches. You will find in them a freedom and a variety which go far to make good his claim to originality. In St. Stephen's, Walbrook, especially will be found an interior of small size, but of charming simplicity, and of great architectural effect. The tower and spire of Bow steeple show also that, in the hands of a master, the details of classical architecture are susceptible of a treatment not less original and effective than those of any other school. In this country it now seems settled, by common consent, that our churches must henceforth be Gothic. I am not disposed to quarrel with this conclusion, as a general rule, though I may perhaps venture to think that some of our new Medievalisms are rather out of place surrounded by squares of modern houses. At any rate, they indicate a division between religious and secular architecture which has never existed before in any period of true art. The old Medieval architecture of this country is so exquisitely beautiful, and the associations connected with it so powerful, that it is impossible to do too much to preserve and sustain what our fathers have left to us, especially as it is not likely that any future time will rival the noble cathedrals which adorn the length and breadth of the land. The grandest works in England have been those of the thirteenth, fourteenth, and fifteenth centuries, and for 400 years no great cathedral has been built, if we exclude St. Paul's, which was altogether an exceptional case. The wants of our modern times are so vast and urgent that it taxes our energies to the utmost to keep pace with them (if, indeed, we can be said to do so) in the supply of churches, schools, and the appliances of religious instruction. Churches of moderate size in which man can readily see and hear, are therefore more likely to be multiplied in the future than buildings on the scale of our cathedrals. Modern thought tends to simplicity, and it is even difficult to prevent this taste from merging in parsimony as regards our architecture. When a rich nation hesitates about the cost of necessary architectural works, there must be something wrong. An individual must govern his wants by his purse; but a nation's true economy is to do well what is required for the public service. It is difficult to suppose that any real masterpieces of art can be erected under a system of nicely calculated less or more, which must fetter genius and cramp originality.

If, however, the architecture of the future is to be original it must be scientific. Herein, in fact, lies its best chance of originality. I have already spoken on iron architecture, and have given my reasons for doubting if at present the extended application of iron has conferred much artistic benefit on our art. As, however, architecture is the art of building, everything which renders building easier must affect the architect. Iron has been a too recent introduction for us to be able at present to fix its exact position in our art, but it would not be philosophical to turn from it with disgust because with its advantages it brings a corresponding train of difficulties. True science, ever simple and suggestive, cannot fail to assist the architect if he will follow the great principles of scientific fitness. Telford's graceful suspension bridge over the Menai Straits is an example of such a success, and the ugliness of its more modern neighbour and rival

is in no slight degree due to its neglect of the rule which has given in Telford's case so satisfactory a result. In the Britannia Bridge the useless towers are unmeaning, and even serve to give an appearance of instability; for, as the tubes pass through the towers, the latter have apparently no adequate support. [Of course this is said in an artistic sense only, for, no doubt, the engineer has taken care that the towers are strong enough.] Here, then, we have two examples of scientific construction which well deserve, though for opposite reasons, the attentive study of the architectural student. We may expect from scientific construction even more daring attempts than these; and indeed engineering progress has been so rapid, that though the feasibility of the tubular bridge was doubted when first proposed, only about twenty years ago, it is not probable that an engineer of to-day would copy it.

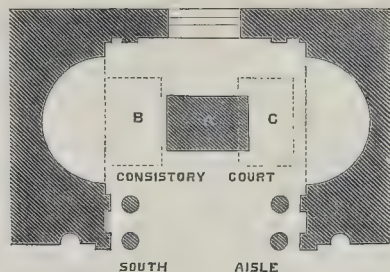
It is essential, therefore, for the architect to keep abreast with science, and to do his best to combine his art with it. When we contemplate some of the appalling structures of modern engineering such as those to which I have before alluded, we may, indeed, ask ourselves in dismay,—Is the world to grow uglier as it grows older? The only way to prevent this misfortune is for art and science to go hand in hand, for the architecture of the future must perforce be scientific. The great Italian architects were scientific as well as architectural. Leonardo da Vinci did the work of a modern engineer in draining the plains of Lombardy. Brunelleschi's dome at Florence was a scientific no less than an architectural triumph, and Michelangelo at St. Peter's achieved that which had not been done before. We ought not, therefore, to have any misgivings for the future of our art if we follow it with zeal, instruction, and common sense. Truth must control, originality must invent, science must construct it. Then and then only will architecture assert its position as a living art, the glory of all times to come, as of all ages past. To achieve this result the architect must work fearlessly and honestly, and he must think for himself. You can only get from a man that which is in him. Noble thoughts and high aspirations can alone lead to good work, and without these it is idle to hope for success. Trusting that what I have said to you on the glorious theme of architecture has not been inconsistent with such aims, I take my leave of you, Gentlemen, as I commenced with the expression of a sincere hope that we may soon have the pleasure of welcoming Mr. Scott on his return to the post which I have partially and imperfectly filled in his absence. I will only add one word at parting by asking you always to remember that truth, honesty, and refinement are the necessary qualities of the true Christian as they are those of the real artist.

THE ROMAN EXPLORATION FUND.

The treasurer's report, July 1 to December 31st, 1870, has been issued in a printed form. It shows that out of the balance in hand on June 30th, of 281l. 18s. 7d., payments to the extent of 175l. have been made, of which a list is given, and that the balance in hand on 1st of January, was 106l. 18s. 7d. The treasurer says:—

"In order to give employment as far as possible, the Italian Government has decided on giving every encouragement and assistance to archaeology, and has granted the sum of 12,000l. sterling for excavating the whole of the Palatine Hill, with the slopes round it, including the ancient *Via Sacra* from the Forum Romanum to the Colosseum, but it limits its operations to that part of Rome only, of which it proposes to make a second Pompeii, of so much greater interest, that it is so much more historical. These excavations are placed under the direction of Signor Rosa, who has so long conducted those of the Emperor of the French; he is to be assisted by Signor Tocco, who found the additional fragments of the marble plan of Rome of the fourth century a few years since, and Dr. Fabio Gori, who has for some years had the direction of the workmen employed by our society with the help of the Roman Exploration Fund. These gentlemen are all now friendly to each other and to us (although they have not always been so): they have power to give us leave to excavate in any other part of Rome, and to leave open what we find, which has never been permitted before. But this is on condition that we pay the owners of the ground the value of what we occupy in this manner; we shall therefore now require larger funds than ever."

A list is given of fourteen sites, which it is proposed to excavate and leave open as at Pompeii, such as the subterranean chambers and corridors under the Great Thermae of Caracalla; part of the wall of Servius Tullius between the Colian and the Aventine; the catacombs of Prætextatus, &c.



THE WELLINGTON MONUMENT, ST. PAUL'S.

SIR,—The *Times*, in an article of the 20th ult., alluded to the mismanagement alleged to have occurred in regard to the execution of this monument, and it appears that the whole matter is now being reconsidered. In regard to the general design, there appears to be no novelty of conception. It is a "replica," with some slight variations, of the tombs to the Queens Mary and Elizabeth, in Henry VII's Chapel. Consequently the chief merit and beauty of the work may be supposed to be centred in the sculpture for which Mr. Stevens is so eminent. But the position of the Wellington Monument, in the Consistory Court, is the most unfortunate possible. It is placed in the middle, with the window behind it! How, then, will the spectator be able to appreciate the sculpture from the north, where it will be lost in shade; or standing on the south side, between the monument and the window in the narrow space, he will be so near as not to be able to apprehend the proportions and relative beauties of the several parts; and no shadows will fall on the sculpture as the light will be directly in front. Besides which, the monument being between the spectator and the window, the group will present, even as it partially does now, a dark mass, and the eye will be dazzled by the very glare of light behind it.

No position could be more unfortunate, and I cannot but conclude that it has been adopted contrary to the opinion of the sculptor and consulting architect.

The consistory court, or chapel, consists of an oblong, terminated at the ends by large hemicycles or niches. I venture to suggest that the portion of the monument now erected be taken down, and the position altered to the east, B, or west, C, just in front of the diameter or centre of the niche at either end. There the monument would receive from the window a direct angular or diagonal light. It would be seen from the opposite end with advantage, and it would catch the eye of the passer-by going along the aisle or nave. I should consider the west end, C, of the court the preferable one, as ensuring the subdued light from the east in the afternoon, when most people visit the cathedral. The expense incurred now by the change would be inconsiderable, in comparison with the disappointment which must ensue if the monument be retained in its present disadvantageous position. I appeal to all artists and men of taste to judge of this suggestion.

T. L. DONALDSON.

THE CIVIL ENGINEER'S PRICE-BOOK.*

A PRICE-BOOK is always useful as a rough and ready reference; but it can seldom be much more. Circumstances alter cases in prices as in all things else, and that which is the price of a material to-day may be more than its price, or only a part of it, to-morrow, or in another place. A price-book, therefore, can never be taken as a conclusive authority on contested questions, save in exceptionally favourable correspondences of facts. With this limitation, Atchley's Civil Engineer's Price-book must be looked upon as very convenient. It is illustrated with plates and numerous woodcuts, and supplemented with specifications for permanent way, for telegraph

materials, and for works, plant, maintenance, and working of a railway; and it furnishes an alphabetical price-list of the machinery, plant, tools, and fittings required by contractors for the execution of public works. But, for all this, it might be still more comprehensive.

The rates of wages in the various counties of England and Scotland would have been of great service, as these materially affect estimates; London prices and country prices being two different things. A London contractor employed on a large work, either public or private, will probably base his tender on London prices; but he may employ the local workmen at a greatly reduced rate of pay, and thereby make a gain; or he may throw himself out of a competition through ignorance of the difference. The prices of cartage should have been given. Contracts for the cartage only of a work are frequently sublet, and general information on this score would have been useful. Tenders recently taken for a small work in the north showed the wide divergence of a full third of the price. The estimates for the mason's work varied only from 400l. to 480l.; but the estimates for the cartage, though all the contractors knew the locality and the road of approach to the quarry, varied from 105l. to 305l. Prices actually paid in the north, south, east, and west upon specified works would be some data to go upon. The rate in one neighbourhood would be insufficient to make the work one of general reference.

Roof-slating appears to be omitted. Here again the prices given at the quarries, with the rates of carriage by rail and water, should have been quoted. Slates that are 46s. per 1,000 at Portmadoc become six guineas per 1,000 by the time they reach the little port in Northumberland, whence that portion of the kingdom is supplied.

The price quoted for lead in plumbers' work is high if looked at as an average. Milled sheet lead is estimated at 44s. 6d. per cwt. At Newcastle-upon-Tyne, the current price is 26s.; and 28s. and 30s. are the prices in the surrounding part of that town and county.

Masonry, with its different gradations of excellence of workmanship, is calculated at a price per cubic yard, but the thickness of the walls is not stated. There is not more face-walling whether they are 1 ft. thick or 5 ft., consequently there must be a difference in value of the work. In the north, it is the custom to charge by the superficial yard: not by the cubic yard. Heights, too, must be taken into consideration, as work one man high must needs be of a much less price than that involving scaffolding. Every practical man knows that the price rises as the scaffolding rises; but then the price-book is intended for those whose practice is not so incessant as to make reference unnecessary. Bricks are estimated as costing from 20s. to 50s. per 1,000, whereas there is a greater disparity than this; for the best yellow bricks cost 90s. per 1,000 in Yorkshire. We give these hints with a view of increasing the usefulness of the next edition of the work. The variation in the prices of labour, cartage, and materials in different parts of the United Kingdom would be valuable information calculated to extend the circulation very considerably among engineers and others. Book, chapter and verse, so to speak, are always acceptable facts.

An eye has been given to the great public works now contemplated and in course of execution in India; and as a rough idea of the prices of materials in that land of engineering promise is better than none, this book will be useful to

those who are thinking of seeking their fortune there. Those, too, who have already confronted the jungle, the ghats, the bullock carts, doolies, and dusky natives in the pursuit of their professional duties, may find, with a sigh of relief, perhaps, exactly the information that will enable them to give an estimate a closer exactness. Considerable pains have been taken with the section on the contractor's plant, which the author looks upon, and justly, as a very important item in heavy works. Mr. Haskoll is the author of several volumes on professional subjects: his word is entitled to respect; all that we wish is that he had given his net a wider cast before he drew it in. He has had, he tells us, four years' experience on engineering works in the East, and personally felt the want of a price-book, and observed the same absence of this convenience among the contractors' agents there. This induced him to compile the section in question with extra care. Whether a railway is in contemplation near Madrid or Madras, Bombay or Buenos Ayres, or a telegraph line is thought of in one foreign port or another, the chances are that the plant will be sent out from England. Hence these prices may, reasonably, be taken as the bases of estimates for works of the kind.

REPORT OF THE ROYAL SANITARY COMMISSION. WATER-SUPPLY.

THE supply of water to towns is, of course, one of the most important subjects into which the Commission could inquire, and is at the same time one of the most difficult to deal with. The recent Water-Supply Commission did not fully deal with these difficulties. Moreover, the difficulty of the subject itself is increased by the uncertainty of what legislation may follow the recommendations of former Commissions in respect of water-aid authorities that were by them recommended to be formed for the better management and protection of rivers. For general sanitary purposes the Commissioners propose to constitute the board of guardians the local health authority,—the new name which is to take the place of the present "Sewer Authority," "Nuisance Authority," &c.,—where there is at present no distinct authority, such as a local board, a town council, or a special drainage district board. This being so, and the union being in its extent an aggregate of a number of parishes, without reference to such boundaries as would most properly limit the areas of watersheds, the difficulty occurs of making the areas of the Local Health Authorities coincide with those of the watersheds. County boundaries and lines of watershed are often coincident; and of the 650 unions which have been formed, no less than 200 overlap county boundaries. If this difficulty did not exist, a more effective arrangement might have been made by giving to the local health authorities some control over the regulation of rivers and streams within their districts, and the Central Authority a convenient means of superintendence of them, through the medium of the respective local authorities. The Central Authority is proposed to consist of one minister for all sanitary and poor-law purposes combined under such a title as will clearly indicate his position; and whether it may be advisable to put under his authority the general control of the watersheds seems at present to be undecided.

It is sufficiently obvious that local authorities must have the duty of providing adequate water-supply for their districts, and the power of applying their rates for such purpose; but whilst conferring on them adequate powers in this respect, it must not be forgotten that there are other interests besides those of the local authorities and the water consumers to be considered and guarded. *Prima facie*, each district may be entitled to consume so much of the water found within it as may be necessary or convenient for its purpose. It may acquire the right to take the water, either by agreement with those who have the right over it, or by compulsory process where those parties oppose. In cases where the exercise of compulsion is necessary the process for taking land for water purposes has hitherto been by provisional order, which involves a public hearing before an inspector of the central authority, and thus incidentally gives that authority a power of veto; but whilst it would be well to retain this form of compulsion in the future law, and to extend it to the taking of water, and of land for water purposes, beyond the district of the authority, it

* Atchley's "Civil Engineer's and Contractor's Estimate and Price Book, for Home or Foreign Service." By W. Davis Haskoll, C.E. London: Lockwood & Co. 1871.

appears to us necessary and proper that the future law should require that the Watershed Authority (if any) of every district affected should also be heard by the officer having the conduct of the inquiry; and that if there be no Watershed Authority, then it should be the express duty of that officer and of the Central Authority to try the question, not merely as one between the water owner and the water consumer immediately at issue, but also with reference to other, perhaps much wider interests; and if this be necessary in cases where the local authority and the owner are at issue, much more might it be useful to require vigilance on the part of some public department where those parties are agreed." The Commissioners further remark that "An illustration of the mischief which may arise from allowing agreements for the taking of water for public supply without the sanction of some tribunal which would weigh all the circumstances, is afforded by the Cheltenham and Gloucester Water Bill, which came before Parliament in 1865, and was rejected by the House of Commons, on the ground that it proposed to sanction the taking of 1,000,000 gallons per day at a spot near, indeed, to Cheltenham, but in another watershed, and belonging to the sources of the London water supply."

We may remark that a similar opinion was expressed by the Royal Commission on Water Supply, in their report of 1869, where they say (p. 124), "It appears to us that the Legislature should always jealously watch any proposal for a town taking water from a gathering-ground at a distance from it, lest by so doing it may deprive other places nearer to such gathering-ground of their more natural source of supply;" and they quote Mr. Bateman's words, in the case of the Liverpool Waterworks, which are these:—"I think that it was altogether wrong that Liverpool should have been allowed to go to this district" (the Rivington district) "because Darwin, Accrington, Blackburn, Wigan, and many other places, are large and flourishing towns closely contiguous to the Liverpool gathering-grounds, the whole district having a dense population, where the inhabitants can only look to this little cluster of hills for a supply of water. Liverpool has put its paw upon that supply, and has very considerably limited the power of the surrounding districts getting an additional supply of water."

Other evidence was given before this latter Commission to the same effect, which may, perhaps, have had its effect upon the decision of the Commission to report against Mr. Bateman's own scheme for bringing a supply of water to the metropolis from the head of the river Severn, and that of other engineers from other distant sources, and recording their opinion that there was plenty of water within the Thames watershed for the metropolitan supply, without touching on the rights of other districts.

The Commissioners proceed to remark that, "Should no Watershed Authority be created, we rely upon the vigilance of the Central Authority, who, upon application made, would not confine itself to narrow and technical views of the relations between two interests which may come more immediately into competition, but would take into the field of survey the entire district, with the varied and complex conditions which each case will present."

After enumerating the clauses of the Waterworks Clauses Acts of 1847 and 1863, which they recommend to be incorporated in the new statute, the Commissioners remark that these Acts do not cover the whole ground; and that, since 1863, several local Acts have been obtained which contain many new provisions, which suggests that another Waterworks Clauses Act should be passed embodying them, and the whole subject reviewed. The destruction of life and property which resulted from the bursting of the Bradfield reservoir, caused an inquiry, in 1865, by a committee of the House of Commons, and they recommended that plans and sections of all large reservoirs should be submitted to the Home Office, or to the Board of Trade, showing the intended mode of construction; that a competent person should be sent down by one of these departments to examine the site; that the plans, with the observations of such person, should be laid before the committee on the Bill; that the works should be inspected during their progress; that the reservoir should not be filled without the sanction of the London authorities; and that the Home Office or the Board of Trade should exercise adequate supervision over all such reservoirs; and the Commissioners recommend that those provisions should be embodied

in the new statute, but referring always and only to the Central Authority, instead of to either of the departments above named.

A very useful suggestion, which we ourselves have more than once made in the *Builder*, is that the local authority shall be empowered to provide rain-water tanks, or to compel the provision of them by the owners or builders of detached cottages. But we certainly do not see why such a useful provision should be limited to detached cottages. Every house that has a backyard should be included, wherever situated. It would probably reduce the consumption of other water by one-tenth at the least, and where water has to be pumped for the supply of a town a reduction of one-tenth of the coal consumed is a material item. And another good feature in this proposition is that it would reduce flood waters in drains and sewers, which ought to be flushed more systematically.

In point of quality it is recommended that the central authority should extend to the whole country such examinations as are now made of the London waters. "Were an extensive analysis of water for domestic use to take place, there is no doubt that many sources now but little suspected would prove to be poisonous or unwholesome, and the prevalence of disease in many districts would be fully accounted for; indeed, the establishment of a few laboratories for this and other purposes seems eminently desirable."

This Commission, like all those who have gone before them, urge the necessity of a constant supply, as distinguished from the system of intermittent supply which prevails in London, and state that owners of (house) property in low localities neglect to provide a proper supply, or access to a proper supply, of water either within or in fit proximity to the houses. As to wells within reach of the soakage from cesspools, the Commission feel bound to direct attention to the evidence, which proves the wide prevalence of the soakage from privies and cesspools into wells; and they recommend that provision be made in the new statute to prevent houses in country districts being occupied without some supply of, or access to, wholesome water.

A DESCRIPTION OF THE ALEXANDRA THEATRE, OF LIVERPOOL, AND ON THE CONSTRUCTION OF THEATRES GENERALLY.*

THE floor of the stage should rake from back to front, for the purpose of assisting the perspective effects, and giving greater ease to the performers in various actions, particularly in dancing—I in 26 I find to be the most satisfactory gradient. This inclination causes a natural tendency in the whole of the stage to bear forward,—a tendency increased owing to the absence of any longitudinal ties, which, as the bridges and sinks have to work transversely, must be dispensed with. To prevent this bearing forward, the stage joists are usually locked (as it is termed) with iron hooks from joist to joist the whole length of the stage, and before any bridge or out can be used, those fastenings between the joists of such bridge or out must be undone, and a most unsatisfactory mode of working it is in this mechanical age. On reference to a section taken through the stage, you will notice the uprights at various distances to support the joists. At the Alexandra I placed these uprights 2 in. out of the perpendicular, so that before any strain could push them forward it must first push them up, a tendency which would be resisted by the flooring. This plan answered well for a year or so, and I learnt only a few months ago that they were obliged to lock the joists in the old fashion, the necessity being caused, I fancy, by the gradual giving and loosening of the joints, and most probably shrinking of the timber. I have a plan which I anticipate will answer, but have not yet had an opportunity of testing. Instead of the sliders working in the usual way, I should fix an iron fillet on the edges working in a groove: thus each slider forms its own lock between its joists. I should very much like to have the opportunity of erecting a wrought-iron stage. I feel convinced that more rigidity, and consequently more perfect working, could be secured in iron than in any other material; but I am afraid it would be difficult to find a manager willing to go to the requisite expense. The mezzanine floor should be only

about 6 ft. 6 in. under the stage, so that should any lever, rope, or slider go wrong, the men below could at once reach the defective part without the trouble or time necessary to fetch a ladder. I do not intend to enter into the mechanical details of the working of a stage. I could well write a paper as long as this on this subject alone. This department is, perhaps, more that of the stage carpenter than the architect's. My interest in my subject has, however, caused me to make a specialty of this department, and I have endeavored to make various improvements in it, and I trust with success.

The painting-room is on one side of the stage. It would have been much more convenient if placed at the end; but I had not sufficient depth to do so. The size, of course, is ruled by the size of the cloth. Especial care should be taken that the frame is high enough to have the canvas stretched in one. It is very frequent, in fact very general, in most painting-rooms, that when painting a cloth it has to be done in twice, a defect which increases the working expenses, since not only have the carpenters to move the cloth after it has been once stretched, but the artist also must work at his picture in patches, and stop at a certain line, however much it may interfere with his painting. In architectural subjects this is particularly annoying, as I myself have experienced. I recollect some years ago painting a scene: it was a town scene, with a tower rising high into the picture. The first 12 ft. were stretched only (this being the depth that the frame was short in height), and consequently I had to guess the position of the vanishing point, as I could get none until I got to the lower portion of the picture.

If I were to consult any artist, particularly an opera singer, about the requirements of a new theatre, the first thing that would be earnestly impressed upon me would be the necessity of having the dressing-rooms very comfortable and very conveniently disposed. There must be no draught, the rooms must be within easy access of the stage, the steps conducting to them must be as few as possible, and they must be away from the stairs that lead to the dressing-rooms of the chorus, ballet, or supernumeraries. Very necessary it is to give those matters full consideration. In the Alexandra the space should not allow me to arrange these rooms as I should have wished. I was able to get only one dressing-room on the stage level: this, of course, the prima donna or star would have, and I got called over the coals by one of the Italian Opera troupe for not providing a second one, a certain lady thinking she was quite as much entitled to this room as another certain lady. It is, however, very desirable that at least four such rooms, two for ladies and two for gentlemen, should be provided. The stairs leading to the ballet and chorus-room should, if possible, be at the end of the stage, so that there may be as little noise as possible. A sense of propriety will also suggest that the dressing-rooms for males and females should be approached by different staircases.

Two green-rooms should be provided, one for the principals and one for the ballet, &c., as the upper ten are very aristocratic in their notions, and do not like mixing with the middle orders. I have constantly seen the green-room, when there is only one, deserted by the principals on this account. They prefer to retire to their own dressing-rooms during the intervals when they are not required on the stage. In this respect the Alexandra is deficient.

The musical portion of a performance having now attained such a degree of excellence in every well-appointed theatre, it is necessary that the orchestra should be of sufficient capacity to accommodate the full complement of musicians for a powerful and well-balanced band. In connexion with the orchestra there should be a room for the assembling of the musicians and for tuning, so placed that the sound of the instruments should not be within hearing of the audience, and another room for practising. There should also be a library for musical literature and score, which, it is indispensable, should be fireproof. For want of this provision, the disastrous fires at Covent Garden and Her Majesty's destroyed priceless musical treasures. The orchestra itself is about 9 in. below the level of the stalls, so as not to interfere with the view of those sitting in the front rows. It should be constructed like a huge box, giving thereby a greater fullness of sound. We all know how much louder the sound of a musical-box is when placed upon a box than on some solid non-vibrating substance.

* By Mr. Edward Salomons. See p. 231, ante.

The different workshops are important appendages to the theatre. The carpenter's shop in the Alexandra is placed below the stage on the mezzanine floor. It was here I had the most room, with a good light. If it could have been placed on a level with the stage, it would have been more convenient, as there is some difficulty, in its present position, in getting out the large pieces of framework that are so constantly being used in a theatre.

The property department is perhaps as important as any, and requires more room than any other, both for storage and making. I may explain that the term properties implies everything movable on a stage, not scenery, from an elephant to an inkstand. These accumulate very fast. Some of them are very costly, so that there should be sufficient room to store them carefully away. There should also be a small room near to the prompter, so that the properties required for the night's performance may be close at hand. There is a want in the Alexandra of a good-sized room, for the storing away of furniture. In the rapid change of scenes there is necessarily an amount of rough treatment, and as we have now sometimes on the stage rooms furnished as elegantly as in a private house, special attention should be paid to this. A well-lighted room of ample size is all necessary for the making of properties. The position of this is not of great importance, care being taken to have an ample passage from it to the stage, to allow for the moving of bulky articles, such as the elephant before alluded to. You will see that I have placed this room behind the gallery, where there happened to be the greatest space: it is well lighted from above.

The gas arrangements for the stage are very important: the ordinary method adopted is perhaps the best, by means of borders, wing-lights, and foot or foot lights. The latter in the Alexandra is somewhat novel, which I devised, and Messrs. Defries carried out and patented. This is a section of it. A channel behind the burners leads into a flue built in the wall, which draws off the vitiated and heated air; in front are two frames filled in with coloured glasses, worked by a lever from the prompter's box, as the effects may be required. The top of the burner is on a level with the stage, and the top of the iron box 5 in. above, so that the view is very slightly impeded, and from no part of the house can the flicker of the flame be seen. Each particular border or wing light can be lowered or raised at pleasure, or the front two of either can be governed by one tap, or the whole of either can be regulated also by one tap, or the whole together are again under the command of one tap.

Besides the gas lighting, it is now very important that the architect should make provision for the time light. In the Alexandra, the gas meters are placed in the cellar below the stage, perhaps as convenient a place as could be found. Supply pipes for the two gases are laid in the usual way, each lantern having india-rubber tubes to attach to the supply pipes. A work-room should be supplied for the gasman; it is here on the cellar-floor level, with a forge, the latter being very necessary, as the gasman has to work all kinds of metal work, and a clever gasman will be able to make armour and arms. It would be very desirable to light all the gas by electricity: a saving of gas would be effected, and a great source of danger from fire averted. I hope to see this done before long, there is no practical difficulty that I can see.

The very important questions of ventilation and heating will next occupy our attention. The Alexandra is heated by hot air. I adopted this in preference to hot-water pipes, as it is more rapid in its effect and the currents more easily regulated. It is only necessary to heat a theatre for a short time before the audience assemble. The people and gas keep it warm enough afterwards; and it is, therefore, of vital importance to get rid of the products of the gas and vitiated air. The usual way of abstracting the vitiated air in a theatre is by a ventilating shaft over the chandelier or sun-burner. The heat of the gas in the sun-light causes a strong current, and no doubt effectually draws away a great amount of foul air. But after the audience has assembled some time, the moment the curtain is raised a great rush of comparatively cool and fresh air finds its way from the stage, and naturally flows towards the centre light, and is at once carried off, and thus to a great extent wasted. Some penetrates under the boxes, and causes eddies and currents; but these are currents of foul air, as there is no

regular current from the different circles, where the audience really are, for the above-named reason. I therefore nearly closed the shaft above the sunlight, so that the fresh air from the stage, and the channels provided for the admission of fresh air, flowed at once to the different circles, at the back of which I provided outlets into flues, which above the ceiling went into the great shaft above the sunlight, and thus utilised the heating power generated. By adopting this course, I simply took advantage of the natural current of air; for instead of the stream of air flowing towards the sunlight (as there is practically no outlet in that direction), it must flow towards those which are provided at the back of the tiers: thus all conflicting currents are avoided, and the ventilation is sustained and maintained in one direction. I may here remark that the result has been very satisfactory.

Great care should be taken to allow for an ample supply of water, and a proper system of stand-pipes in case of fire. The ordinary system adopted is as perfect as any I know. As many turncocks as possible should be provided with hose ready attached. In a theatre it is not difficult to extinguish a fire if taken in time. There are more narrow escapes in theatres than the public are usually aware of. A prevalent idea exists that scenery is very inflammable. Such is not the case. The paint used—distemper—is not easily combustible. I have tested a piece of canvas covered with paint, and it is very difficult to burn, impossible to set in a flame; it will smoulder. What makes a theatre so liable to fire is the quantity of wood, not only on the stage, but throughout the house; that on the stage could scarcely be better disposed for catching fire, with its light scantlings and air spaces between. As water is now abundantly used in scenic effects, it is well to provide a large cistern for an ample immediate supply, and to lay, as I have done at the Alexandra, a drain, with an eye in the centre of the stage to carry away the waste water.

I have alluded to the difficult question of acoustics; fortunately the general form of a theatre is most favourable to the conveying of sound. It is said that there should be as little raised decoration as possible, so as to allow a free surface for the passage of sound, and to this the perfection of the acoustic properties of Her Majesty's late Theatre was in a great measure attributed. I am doubtful whether this was the cause, as the whole of the boxes, and the theatre was almost all boxes,—were hung with curtains, the worst conductor of sound, and quite sufficient to counteract the good effects of the level surfaces of painted ornament, which, by the way, were painted on canvas, a non-conducting medium. I attribute its perfection to its form, and the boxes and fronts being made of wood; and this accounts for the great rapidity with which it was gutted by the fire.

I am strongly in favour of raised decorations. In my opinion no similarly rich effect can be attained by any painting, however good. And if the painting be not of a very first-class style, which is most difficult to obtain, and if obtained very expensive, it has a tawdry effect, and resembles ordinary paper-hanging ornament. At the Alexandra Theatre, the panels in the box-fronts are filled in with blue tufted satin, which gives a very rich effect, and is not expensive. I was at first a little afraid that this would interfere with the sound. But I argued that if the mass of loose drapery at Her Majesty's late Theatre had not that effect, the satin panels would not either, and the result proved that I was correct.

I cannot here resist the temptation of giving you an extract from the *Times* of October 22nd, 1867. It appears that Mr. Oxenford, the *Times*' theatrical critic, had paid a visit to the American theatres, and written various notices on them. The following extract was written on his return, and is dated from Liverpool:—"Having now completed my tour of the New York theatres, the most fitting conclusion to my short series of letters will, I think, be an enumeration of the results I deduce from my observations and inquiries. I give this in the form of a report, incurring the risk of being charged with self-repetition, or even of self-correction, if this letter be compared with those that have preceded it. I. With the exception of the Bowry, the New York theatres, considered as edifices, furnish models which the London architect would do well to imitate, as they are light, commodious, and so arranged as to allow nearly the whole of the audience a good view of the stage. The theatres in London that mostly resemble them are

Astley's, in its present condition, and the small house at Highbury Barn. But a far better imitation, one indeed that exceeds the originals, is the Alexandra Theatre, Liverpool, in which the lightness of the American house is qualified by gorgeous 'appointments' scarcely to be matched anywhere."

I may here remark that I have never been to America, nor have I ever seen any drawing of an American theatre.

STAINED GLASS WITH REFERENCE TO MODERN ART.

At the London Institution some very agreeable *conversations* are being held, whereas papers are read and many interesting matters exhibited. At one of the gatherings, on the 15th ult., Mr. H. Holiday lectured "On Stained Glass aesthetically considered with reference to Modern Art." The lecturer dwelt strongly on the necessity of taking into consideration the exigencies of the materials dealt with in art; hence stained glass was not to be made to look like mosaic work or an oil painting. After describing the miserable condition of the art of glass-painting in this country, Mr. Holiday pointed to the improvements that had been effected through Mr. Winston, Messrs. Powell & Co., and Mr. Burne Jones. Speaking of what is still done, he continued:—

Some of the leading stained-glass firms possess among their members artists of considerable ability, who use every effort to keep the work executed under their superintendence up to a good standard; but the difficulty of avoiding mannerisms where a large quantity of work is constantly being produced appears to be enormous. Many houses, I fear, act on this painfully commercial principle; they have no objection to produce good work; they would rather do so if their clients will pay for it: it would be more to their credit; but if a window is asked for which must be cheap, they do not represent to their customer that if it be cheap it must also be of modest pretensions; that he must be content with a single subject or figure in the centre, and must allow the upper and lower parts to be filled with white glass, treated in a simple and inexpensive manner. They know their customer well; when he asks for a cheap window, he does not want to forego anything but quality: he will have the space filled with subjects and colours, and cares nothing whether one or the other be artistic.

To insist that they will only do good work, and that if he wishes to give less money he must have less of it, might risk the loss of their customer: so they reject this unbusiness-like and Quixotic course of action, and proceed to execute a window marvellously cheap and marvellously hideous. Such firms, when they receive an important order, with instructions that no expense is to be spared, place the designs in the hands of a professional artist, employ their most able glass-painters in the execution of the work, and allow none but the best glass to be used.

In works of secondary importance, but where they desire to do themselves credit, the design will be given to a draughtsman engaged on the premises, who, having a facility in sketching a subject, has been educated to produce more or less successful imitations of the early styles; and as much expense is avoided by this means, probably the firm can afford good glass, and the result is a window wholly uninteresting, but not violently offensive.

But in the many cases where cheapness is the only condition insisted on, the cartoon will be produced by some lad apprenticed to the trade of drawing distorted limbs, whose ideas about art are on a par with those of the average crossing-sweeper, and the dreadful thing which he calls his cartoon is made still more terrible in the process of execution by the employment of all the coarsest and crudest colours kept in stock. Not only is this system common, but I doubt not that those who act upon it believe that they are honestly doing their duty in that state of life to which it has pleased God to call them. Probably any effort to show such men that the deliberate production of bad art, knowing it to be bad, is immoral, would be simply thrown away. They would consider it quite sufficient to urge that, if their clients liked it, and were willing to pay for it, how could it be dishonest to supply them with it?

There are also houses where no good work is even attempted, where the entire staff of draughtsmen and painters are engaged in manu-

facturing the kind of window which I last described. "But these," you will say, "are surely employed only on obscure churches in provincial towns?" Not at all; it is in our cathedrals that you must look for their productions. Some of the largest windows in Westminster Abbey are of this kind. They abound, also, in fashionable churches, and will abound so long as the public cannot discern between good work and bad.

This being the case, it is not surprising that many persons, whose common sense enables them to see the folly of filling a window with caricatures of archaic drawing, should be carried away by the contrasts presented by the Munich glass. There they find excellent drawing, and the colour, though not fine, is not so offensive as that of most of the glass produced here.

Probably those who have been concerned in filling some of the windows of St. Paul's with Munich glass felt in this way; and one of the lamentable results of the reckless production of worthless art here is, that in flying from one error there seems a strong likelihood that many people will only run into another. Seeing that cheap windows designed here by young apprentices are worthless, and that, by spending large sums of money in securing the services of the first artists in Munich, something much better can be obtained, they naturally adopt the latter course, where good work is wanted and funds are abundant,—naturally, that is, if there is no other course open; but they seem to forget that another course may be open; that perhaps, if designs by our best artists were compared with those by the Munich apprentices, the difference might be in our favour. Unfortunately, the attractions of Munich glass are too apparent. When taste has once been vitiated, it is much easier to accept a fallacy than a truth; and it is this very vice in the style, this fatal hankering after the effects of an oil-painting, which destroys the vitality of the Munich school, and renders their progress to anything good impossible; it is this very error which causes it to be so popular with persons of imperfect artistic education.

I have hitherto only spoken of the qualities to be sought after or avoided in dealing with various materials, and have endeavoured to establish the principle that all art is radically bad in which the exigencies of the material are not recognised, and in which the beauties of the material are neglected; also that that can hardly be considered as art which is not produced by artists,—at least, where the drawing of the figure is concerned, though I should use the word artist in the most liberal sense, to include all who produce works of beauty. But we now come to another branch of our inquiry,—the mode in which the figure may be treated in arts where a limitation arises from the nature of the material. If we cannot produce the almost unlimited effects of oil painting, if we consider our first inquiry as to whether an art should be influenced by the material with which it deals to be answered in the affirmative, and having settled this point, we consult early art as to the kind and degree of imitation which is admissible, a variety of answers appear, and we find ourselves perplexed by the vexed question of styles. In order to make the present difficulty understood, I must briefly review the changes of style which have taken place in stained glass. . . . Having, then, various styles to study and choose from, which shall we adopt, admitting them all to be good? If you ask this question of most persons who have the management of stained-glass works, they will tell you the answer is obvious. Your style must depend on your architecture: if you are working in a church built in the thirteenth century, or in a modern church in the same style, your glass must be like that of the thirteenth century. If your building is later, your glass must be later; no rule can be simpler. But let us consider again: the fourteenth-century style grew naturally and gradually out of that which preceded it. If this was the case when the transition was complete, all artists of the later period worked in harmony; so that those who study these things can tell at a glance within a few years when any particular window was made. This would certainly be admitted. A fourteenth-century artist, then, always worked in the style of his own age, wherever his window was to be fixed. "Certainly." And did not, and probably could not, design in the manner of an artist of the preceding century. "No." Still less could a fifteenth-century artist have forced himself into the style of 200 years earlier. "Doubtless." Then how can you ask a nineteenth-century artist to take up at will all three

styles? The answer is most likely a shrug of the shoulders, and "What would you do?" Thus the difficulty is always shirked, not faced, and men are wasting their time tracing the particular lines and patterns of the early glass, not for their beauty, but in order to be able to imitate the glass of any age at will.

Once more let me say it. We cannot put on thirteenth-century sentiment as we do a morning coat, and change it for that of a later age as we change our dress for dinner. The styles when they existed were the spontaneous growth of the ages, and were fraught with intense meaning; let us not degrade ourselves by caricaturing them, it must all be false and hollow if we do. Their drawing is not natural to us; their ideas are not ours; that which is impressive in them would be foolish in us. When a Mediaeval artist drew the Creator standing upon the earth planting the sun and moon in the heavens, one with each hand, the conception was colossal. But we cannot do this now. Our heads are full of diagrams of the solar system, and we should feel that the Creator must have one arm nearly 400 times longer than the other to place them at their respective distances from the earth. When our astronomers are calculating how many years light takes to reach us from the fixed stars, we cannot, with Virgil, talk of the waves in a great storm leaving the stars dripping: it is too much even for hyperbole. Our work is to discover that which is truest and best in our age, to cultivate and perfect this, and to give free expression to it in our works. We should neglect no lesson which can be learnt from the art of past ages. Every method of developing the beauty of a material which they discovered should be thankfully accepted as their legacy to us, but above all, we must remember their most important lesson, and that is never to destroy the vitality of our art by aping the peculiarities of ages to which we do not belong. By this means only will the work of the nineteenth century ever command the respect of future ages which that of the thirteenth, fourteenth, and fifteenth centuries obtains from us.

NEW STABLES FOR H.H. THE VICEROY OF EGYPT.

The new stables now in course of erection for the Viceroy of Egypt, at Cairo, and which are, we understand, to be carried out in great style, are at the present moment a subject of interest to English manufacturers; and we have had our attention directed to the stable fittings expressly designed and manufactured by Mr. James Barton, of Oxford-street, London, from dimensions and instructions received from the Daira of H.H. the Khedive, and which samples have recently, at Alexandria, received the personal inspection and approval of His Highness.

The first noticeable feature in the design under consideration is the increased dimensions substituted for the sizes ordinarily used by English architects; and the divisions of the loose boxes have, in consequence, required the introduction of an intermediate iron post, to give additional strength and support. This post has been made of an oval shape, to prevent the possibility of injury occurring to the horse from a projection inside of the loose box, an objection which might have been raised to the introduction of the ordinary circular post under the same conditions. The stall and loose-box posts are of a bold and handsome pattern, with ornamental circular caps, decorated with the "star and crescent." The upper portion of the divisions consists of a ventilating ornamented open-work panel, a combination of wrought and cast iron; and the lower portion, instead of the usual wood stall-boarding, is composed of wrought-iron plates, hammered perfectly true and straight by steam power, and, at the perpendicular joints, strengthened and fixed by means of wrought-iron double-grooved standards between the middle rails and cills of divisions. The loose-box doors are made to match, and, though of considerable size, are so hung to the supporting post as to be opened and shut as easily as an ordinary wooden door.

The walls over the mangers at the head of the stalls are lined, up to the height of the top of the divisions, with prepared enamelled iron plates, in blue and pink enamel, and bordered with an ornamental design. The joints are covered with wrought-iron upright standards, enamelled, of the same tint as the plate it supports, and a moulded iron top-rail, fixed horizontally at the

top of plates, forms a satisfactory finish. Above this an oblong iron frame, relieved by a solid brass moulding, and surmounted with an enamelled scroll, decorated in colour with the star and crescent and the order of the Medjidie, receives a wrought-iron plate, enamelled, with the names of the horses, the names having been furnished from Egypt.

The walls of stalls and loose boxes are lined, from the floor line up to the level of the mangers, with iron plates to match the divisions, as before described. It will be evident from the foregoing that the chief feature in these fittings consists in their being constructed entirely of iron throughout, without the use of any wood-work whatever. The advantages hoped for are the increased facility of washing and cleansing, and, from the non-absorbent properties of iron, the consequent prevention of malaria and infection, and the great desideratum of permanent durability. The enamelled manger-fittings have been prepared from entirely new patterns, with improved top-plates, and are fixed to the iron divisions and wall-linings of stalls and boxes, in a simple, but most efficient manner. Mr. James Barton has already supplied stable-fittings for 170 horses.

ENLARGEMENT OF THE GLASGOW POST OFFICE.

THE Government has purchased the centre block of buildings whose frontage faces George-square, between Frederick and Hanover streets. The purchase-money, we understand, is about 30,000*l*. The concentration of the telegraphic business, the late increase of the postal duties, and other contemplated measures, necessitate larger buildings.

George-square, since its late improvement, offers a very good opportunity for architectural display; and now that such a chance occurs, we hope the occasion will not be allowed to pass by of rendering the new buildings worthy of their excellent site. George-square, on the score of convenience, can be hardly objected to. The position is central, and within a short distance of the most populous thoroughfares and railway termini. It would, perhaps, be too much to expect that the guild of architecture will have more reason to rejoice at reconstruction in George-square than in St. Martin's-le-Grand.

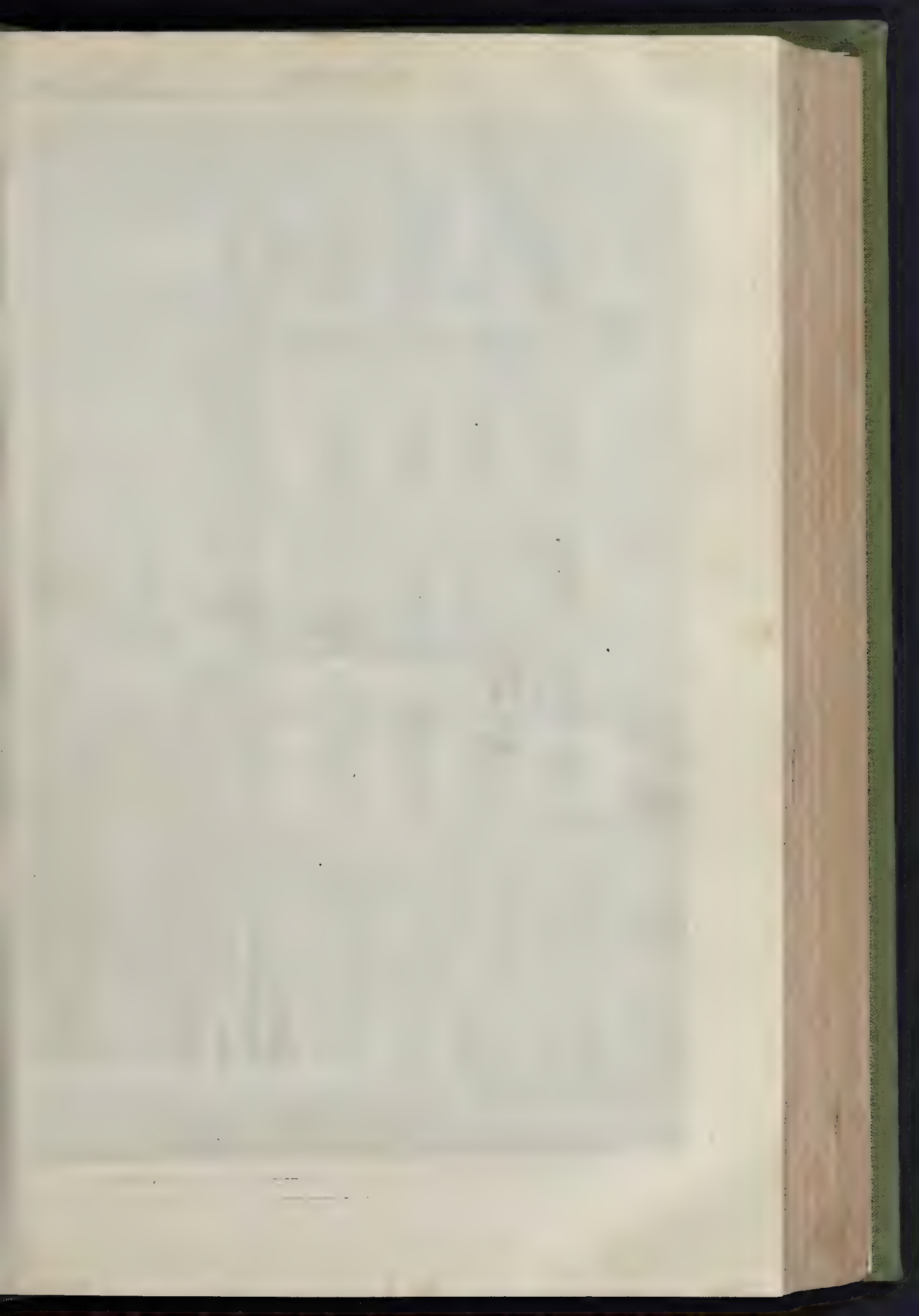
THE "KING LUD," LUDGATE CIRCUS.

It is satisfactory to observe that a start has at length been made in covering the land, so long lying unoccupied on the east side of Farringdon-street. The engraving in our present number shows the first building, which has been erected on that portion of the land in question, which is at the foot of Ludgate-hill, and which has been named Ludgate-circus. The building is intended to be used as a tavern, and has received the appropriate name of "King Lud." Its area is very circumscribed, except on the ground floor, where advantage has been taken of an adjacent railway arch, which has been utilised for the purposes of business.

Some idea may be gained of the value of a fancy site in London, when we state that the annual ground-rent paid for the land on which this building stands would, if capitalised by the multiplier ordinarily used for ground-rents in such situations, produce upwards of 400,000*l*. per acre. This should be cheering to such of the railway companies as have large quantities of surplus land in good situations, which may at the present moment be lying uncovered, and consequently unproductive.

The front wall of the building, as also the short return next Ludgate-hill, are built entirely of Portland stone, up to the two-pair level, and above that of Portland stone and white Suffolk bricks. The attic story contains five bold dormers, with circular heads, unmounted with gilt wrought-iron finials, supplied by Messrs. McFarlane & Co. The ground story has three-quarter polished Aberdeen granite columns, with carved foliated caps and bases freely treated.

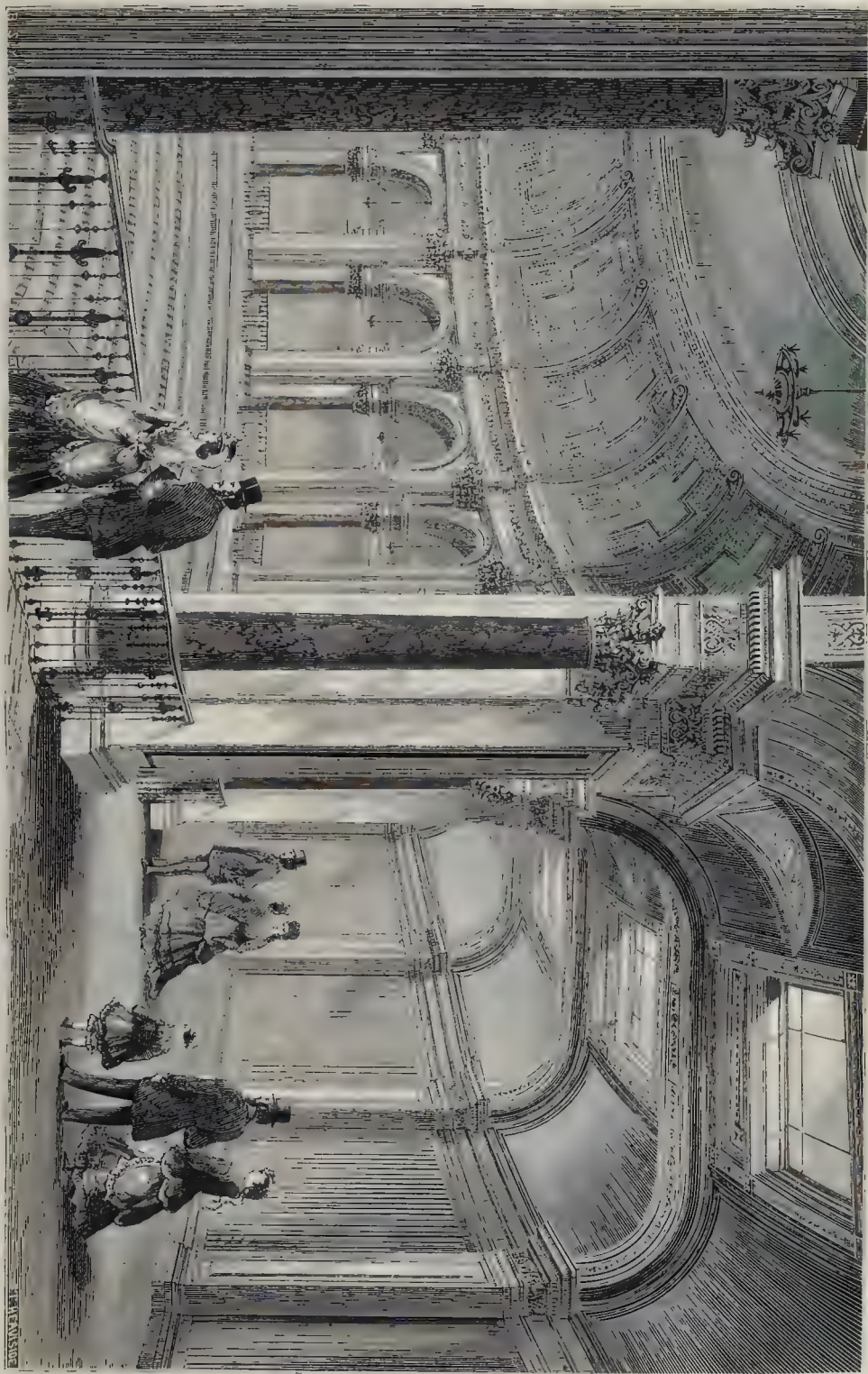
The wrought-iron girders were supplied by Messrs. Phillips, of the Coal Exchange; the polished granite was provided by Messrs. Manuelle; and the carving was executed by Messrs. Bell & Almond. The whole has been carried out at a cost of about 5,000*l*, by Mr. Elkington, of St. Peter's-road, Kingsland, from the designs, and under the superintendence of Mr. Lewis H. Isaac, of Verulam-buildings, Gray's-inn.





THE "KING LUD," LUDGATE CIRCUS, LONDON.—MR. LEWIS H. ISAACS, ARCHITECT.

VIEW IN THE PICTURE GALLERY, ROYAL ALBERT HALL, OF ARTS AND SCIENCES.—COLONEL SECT, DIRECTOR OF THE WORKS.



THE ROYAL ALBERT HALL OF ARTS AND SCIENCES.

THE building was opened on Wednesday last, under the most brilliant auspices. All the arrangements were excellent, and the whole passed off without a hitch. When the vast assemblage within the walls were standing to receive her Majesty, the effect was marvellously fine. It must not be forgotten, as mentioned in the address which H.R.H. the Prince of Wales read so well, that this great building has been erected without any aid from funds derived from public taxation. It is a clear gain to the metropolis. The Prince further said,—

"Your Majesty will hear with satisfaction that results have justified the original estimate of the cost of the building, and that, aided by the liberal assistance of your Exhibition Commissioners, the corporation will commence its management unfettered by pecuniary liabilities, and under conditions eminently calculated to ensure success."

The Queen, in her written reply, says:—

"In opening this spacious and noble Hall, it gives me pleasure to acknowledge the generous spirit which has been manifested in the completion by voluntary effort of a work promising so much public usefulness."

I cordially concur in the hope you have expressed that this Hall, forming as it does part of a plan in which I must ever take a deep and personal interest, may largely and permanently contribute to the promotion among my people of the love of art, as well as to the success of the annual exhibitions, which will bring successively into instruction the choicest products of the industries of all nations.

These objects could not fail to commend themselves at all times and all places to my sympathy and interest, fraught, as they are, with recollections of him to whose memory this Hall is dedicated, and whose dearest aim was to inspire my people with a love of all that is good and noble, and by closer knowledge and juster appreciation of each other, to cultivate a spirit of goodwill and concord among the inhabitants of all regions."

Of the acoustic properties of the Albert Hall, as tested by the first vocal and instrumental music in December last, we spoke in terms of satisfaction, which, fortunately, we have now no occasion to modify. But opinion in the matter—educated opinion, that is to say,—has passed in the interval through a phase of doubt and disquiet. It must be borne in mind that on the occasion to which we refer, although the greater part of the internal timber scaffolding was removed, the large central stack, which had been erected to support the roof during the process of fixing, was still in place. In fact, in the very centre of this stack was a platform, on to which her Majesty was conducted; and this was the very best position for hearing in the entire amphitheatre. As this stack was removed, the glazing of the roof was carried on, so that when, at about the same period, the shell of the building was complete, as to its ceiling, and was emptied of the scaffold, it was not easy to say how much of any change in the acoustic properties developed was due to either circumstance. So it was, however, that at that time a very unpleasant echo became perceptible. This echo varied in different parts of the building; it also varied, in a still more marked manner, with the musical instrument which produced the sound. This latter fact led us to anticipate the verification of the opinion of Col. Scott, that the cause of the echo was the glass ceiling. Such instruments as had their mouths facing directly upwards had a repeat that might be traced clearly to this source. On the whole, the effect was much marred, the auditors in some cases hearing at once a bar of music from the orchestra and the repeat of a former bar from the roof; but we felt it to be quite probable that the mischief might be cured.

We have great pleasure in saying that this opinion has been, to a considerable extent, verified. In such parts of the hall as we could try, the bars ceased promptly and distinctly, without echo or reverberation. The destruction so far of the disturbing echo has been effected by the simple expedient of a velarium, or tent-like roof, stretched over the area below the glass ceiling. We may observe in passing that this acoustic expedient has had a very happy architectural effect. It has almost entirely hidden from view the not wholly satisfactory lines of the glass ceiling. The tent-like structure and arrangement of this veil is appropriate and happy.

We give our readers an illustration, showing a feature of the building which may be made, in an unusual degree, a source of popularity and of attraction. This is the upper gallery or corridor, which occupies the zone above the second row of lights, and within the portion of the building adorned by the *terra-cotta* frieze. Lighted from above, and commanding a view of the entire amphitheatre, through an arcade,

this gallery is suited and intended for the display of pictures. The opportunity for a leisurely promenade, brilliantly illuminated, adorned with chosen works of art, and within hearing of fine orchestral music, is such as is nowhere else afforded. When concert or festival fills the hall, or when scientific meetings occupy the apartments suitable for the purpose, the advantage of such a noble cloister will be most palpable. It is likely to be, in such times, crowded with notoriety. It will enable us to blend the freedom of an open-air promenade with the shelter or demanded by our variable climate.

The organ has been proceeded with at a rate that is surprising, although it is as yet visibly far from complete. We did not observe, during the performance, any attempt to touch the pedal organ. The design of the case of the instrument cannot yet be judged of. The player sits before a sort of niche far below the apparent rows of pipes. Of these some of the principal are immense tubes, that would serve for the funnels of a first-class steamer. There are five distinct organs, played by four manual claviers and one set of pedals, and the entire number of pipes is more than six thousand. There are some stops which have never before been constructed. The wind is raised by a twenty-one horse power steam engine, and there are three sets of wind-chests, each containing air at a different pressure, so that the mechanical means of modulating sound placed at the command of the organists are most complete. The visible organ, large as it is, is only a portion of this gigantic and fivefold instrument. There are several rooms filled with the different portions of the apparatus, the swell-organ alone occupying a room to itself. The boilers and engineering arrangements are below. In fact, the pipes form almost the least part of this magnificent work of Mr. Willis, the invisible and subsidiary arrangements being on so unusual a scale.

It is noticeable that the building itself is directly the counterpart of the organ in this characteristic. The visibility of every portion of the great structure is one of its most remarkable features. It contrasts in this respect with such a building as an opera-house, such as Covent-garden. The enormous works of that edifice, of which the public are entirely unconscious, occupy to the full as many cubic feet as do the visible portions of theatre and of stage. You may lose yourself in a labyrinth of rooms, stairs, and passages, without ever reaching the portion of the building destined to contain the audience, or to exhibit the performance. In the combination of the two requisite forms of the horse-shoe, or the ellipse, for the former, and of the parallelogram for the latter, there lies great difficulty,—all sorts of odd corners are thus created; and although they may be all turned to good account, they cause perplexity to the visitor. In the great amphitheatre at South Kensington the plan is at once intelligible. The sufficiency of stairs and galleries to interior was fairly tested, on the occasion of the Queen's visit. As far as we have yet seen, readiness of exit—that most vital point in a building in which 8,000 people may be accommodated—has been daily provided for.

Following the traditions of the architects of Imperial Rome, the builders of the South Kensington Amphitheatre have had a difficulty to meet unknown beneath the calm summer skies of Italy. The English climate demanded a roof. Our improvements in the manufacture of iron and of glass within the last quarter of a century have enabled the architect to do that which all the power of Augustus would have been unable to accomplish. A new difficulty sprang up from this very triumph of mechanics. The genius of music fumed and fretted, and struck angrily against the enormous skylight. Colonel Scott has been equal to the occasion, and has bound the recalcitrant echo in a transparent web.

Sheffield Architectural and Archaeological Society.—This society commenced its annual series of excursions last week, by visiting the Sheffield Parish Church. The Shrewsbury Chapel, with the very fine monuments of the fourth and sixth earls, was of course the chief object of interest. In the vestry the members were somewhat surprised to find the parish register kept in an ordinary wooden cupboard, and subject to all the risks of fire,—an arrangement that is, at the least, risky, and which might prove disastrous. The tower alone shows traces of really ancient work.

FOUNTAIN FOR THE THAMES EMBANKMENT.

THE designs for an Ornamental Fountain for the Victoria Embankment submitted to the Metropolitan Board of Works are about thirty-five in number, and for the most part very indifferent in merit; the majority of them, indeed, are simply contemptible. Of pictorial designs for fountains involving sculpture, it may almost be said, as of forms of Government, "Whatever is best administered is best," so much depends on the manner in which they will be carried out. Amongst the designs at Spring Gardens which, for one reason or another, should be looked at, we may name in the order in which we fell in with them those marked "Udine," "Aquarius" (the one with rock-work), "Spes," "Time tries All," "Natura," "Ego," "Faire ce que peut, &c.," and "Architect."

FEMALE SCHOOL OF ART.

THE theatre of the London University, Burlington Gardens, was filled with the students and their friends on Saturday last, when Lord Eliocho, with his accustomed geniality and tact, presented the prizes to the successful candidates,—a long list. Mr. Valpy read a report from the committee, showing the good progress of the school. The school is now free from all debt; the current expenses being met by the annual receipts. As, however, there is no endowment, no provision is secured for needful repairs to the school buildings, and repair or renewal of furniture and apparatus; and there are no means available for the purchase of casts or other art examples which from time to time are necessary, the committee appealed to those who acknowledge the benefit of such an institution, and have the means, to add their names to the list of annual subscribers.

The prize of 5*l.* offered by Sir Stafford Northcote for the best essay on the use of flowers and plants in ornament, historically treated, was awarded to Miss Eliza Toulmin Smith.

Prizes offered by the Science and Art Department for original designs for fans were gained by Miss Anne Elizabeth Hopkinson and Miss Alice Locke, with honourable mention to Miss Ellen J. Hancock.

Medals and prizes offered to those students whose works were successful in the National Competition were gained by the Misses Catherine Banks, Ellen Hancock, Charlotte James, Emily Selous, Alice Locke, Alice Blanche Ellis, Julia Pocock, Edith Boyle, and Mary Whiteman Webb.

Third-grade art certificates, offered to those students whose works were accepted, and who had passed in all the subjects of the third-grade examination, were won by the Misses Emily Austin, Catherine Banks, Eleanor Manly, Mrs. Eliza Molynaux, and Miss Sarah McGregor.

The Queen's gold medal was awarded to Miss Emily Selous.

The chairman made an interesting address, and shorter addresses were made by Professor Westmacott, Mr. Alderman Gibbons, Mr. Godwin, Mr. Barchett, and Professor Donaldson. One or two points in Lord Eliocho's speech we reserve for comment on another occasion.

SIR,—Will you do me the favour of inserting a few lines in the *Builder* to correct a remark made by one of the speakers, who said that Miss Pocock was resting on her laurels since she took the Queen's Gold Medal last year, which is not the case.* Miss Pocock won the Queen's Gold Medal last year for a chalk drawing from the antique, and she is now competing in a higher stage for national silver and gold medals.

Another speaker suggested that our advanced students should seek to exhibit in the different exhibitions. They do so.

The following are the names of some of those who have already exhibited at the Royal Academy, Crystal Palace, the Dudley Gallery, and the Female Artists':—

Alice Elfrida Manly, Charlotte James, Julia Pocock, Mary Whiteman Webb, Sarah MacGregor, Catherine Banks, and others.

Both Charlotte James and Julia Pocock were commended by the press for their works exhibited this year at the "Female Artists'."

LOUISA GANN.

* The speaker was misunderstood; but it is unnecessary to explain.

JOTTINGS IN THE GALLERIES OF THE EXHIBITION.

A STROLL through the as yet unarranged galleries of the International Exhibition at South Kensington furnishes matter for congratulation to those who are interested in English pottery. It is as yet, of course, too early to attempt anything like an exhaustive description of even the best of the exhibits. By the 15th of April, it is expected, the galleries will be in a state to allow the reporters to go to work—that is to say, the gentlemen invited to draw up the official reports. In the meantime, jottings are of interest. The first ceramic articles that catch the eye are the bold and handsome productions of John Adams, of Victoria Works, Hanley, a sort of reproduction of the patterns and colours of Wedgwood, on a larger scale, and in what must be called a coarser texture. Not that we mean to speak disrespectfully of a very good style of work; yet it is to old Wedgwood what stone is to marble.

Josiah Wedgwood & Sons, with the old stamp of Etruria, seem to be the most voluminous contributors. Pottery of almost every kind bears their name. There are specimens in which the tender blue of the old ware is very justly reproduced. Others are of a delicate sage green. One very elegant vase is of pure white, with green arabesques and white medallions on a chocolate ground. The black basalt ware is represented by some noble specimens. The well-known busts of Milton and of Shakespeare have the stamp of old Wedgwood. There are two round plaques containing the dancing figures from Pompeii, so well known to collectors. A very elegant pair of lamps, of Greek pattern, with seated figures forming the handles, are also produced in black basalt. Perhaps the most effective specimens of the entire series are a pair of candelabra, formed of little satyrets, running and carrying swans. The life and go of the figures are admirable. Messrs. Wedgwood's productions are by no means confined to the species of ware known by the name of their celebrated ancestor. Some modern *majolica*, from Etruria, is painted with great force and delicacy, and gives promise of a school not to be despised by the masters of Urbino. Again we have vases imitating the mottling of granite and of serpentine; copies, we take it, of a Chinese make. Statuettes in biscuit are also contributed by Etruria, and the display is altogether worthy of that famous establishment.

Of other English manufacturers we must mention the names rather in the order of casual local arrangement than in that of merit. In fact, the apportionment of prizes, if any had been proposed, would have been a task of extraordinary difficulty. Messrs. Copeland exhibit painted and gilded vases of great magnificence, and a case of statuettes, in biscuit or Parian ware. They have also fine specimens of *majolica*, or rather Pailmay ware. There is a *tazza* formed of a shell-like cup, supported by two romping Cupids, that will be admired. The reproductions of Sèvres and Limoges ware by the Worcester Royal Porcelain Works are also of high merit. There are two large vases, with narrow, flat cylindrical centres, cut away to form the stem and neck, and adorned by groups in *cameaux*, representing the oath taken by Harold on the relics, and the fight on the field of Hastings, that merit much praise. The subjects are from "The Norman Conquest," published by the Art Union of London. The sage-green ware, with low relief in white enamel, as delicate as the French *celadon*, but with a character of its own, must also be noticed. There is an oblong vase of painted ware, the handles of which are formed of two gilded terminal figures, that are a great triumph of the potter.

Messrs. Minton send a large assortment of vases, *jardinières*, flower-pots, and ornamental ware, for the greenhouse and for the garden. The full rich colours attained by these manufacturers are especially fine; and the effect producible by the use of their pottery in relieving the monotony of the row of flower-pots will be welcome to all who have a passion for ornamental gardening. The pure turquoise hue of some of their smaller vases is as remarkable as the deep blues, greens, and browns of their larger works. For tiles, of course, they are famous. There are also some superb *tassas* by these manufacturers. We must further call attention to a very creditable reproduction of a *Henri Deux* candlestick, by Messrs. Minton. The material used for the reception of the inlay is too pure a white; but if the actual *ovion* clay had been

procured, so as to give the true tint, the imitation would be very good. The restoration of a portion of one of these costly candelabra now in the ceramic gallery of the museum, should be studied by the clever artist who has produced this *tour de force* of Messrs. Minton.

Messrs. Goode & Co. exhibit some fine *majolica*, properly so called, painted with free bold touch on flat enamel. Two square *jardinières*, of deep blue, modelled in a sort of *cameaux*, might have been taken for Oriental china. Messrs. W. J. Wells & Co. give groups in red terra-cotta that are very effective. One of *Titania* and *Bottom* is perhaps the best. There are also some elegant and serviceable dinner-sets, that hardly look out of place among the more strictly ornamental china. Mr. Mortlock sends a pair of fine vases. Prometheus, devoured by the eagle, is on the top, while the handles are formed of bound and imprisoned giants. The treatment is very bold and successful. The oviform part of the vase is painted in *cameaux*. Messrs. Batlam & Sons contribute some lovely-painted vases. One which is adorned with a dance of Cupids especially claims admiration. Their ewers, in imitation of Limoges work, are also excellent. Messrs. Kerr & Son have a case of the iridescent china which was first produced from the Belleek clay, containing some very graceful specimens. They also show the unique form of a tinted Venus, a figure that instantly attracts the eye. The pronounced colour of the cheeks and lips will probably be adjudged a mistake; but the soft, tender, flesh tint of the whole figure (it is a miniature of the famous crouching Venus of the Capitoli) is very attractive.

Among the specimens of English manufacture are to be seen several of foreign origin. A pair of fine blue Japanese jars, with plaques of gold and red lacquer inserted, are exhibited by J. C. Parr, of Derby. Messrs. Hunt & Roedel send a large and curious Chinese incense-burner, of cloisonné enamel on copper, with dragon handles and elephant-like legs. There is a case of vases and water-jars, which we took to be Buen Retiro ware, but which are stated to come from Egypt, with a large assortment of stoneware and terra-cotta. Outside, under the arcade, the magnificent pipes, and crucibles, and plaques of Messrs. Doulton & Watt, of the Lambeth Works, stand sentries over the whole ceramic series, and show that the art of the potter may emulate, in size, in hardness, and almost in strength, that of the worker in cast-iron. Our advance in earthenware manufacture since 1851 has been made with gigantic strides.

"THE LITTLE ONES."

SIR,—In reference to a letter in a late issue, "Give the Little Ones a Chance," might I, as a very little one indeed, venture to say a few little words? How many struggling ones there are of us who would only be glad to "catch the crumbs that fall from the rich man's table," is known to you, sir, perhaps better than to any one, and how many heart-sick trials, waiting with hope deferred, there are endured in competitions and other "legitimate" means used to work up a practice, few know, and fewer care; still the fact, remains—and I imagine always will to a certain extent—that success commands success, and that the fact of a man having executed so many works will always, with the multitude, be the best possible reason that he should execute so many more. The suggestion that "big men" should charge 10 per cent., and the smaller ones 5 per cent., would, I fear, lead to some difficulty in practice; but I hold that the system of an unknown man charging equally to the most eminent is wrong in principle. I consider the fairest way would be to sink the question of per centage altogether. Let an architect be paid a certain sum for his work, and the clever man will soon find that he can charge best prices doing the best work; while employers who might be content with mediocre achievements, would be charged moderate prices. In other professions it is so; the young barrister with his first brief does not expect to command the fees of the great Serjeant Buzfuz; the young medical student setting up in a "rising locality" cannot charge his guineas so frequently as the famous physician, although in both cases the little ones may be equally clever with the great, and in time be considered so by general opinion. Why, therefore, should not our profession be the same? Fulfilling the trade axiom, "That an article is worth just what it will fetch," we must remember

that the little ones will always predominate, and that there can be but a very few "big men" rise up amongst us who ought in fairness to receive larger rewards, which they do now by simply taking more than a fair share of work; instead of being (as it seems to me) better paid for what they really do personally. Doubtless abler pens than mine will take the matter up. E. Sisson.

SIR,—Many must have read with pleasure and satisfaction the letter in your journal by Amateur, "Give the Little Ones a Chance," and we heartily hope he will give us more of his experiences with architects of great name.

The rage that prevails for having down the great "Mr. Boss," from London, to "superintend" works 200 miles away, is, I am sorry to say, rampant in the West of England, as well as in other quarters.

It is not so very difficult for a leading man to take notes himself, in his fly-about-the-country life, of, we will say, a country church, send down an *employé* to take the plan and section; and then to contrive and get carried out a complete renovation; or so much as can be afforded, with the aid of a clerk of works at 2l. 12s. 6d. per week for some months.

Still, as good and studious architects are to be found in country towns, who are thankful and glad to give a great deal of time to a work of restoration, why depend on Mr. Boss's clerk of works, a very corruptible person, no doubt, and with his own schemes on foot besides his employer's, or on his assistants, who cannot secure the preservation of old details and features, or on the little attention, "Mr. B." himself can give the work?

I have known important works carried out in this neighbourhood, where the great man had not vouchsafed time to arrange distinctly his specification, and heavy extras had to be paid to the deceived builder, he having estimated wrongly. Had a provincial architect made the blunder, what raps on the knuckles he would have had; but it would be high treason to breathe any blame, or find the least fault with "Mr. B.:" so let us wish him success in his heroic career! A WEST-COUNTRY ARCHITECT.

CONCRETE v. BRICKWORK.

SIR,—May I trespass upon your space, and through it upon the time of some of your correspondents to satisfy myself and a number of gentlemen as to which of the above materials are the most durable and proper for lining a Kentish Rag faced building of large dimensions and wide span? I have been looking through about fifty copies of the *Builder*, but have not found an article directly bearing upon the subject of combining rag-stone and concrete. I have seen houses built with concrete in and round London, and have seen a combination of brickwork and concrete upon a small scale, but have never seen concrete walls faced with Kentish rag-stone, and am personally opposed to the mixture, not, however, altogether for that reason, but because, in my opinion, the strength of the walls would be inadequate to the weight they would be required to carry, unless the facing were laid in ashlar courses, which would, in Kentish rag-stone, involve more extra labour than the extra cost of brickwork. Our architect recommends the concrete lining partly for economy's sake, and partly for strength. We should save, perhaps, 100% in the cost of the structure, but we should have a building, the walls of which were not properly united. The concrete would be composed of Portland cement; but the facing stones would be bedded in mortar. Then, as to the proper ballast to be used for concrete, the builders should generally avail themselves of its use, as it has to be taken out of the foundations and carted away. It seems to me, to make a strong wall of mixed materials, the facing-stone or brick should be of the same relative weight as the inside lining and the outside. Perhaps a concrete wall faced with 4 in. ashlar of Bath stone would be as good and cheap as the proposed work. Concrete is said not to require a damp course, but I think otherwise. I prefer the footing foundation to be of lime concrete, and a Taylor's damp-course brick bedded upon that at least 6 in. to 9 in. below the bottom of the ground floor of joist; then commence the concrete erection in cement. If we could build our tower of concrete it would doubtless be a great

saving; but the gentlemen of the committee would not for one moment sacrifice either strength or beauty for the sake of saving the sum named. I know of many houses composed almost, if not altogether, of concrete, and I remember one or two in Surrey tumbling down during the erection; but this was easily accounted for by the walls being built too quick, and not properly supported. The combination of the materials in question may have been discussed in your valuable journal, but I have not seen it; and as concrete is now coming into general use, not only in the suburbs, but in London, a little information upon the subject will be serviceable to many besides the writer and the committee of which he is a member.

F. F. ROWLEY.

BELLS FOR MASON'S ORPHANAGE, ERDINGTON.

The firm of William Blews & Sons, of Birmingham, have cast a peal of bells for Mr. Mason's Orphanage, at Erdington. These bells, five in number, are composed of Mason & Elkington's pure deposit copper, with a slight admixture of tin. The large bell, which weighs 9 cwt., will strike the hours; and the other four, respectively weighing 6 cwt., 5 cwt., 4 cwt., and 3 cwt., are intended to chime the quarters. The Orphanage clock, which regulates the peal of bells, and is now being constructed in the factory of Messrs. Gillett & Bland, of Croydon, Surrey, will have four dials, each 5 ft. in diameter, three of which will be illuminated. The following inscriptions are on the Orphanage peal of bells:—Hour bell, "I call upon the orphans' trustees to be faithful;" four-quarter bell, "Josiah Mason, born February 23, 1795, age 76, 1871;" three-quarter bell, "These five bells are made of Mason & Elkington's electro-deposit copper;" two-quarter bell, "2 Timothy, chap. 3, verse 15;" one-quarter bell, "James, chap. 1, verse 27." Messrs. Blews have in progress a bell of 25 cwt. for the International Exhibition of 1871; a peal of six bells for a church-tower in Alloa, Scotland; and others.

THE KING'S SCHOOL, SHEERBORNE.

The new buildings, which form a "science and art department," are just completed, from the designs of Messrs. Slater & Carpenter. They include lecture and class rooms, and masters' rooms arranged in two stories, available not only for the school, but also for the town of Sherborne. The buildings form the west side of a quadrangle, the north and east sides of which are the chapel and school-room, the fourth being open to the Abbey Close. The whole is therefore arranged to group with the Abbey Church, which stands close to the south end of the school-room. This school-room, with class-rooms under, was originally the Abbey refectory, and has a magnificent open eleventh-century roof. Besides this, are many other buildings converted into studies, which were formerly the Abbey domestic buildings, and a fine Norman cloister occupies the whole of the space under the chapel. The style of the new buildings, therefore, follows the ancient local fifteenth-century type, the detail of which is good. The dressings, windows, chimneys, &c., are in Ham Hill stone, and the walling generally of coursed local stone. The contract, about 1,500*l.*, was taken by Mr. Thomas Farrall, of Sherborne.

It is intended before long to complete this new quadrangle by adding aisles and a tower to the school-chapels, with various other important works.

"TENDERS THAT REQUIRE EXPLANATION."

SALE SEWERS.

Sir,—In your remarks under the above heading, in the *Builder*, you stated that "the same quantities were supplied to all by one surveyor, Mr. Joseph Commina." I beg to say that I was the only surveyor who took out the quantities.

Now, as you consider yourself "bound to ask for explanation of such differences," permit me to state, the person who sent in the lowest tender did not estimate from my quantities. Were we to ask Messrs. Jowitt & Nicholl, who sent in the highest tender, to "explain" why their tender was so high, I think it possible the only reply we should be favoured with would be, "We have already lost time enough over the

job;" and were we to ask the "contractor" who sent in the lowest tender to "explain" why his tender was so low, I imagine that, as a candid man, he would consider himself bound to say that he had not sufficient time to make an estimate; for he only made his appearance about one clear day before the tenders were lodged, and even at that late hour he insisted upon "taking out the quantities himself," notwithstanding the engineer informed him that the quantities were then ready, and to be had on the spot.

JOSEPH SIMMONS.

PENDLETON UNITED PRESBYTERIAN CHURCH COMPETITION.

The following architects were invited to compete:—

Messrs. Clegg & Knowles, Ellis & Hinchcliffe, Popplewell, Price & Linklater, and Seddon, of Manchester; Messrs. Maxwell & Tuke, of Bury; and Mr. Ward, of Birmingham.

The design submitted by Mr. Ward has been selected. It is Early Gothic in style, and will be executed in red brick, with freestone dressings, the internal fittings and open-timber roof being stained and varnished. There will be a tower and spire at the north-east angle, and school-room, lecture-room, vestry, &c., at the east end. Seat accommodation will be provided for about 600 persons. The total cost, inclusive of heating, lighting, fencing, walling, is called about 4,000*l.*

NEW TOWN-HALL, WINSFORD, CHESHIRE.

A DESIGN, which has been approved for the new Town-hall, Winsford, Cheshire, has been submitted by Mr. James Bedford, of Manchester, and Mr. J. A. Davenport, of Over.

The intended site is a picturesque spot adjoining the River Weaver and Winsford Bridge. The building will be constructed on piling, in the fifteenth-century style of timber erections, with plastering between the wall framing; no stone or brickwork, or other weighty material will be used, as novel provision will be made to lift the Town-hall when necessity arises; for, consequent upon the pumping up of brine (the staple commodity of the district), the buildings in the neighbourhood gradually subside (with many rents and fissures) into the ground, reminding one more of a South American city subject to earthquakes than a town in merrie England.

"COLONEL SCOTT ON LIME AND CEMENTS."

Sir,—Those of your readers who are interested in the scientific investigation of the materials they use must read Colonel Scott's very able lectures with great interest. May I venture to call attention to one or two practical points which I have observed, and which his lectures have forcibly recalled? I allude to the difference in composition of various hydraulic limes (chiefly those of the liassic formation), and the anomalies and failures that arise from using the same mode of treatment for these widely differing substances.

In the usual specifications of our large works, where lia stone is specified to be burnt, it is usual to state that the stone must be "free from shale, and clean," the shale being the marly clay above or below the bed of lia stone, and often adhering to it. At the same time, in using this lime for concrete to be made therewith, it is usual to mix the hot ground lime with the sand and shingle, and put it in its place at once. No previous gauging or slaking with sand is allowed, so as for the lime to disintegrate.

Evidently this is an anomaly, as the lime made from the clean lia stone does not contain alumina and iron enough to set at one process, but requires to be slaked first. Thus this wrongly used lia frequently expands and heaves, to the injury of the whole work around it. In fact, it is a lime, and not a cement. By simply allowing the same ground lia to fret down with the damp sand for twenty-four hours before using, the concrete becomes as hydraulic as Portland cement, with, perhaps, an even greater relative tendency to harden with the action of time and the elements.

In experimenting on the different limes, I have found that the marly beds, or even a mixture of them with the stone, will not carry so much sand as the stone-lime itself; and it has appeared

to me questionable whether, through a series of years, it indurates to the same extent or ratio.

Probably all, or nearly all, the failures arising from hydraulic limes may be traced to a want of proper treatment rather than to any inherent defects in the lime itself.

PLYMOUTH.

RELICS OF THE OLD WATER MAIN.

DURING the present re-laying of a line of new metal pipes through Gracechurch-street, several trunks of stout elm, varying in length from 8 ft. to 10 ft., have been unearthed. They present an irregular form, exactly as they grew when living trees, the bark remaining attached to many of them. Some of them are from 18 in. to 24 in. thick at one end, but of course they are thinned down at the other extremity to enable them to pass a few inches into the bore of the other length of piping to which they were attached. The bore does not even run uniform in some of them, and varies in diameter from 6 in. to 9 in. These old trunks are in tolerable preservation, and are a curiosity to look at. They have evidently been lying undisturbed under the pavement of Gracechurch-street since the first metal main was laid in the City. They have escaped the diggings of many gas and water companies, but they have been dug out at last, and are now lying, as we write, stretched along the wooden pavements, which will shortly disappear, like themselves, for ever.

ARCHITECTS, SURVEYORS, AND THE STAMP ACT.

The following correspondence will afford answer to several inquiries that have been addressed to us:—

"London, March 18, 1871.

Gentlemen,—The new Stamp Act exempts appraisements or valuations made for, and for the information of, one party only, and not being in any manner obligatory as between parties, either by agreement or operation of law. As Editor of the *Builder*, I have received the following inquiries with reference to this, and shall feel obliged if you will enable me to answer them correctly:—

Is it necessary for an architect to take out an appraiser's licence for the purpose of enabling him legally to make such appraisements or valuations as are so exempted from stamp duty?

Again: By contract between the building owner and builder the price of extra works is to be determined and settled by the architect: does such a stipulation render the architect's determination as to such prices so far obligatory between the parties as to require his valuation of the same to be stamped? And is it necessary that the architect should be a licensed appraiser for the purpose indicated by the contract?

Soliciting the favour of an early reply,

I am, &c. GEORGE GODWIN.

The Honourable Commissioners of
Inland Revenue."

"Inland Revenue,
Somerset House, London, W.C.
22nd March, 1871.

Sir,—In reply to the inquiries contained in your letter of the 18th inst., I have to acquaint you that no licence is required to enable an architect to make valuations in either of the cases stated by you, but that the architect's valuation in the second case, i.e. where the price of work is to be determined thereby, is liable to stamp duty.

I am, Sir, your obedient Servant,

WM. LOMAS.

George Godwin, esq."

CAUSE AND EFFECT.

In Dr. Whitmore's last monthly report on the health of the parish of St. Marylebone, he says, in reference to small-pox, "I have reason to believe that bad and defective sanitary conditions have a decidedly prejudicial influence upon this disease. Some of the worst cases sent into our local hospital have been taken from houses in which nuisances injurious to health constantly exist, and which no amount of sanitary supervision can effectually remove, whilst on the other hand cases of a very mild type have come from houses in which the sanitary conditions were generally very good."

The worthy doctor might have gone further, and boldly stated that neglect of sanitary precautions, and the existence of nuisances in our towns and cities in connexion with human dwellings, are the primal causes of epidemics like those from which we are suffering. They are not only nursed into strength and virulence in our undrained and uncleaned slums, but actually germinate there. The mission of the true physician is not in the act of dispensing physic, but that of rendering it unnecessary.

The foundation of sanitary law is based upon that trite but unerring axiom, "Prevention is better than cure." We have preached these truths for half a lifetime; but prejudice, which is only another name for ignorance, needs incessant action on it that it may be overcome. When medical officers of health speak candidly and honestly, and fearlessly perform their duties, as some at present are doing, there exist strong hopes for the future of social and sanitary science.

LEICESTER MUNICIPAL BUILDINGS COMPETITION.

SIR,—In reply to your correspondent, a "Would-be Competitor," allow me to say that the terms of the competition have been modified, and that an advertisement to that effect appeared in your issue of the 4th inst. It is only due to the corporation of Leicester that it should be known how promptly they acquiesced in the alteration of some of the conditions, when their unusual character was pointed out to the council by a few of our local architects. H. S.

"THE CRITERION."

SIR,—In your notice of the competition for Messrs. Spiers & Pond's "Criterion," last week, you speak of the fourth premium being awarded to Mr. A. Evers. As I was associated with him in the matter, it should have been Messrs. Evers & Milbourn. May I ask you kindly to make this correction in your next number. CHAS. H. M. MILBURN.

TOUTING ARCHITECTS.

SIR,—By book post I beg to forward a pamphlet lately received ("What to Take, Keep, and Avoid"), which fully exemplifies all that has before been said relative to the advertising and toutting propensities of some architects of our time.

I should wish to direct attention to the eleven and following pages, but more especially to the sixteenth and last, an extract from which, even without comment, would certainly be sufficiently instructive upon the subject of "What to Avoid."

It is this style of proceeding which, in the public opinion, tends to degrade the profession to an equality with the enterprising tradesman who "begs to inform the nobility and gentry, &c.," concluding, as the author here does, with a list of references forwarded on application. R. E. P.

* The very undigested pamphlet referred to has been sent to us by three other correspondents.

LIGHT AND AIR CASE.

Kell v. Pearson.—Court of Chancery, Lincoln's Inn.—The bill in this suit was filed by Mr. George Kell, a gentleman who resides in a house called Ness Cottage, in New-road, Notting-hill, to restrain the defendants from building a row of new houses so as to by the new access of light and air to the plaintiff's house. The plaintiff's house fronts to the north, and has a garden on the north side of it. The new houses which were being built by the defendants face to the south, upon a new road, running east and west, the west end of which road abuts on the east side of the plaintiff's house, the south front of the new houses being in nearly the same line as the north front of the plaintiff's house. Vice-Chancellor Bacon having granted an injunction, the defendants appealed. When the appeal motion came on to be heard, it was arranged that notice of motion for decree should be given by the plaintiff, and that the cause should be heard before the Lords Justices with the appeal motion, and finally disposed of. There being a considerable conflict of evidence, as is usual in cases of this kind, the Court desired that an independent surveyor should go and view the premises, and make a report of the result of his observations in court, where he should be subject to cross-examination. Mr. Whitehead was appointed for this purpose; and this morning he attended, and made his report to the Court, and was asked several questions thereupon. The result was that, in his opinion, the new house nearest to the plaintiff's house (to which his report was limited, because the Court was of opinion that the evidence did not show that anything amounting to a legal nuisance to the plaintiff was caused by the other new houses), so far as it was yet carried up, did substantially interfere with the access of light and air to the plaintiff's house, so as materially to diminish the comfortable occupation of it.

Mr. Kay, Q.C., and Mr. Nalder were for the plaintiff; Mr. Amphlett, Q.C., and Mr. Crossley were for the defendant.

Lord Justice James said it had been argued that under the Statute of Prescriptions, 2 and 3 William IV., cap. 71, a person had no, after twenty years' enjoyment, an absolute and indefeasible right of property to all the light and air coming to his house. His lordship was of opinion that this statute had in no degree whatever altered the pre-existing law as to the nature and extent of the right to light and air. The right to light and air before that statute was a right to that amount of light and air which, according to the ordinary notions of mankind, could be sufficient for the comfortable use and enjoyment of the house. The right was, therefore, to prevent one's neighbour from building in such a way as to diminish the access of light and air so as to render the occupation of one's house substantially less comfortable than it was before. That right was the same since the statute as it was before. The question was, therefore, one of degree, which the Court must determine as a jury upon the evidence. Upon the evidence in this case, his lordship came to the conclusion that the house nearest the plaintiff's house did diminish the access of light and air, so as substantially to render the occupation of the plaintiff's house less comfortable than it was before, and the plaintiff was therefore entitled to a mandatory injunction compelling the defendants to pull down the nearest house to the plaintiff's.

Lord Justice Mellish was of the same opinion.

STAINED GLASS.

Sutton Coldfield Church.—One of the four perpendicular divisions of the north-east window of the parish church has been filled with stained glass by public subscription, primarily to the memory of the late Mr. T. Colmore, and secondarily as a memorial of Bishop Hackett. The picture in the centre of the window represents Ezra rebuilding the Temple. Above is a coat of arms of Bishop Hackett, and beneath are the words, "The holy places made with hands are the figures of the true." Bishop Hackett was the re-builder of Lichfield Cathedral, and the subject of the rebuilding of the Temple was considered the most appropriate. Another of the four divisions of the window was filled with stained glass some time back, as a two-fold memorial to the Rev. J. Packwood, a former curate of the church, and Bishop Vesey, who obtained the park for the inhabitants of Sutton. At the top of this division is Bishop Vesey's armorial bearings, and underneath a representation of Joseph begging the land of Goshen from Pharaoh. The arms of Bishop Fleetwood and Bishop Arundel will be placed at the top of the other divisions of the window when they are filled. The new memorial portion has been executed by Messrs. Ballantine, Edinburgh.

Harpurhey Church (Manchester).—A stained-glass window has been presented to the parish by the family of Mr. Frederik Andrew, of Green Mount-place, Harpurhey. The window is a three-light window, in the Early English style, at the west end of the church. The window is by Wailes & Co., of Newcastle. The subjects, six in number, are the acts of mercy recorded in Matthew xxv.—"Hungry, and ye fed me;" "Thirsty, and ye gave me drink;" "A stranger, and ye took me in;" "Naked, and ye clothed me;" "Sick, and ye visited me;" "In prison, and ye came unto me."

Sheffield Parish Church.—A stained-glass window is being placed in this church, in memory of the late Mr. George Hounfield. It stands at the east end of what is known as the Shrewsbury Chapel. The window is divided into four parts, and the subjects portrayed are "The Last Supper," "The Passover," "The Feeding of the Five Thousand," and "The Fall of Manna." Messrs. Clayton & Bell, of London, were the artists.

Wigan Parish Church.—A stained-glass window has just been placed in this church, to the memory of the late Mrs. E. J. Wright, of Hindley Hall. It is on the south side of the church, and has been erected by Messrs. Lavers, Barand, & Westlake, of Bloomsbury. The window is one of three lights, and is designed in the style of art prevalent in Germany during the early part of the sixteenth century. The subject illustrated is the Ascension of Our Lord, whose figure occupies the upper portion of the centre light, the company of angels appearing in the corresponding part of the two side lights in attitude of adoration. The eleven Apostles and the Virgin Mary are grouped in the lower portions of the three lights, the latter and the Apostle St. John being nearest to the ascending figure of Our Lord. The insertion of this window, which has been erected at the cost of Mr. E. L. Wright, as a memorial of his wife, completes the five which were required on the south side of the body of the church. The whole of the windows on this side of the edifice are now of stained glass, with the exception of those which light the Crawford Chapel.

Madron Church.—To the several stained-glass windows which the vicar has presented to the parish church, says the *Cornish Telegraph*, he has just added another, a memorial one. It is inserted in the north side. The subject is, "The Raising of Jairus's Daughter;" the figures represented being included in the 61st verse of the 8th chap. of St. Luke, "And he suffered no man to go in, save Peter, and James, and John, and the father and the mother of the maiden." In the tracery-lights are two angels, with scrolls, "I am the resurrection and the life," and "She is not dead, but sleepeth." The window has been lately brought over from Bavaria, where, at Munich, it was manufactured, during the war.

Christ Church, Chadderton, near Oldham.—A memorial window has just been erected in the chancel of this church. The window has five lights, the three centre lights representing the Crucifixion. One of the side lights is filled with a representation of Abraham offering up Isaac; the other side light represents Moses in the Wilderness, pointing to the brazen serpent. The

centre portion of the tracery is occupied with the figure of our Lord in glory, surrounded by angels in the act of adoration. The spandrels and other parts are filled with devices and monograms. The whole has been designed and executed by Mr. C. E. Clutterbuck, of Stratford, Essex.

Books Received.

"De Quincey's Works." Vol. XVI. (Supplementary.) Edinburgh: A. & C. Black. UNDER the sub-title of "'Suspicia de Profundis,' being a sequel to the 'Confessions of an English Opium-eater,' and other Miscellaneous Writings," by Thomas de Quincey," this additional volume, containing various scattered writings of the author, has been published.

The chief point of interest in it to our readers will be the "Historic and Critical Inquiry into the Origin of the Rosicrucians and Freemasons," which appears under the head of "Translations from the German," but which seems to be a very free translation indeed, since it rather appears to be a general adoption of the ideas of Bahle, the German author, as far as these go, with much additional matter of De Quincey's own. The drift of the whole is to show that Rosicrucianism was of German origin in the Middle Ages,—originated, in fact, in a romance written by a boy of sixteen,—a very unlikely thing! and that Freemasonry was an English "translation" (like De Quincey's, we suppose) of the German Rosicrucianism,—the whole being thus "a box played off by a young man of extraordinary talents in the beginning of the seventeenth century (i. e., about 1610-14)." The English word "Masonry" De Quincey identifies with the Anglo-Saxon word "Massoney" (or Masonry), "a secret communal society," as Lessing has it, and which word in turn comes from Mase, a table. [Had the mace on the table anything to do with it?] The masonries of the Templars, as De Quincey remarks, were highly celebrated in the thirteenth century, and one of them was still subsisting in London at the end of the seventeenth century, at which period, according to Lessing, the public history of the Freemasons first commences. De Quincey is not of Lessing's opinion, that Wren modified a Masonry or society of Knights Templars, and so originated Freemasonry in England. He points out that it originated long before the rebuilding of St. Paul's, and that, in fact, Wren was himself elected Deputy Grand-master of Freemasons in 1668.

De Quincey displays a good deal of superficial learning on the subject of the tenets of the ancient magical religions, whence those of Rosicrucianism and Freemasonry are supposed to have emanated; but of the true nature of neither the one order nor the other had he any clearer idea than "a boy of sixteen;" far less of the relation of the whole to Scriptural doctrines, at the time he wrote this treatise. Into the merits and demerits of De Quincey's paper, however, we cannot here enter.

The Practical American Millwright and Miller.

By DAVID CRAIK, Millwright. Illustrated. Philadelphia: H. C. Baird. London: Sampson Low & Co. 1870.

This treatise appears to contain the results of a great deal of practical experience as a millwright; and it also comprises the elementary principles of mechanics, mechanism, and motive power, hydraulics and hydraulic meters, mill dams, saw mills, grist mills, oatmeal and barley mills, wood carding and cloth falling and dressing windmills, steam power, &c.; and must be a very useful book of reference, especially for colonial use. It is illustrated by numerous wood engravings and folding plates.

VARIORUM.

"Pocket Notes on the Use of Adhesive Stamps on Receipts, Agreements, &c." By Edward Cox. London: Cox, Chancery-lane. This is a very useful tractate, giving much information as to stamps of various kinds.—"The Annual Report of the Nottingham School of Art." This report, to which we have already referred in the *Builder*, is now issued in the printed form.—"Sewage Irrigation: a Lecture, by W. Hopk, V.C., delivered to the Ratepayers of West Derby, near Liverpool. London: Stanford, Charing-cross, 1871." In this pamphlet Mr. Hopk explains what is, in his judgment, the only method of really utilising and exhausting sewage by irrigation, with suggestions as to other modes. The

subject is illustrated by a map of "Breton's Sewage Farm, Romford," where Mr. Hope's well-known views have been tested.—Mr. Hotten announces a book about houses, under the title of "The Englishman's House, from a Cottage to a Mansion: a Practical Guide to Members of Building Societies, and all interested in selecting or building a House, with nearly 600 Illustrations. By C. J. Richardson, architect."—"Breaking up of the *Agamemnon*," is the title of a new etching, by Mr. Seymour Haden, published by Messrs. P. & D. Colnaghi & Co. The locality is opposite Greenwich. The day is declining, and the men have struck work for the night. Barges, barks of timber, lighters, and other Thames accessories occupy the foreground, and alongside the half-demolished hulk (which fills nearly the whole of the middle distance) is a derrick prepared to lift out her remaining mast. Greenwich Hospital, Deptford Dockyard, and the *Dreadnought* lie off to the left, and a sailing barge, passing under the bows of the condemned vessel, suggests her comparative proportions. It is probably the best of Mr. Haden's works, and many of our readers know how many admirable etchings that gentleman has produced.—The new number of *London Society* (Bentley) contains the first of a series of chapters likely to be very popular.—"Recollections, by J. R. Planché." No. 1 is an admirable beginning, full of fun and good stories, and something besides. We shall be much surprised if these papers do not gain for *London Society* a large circle of new readers.

Miscellaneous.

Midland Steam-Boiler Inspection and Assurance Company: Chief Engineer's Report for 1870.—At the eighteenth half-yearly meeting of this Society, the report now issued in a printed form was read. The following is a brief summary of the working of the company during the whole year 1870. At the close of the year, there were under inspection, 1,319 boilers, and under assurance, 1,638, making a total of 2,957. These boilers were used for the following purposes:—1,263 in collieries and mines, 1,325 in ironworks, and 369 in mills of various kinds. The boilers were of the following general description:—2,395 fired externally, and 562 fired internally. During the year there have been made 13,436 examinations, of which 1,804 have been internal, and 1,699 in the flues. This shows that each boiler has been seen four or five times, and about 3.5ths of the number examined inside and in the flues. Thirty-four engines have been indicated, and reported upon, and in many cases great waste of fuel prevented. Of the explosions during the whole year 1870, three in the list were under assurance, No. 9 exploded from "furnow" beneath angle iron, No. 41 from seam rip at old repair, both invisible by inspection; and No. 69 from shortness of water. There have been four other explosions of assured boilers too slight to include in the list; three were from the collapse of Cornish boilers from shortness of water, and the fourth from rupture of the side of a furnace boiler through accumulation of scale. One boiler exploded which had been under inspection, but several times refused as unfit for assurance.

St. John's Church, Bethnal-green.—This district church, which was destroyed by fire, so far as the interior is concerned, on the 16th of February, 1870, was re-opened, after its restoration, on Saturday last; the preacher in the morning being the Right Rev. Bishop Staley, late bishop of Honolulu, and in the evening the Rev. J. Bardsley, rector of Stepney and rural dean. The restoration has been carried out under the direction of Mr. W. Mandy, architect. The expense will all be covered in the amount received from the insurance company. The choir stalls are within the chancel, and the altar raised upon three steps. The sitting accommodation has been improved.

Kirk Edge Orphanage.—The plans of this new institution for poor boys and girls of the Roman Catholic religion of the town and neighbourhood of Sheffield, at Kirk Edge, near Bradfield, which had been prepared by Messrs. Hadfield & Son, have been adopted by the committee, and the work is to be forthwith commenced. The whole pile, when complete, will give accommodation for 300 children. The building will be of stone, and, including the courts, will cover an area of 300 ft. square.

Opening of the New Synagogue at Newport, South Wales.—This new edifice has been opened for divine service. It is situated at the junction of Lewis-street and Francis-street, the principal front being to the latter, and forming a façade of Romanesque character, of which the centre comprises the entrance-porch, lobbies, and stairs, the left wing being the minister's house, and the right wing the synagogue. The exterior is of black rock limestone, having a rockwork face with quoins, strings, reveals, and arches of grey brick, and Bath stone coping, corbels, and keystones. The front to Francis-street presents a somewhat irregular elevation, of which the gable of the synagogue is the highest part. This has a group of four small ornamental windows in the lower part, lighting under the gallery set apart for ladies, and another group formed by two semicircular-headed windows, with a circular one above them, confined under a large semicircular arch, the tympanum or interval being filled with diaper mosaic work, in bas relief, of five-point stars and pellets. The minister's house, forming the left wing, is of the same character. The interior of the synagogue is 460 ft. from east to west, and 30 ft. wide, and is divided into eight bays by the corbels and elliptical arch-ribs of the roof and ceiling, which is of red pine, stained light oak colour, and varnished. The cost of the building, including all expenses, has been 1,023l. The builder was Mr. Chack. Mr. James supplied the marble-work. The architect was Mr. Lawrence.

Patent Gas.—A meeting of the proprietors of the Patent Gas Company (Limited) has been held, at the City Terminus Hotel, to receive reports on Dr. Eveleigh's patent method of producing gas at a low temperature in iron retorts. Mr. J. Ogle, in the chair, briefly explained that the company had been formed to purchase Dr. Eveleigh's patent, the experiments which had been made having fully borne out all the statements put forth in the prospectus. The result of their operations at the works had been highly satisfactory, proving that the gas made by the patent method was free from all injurious compounds of sulphur so prevalent in ordinary gas; that a higher quality of gas was produced from a lower quality of coal; and that the lighting power of the gas made was from 13 to 20 candles, as against 14 candles made from the same coal by the ordinary process. The subject had been brought before the Board of Trade, the Metropolitan Board of Works, and the Corporation of the City; and the two latter bodies had appointed committees to inquire into it. Dr. Letheby, who had examined the small experimental works at Peckham, reported favourably on the gas; and a report from Dr. Eveleigh was also presented. At a special meeting, held at the conclusion of the ordinary business, the directors were authorised to create a further issue of 2,500 shares of 1l. each, upon which a first call of 5s. per share will be made.

West-end Clubs in Danger.—Before the Select Committee of the House of Commons on steam-boiler explosions, some startling evidence was given with respect to steam-boilers in some of the leading West-end clubs of London. Mr. Fletcher of the Manchester Steam-Users' Association, stated he was of opinion that there was danger of the boilers in some of the clubs exploding. He mentioned clubs, political and military, to which his remarks applied; and the cause he assigned for this state of things was the fact that at these clubs the boilers were so badly set that they were inaccessible for the purposes of examination. The external brick-work went round the boilers in such a way as to render it impossible for an inspector to get round them in order to make his examination. Mr. Fletcher did not believe there was any danger of the boilers in the House of Commons blowing up, as they were new, and guaranteed to work up to 300 lb. pressure.

The Late Mr. Brassey.—A gift has just been made to the Benevolent Fund of the Institution of Civil Engineers by the three sons of the late Mr. Brassey, each of whom has contributed 500l. in memory of his father, and to mark the interest he took in the Fund and in the Institution, with which it is connected.

The Metropolitan Buildings and Management Bill.—The new Bill has not yet been brought into the House of Commons, and cannot strictly be said to be completed. Although printed by the Board, it is still open to alteration.

Registrar's Summary: London and other large Cities, 1870.—The population of London is now overflowing its borders, and the estimated population (3,214,707), and the dependent rates, can only be considered approximations, to be corrected by the Census. The mortality in the seventy cities of the kingdom was at the rate of 24.9 in 1,000. The mortality in the rest of the kingdom was at the rate of 23.1. For the year, the mortality was low in Portsmouth, Wolverhampton, Birmingham, Hull, and Sunderland; in these places it ranged from 20.1 in Sunderland to 21.8 in Hull and Wolverhampton. The mortality was highest in Leeds, 28.2; Glasgow, 29.8; Bristol, 29.9; and Liverpool, 31.1. The registered birth rate was 36.0 in the 20 great cities; it was at the rate of 40.1 in Salford, 40.2 in Leeds, and 31.4 in both Portsmouth and Nottingham. The ruling epidemic was scarlet fever. London and Liverpool were great sufferers. The mortality was at the highest rate of 31 in 1,000 inhabitants of the great cities during the coldest week, when the temperature was 3.5 centigrade degrees below the freezing point; it was lowest (21) in the genial weeks of June. The small-pox still ravages London; it destroyed 25,061 lives in the 31 years, 1840-70. The annual deaths averaged 808. The lowest number of deaths in any one year was 154 in 1857; the highest number was 2,012 in the year 1863.

Aquarium at the Crystal Palace.—The Crystal Palace Company have occupied the piece of ground laid bare by the fire of some years back, and stretching from the north tower to the door of the tropical department, by erecting thereon the necessary buildings for an aquarium on a great scale, the top of which will form a terrace leading to the north tower, while the visitors who pass through the aquarium beneath will be able to continue their walk through a new conservatory leading to the orangery in the north wing. The new aquarium is intended to be wholly marine in its character. The work is under the direction and management of Mr. William Alford Lloyd. The portion of the new building which will be open to the public is 320 ft. in length, and 35 ft. in breadth; two smaller rooms, 25 ft. in breadth, open into this long hall, and in these are placed smaller tanks. The tanks are sixty in number, and vary considerably in size, some being suited for the habitation of cod fish, and others more especially for the molluscs and other small denizens of the deep. Underneath the long hall is a great tank for storing sea-water, which will hold 130,000 gallons, carefully excluded from light. The whole of the work is rapidly approaching completion, and will ere long be a special attraction to the Crystal Palace.

The Jarrah Timber of Australia.—A great deal of discussion has taken place during the last twelve months relative to the durability of the jarrah timber of Western Australia; but, until the present time, no positive proof has been given to residents in Melbourne of its good qualities. There are, however, at present on view at the Flinders-street station of the M. and H. B. Railway Company there, three logs of jarrah timber which have, for the last thirty years, formed a portion of the jetty at Perth, Swan River, Western Australia. They have been drawn by the Government and forwarded to Melbourne with a view of exhibiting the capabilities of this wood. The logs are about 20 ft. in length, with a diameter of about 12 in., and, having been sawn down the full length and polished, exhibit the splendid grain of the wood to great advantage. The wood, it appears, is as firm and solid as when first hewn. The grain is close, of a fine dark colour, and taking a rich polish. Each pile bears a written certificate from an officer of the Western Australian Government. It is to an astringent principle in the wood poisonous to insects that its preservation is attributed.

Christ Church Cathedral, Dublin.—A magnificent offer, rivaling that carried out by the late Sir Benjamin Lee Guinness in his restoration of St. Patrick's Cathedral, Dublin, has been made by Mr. Henry Roe, of Dublin. Mr. Roe, who is a distiller, as Sir B. Guinness was a brewer, offers to defray the entire cost of the restoration of Christ Church Cathedral, Dublin, in accordance with a design prepared by Mr. G. E. Street. Mr. Street prepared a report on the subject two years ago.

Society of British Artists.—The exhibition now open in Suffolk-street comprises 897 pictures and 10 pieces. It is an agreeable collection, to which we may return.

Stockport Infirmary.—The new wing, which has been subscribed for by the public, is now advancing towards completion. Plans will be laid before the Board for the proposed enlargement of the Victoria Ward and the accident-room, the rebuilding of the porter's lodge, the erection of a hoist, and the building of a bath-room and lavatory, in connexion with that ward, from plans prepared by Mr. T. H. Allen, architect, the designer of the new wing. The cellar or basement of the new wing comprises washhouses, &c., where a shoot is fixed for the conveyance, from the upper stories, of the clothing, bed linen, &c., of the infected cases, preparatory to their being placed in a disinfecting tank. The ground-floor in front of the building includes dormitories, and day-room, for both male and female patients, with laboratories for each of the sexes, and separated by passages and openings. The room looking westward is set apart exclusively for small-pox patients, the laboratories and other conveniences being classified according to the sex. Above this is the one-pair floor or convalescent ward, with dormitories, &c., the nurses' rooms and surgeons' rooms being in the centre of the building for the convenience of the patients and their medical and home attendants. Looking southward are the fever wards, with the requisite baths and lavatories, approached by staircases distinct from those leading to the small-pox department. The plastering of the walls and ceilings has been completed with Keen's cement. The contractor is Mr. W. H. Brown. The fever-ward for females measures 26 ft. by 22 ft.; that for males, 24 ft. by 20 ft.; whilst those for the reception of small-pox cases each measures 20 ft. by 14 ft. The connexion between this wing and the present infirmary is effected by a long and lofty corridor, 5 ft. wide, with arched openings, supported by strong cast-iron columns. A hoist connected with the culinary department has been fitted up amongst the internal arrangements for the regular supply of rations to the patients in the upper wards. The two buildings are intercepted by an air passage 12 in. wide, with grida both back and front, so as to prevent the possibility of any infectious disease passing directly and internally from the fever ward to the general infirmary where convalescent cases of the ordinary class are treated. Externally the design of the new wing, which is of stone, has been adapted as much as possible to that of the old building.

University College, London.—The report of proceedings at the annual general meeting of the members of this college in February last, with the report of the council, &c., has been issued in a printed form. The most important academic event during the past year has been the institution of a new Faculty of Science, which marks a distinct stage in the development of the college, corresponding to the progress of public opinion in reference to the objects of the higher education, the effect of which is seen not only in the University of London, but also in the older academic institutions of the country. The main principle represented by the new Faculty is, that science should first of all be cultivated for its own sake, and that even where there is a practical object in view, a broad foundation should be laid of general scientific training. It is believed that the habits of thought thus engendered are the first conditions of all true advance, either in scientific discovery or in practical invention. A second principle is, that the pursuit of science should not be divorced from literary culture; and this the Faculty, from its position in University College, is specially enabled to uphold. Certain subjects are included which lie out of the sphere of Natural Science, as commonly understood, but none that do not admit of a strictly scientific treatment. Two additional ladies' classes, besides the chemistry and physics classes, namely, English and French, will probably be established in the college.

Trade-Unions Bill.—On Monday evening next, the 3rd April inst., a meeting of the Social Science Association will be held at their rooms in Adam-street, Adelphi, to consider a "Report of the Executive Committee on Labour and Capital on the Trade-Unions Bill." The chair will be taken at eight o'clock.

"Progress at Wells Cathedral."—We are informed that we were wrong in saying a complete statue on the upper portion of one of the towers had been renewed. The niche in which the statue kneels, with its elaborately worked canopy, is the only part, we are told, that has been really renewed.

Building Grants.—In the Commons, in reply to Mr. Raikes as to building grants to Church of England schools in Wales during the last six months, Mr. W. E. Forster, Vice-President of the Council for Education, said the principle upon which the Privy Council proceeded was, that no grants should be given for new schools to applicants on behalf of any religious denomination, unless the council was satisfied that the majority of the parents of the children likely to attend the school belonged to that denomination. That was a principle which he found when he came into the department, and he had carried it out with special care in Wales, on account of the denominational feeling which unhappily existed there. The council endeavoured to apply the same principle to existing schools.

The Biblical Archaeological Society.—A society has been formed, under this title, as our readers know, to encourage the study and application of the various discoveries that have been going on for the last thirty years in Egypt, Syria, and Palestine, and in any other places where research may bring to light historical material relating to Biblical history. At the inaugural meeting, held at No. 9, Conduit-street, Dr. Birch, of the British Museum presided, last week, and read an introductory paper, pointing out the chief objects of the society. A course of lectures was announced, the first of which is to be given by Sir Henry Rawlinson, "On the Relations of the Assyrian and Scriptural Chronology."

Asserted Paintings by Morland.—Some paintings on the wall of a ward in Whitecross-street Prison, now destroyed, were supposed to be the work of George Morland, who was at one time confined in it. It was feared that they would perish with the building, but Mr. George Ellis, we hear, has rescued them. It was a work of more than ordinary difficulty, as they had to be cut out of the solid brickwork from walls of great thickness; added to which the dry and brittle nature of the surface rendered the operation peculiarly hazardous.

French and Flemish Exhibition.—The annual exhibition of French and Flemish pictures (Pall-mall) will be open to the public on Monday, the 3rd inst. Several foreign artists now in England are acting with Mr. Wallis to promote its success.

Leicester-square.—In consequence of the opposition given by the ratepayers to the Leicester-square Improvement Bill, the Metropolitan Board of Works have withdrawn it. The Board have chiefly themselves to thank for this opposition.

Society of Engineers.—At the next ordinary meeting of the Society, Monday evening, 3rd April, a paper will be read on "The Ventilation of Sewers," by Mr. Baldwin Latham, president of the Society.

"How to Spend a Quarter of a Million." We have received a large number of letters in reply to our invitation. They will be considered at the proper time.

TENDERS

For excavating site for three mansions, Marlborough-place, Brighton, Mr. John Hill, architect:—
Rassbottom £250 0 0
Lockyer 200 0 0
Blackmore & Howard 190 0 0

For additions to Buntingford Workhouse, Messrs. Nash & Son, architect:—
Buns & Son £730 0 0
Cole, Bros. 640 0 0
Gibbons 587 0 0
Lawrence 594 0 0
Saggers (accepted) 573 0 0

For new Baptist Chapel, South-street, Greenwich, Messrs. Chas. G. Searle & Son, architects:—
Hammer £5,432 0 0
Dove, Bros. 4,215 0 0
Putnam & Co. 4,494 0 0
Todd 4,489 0 0
Higgs 5,343 0 0
Battley 4,394 0 0
Dover 4,158 0 0
Stoner 3,989 0 0
Ebnor 3,935 0 0
Copper 3,970 0 0

For two cottages, Wellington-road, Bow, for Mr. Christie, Mr. Ficker, architect:—
Morter (accepted) £1,169 0 0

For pulling down and rebuilding No. 275, Mile-end-road, for Mr. French. Mr. Dexter, architect:—
Hobford £375 10 0
Forester 344 0 0
Pierpoint 338 0 0
Granger 320 0 0

For rebuilding Camberwell Green-coat Schools, St. Giles's, Camberwell, Quantities supplied by Messrs. Pain & Clark:—

	Credit for Old Materials.	
Tully	£5,400	£54
Pritchard	4,857	88
Hart	4,940	125
Henshaw	4,880	110
Nightingale	4,870	110
Manley & Rogers	4,870	110
Carter & Son	4,787	80
Thompson	4,760	120
Hill, Keddell, & Waldram	4,650	105
Cooke & Green	4,536	95
Crabbe & Vaughan (accepted)	4,532	176

For new buildings at Battersea for the Dogs' Home, Quantities supplied by Messrs. Pain & Clark:—

Bracher & Son	£1,098 0 0
Colls & Sons	1,898 0 0
Wells, Bangs, & Co.	1,888 0 0
Manley & Rogers	1,827 0 0
Thompson	1,740 0 0
Tully	1,680 0 0
Cooke & Green	1,667 0 0

For four shops, New Cross, Messrs. Tolley & Dale, architects:—

Jerrard	£823 0 0
Feast	716 0 0
Thomas	680 0 0

For the erection of a shop and premises, Victoria-street, S.W., for Mr. Harris, Plans and quantities supplied by Mr. W. Cloutman:—

Bevan & Son	£254 0 0
Davis & Son	642 0 0
Hamblett	627 0 0
Diment	618 0 0
Howell	468 0 0
Church & Phillips (accepted)	460 10 0

For the erection of a Wesleyan Chapel at Grimsbury:—

Davis, Bros.	£1,731 0 0
Orchard, Bros.	1,693 0 0
Claridge	1,687 0 0
Kimberley (accepted)	1,574 0 0

For building three houses with shops in High-street, Southend, Essex, for Mr. Froom, Mr. G. Jackson, architect:—

Palmer & Son	£1,856 8 0
Wilkins	1,768 10 0
Harpur	1,750 0 0
Hulby	1,843 0 0
Harris & Wardrop	1,720 0 0
Dark	1,680 0 0
Keene (accepted)	1,490 0 0

For converting Welsh Chapel, Aldersgate-street, into a warehouse, for Mr. Clark, Mr. Wimbles, architect. Quantities supplied:—

Saich & Co.	£1,490 0 0
Easton, Bros.	1,478 0 0
Hansley	1,434 0 0
Ridley	1,343 0 0
Hart	1,290 0 0
Scrivener & White	1,289 0 0
Newman & Mann	1,335 0 0
Morter	1,169 0 0

For stables, including all fittings, for Mr. W. S. Burton, Inner Circle, Regent's Park, Mr. H. Saxon Snell, architect:—

Dove, Bros.	£1,455 0 0
Chappell	1,285 0 0
Howard, Bros.	1,344 0 0
Gibson, Bros.	1,196 0 0
Manley & Rogers	1,147 0 0

For the Royal Patriotic Fund Boys' School, Wandsworth, including engineering, drainage, gas and fittings of every description, Mr. H. Saxon Snell, architect:—

Higgs	£2,945 0 0
Hill, Keddell, & Waldram	2,880 0 0
Howard & Co.	2,139 0 0
Henshaw	2,075 0 0
Cnappell	2,036 0 0

For the rebuilding of Nos. 155 & 156, Aldersgate-street, City, for Messrs. M. & N. Salaman, Mr. H. Taberner, architect. Quantities supplied by Messrs. Franklin & Andrews:—

Little	£2,198 0 0
Sewell & Son	2,144 0 0
Rider & Son	2,120 0 0
G. Pritchard	2,985 0 0
Mark	2,039 0 0
Perry, Bros.	2,037 0 0
Palmer & Son	2,036 0 0
Cohen	2,029 0 0
Jane Pritchard	1,697 0 0
Merritt & Ashby	1,508 0 0
Brown & Robinson	1,983 0 0
Henshaw (accepted)	1,955 0 0

TO CORRESPONDENTS.

C. F. (a case recently reported in the *Builder* entitled the law that the alteration of the position of an ancient right in rebuilding does not necessarily affect the right. To increase the area would be dangerous)—S. A. C. (apply to the Society for improvement of the Working Classes, Exeter Hall)—T. G. L. (nothing effectual can be done. Some letters on the subject were printed in the *Builder* and no doubt, as to the sound of the front-door knocker, this depends greatly on how it is hung, and what it strikes against)—Professor G. D. R. L. W. C. E. S. J. H. C. A. G. R. M. F. A. H.—S. A. C. (Messrs. C. M. & R. J. A. C. C. & Co.—S. A. C. F. G. R. D. M.—Benevolent in Intention—W. R. C. R. H. B. O. R. A. M. J. B. C. S. R. O. H. J. H. S. A. F. W. C. O. P. A. Joiner—J. R. E. One of the Competitors—C. R. P. S. J. F. G. B. C. G. J. A. Birrer—Moon—P. R. A. L. W. M. C. P. D. R.—Cases under Building Act (next week)—T. & G. H. (next week).

We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

N.B.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

The Builder.

VOL. XXIX.—No. 1470.

Cottage Building and the Royal Sanitary Commission.



N the subjects of sewerage and water supply, we have already given the gist of the Commissioners' Report. We would now make a few remarks on the general bearing of other subjects. The Commissioners seem to us to have dealt too tenderly with some of the present difficulties, and propose to leave them pretty much as they are, still to obstruct the reformation of the sanitary condition of the country, difficulties which might very properly be brought under the control of the proposed new statute. The Commissioners, indeed, seem to have felt this, for they offer excuses for their omission. For instance,

it was proposed to them by several witnesses, that cottages built in country districts should be under the regulation of the local authority as to size and accommodation, and that there should be a surveyor for every union for this purpose. The following passage is vague, and of doubtful meaning:—"As regards rural districts, we recommend building bye-laws of a simpler character, but do not think the deposit of plans necessary. It would be sufficient to enforce by fine, compliance with the general regulations laid down by the bye-laws." Bye-laws simpler than what? They have yet to be made, and experience plentifully shows that when they are proposed to be made, some excuse will be made for not making them. And yet the Sanitary Commission would not have plans submitted for approval, but would allow objectionable houses to be built, and then, when the mischief is done, would fine the persons who built them. If the Commissioners had had any experience of the practical working of such legislation as this, they would have known that it is a very effectual way of establishing exactly those things which it is pretended ought to be prevented, viz., the insufficient size and number of rooms in cottage houses.

The Report goes on to say, "A large portion of the cottages in the country are built as part of farm accommodation, without adequate or, indeed, any rent being paid for them. This renders it exceedingly undesirable to impose any restrictions on cottage-building which would render the landlord less willing to expend his money without profitable return." This is a curious argument for a Sanitary Commission to use. It is simply providing those people who have too many excuses already an excuse for doing the very thing that a Sanitary Commission should be anxious to prevent. People who build houses for labourers to live in are but too ready to advance such excuses for the miserable semblance of a house that they cobble together for the dwelling of a labourer and his family. Plans are not to be submitted, but such places are to be allowed to be built, and then, by hook or by

crook, by some quite unknown means, the owner of such places is to be fined. And yet, which seems inconsistent, "it is right that in all cases such restrictions as are necessary to prevent unhealthy cottages being erected should be enforced." Yes, it seems that the necessity of doing this forces itself on the attention of the Commission, and yet they shirk the duty of suggesting some legislation which shall effect the purpose.

One way in which the Commission excuse themselves from suggesting any legislation on this point is by asserting their agreement with the opinion of the Right Hon. Lord Penrhyn, that much may be trusted to the rapid advance of public opinion to carry out improvement, without public coercion. But the Report does not mention other and very important evidence of this witness. We will, however, refer to the following remarks by his lordship, which very much qualify the opinion above given:—

Q. 7,868. "We have had it suggested that the local authority might have power to lay down regulations that there should be so many cubic feet of air in the dwelling-rooms of cottages, and that a cottage for a labourer's family should have three bedrooms. Do you think that such regulations might be entrusted to a local authority?"—A. "I could give you cases where it would be wrong, I think, to enforce such a stringent regulation as that. On my own property I have as many cottages, perhaps, as almost anybody, and have built a great number within the last thirty years. I have never allowed a cottage to be built without three bedrooms, except in particular cases, where it was for the family of an old widow, or something of that sort of thing; but I think it would be impossible to lay it down by a stringent regulation that you must in every case have three bedrooms, because, if they were not wanted, the people would take in a lodger, and you would get the house as much crowded as ever; but there is so much going on in the way of improvement of cottages, that I think it might be left to the operation of public opinion."

This seems at first sight to favour the opinion at which the Commission have arrived; but it must be said, while speaking with every respect of the noble lord, the witness, that he is on this question of labourers' cottages a directly interested party, and naturally does not wish any extraneous control of the manner in which his cottages shall be built. Every owner, of course, takes the same ground; and yet the witness finds it necessary to insist on the workmen building their houses according to a plan approved by himself or by his agent, as will be seen further on. Q. 7,870. "How are the cottages built at the great slate quarries? by the employers or by the owners of the land?" A. "Two of the great slate quarries in my own county are in the hands of the owners, and worked by the owners. In my own case I have built a great number of cottages. The workmen themselves have also built a very great number upon lease; but then I always insist upon their building according to a certain plan and specification, and they have taken a pattern from those cottages which I myself have built, and they are all remarkably good cottages now." With regard to some other quarries the witness says, "There are quarries scattered round, many of them worked by people who have no other property in the county; and there, I think, they are built on lease by the people themselves, or by speculators." So even here speculating builders come in,—and we know what the speculating builder is, left without control.

It is evident that Lord Penrhyn conscientiously looks after the welfare of his workmen, in respect of their houses; but we are well aware that there are other owners of cottage property who do not do so, and we think the whole tenour of this witness's evidence shows

that it is necessary that these houses should be built according to some approved plan.

The Commissioners do, indeed, think that new aggregations of people about a coal or iron field, or a fresh seat of manufacture, are frequently housed without any plan or sanitary provision whatever; and that in such cases it must be required that plans of new buildings shall be first submitted to the local authority, for the purpose of being brought into some general system, so that the population may escape the almost irremediable difficulty found where the houses, themselves miserably built, are arranged without order or system.

The Public Health Act, 1848, enabled the General Board of Health to apply the Act by Provisional Order, upon petition of not less than one-tenth of the inhabitants,—not being less than thirty in the whole,—or where it appeared from the returns of the Registrar General that the mortality had exceeded the proportion of 23 in 1,000. But the Local Government Act of 1858 deprived the central authority of that power, and gave the locality the fullest discretion as to the adoption or non-adoption of the whole or any part of that Act. The Commissioners remark that "It does not appear expedient to limit the application of the new statute by either of the above restrictions. Those places where the greatest negligence prevails, and where the most serious evils have arisen, are shown by the evidence and by daily experience to be the least ready to move by petition, or indeed, any other process; and the limitation of the central initiative to cases where the mortality has exceeded a certain proportion pre-supposes the existence of those mischiefs which it is the duty of public authorities to prevent by action in time, rather than to remove when too late, after the population has been diminished by death, weakened by disease, and demoralised by the pauperism and social degradation which ever accompany a low physical condition."

On the subject of officers, local and central, it is said that "some external pressure and vigilance is, especially in rural districts, necessary to force local sanitary authorities into action. Highly intelligent members of boards of guardians who have given us their opinions agree that if such boards are made the sanitary authorities in rural districts, they must at first be stirred up to and assisted in their work. It cannot be allowed that the health and strength of the people should suffer by their inaction, and many guardians would gladly avail themselves of an external pressure compelling them to act."

"The central authority, when, like the proposed new ministry-in-chief of local government, it is charged in one of its departments with the superintendence of all sanitary authorities, and equipped with a sufficient staff of officers, both medical and inspectorial, must, nevertheless, avoid taking to itself the actual work of local government. We would leave direction only in the central power. It must steer clear of the rock on which the General Board of Health was wrecked; for so completely is self-government the habit and quality of Englishmen that the country would resent any central authority undertaking the duties of the local executive. The new department will have to keep all local authorities and their officers in an active exercise of their own legally imposed and responsible functions; to make itself acquainted with any default, and to remedy it; it will have also to discharge to a much greater extent its present duties, namely, to direct inquiries, medical or otherwise; to give advice and plans when required; to sanction some of the larger proceedings of the local authorities; to issue provisional orders, subject to Parliamentary confirmation; to receive complaints and appeals; to issue medical regulations on emergencies, and to collect medical reports."

"The knowledge that power is in reserve,

together with a natural reluctance to be superseded in the management of their own affairs, and to have the power of levying rates transferred from representatives of the ratepayers to an office in London, will act as a stimulus to authorities, and render frequent recourse to those extraordinary powers unnecessary. It is probable that, when once convinced that the works must of necessity be executed, the ratepayers will desire themselves to administer the details, and to exercise control over the expenditure."

Well, yes, they probably would do so; but sanitary improvements cannot be effected by platitudes such as these. We should have liked to see the Commission, to use a not inapt simile, take the bull by the horns, and recommend for future legislation something tangible and practical to remedy the want of knowledge and the self-interested actions of local sanitary authorities. Instead of that, the Commission seem to have been afraid to disturb the comfortable policy of do-nothing which now is, and ever will be, popular amongst the ratepayers. Ratepayers, as such, have no *esprit de corps*. They send representatives to the Town Council or the local board as a matter of form with which they are obliged to comply, but these representatives are the most popular who know least about such things as sanitary improvements, and it is because the members of these bodies do not know what is required, and do not like to be told it by their officers or others, that practical rules ought to be laid down by supreme authority, and the local authorities be compelled to carry them out.

The Commissioners seem to think the General Board of Health of 1848 was wrecked because of its too arbitrary exercise of power; but from 1848 to 1870 is a long time, and during that period the English public have had their attention very much directed to sanitary questions, and it is not at all too much to say that, if the General Board of Health were now again proposed to be formed, there would be but little opposition to it. There were reasons for its non-success of which we are well aware, but to state them would serve no public purpose; they were not, however, as we think, those which seem to have been supposed by the Commission.

If the General Board of Health, starting with a good and true idea, exaggerated its importance, and tried to supersede by it much former experience and sound knowledge (which, indeed, cannot be denied), it did at the same time establish in the main a system which has proved to this day beneficial; and all countries, but our own especially, are now receiving the benefit of the wisdom of the founders of the General Board of Health, without it may be added, any public acknowledgment of it. Whatever may have been the errors of that Board, later experience has shown that in the main its doctrines were right; and with the elimination of a few of its precepts, it might be re-established to-day with advantage to the country.

MEASURING AND VALUING ARTIFICERS' WORKS.*

If we concede that two heads are better than one, we are bound, perhaps, to allow that three are better than two, and to look with especial leaning towards work that has passed through the brains of three persons, notwithstanding the limit our ancestors put to our acceptance of the first proposition in the statement, that too many cooks spoil the broth. A volume is now issued entitled "The Student's Guide to the Practice of Measuring and Valuing Artificers' Works," which is the result of the labours of three persons, and which appears, in many respects, to have arrived at the completeness which the teaching of the ancient adage would lead us to expect. Written many years ago by a retired surveyor, who, it appears, did not live to see it through the press, the MS. was placed in the hands of Mr. E. Dobson, who edited it; and now, after a long interval, a new edition, with considerable additions, has appeared, under the auspices of Mr. E. Wyndham Tarn. Many new materials have come into vogue since the retired surveyor framed the original work, as well as new applications; and mention of these has been engrafted upon it, so as to bring it up to the requirements of the day. Mr. Tarn is also especially to be credited with a large amount of

extra information, concerning technicalities and modes of construction, indispensable to the guidance of the student.

Full and able as we find this three-ply guide to be, there is still instruction missing in it that many a student would be glad to find. Everybody allows that it is easier to build a new house than to successfully adapt an old one to increased requisites; and in the same way it is easier to measure new work than to ascertain the value of additions to existing structures. This is a difficulty that Mr. Tarn has overlooked. Students will turn to his pages for information concerning the proper allowance to be made for work erected at a height by the aid of scaffolding, and not find instructions upon this point. Let us say two stories have to be raised upon an existing house. The first thing to be done is to unslate the roof and pack the slates for re-use. Now, turning to Mr. Tarn's chapter on slating, we find there is not an inkling of the fact that, in such cases, only two-thirds of the slates may be calculated for as fit for further service, owing to breakages, &c. And turning to his chapter on brickwork, we perceive there is not the least intimation that a higher value should be put upon work executed at the full height of a house from the ground. Nor, anywhere, do we find any indication of the value to be allowed for, or deducted for the use of, old materials.

On the other hand, however, there is absolutely but little left unsaid about new materials, either as to the manner of their use, their cost, or the mode of ascertaining the quantity used. The retired surveyor who penned the first outline of the work could scarcely have calculated upon the large and general use now made of iron. Yet here we have a full enumeration of the purposes to which it is now applied. Electricity as a means of communication, instead of bells, is unlikely to have swum before his eyes even in a dream. And such luxurious contrivances as felt beneath slates, or appliances to prevent sounds being heard from one chamber in another, or hollow bricks, and similar cunning inventions could not have entered into his calculations; yet they are all here. There are, also, so many kinds of tables in this volume for facilitating measurements and calculations, that at first sight it might be taken, momentarily, for a "Ready Reckoner."

Two tables that are inserted will be found useful for reference on the veracious question of obstruction of ancient lights. This source of so much unneighbourly feeling is subject to rules and regulations like most other things; and Mr. Tarn's abridgment of the law may, in nine cases out of ten, save the trouble of further reference. The tables alluded to show the relative values of light entering a vertical window from different parts of the sky surface, on the hypothesis of an equal diffusion of light, and of a variable diffusion.

An important item in the practical value of the book consists in the eight plates figured to show the proper mode of measuring. There is a ninth plate for a frontispiece; but we exclude its very familiar face,—it is the north door of the refectory, leading into the cloisters of St. Maria's Abbey, Beaulieu,—as scarcely bearing upon the subject. The first of these eight plates shows one of the plainest of the plain brick houses that were the fashion when Baker-street, Harley-street, and their numerous followers were built. It is complete even to the kitchen, looking duly out of its two oblong windows into the limited oblong area; and it has a first and second floor. It is accompanied by sections and details, all measured; and in the letterpress is a description of the methods by which the measurements are taken. The next plate belongs to the trades of the carpenter and joiner, and shows the various ways of laying floors; and of replacing a board in the middle of a doweled floor without disturbing the dowels, a process easy enough to those who know how to do it, but which must look very much like a Chinese puzzle to the unfigured student. The construction of gutters and bearers, bracketing, plasterers, and dados, is shown on the next sheet; and these items are also figured, to give the quantities used. Doors and windows occupy the fourth sheet; staircases fill the fifth and sixth; on the seventh the mason is instructed how to measure his details; and the eighth gives some supplemental doors and windows, of a more elaborate character, duly measured. All this is, of course, real technical instruction, that is sure to be needed.

The next feature of value in the work consists in the minute, yet not tedious, descriptions

of the manner of following out the different trades. Dipping into the chapter on masonry, for instance, we see every kind of tooling described; and not only this, but the different modes of tooling various stones. Granite is seldom worked by the masons accustomed to softer stone; a mason from over the border is sought, if the work be in the north; and he thus talks of his mode of operation, "Will ye hae it hammer-blocked or scappled, rough-picked or close-picked?" And if a finer finish be required than either of those, he will ask you to choose between single-axing and fine-axing. Mr. Tarn has all these terms duly noted and explained, just as clearly as those in use connected with ordinary masonry. The localities of the leading stones are also given. When any one has read and thought over this section, it is not too much to say he must be unimpressible indeed if he have not a very fair general idea upon the subject of building stones. Some effort of memory, doubtless, will be required to master the abbreviations used in measuring, to distinguish cube Portland, plain work, sunk work, moulded work, circular work, circular circular work, circular sunk work, and circular moulded work; but that is all. The directions here given are both precise and full; and a mason's bill of quantities is added, in which the proper rotation is observed.

And so, too, in carpentry. Beginning with the three kinds of naked flooring, single-joisted floors, double floors, and framed floors, and passing on upwards to roofs, Mr. Tarn gradually habituates them with every kind of workmanship and timber, describes them, measures them, and puts the student in the way of making a bill of quantities in the proper rotation. He gives him two strings to his bow in the matter of measuring, giving him choice of taking the superficial contents of roofs, floors, partitions, &c., at per square of 100 ft. for the labour and nails, and then the cubic contents of the timber without labour; or of measuring the cube contents of the timber as cube fir and labour, framed, &c. The list of abbreviations in use in these trades is very long. As in masonry, the initial of a word stands for the whole of it. Thus, L.N.O. stands for labour and nails only; W.L.S. means wrought one side; M. & C., mixed and chamfered; and so on. S., that, carved on the bark of a tree or elsewhere, might mean Sarah, or Sophia, or Sophroniaba, in a carpenter's bill stands for sunk. D, over which the student may have dwelt for hours, attempting to intertwine it with his own initials as a possible future monogram, signifies dovetailed, and nothing more. The author properly remarks, "in abstracting carpenters' and joiners' work, the greatest possible care must be taken to prevent confusion; for when several thousand dimensions have to be entered under their respective heads, unless a regular rule be observed in drawing out the abstract, and placing every description of work in the situation usually allotted to it, much time would be consumed in referring to the different heads." But for the abbreviations to which we have alluded, every document relating to artificers' work would be quadrupled in bulk; hence their convenience.

There is no attempt to give the current prices for labour or materials. For this information other sources must be applied to.

Among the new materials and appliances that we have concluded were unknown to the original author of the work are revolving shutters. The principle of these was known, doubtless, at the time, but not its present useful and wide application. Mr. Tarn enumerates several kinds. There are those that wind round a roller at the top or bottom of a window by means of a worm and wheel, and those wound by chain-winding gear; there are those that are made to wind round the shutter horizontally; then there are those that are made to coil by means of a steel band passed through all the laths; and a fifth kind made of one sheet of corrugated steel worked up and down by hand without balance-weights or gearing. A revolving shutter for a window 10 ft. high, Mr. Tarn says, requires a space of 9 in. for the coil if made of iron, and one of 12 in. if made of wood; whereas a self-coiling shutter for a window of the same height requires a space of 12 in. if made of wood, and 10 in. for steel. Over and above these there is the "louvering shutter-blind," a combination of the revolving shutter and outside Venetian blind. As a specimen of the instructions we will quote the directions for measurement:—

"Revolving and coiling shutters are measured by the foot superficial, and priced according to material and

* "The Student's Guide to the Practice of Measuring and Valuing Artificers' Works." Originally edited by Edward Dobson, architect. New edition, with additions, by E. Wyndham Tarn, M.A., architect. London: Lockwood & Co., 1871.

gearing; an additional charge per foot is made for shutters under 6 ft. area. In measuring, the full width is taken, which is 2 in. more than the sight measure; and the height is 9 in. to 12 in. more than the sight measure in shutters working vertically.

In measuring shutters which work horizontally, the actual dimensions are 6 in. in height and 9 in. in width greater than the sight measure."

And the writer goes on to warn persons preparing for revolving shutters that they should make provision for the easy removal of all linings and casings, so as to allow of access to them and their gear, for the purpose of oiling, cleaning, and repairing. The other new items are described as carefully: we have simply selected this as one worthy and likely to be used still more generally than it is at the present day; for there are still many towns in the country into which this useful article has not been introduced; and this mention of it may help to place it in the category of ordinary building contrivances. Earth-closets; Venetian, Florentine, and Spanish blinds; hydraulic and other lifts; and modes of warming and ventilation, also come in as sundries and novelties not coming under the heading of either of the trades; but in each artificer's department there will be found a still larger array of new objects and treatments. The process of galvanising iron and zinc comes in the chapter on smiths' work, as do such matters as steel ribands for easelines, iron stable fittings, as well as fire-proof flooring, and other modern inventions on a larger scale. In the chapter on decorators' work will be found mention of many of the new artistic modes of decorating coming into vogue.

As we lay aside the volume, we think of the worthy surveyor who originated the book, with the results of his fifty years' experience. He wrote,—"If the student intends to maintain his independence and be respected, he must make a point of conscientiously doing his duty with the strictest integrity; to accomplish which, it is not only essential that he be honest in his intentions, but that he should be qualified for the business he undertakes." We altogether agree with him, and cordially recommend the result of his endeavour to give this qualification. We feel, too, that Mr. Tarn has increased its usefulness by his revisions and additions.

THE DEPTFORD DISTRICT.

RAMBLING in search of information, we passed down the river to the Commercial Dock, and afterwards proceeded through a portion of Rotherhithe, finally directing our attention to the district of Deptford. It would be wearying to our readers to enter into minute details of the social life and social wretchedness we encountered in our rounds. We can only certify to its existence, or at most adduce an instance or two by way of illustration, hoping that our remarks may lead to improvement.

It is necessary to look back for a moment or two that we may be able to realise the state of things more readily. The commercial and naval importance of Deptford dates from the time of Henry VIII. It is connected with a portion of English history, and anything connected with its industrial career and resource is a matter of general interest. It is not, however, our purpose to touch upon Deptford historical and national; our picture belongs to the social canvas, and certain lights and shades attendant.

Poor Deptford has suffered sorely of late. The depression in the iron trades and the closing of the dockyard have sent some thousands of skilled hands adrift. Some have passed southward and northward; many are to be found along the coaly Tyne and Wear, and not a few on both sides of the Clyde. The greater portion have unfortunately been forced to emigrate to America and the colonies, taking with them that acquired and masterly skill which may sooner or later be badly needed at home. In the collapse of the iron and timber shipping interest and the various trades in connexion, Deptford has indeed suffered a severe blow, from which it will take her some years to recover. Poplar, Blackwall, and Millwall have also suffered since the termination of the American war. The little indigenous trade that remained on the north side of the river for the last few years, was altogether insufficient for the vast number of hands that remained, hoping against hope, that things would somewhat turn. Soon came poverty, sickness, discontent, emigration, and in numerous instances the stow-away and parish workhouse.

For many months past in Deptford, holidays have been kept on, and shops occupied, though enough to pay the rent and taxes has not

been made. Even public-houses, which are the last to give up the ghost, have been obliged to advertise "reasons for leaving." No place about Deptford has felt the pinch so severely as the vicinity of the dock and victualling yards. The public-houses, the provision shops, butchers, bakers, greengrocers, and all else who lived by the distribution of the large sums of money paid in wages, soon realised the loss of custom, but as a matter of fact all Deptford and Greenwich in one way or another experienced it.

The old and modern portions of Deptford are so much mixed up together, that the sixteenth and seventeenth century characteristics of the locality have all but faded away. The asylums for decayed masters and pilots, and their widows, belonging to the Society of Trinity House, are old structures. One of these was built in 1655. It forms a quadrangle, with garden space in centre, and a statue to the memory of Captain Richard Maples occupies a space upon the central walk. He died in 1680, leaving value to the extent of £1,300 to Trinity House, and that bequest went to the building of a portion of these almshouses. The old building, as a design of the seventeenth century, and a bit of execution in the red brick of the period, is worthy of observation.

Some half-timber houses will be found in the older portions of the town, whose roof and wall construction will interest. The High-street of Deptford is of moderate width, and fairly clean, but in passing down a few of the side streets on either side, we met with much neglect. We found some narrow lanes and courts in a very bad state,—Queen's-court, Brunswick-square, Regent-street, Queen-street, and the thoroughfare alongside the railway.

We entered a narrow gut, called Tinder-box-alley. This alley has an opening into Brunswick-square; and on a wet day the latter spot can be little better than a swamp. The roadway and footway here are rooted up, as if all the pigs in the parish made it their rendezvous. On the comparatively dry day of our visit there were pools of puddle before the doors, and a number of dirty children, bare-headed, bare-footed, and sickly-looking. Poor things, we have not the least doubt, if we questioned them all as we questioned some, we should have heard a similar tale. Hunger is often allied to dirt and want of employment, coupled with ignorance. We found several houses in an uninhabited condition, and many shut up by landlords, who turned the tenants out, being unable to get their rents.

Beside the dockyard there is a one-sided blind street, called Czar-street, evidently owing its name to the tradition of Peter the Great once working in Deptford Dockyard. Old residents will point you out the spot near here where the great Peter's house once stood, or, perhaps, where he lived, if he ever was in Deptford. Czar-street is a woe-begone spot to-day. The few houses that occupy it are half-habitable, and half the number of these are not at present inhabited at all. There is no din in the dockyard opposite. No anvil's hammer or ship-carpenter's mallet is heard giving a thud, no smoke curls up from the chimneys, the whirl of the steam saw and the clink of the riveter's hammer are drowned in an ominous and unutterable silence,—there is no work, so there is no echo.

During the winter there was much poverty and suffering through Deptford. A Coal Society and a Soup Institution did a little to relieve the sore distress, but much undoubted misery remained untouched. One picture of living life which we came across is as much as we have space for at present. It will serve to illustrate the struggle for existence now going on in many of the humble dwellings of Deptford.

In one narrow old court of five inhabited houses, we found a woman outside the door of her house hard at work in cross-cutting some old ship-timbers. The saw was one of the framed kind, and the poor woman, though she was exerting all the physical strength of her system, was scarcely able to keep it in motion from it not being properly set and sharpened for such work. She paid 1s. for the few irregular junks that lay outside her door, and before she could earn 1s., a day's labour of cross-cutting, splitting, and tying into bundles, assisted by her only son, would have to be gone through. Her husband was for some time dead; her son, who was about fifteen, formerly earned, for a short period, 8s. a week at some saw-mill, but had met with an accident, by which he lost the first finger of one of his hands. He was now her only help and assistance in her own labour. She

had a daughter whose husband had deserted her five months since, leaving her with one child, and this daughter was expecting to be confined in a few days. On the occasion of our visit the young woman had applied in vain, at least once, to be admitted to the workhouse, in anticipation of her certain sorrow. Her mother kindly took care of her little grandson. The poor old woman's average earnings were about six or seven shillings a week with her son's help; on rare occasions it might rise to eight or nine, and it was equally certain at other times she might not earn more than four. The house had three rooms, small and confined indeed, but in this instance they were kept fairly clean. It would not, however, be a very great feat of strength if the whole household effects were bundled tightly together, for one man to carry them. Three shillings were paid for the rent, and the poor woman, paid a collector twopence a week "burial money." "You know," she said, "We must be buried, sir." She could not brook the idea of a parish coffin. She hoped for Christian burial, and for the purpose of securing it she had paid regularly for many years her weekly pence to a burial fund. She told us that she did not taste a bit of meat from one end of the week to the other. It was nothing but the weary cup of tea and the baker's loaf. Dripping supplied the place of butter, and a bloater or a few sprats kept her heart from "watering after higher luxuries." Vegetables were out of the question. A few small onions fried in the dripping would be procured now and then; but tea, tea, tea, dry bread, and the rent, swallowed up all the earnings of mother and son.

Such is a picture of life's struggles in the outskirts and the interior of London; and it may not be amiss to remember that though there is no investing army outside the capital, nor besieging batteries planted on the heights of Hampstead or Highgate, yet thousands of the poor are starving in this non-besieged capital.

A good number of the labouring population of Deptford find employment along the river side or in connexion with the Commercial Docks. The employment in the latter place consists of unloading and piling timber, and it requires strength, practice, and judgment. The division of labour in this sort of employment produces bodies of men known by the name of "gangers," "backers," and "lumpers." Without going into detail, the "gangers" may be said to be a class of small masters, who undertake to unload the vessels for the captains; the "backers" are men employed by the "gangers" who work at the unloading or piling; and the "lumpers" are the irregulars who work when they can get it, or who work subordinates in busy times to the "backers." There are, however, "master lumpers," who will undertake to discharge a vessel of its timber, either in connexion with the captain's crew or without their help, according as it may be agreed upon, and these "master lumpers" employ "sub-lumpers."

The system of payment at the Commercial Docks for unloading timber cargo is regulated by what is termed "the St. Petersburg standard." Say, for instance, 120, 12 ft. by 1½ in. by 11 in.; or 60, 12 ft. by 3 in. by 11 in. Whether the number of deals vary in length or thickness, the rule is always adhered to of making them up to or reducing them to "the standard."

The "gangers" earn about two guineas a week, the "backers" from 6s. to 8s. a day, when busy, and the "lumpers" or irregulars from 4s. to 5s. per day when employed. The "gangers" have the advantage in the winter time, when the timber trade is dull in the docks, of being found in constant work in sorting and piling the timbers, a good luck that does not of necessity fall to either the "backers" or "lumpers."

The timber auctions and sales which take place subsequently in the City and in the docks carry the subject of that which we have noticed further. From the ship to the dock, from the dock to the saw-mill and the builder's yard, and thence into the building. Not many months, indeed, separate the tree in the forest from its transformation into a roof-tree in London.

The waters of the Ravensbourne, which in its confluence with the Thames forms Deptford Creek, are most noisome and foul, as far as they are navigable. The sight at low-water of this open sewer is most shocking, and in the summer weather it cannot be otherwise than dangerous to health. We do not know if the Thames Conservancy give it a thought, but we are certain that if they would bestow a little attention on this Deptford puddle-dock, there

would be less delta sewage to be dredged from the Thames. There are many local tributaries yet polluting the river between London Bridge and Barking.

The name of the famous John Evelyn, 1620—1706, still exists in connexion with Deptford, in the name of a street and an estate, and we even noticed among the living localised the name of Pett, but whether a descendant of the great ship-builder, Captain Phineas Pett, whose ancestors, for the space of two hundred years and upwards, were connected as officers and architects with the Royal Navy, we know not. The famous Phineas, however, resided at Blackwall in James I. reign, but the family name continued down in connexion with our naval dockyards to the end of William III.'s reign.

The working classes and shopkeepers of Deptford are indulging at present in strong hopes that the proposed conversion of the Government dockyard, or a portion thereof, into a cattle-landing depot and slaughter-yard for the City, will improve business in this locality. No doubt the existence of a large abattoir in Deptford would open up other shipping resources connected with the home and foreign trade depending thereon. Whatever tends to give employment to the unemployed lightens the public burden.

Deptford and its neighbourhood will need to see the uprise of a stronger local trade than miserable wood-splitting, if her poorer population is to be preserved from extinction. Fire-wood is indispensable, but the wretched pittance that women, girls, and boys earn at this work hardly keeps them above a state of semi-starvation. Half-housed, half-fed, and half-clothed beings cannot be happy,—cannot be good. The temptation to vice and crime among such a class is unfortunately strong. Hunger may drive many to do wrong, but independently of this, examples are plentiful in our midst by which both sexes may escape one evil, but it is only a tardy respite earned by the barter of body and soul. Honest work alone can make men and women happy, and it were to be wished that in the interior and environs of this huge metropolis labour were more abundant. If it were, want and suffering would visibly decrease, and dirt and sickness could be more easily combated. We have witnessed painful scenes, and entered dismal and terrible homes, in all quarters of London, and we must say, after a careful consideration of what we have encountered, that the neglect of local authorities is greater than the individual neglect. The very poor need to be assisted to preserve their health, that they may outlive their present necessities. Low diet and want of clothing often leave them a prey to epidemic diseases. By removing from the vicinity of their dwellings those accumulations of filth and germs of pest by which they are constantly in many places surrounded, the poor will be enabled to resist attack. The poor are as often poisoned by neglect outside their thresholds as within them; and though they are free to complain, they are powerless to compel landlords or local authorities to help them.

In touching upon the condition of Deptford, we might also have instanced local neglect in Greenwich in more places than one, and cited pictures similar to those we found in the former place.

HOUSE-BUILDING BY SIR CHRISTOPHER WREN AND MODERN HOUSE-BUILDING.

We have often contemplated what is said to be, and is thought generally to be, improved house-building,—that is, in other words, what it is possible to leave out of and to add to a common house, as put together in the last generation, before patented contrivances in building came into use and fashion, and before "improvements" commenced. We cannot but think that a short notice of them may prove of some value to many readers, who must be doubtless interested in this subject of house-building, and, let us add, house-decoration. House-building is the beginning of architecture and of building, and the motive of painting; for a decorated house is, to a certain extent, a painted house, and art in it, irrespective of its architecture, becomes a necessity. Nothing can be more instructive than to go into a house built in the beginning of this century, in some of the older and more worn-out parts of London, and to be told that the said house is old-fashioned, and to have the several old-fashioned bits of it pointed out to you and severely commented on, and no small amount of contempt thrown on it, when any-

thing in it is contrasted with the things that are now all the rage in modern and improved house-building. "Old-fashioned" (if we may use that phrase as a descriptive one) house-building, not now to speak of Gothic work, may be said to have commenced and been well-nigh perfected by Sir Christopher Wren and Inigo Jones and their successors, and is exemplified by such buildings as Hampton Court, Chelsea Hospital, many houses in Lincoln's-inn-fields, and in the older parts of the City and Westminster, more especially in parts of the present Deanery, with its palatial staircase by Inigo Jones, and, indeed, by hundreds of houses scattered here and there in most of the unimproved parts of this great city. Here, then, it is that the question arises, what is "improvement" in house-building, and where does it begin and end, and what is there better, or so good, in the most modern of houses that makes it a better place to live in and look at than an unimproved house, built in the days of Wren or Inigo Jones.

First, let us call the attentive reader's notice to one very remarkable *alteration*, as we may call it, in common house-building. Most readers will have noticed, on going into any old-fashioned dingy-looking street, that the houses of it, more or less neglected, have all of them *dormer* windows in the roof, and a more or less visible roof, the sloping sides of which are visible from the opposite pavement. This is antique enough for our great-grandmothers to take delight in, and the appearance of an upper room thus lighted by "dormers" is quaint enough, and, when empty, sufficiently ghostly even for a novelist. In such rooms pretty nearly the whole concourse of authors of the last generation and the one before it, seem to have lived and worked in their vocation,—old Sam Johnson, Chatterton, Savage, and a whole host of them. But few are the London streets in which modern improvement has not found its way; and if the wondering spectator look a little closer he will perceive that in one or two or more of the houses the dormer windows have disappeared; that the front wall of the house has been raised some feet; that no roof is anywhere visible; and that, in place of the old-fashioned dormers, the ordinary plain openings called windows, similar to those below them, have been substituted. This was the very latest improvement in common house-building a few years back, and many are the streets that have been denuded of all picturesque by the change made in the upper stories of the houses so altered. The interior of an upper room so built is, of course, just the same as that of the one under it; the inconvenient dormer and sloping front wall are gone, and most certainly the "hostels" with them.

Now comes a most curious fact. Few will deny that this was a move in the right direction, and a vast "improvement" on the old style of doing things; and one would naturally have expected that every house in London pretending to newness and modernism would have been built in this scientific way; but, strange to say, if you now go down into the aristocratic regions of Belgravia, and look at the monster new houses there, with stone fronts, covered with carving, and fitted with all kinds of patented contrivances, and with every available new material and newly-discovered mode of construction, you will discover that the old-fashioned, inconvenient, and picturesque "dormer" has been revived, and that the roofs of the new houses, so far from being hidden away as things to be ashamed of, are almost painfully visible, no opportunity having been lost to force them into notice; indeed, so much so, that some of the upper rooms are in the roof itself, and have four sloping walls to them. Now, this is all very curious when we come to think of it; for it shows how what is improvement and improved construction and science in one generation, or in one year, is barbarism and bad construction in the next. It is for the reader, according to his proclivities, to say which is best. We would but remind him of the service or disservice, whichever it be, which was done to architecture when attention was called to the artistic value of the old Gothic system of roofing, and to the works of those who evidently thought that the roof of a building was a good feature in it, told its own story, and that consequently the roof ought to be visible and to show itself, even at the sacrifice of some interior convenience. We name this first, because it is the most noticeable thing that has been done in house-building, and because, what a few years ago was an old-fashioned evil, and even nuisance, is to-day a merit and a something to be got at, almost at any price. If we may be

allowed in this place to have a taste, it is for the dormer, both inside and outside, being partial to shadows, goblins, sloping roofs, old memories, and what not; but how it has been humanly possible to force all these horrors on the Lothairs of Belgravia, or even Clapham, or Highgate, to say nothing of "Palace Chambers," may remain a marvel for the curious. What will the very next improvement consist in,—roof visible or invisible?

But now for the room of rooms, the first thing of all, the drawing-room: what improvement, it may be asked, has been effected in it? In the houses built by Wren (and here we are bound to say that there are none so good artistically in any way, or so quaintly convenient, and that no improvement has been made on them by modern men, as the reader will see) the first thing that strikes one is, that the lower parts of the walls of the room are always *wainscot* up to about 3 ft. or 4 ft. from the floor; in the best houses the walls are entirely wood lined, and that the massive cornice which supports, apparently, the ceiling, is of wood like the walls, and not of plaster. Even in comparatively small houses this wainscot lining is always present, and gives to rooms of this kind a look of comfort and warmth which no papering can do. The modern improvement, consisting as all know, in *peperhanging* the room from the paltry little cornice of thin mouldings down to the 9-in. board, which makes up what is called the plinth, and which is but just enough to prevent the chairs and tables from breaking to pieces the wall plastering. A good deal might be here said on mouldings and ornament, and wall and ceiling decoration, and characteristic wood carving; but all this we must leave for the present, and next ask the attention of the reader to the *windows*, or rather window openings. In most, if not all, houses, whether large or small, and newly built, the window openings will be found to be not only out of all proportion to the cubic contents and size of the room, but the window jambs on which the shutters fold back, are what is termed *splayed*, i.e., the angles are out off so as to throw all the light that is possible into the room, and so as to avoid shadows; indeed, shadow is almost impossible in a room thus lighted, until curtains come to make up for the want of the proper amount of walling, so that this inordinate amount of splay not only spoils a room artistically, but makes it almost impossible to warm it, as no amount of curtain, however thick, can make up for solid wall. In the noble rooms at Hampton Court it may be seen how Wren managed these things, and no one who but glances at them will contend that house and room contriving is in course of improvement, or that we are mending Wren's way of work. All dignity and nobleness in an apartment are utterly destroyed by it. It is almost needless to mention that last effort of modern science, the huge plate of glass which fills up sometimes the whole window without apparent support of any kind, or dividing window-bars, so that it looks as if there were no window at all. It is quite impossible to look at two rooms, the one old-fashioned and the other new and improved, without the fair acknowledgment that no real improvement either artistic or constructive has been or is being made in common house-building, still less in palatial house-building, wherein something more than mere utility is sought after. We say nothing of fireplace, chimney-piece, or stove, either as matter of architectural design or as apparatus for affording heat, as almost the sole wonder of every one must be how the fire in a modern fashionable grate burns at all; you can only congratulate the owner of the big house on his unlimited means, that fuel is no object to him, and that such are the mighty laws of chemical action as to compel the burning of the fire if but the fuel is sufficiently plentiful, and that he is content to see it, piled up almost out of sight and in the chimney.

But of all things appertaining to new and improved scientific house-building and contriving there is nothing that can possibly compare with the *staircase*, and stairs, and hall of approach. We but lately had an opportunity of witnessing the pulling-down and total destruction of a fine house, or, we had almost said, a mansion, not far from the Bank of England, designed and put together in the old-fashioned and unimproved style, and underwent not a few pangs of sorrow and dismay at the sight of such ignorant and thoughtless demolition of a good thing, and one which it would have been almost a patriotic act to preserve. Let us preserve but the *memory* of a part of it,—the stair-

case. Most people know what a modern staircase is, even in a grand house. You do not walk up, you must climb up; but in this instance the whole staircase seemed contrived so as to lessen the labour of passing from one floor to another. Surely there must be some one proportion better than another for the height and depth of a common stair. These were wide enough to stand on, and not too high to ascend with ease and without effort,—the stairs of efficient width for apparent as well as real space and utility, and the hand-rail large enough to lean on, with balusters, not made out of thin square strips of wood or cast-iron scroll-work manufactured by the mile, but were carefully and thoughtfully designed and elaborately carved, and massive enough to give the appearance as well as the reality of strength. The landings were so divided that no flight of steps became too long; indeed, it would be difficult to see how such a staircase could be well improved on, or what you could do to make it better, or how better to proportion it. Many houses there yet are wherein may be seen staircases of this kind; but we would specially note the one by Inigo Jones in the Dean's house, Westminster. It may be seen in a drawing in Britton's book; but, of course, to be thoroughly appreciated, the staircase itself and the hall it stands in must be seen. It is really wonderful how its architect contrived to make so much out of so little, and to put into so comparatively small a space a staircase fit for a grand palace. The one we refer to was not certainly so fine as this, but quite rare as we are that no modern and improved stone stairs, each stair some 6 in. or 7 in. high, and 9 in. or 10 in. tread, and with break-neck length of flight like a stable ladder, could by any one be compared with it. It may just be mentioned that the material of it was good oak wood, and that it was all carted away in broken fragments for firewood, with the rest of the lumber, to make way for "improved offices," which cold, inconvenient, comfortless places need no description, as all to their cost know but too well what they are!

We note this from the fact of our seeing and witnessing the destruction, and to show how fallacious is that notion which so many seem to hold, that everything, including house-building, is in rapid course of improvement. We absolutely deny it, and strenuously maintain that not only is there nothing in a modern and improved house of to-day which is better than that which Christopher Wren and Inigo Jones, and their immediate successors, built up and contrived; but that all and everything, if thoroughly looked into, is a retrogression and falling away from their mode of work. We might, and may yet, go into details in proof of this, and to show how, if you want to see good and comfortable English house-building, whether little or big, it is not to be found in the improved system of house-building that is now in vogue, and is to be seen even in Belgrave, much less in the little streets of Camden-town, Portland-town, Kentish-town, or "Victoria" streets; but in the rapidly disappearing houses of Wren, and those who immediately succeeded him, and before a single patented contrivance or modern house improvement was thought of.

FOREIGN PICTURES IN PALL-MALL.

MR. WALLIS opens with the opening month of spring a bright and fresh collection of pictures by artists of the Continental schools. Under the present conditions of the Continent, it is highly to his credit to have brought together so good an exhibition. The pictures are 167 in number, and they are the work of no less than 113 artists,—a fact which, no doubt, goes far to account for that sensation of novelty which the view of the gallery excites.

First in excellence we must rank No. 35, "An Eastern Girl," by Jean Leon Gerome, the execution of which is equal to anything that we have seen from the easel of this master. Glad in a tunic of a material resembling erape, with a petticoat of a heavier texture, she leans against the wall of a gateway, showing her white teeth, dreamy dark eyes, and full but exquisitely modelled figure, to perfection. Over her face is thrown a transparent green veil, the colour of which, floating in folds, or spread over the features, affords a wonderful example of skill of the highest order, in blending, without muddling, colour. The architectural setting of this bit of Eastern life is as true to nature as the girl herself. The picture was immediately sold (we

understand at a high price), to the Duke of Wellington. It is a very admirable production.

Almost a pendant to this Gerome is No. 44, "Indecision," by J. E. Saintin, a picture very charming for its tender sentiment. It represents a young widow standing by a window, through which she glances while she draws on a grey glove. She is evidently on the verge of decision, nor can one doubt, from the soft expression of her features, which way it will be given. A faint reflexion of her sweet face looks back from the window-pane, as if it were a ghost come to aid her meditation. Portraits of herself and her late husband, and photographs of other subjects, hang on the wall.

"Expectation" (15), by Edouard Richter, is another of these pieces of sentimental genre, using the word in its proper and not in its slang sense. A lady in a long dress of rich blue velvet, a bit of colour that lights up the whole side of the gallery, stands by a window in a richly furnished apartment, looking out for some one—lover or husband, who is overdue. The face and attitude are admirably expressive of that feeling, half anxiety, half irritation, which the unpunctual are apt to excite in those who care for their coming. Drawing, as denoting study of the pathognomical expression of the figure, no less than of the face, colouring, and expression, are all good.

R. Mulren, in his two pictures, "Coming out of Church" (143) and "Learning the New Piece" (149), has reproduced in oil the touch and the colour of the Chevalier Fortini in his wonderful water-colour drawings. We believe that the artists are brothers-in-law. In the former piece, a scene before a Spanish cathedral, the bright tints of the dresses, heightened—certainly in an old woman's cap,—by a little artistic poetry, contrast admirably with the time-stained stone and garish worn-off paint, of the door of the old church. The lady who is learning the new piece, in a room where the bright crimson of the Japan screen brings out the contrasted green of her dress, is giving her whole thought to the music. These two pictures will make every one anxious to see more of the works of this artist.

Henriette Browne gives a very truthful chorister boy in that scarlet dress which denotes the choir of the Cathedral of Avignon, or some other see specially honoured by Papal privileges. He is engaged in burnishing up a silver crucifix for some approaching ceremony. The colour of the boy's attire is somewhat overwhelming; but the picture is very true to life,—foreign eclesiastical life, that is to say. As a contrast, both in treatment and in execution, to this life-size chorister, let us call attention to No. 12, by A. Gués, "Pages playing at Chess," a scene from an ante-chamber of a by-gone date, remarkable for its delicacy of handling and enamel-like finish. Similar, in some degree, in sentiment to the chorister boy, is No. 57, a "Cottage Madonna," by Josef Smaels, a picture which has in it something more than mere painting. The scene is humble, the woman unattractive in features, and her dress, though affording a well-designed contrast between her blue sleeve and the red petticoat of the child, subdued and grave. Yet though a scene of humble, it is not one of vulgar life; and there is a thoughtful, maternal earnestness in the face and attitude of the mother, not unworthy of the title, if we consider it to be translated into Dutch. Contrasting, again, with the breadth of these larger pictures, is the delicate detail of No. 53, "Gulliver securely fastened to the ground and surrounded by the Army," by Georges Jean Vibert. The weak point of this clever picture is the Man Mountain, who should have been conventionalised into indistinctness more thoroughly than the artist has attempted this part of his task. The busy air and elaborate dress of the host of little men who surround Quinlan Plestrin, is very good, and appropriate to the subject.

No. 70, "A Mother's Joy," by William Adolphe Bouguereau, represents an Italian Contadina teasing her child, by the tantalising display of a bunch of grapes. The infant lies in one of the wooden cradles that serve as arks to generation after generation of the children of the south. The fault of the picture, not to the eye, but to the critic, is that it is not an Italian infant. The slight curls of pale golden hair mark Teutonic blood. But the expression in the woman's face is that of the mother—very happily seized and rendered. The play of the sunlight on the charmingly modelled arm that holds up the grapes is perfect. The longer the picture is looked at the more it gains upon the fancy.

Several noticeable pictures cluster on the north wall. Some good bits of landscape there relieve one another. Cows chew the cud reflectively in No. 6, "A Sunny Day on the Coast of Belgium," in No. 7, "Une Plage de Villerville-sur-Mer," by C. F. Daubigny, there is only a long line of water-worn and weed-encrusted pebbles, with sand and sea beyond, but it is so photographic in its truthfulness that you look for shells in it. The deep maroon glow of the sky in No. 10, "View in Holland," by W. Roelofs, contrasts with Mr. Roemmerer's "On the Coast of Soheveningen." In "Santa Lucia, Naples" (18), by Jules Rainart, we have a familiar peep at the magic bay. We see the gaily-dressed women stepping into a boat for a sea-trip on the *fête* day. The double cone of Vesuvius glows purple in the distance, and the imagination recalls the hideous discord of the endless song of the lazzaroni. Contrast "Travelling in Italy," in rainy weather (27), by C. Pittam, with that on "A Wood Sleigh in Holland," by A. Manne. The Wallachian "Horses at a Trough" (41), by A. Schreyer, are very truthfully represented for a set of scaramouches not worth the price of the canvas and the colour. "The First Mail after the Proclamation of Peace" shows us the Admiralty Pier at Dover swept by an angry sea. The tops of the funnels of the mail-boat and the discredited tricolour just peep over the wall, and a policeman signals to the train to rush on. We have marked farther (72) "A Mountain Pass," by B. C. Kockroek; (108) "Moonrise," by A. Stedeman; (156) "A Surprise in the Forest," by L. Wopfer; and (76) "A Normandy Bride," by J. Portals.

M. Alma-Tadema has far less than his usual delicacy of finish in No. 38, "In the Temple." The marble gleams and the bronze censer shines with the truth familiar to this artist's touch. But under the straight falling folds of the dress of the priestess, or singing girl, there is no such form of flesh and blood as the head demands to support it. And the nationality of the artist is surely no excuse for his making two mistakes in the spelling of a single Greek word, and that one so well known as the name of the Goddess of Beauty. A. Savini's finish, minute almost to hardness, of the figures in the "Last Days of Pompeii" (118), compares advantageously with the careless touch of the established master. Nydia is too tall, and the grouping is imperfect; the figures occupy too much space on the canvas; and yet this picture is an extremely attractive one. With these we must group the "Poesie" of M. Cooman (94)—a picture charming in taste and tone, though the drawing might be improved with advantage. A dark girl reads, while a fair girl listens. The head of the latter is hardly enough relieved from her shoulders, and the right arm of the former, though not actually out of drawing, represents an ill-formed model. The picture provokes the remark that an artist of such graceful taste ought to take more pains with his drawing. We have only space to add a figure with many claims on our notice,—the "Young Fellah Girl" (105), by E. Veret Leocompt. The blue dress, full form, dreamy eyes, and the happy lighting up of the composition by the introduction of an orange, rich with blood-red juice, give reality to this little specimen of life in Egypt. We congratulate Mr. Wallis on his collection, and shall have to congratulate him on a full and rapid influx of purchasers.

ON ENTASIS AND SPIRES.*

DID nothing remain to us but the fragment of that glorious temple which once crowned the Acropolis at Athens, it alone would establish the supremacy of the ancient Greek in intellectual culture and taste over all other nations since the world began.

Like the fully-equipped Minerva which sprang all at once from the front of Jove, this temple seems, methinks, the instantaneous offspring of that divinity, and represents the most perfect and refined embodiment of ancient art.

It stands unique, and is as superior in excellence to what followed as it is to all that preceded it; and although twenty long centuries have elapsed since it shone forth in all its sparkling brilliancy the glory of Athens, its spell is mighty yet; its every fragment is precious, portions are found in every art museum in the world; and every detail of this

* By Mr. James M. Hay. Read at the Liverpool Architectural Society.

celebrated monument has formed a separate theme for artists and lecturers and scholars.

The ordonnance of the Greek Doric, as exhibited in this temple, attains its highest and most complete development.

The stylobate, the column, and entablature, along with all their subordinate parts and lesser members, when critically examined, appear to warrant the conclusion of an ingenious writer in one of the reviews, which I remember reading many years ago, that the typical idea therein embodied and presented to the mind was that of *weight adequately supported*. The author illustrated and enforced his argument by reference to Egyptian architecture on the one hand, in which the typical idea suggested was that of simple *weight*, and to Gothic architecture on the other, in which the typical idea was that of *weight annihilated*.

In the Doric temple, the massive stylobate is laid in three stages or steps, rectangular in profile, producing an impression of absolute solidity and repose, and upon this basement rests the colonnade or line of columns.

The quality of supporting power with which the column is invested is something marvellous. It is not merely cylindrical; otherwise it would have been clumsy, top-heavy, and instable. It is not simply tapering, else it would have indicated weakness. It rises from its basement slowly and deliberately, like a thing of life and as if it knew its work, and gradually tapers more and more as it ascends till, before suddenly expanding into the beautiful echinus, it knits its sinews together like the wrist of a strong man whose hand supports a burden or delivers a blow.

While the column expresses supporting power, the entablature expresses weight. Divided into three portions, the first, the architrave, is simply a square beam or lintel, and rests upon the column unaided by any means of art, its gravity alone being sufficiently expressive of its purpose. Not so, however, with the frieze, which could not thus have asserted itself had it only been another, — a superincumbent architrave; but by means of the triglyphs, with their vertical channels, its individuality is marked, and its downward pressure strongly expressed. And these vertical channels are not continuous all along the frieze, but thriftily gathered into triglyphs, or groups of three, whereby their power is increased. Then, by another of those refinements peculiar to this order, their expression is still further increased by means of the guttae, or drops, which hang beneath them suspended to the fillet of the architrave. These guttae are not intended to represent drops of water, as some would foolishly have it, but, like little pendent plummets, they carry out and intensify the idea of weight. The metopes, or square spaces between the triglyphs, were filled in with sculpture *in alto relievo*, and by means of the fine contour lines of the human figure would add by contrast yet another element of force to the weight-suggesting idea of the triglyph. The projecting cornice crowns the whole, and you will observe that it is not horizontal, like most other cornices, but sloping or inclined outwards, having the soffit of the mutules furnished with guttae, all expressive of weight or downward pressure.

I return to the column, to the peculiar curve of whose vertical section has been applied the term *Entasis*. What does this mean? It is generally understood as a *swelling* or convexity of outline to denote strength. This is near the truth, but far from embodying all that is contained in that word. On referring to Donnegan's Lexicon, I find *Entasis* defined as *the act of straining or stretching; constraint; effort; strain; tension; intensity*. This throws a wonderful light upon the aptness of its application to the Doric column. Instead of this upright pillar of stone being a passive, inert mass, like the lintel which it carries, it is ended with vitality and effort; and asserts its purpose, according to the true principles of scientific law applied with an amount of exquisite æsthetic feeling unequalled by any similar example that I know of in architectural history.

I shall not speak of the delicate flutings which intensify this upward energy, nor the three annulets which bind the neck of the column before it spreads out into the self-asserting freedom of the ovolo, — a freedom which was again checked before it had got too far by curving inwards to support the abacus. I shall not dwell on the minor details of this unrivalled monument, all more or less carrying out and supporting the typical idea; nor shall I refer to

those invisible or almost imperceptible curves said to be found there, which at one time originated so much curious and interesting discussion. Neither is it necessary for me to allude to the skilful means adopted by the Greek artist in overcoming certain optical illusions, such as increasing the diameter of the angle columns and setting them closer to their fellows, although these are all auxiliaries in the enforcement of the dominant idea. I am content to redeem the entasis of the Doric column from its being supposed to owe its existence to a regard for æsthetic beauty alone, and to show that it appeals to the intellect, and rests its highest claim on our admiration to its being a splendid example of the principle of generalisation of a varied and extensive natural law.

Nowhere has this principle been so well or so cleverly set forth as in a little book on the principles of design by that ingenious though somewhat eccentric writer, E. L. Garbett, — a book that ought to be in the hands of every student of architecture.

Well then, since we have got to the root of the matter, — since we know what entasis means, — since it no longer signifies a simply beautiful swelling outline, but is indicative of a vital force and energetic supporting power, — the absurdity of a column possessing this quality set up as a monument, and carrying nothing at all, is transparent enough; for the trifling figure, or ball, or urn, with which such elongated pedestals are surmounted, claim no such demand of wasted energy and strength. And yet, "can such things be, and overcome us like a summer's cloud without our special wonder?" Yes, they do; and almost every city in the kingdom bears witness to the folly. Oh, what a prolific crop of ridiculous imitations has that triumphal pillar of Trajan's brought forth; itself the worst specimen of the corrupt taste of imperial Rome. Greece, with her fine art feeling never could have perpetrated such an invention; and had not Rome, the mistress of the world, with her extensive influence set the fashion, Europe might still be free.

With regard to beauty of line in itself, I consider that every curve is beautiful, more or less according to its intelligent application. The concave is equally beautiful with the convex. The Eddystone Lighthouse, designed by Smeaton more than a hundred years ago, is a beautiful object, and at the same time a triumph of engineering skill; and yet that work exhibits in its outline a very decided concave. Planted upon a rugged rock in the English Channel, it rises to a height of 100 ft., and bids defiance to every influence of wind or wave. Enormous strength is its primary and predominant characteristic; but its strength is not that of the uplifted arm, as in the Doric column, but more akin to that of a gigantic tree whose wide-spreading roots stretch out around it, and pierce and grasp the solid earth.

Smeaton's first concern was to level the rock to prepare it as a platform for the building, and to unite the foundation course of solid blocks of granite securely to it and to each other. Course after course as they rise above the waters, and block to block are ingeniously dovetailed together and interlocked, so as to form one perfect and compact mass of masonry. Slow and anxious deliberation mark its base, gradually increasing confidence each contracting circle as it rises upwards, till in full assurance it mounts plumb up to the famous lantern light that crowns it.

The tall chimney may be made a pleasing object if intelligently designed, not that it should resemble either the lighthouse or the classic column. It being the hollow frustrum of a cone, such a wide-spreading base as that of the Eddystone would convey an idea of weakness. Neither should it be an imitation of the Classic column, having nothing to carry but carry off smoke, and no substance to do that if it had. Besides, the swelling outline of the column would actually convey the painful impression that the influence of heat was causing it to bulge and burst. Nor should it ape, as it sometimes does, the Italian campanile, with which it has nothing in common. It ought, in my opinion, to be the well-proportioned, tapering shaft, perfectly straight or spreading outwards towards the base, the cap high, without extravagant projection, and the plan circular or multangular.

[Some few years ago a paper, or papers, by an eminent sculptor, was published in the professional journals, purporting to be a discovery that the ancient obelisk had a decided entasis, or explaining that it ought to have one, and how to construct it. I could not agree with the conclusions arrived at. The obelisk was used in

pairs in the gorgeous palace-temple architecture of Egypt, and, whether there or set up as a separate and distinct monument, simplicity of outline and durability alone were considered in its design. It was a monolith of granite, syenite, or other hard material, square on plan, of great height, and tapering straight to a blunted point.

It was urged by this writer, that owing to some optical illusion, the sides, if made straight, would have a hollow outline, and thereby produce an unpleasant impression of weakness. Instead of weakness, I should say elegance and stability, and if this hollow outline did not *seem* therefrom the cause suggested, it would have been in strict accordance with sound taste to have imparted and secured it. The obelisk was a single, solid, compact block, and stood erect upon the level plain, self-dependent, without base or pedestal, or footing, and the slightly hollow curve towards the ground would give the very preparation for the union both mind and eye desiderata.

Entasis applied to the obelisk, whether in the imperceptible curve or some of the more exaggerated forms it assumes, has, I think, no right to be there, structural, optical, or æsthetic; and I am convinced that the further it departs from the straight line, to the same extent does it diverge from elegance towards coarseness and vulgarity.

The monumental pillar, the lighthouse, the tall chimney, the obelisk, have one thing in common, and it is this, — they are only subjected to *lateral pressure*. They have to resist no downward weight, no crushing force, but they may be blown over in consequence of insufficiency of taper or width of base. The outline which such a class of works ought therefore to assume, appears to me to be some variety of the inverted parabolic curve, the hollow in this case, in place of weakness, being remarkably expressive of elegance and strength.

I come now to speak of the application of the entasis, that peculiar curve denoting strain or effort to the spire. I am not aware of anything that has been written treating of this subject; but I may venture to say that, if this peculiar curve is employed here at all, it is employed in a sense and for a purpose very different to that in which or for which it was used by the architect of the Parthenon. There, it was the refined expression of supporting power: here, it is to accomplish the more pleasing junction of two opposite lines, — the vertical and the oblique. Now, it would be well, in order to prevent confusion of ideas, that some new term were invented to denote this very different purpose. The English word *camber* rather recommends itself to my mind, as both more suitable and expressive. However, in deference to the fashion of the present age, I will, in the further observations I have to make, continue to use the old Greek word, but in its vulgar acceptance.

Some architects consider that every spire should have an entasis, as something indispensable to its beauty. I have hitherto failed to perceive the force of this, either in ancient or modern works; and I think it will be found that a good design is in no instance indebted to entasis for its excellence. In the broach spire alone is it admissible, — in all others it is a defect; and in some other cases, where its presence even is suggested, you will find counter-acting means adopted to destroy or neutralise it.

The spire was originally no more than the pyramidal roof or capping over the Norman bell-tower, and it gradually assumed loftier proportions as the style changed from the round arch of the Normans to the pointed one of the Early English. Its transitional shape was probably like that shown on diagram No. 2, where it rises square from the tower, and is speedily brought into the octagon by short bevels from the four angles of the base.

This form is usually adopted in wooden spires, and was often repeated in stone down to the Decorated period. It is to be seen in the fine old spire at Bevington.

Contemporaneous, or immediately following this form, appears the broach spire; the term broach being applied to the four angular portions of a pyramidal capping that would be exposed were an octagonal spire let down over it. The great majority of spires of the Early English, Geometrical, and Decorated periods are based on this form. In early examples, the eight angles of the spire come right down to the base, or where it joins the tower, and the broach, when of lofty proportions, unites the tower with the spire in a pleasing manner. Immense variety of

character is produced by varying the proportions, by the introduction of pinnacles upon the ridge of the broach, sometimes at its base, higher up, or at its summit, and by the use of spire lights. In many instances the pinnacles are the upward extension of the tower buttresses, and sometimes are connected by flying buttresses to the spire, or with other higher pinnacles at its root.

The least satisfactory variety of spire is that most commonly to be found in late Decorated and Perpendicular, where the naked spire rises abruptly from behind a parapet with or without pinnacles at the angle, and where every reminiscence of the broach has disappeared.

I will now bring before you all the instances of the application of entasis which I have been able to discover in a careful reference to all the old examples within my reach.

The first example is that of St. Margaret's, Crick, with three tiers of spire-lights on alternate sides, and a two-light window in the plain belfry story. This has an entasis. And upon the same grounds that I say a thing of beauty is not a joy for ever when it is reproduced too frequently, and that novelty, even if of inferior beauty, is sometimes more pleasing because of its novelty, than, in spires of this kind, entasis may be used as a variety, but, as a rule, it is not an improvement.

In the letterpress to that splendid collection of spires by Mr. Charles Wicks, I find no allusion made to entasis, and, with the exception of that at Crick, no other examples given than one on plate 20, vol. ii., three on plate 11, vol. iii., and one on plate 23, vol. i.

The one on plate 20 is that of St. Nicholas, Walcot, Lincolnshire: a broach spire, crocketed, with three tiers of crocketed gable spire-lights on alternate sides. The swell is towards the upper part. In juxtaposition, upon the same page, as if to challenge comparison, is represented St. Mary's, Ketton, Rutlandshire, of precisely similar features and proportions, but *without entasis*; the lines are clean and straight, and its superiority over the other is unmistakable. The spire of Ketton, by the way, has no crockets on the angles. Perhaps the most hideous example in the book is that of St. Vincent's, Gaythorpe, Lincolnshire, on plate 11, a crocketed spire without gable spire-lights, rising from behind the perforated parapet of the tower, and connected to the angle pinnacles by flying buttresses. It is very tall, and has a terrific swell towards the summit. Only less ugly is that of St. Helen's, Broughton, of the same county, Lincolnshire, and on the same page, somewhat similar in design, but the entasis is less marked.

The third example is All Saints', Leighton Buzzard, Bedfordshire. Plain broach spire, with angle-pinnacles and spire-lights. Here also the entasis detracts from its effect. The sixth example is that of St. Bartholomew, Lostwithiel, on plate 23, vol. i., consisting of a plain octagon spire set upon an octagon stage or lantern, filled in on each of the eight faces with a decorated two-light window, and finished with gables. The spire-lines have a regular entasis the whole length. The only result is a stiffness and rigidity to the outline which had much better been absent.

Of the eighty-four examples comprised in this collection, there are only six represented with entasis, and none of these, I am sure, is sufficiently successful to encourage imitation.

I would next mention the well-known example of St. Andrew's, Ewerby, from Bowman & Crowther's work, according to whom it has a swell in the spire at about one-third from the top. It is a most effective design, but I question if it derives any of its excellence from this feature: rather does it arise from the elegant proportions which pervade it throughout, its massive and substantial character, and the delicacy and finish of its mouldings and details.*

* In order to try the effect of giving the greatest swell to near the base of the spire where it ought to be, if there at all, I have had several drawings prepared to a large scale,—first, front and diagonal elevations of the spire, according to the dimensions given in Bowman & Crowther's work; second, similar elevations giving the greatest swell to near the base; and third, similar elevations, but drawn without any swell at all. The height of the spire is 90 feet; the height of broach, 30 ft. The results are as follow:—In Nos. 1 and 2 the swell over the straight line is 7 in.; but the width of spire at top of broach of No. 1 is 16 ft. 6 in.; of No. 2, 17 ft. 3 in.; and of No. 3, 18 ft. 6 in. Consequently, the spire, according to No. 2, will be the least hollow of the three, when judged by the crucial test of the diagonal view. Moreover, this is obtained without exposing where or by what means this fuller body is obtained, instead of swelling it out at about 30 ft. from the base, as in No. 1, where it is seen from whatever view the spire is looked at.

In St. Peter's, Throckingham, we have a broach spire, in which the lines of the broach are very much curved, but those of the spire straight. Where you get the diagonal view, the effect of this is far from being good.

There is a class of spires furnishing many examples, in which the spire proper is set upon an octagon. This octagon, according to its treatment, may be made to appear more or less the upper story of the tower. Still, even when finished with plain or open parapet, its being octagon on plan like the spire, and vertical, the angle lines produce at once the impression of entasis: witness the unpleasant effect of this in St. Lawrence's, Stanwich, Northamptonshire, where the octagon continues down to the ground.

But this result is counteracted in most instances by uniting the octagon to the square tower by means of high or low broach, with the addition of buttress, niche, or pinnacle. A very original and peculiar example of this is to be seen in St. Mary's, Bloxham. Though imperfect in many respects, this steeple altogether contains the germ of a large amount of architectural character, and the study it has received by some of our foremost Gothic architects of the present day is evinced in some of their works.

A very different but most beautiful example of this class is given in SS. Peter and Paul, Exton, where both octagon and tower are finished with battlemented parapet, the former having large octagon turrets, also battlemented, but without pinnacles, set upon the broach at the angles.

The union between tower, octagon, and spire is most beautiful and complete, the outline, the fillings in, and arrangement of windows, spire lights, &c., and the light and shade all helping each other.

In St. Mary's, Wilby, Northamptonshire, on the other hand, the swelling and bulging effect of the octagon is not sufficiently carried off by the too slender pinnacles and flying buttresses at the angles of the tower.

Mr. Freeman rather disapproves of this class of spires from their "suggesting the idea of the lower part of the spire having been shaved down vertically;" in other words, suggesting the bulging effect of entasis.

But their advantage appears to me to consist in the opportunity it affords of introducing a massive or clustered pinnacle closely attached to the spire, which, in skilful hands, is capable of an infinite variety of treatment, and of excellent results.

Another effective method of forming the junction between tower and spire is that represented by the spires of Salisbury, and St. Mary's, Oxford, where the massive or clustered angle pinnacles are supplemented by others higher up, and set between these and the alternate sides of the spire, completely filling up the gap, and producing a rich and gorgeous effect.

Similar objections would hold good against the application of entasis to spires, which rise at once from within the plain perforated or embattled parapets of square towers, whether furnished with angle pinnacles or not.

The junction in these cases is marked and decided, and the diagonal view is very seldom good, but much may be done even here by flying buttresses and large pinnacles, or by a skilful treatment of the belfry story; or when this is not attempted, where the abruptness of the junction is left unchanged, a similar squareness of effect may be re-echoed in lesser degree in other parts of the church to which the spire is attached, and thereby unity of design attained.

But this is rather travelling into the principles of general design, which I must avoid. With the exception of the few instances I have given, no other spires that I am acquainted with have any entasis; their lines are straight as an arrow, and I am convinced that any departure therefrom, after they have fairly cleared the base, would seriously mar the beauty of the whole.

Turning to modern examples, I am acquainted with none where entasis has been successfully applied. It is not to be found in any of the late Welby Pugin's works, nor is it alluded to in his writings. The broach spire was rather a favourite model of his, and that of the little Catholic Church at Old Swan is even yet one of the finest spires in Liverpool or its neighbourhood, charming alike in its simplicity and elegant proportions. That of St. Giles's, Cheshire, is another, but richer and fuller of detail and depth of effect. His lines are all straight and decided.

But instead of this swelling outline being a desirable thing in a spire, we have the most numerous beautiful examples in which the outline is a decided hollow. See St. Nicholas's,

Cotesmore, a broach; St. Mary Magdalene's, Warboys, a broach; St. Mary Magdalene's, Newark, a broach, with angle pinnacles; St. Maclou's, at Ronen, &c. That of St. Giles's, Camberwell, by Mr. Scott, as given in Petit's sketches, is a noted example and beautiful design.

In drawing these observations to a conclusion, I would guard myself from any desire to limit or confine the inventive genius of the architect; and if I have spoken with some confidence as to the results of my own experience and studies, I am not vain enough to suppose but that some ingenious artist may arise, more lucky than the rest, and produce a design, like Gainsborough's celebrated blue boy, upsetting all my theories, and at the same time throwing the best ancient examples into the shade. If such should be the result of this paper, it will afford me some consolation that, as the saying is, my labour has not been in vain.

I began by alluding to the Parthenon, the most perfect embodiment of classic art the world has ever witnessed, the typical idea of which was *weight adequately supported*. There, entasis had a place and purpose.

I proceeded to refer to numerous examples of Christian art, an art in which the typical idea was that of *weight annihilated*, and, among others, cited the cathedral of Salisbury, whose steeple from floor to final measured over 400 ft. How graceful, how rich, and yet how simple in outline, and how worthily it occupies its place as prime feature in an architectural composition, which, as seen from the north-east, for grand picturesque effect is unsurpassed by any other in England.

In the Gothic cathedral there is no entasis, no effort, no strain, and the uncounteracted suggestion of its presence even is antagonistic to the genius and spirit of the style. The clustered pillars do not bulge and swell like the dropical columns of the Roman and Florentine schools,—themselves the caricatures of those at Athens. They shoot up to a height of sometimes 50 ft. or 100 ft. without swell or diminution, and without producing the faintest impression of weakness or instability.

Unimpeded by the slight cap-mould, they spring into the arch and ramify over the vaulted ceiling in a thousand beautiful curves and fine-drawn lines, and then are lost in the dim infinity of height and distance; and the ponderous bosses are as lightly carried by the fairy fingers of the groin ribs, as if they were made of gossamer.

The capital, as if conscious that its burden is light, bursts into foliage, and ripens into rich clusters of fruit and flowers.

There is the spring of perpetual growth in every form and detail of this glorious style, in the window, the shaft, and the arch, in buttress, pinnacle, and spirelet, in moulding, flower, and crocket.

To exhibit any swell or roundness in the spire is to acknowledge a flagging of this upward growth—to admit that it begins to feel the effects of resisting power—to proclaim at last that *weight is no longer annihilated*.

But it is not so; the old and decrepit under the weight of years and sorrows bend into a circle, the young are straight and free, the spire is not blunted as it hastens to the point, but sharpened and intensified. Nothing does nothing must interfere with the ever youthful and vertical expansion of the style.

Triforium grows out of arcade, clearstory over triforium, transept rises over aisle, gable over gable, tower over all, and then the central spire in its mighty grasp gathering together the leading lines, flies straight off heavenward with them all.

WARMING BY HOT WATER.

Messrs. COMYN CHING & Co., of Castle-street, Long Acre, have patented an apparatus for circulating hot water, by which the risk of explosion would seem to be avoided. It consists of a small tubular boiler, 11 in. square and 2½ in. deep, fixed at the back of an ordinary stove and communicating with a large conjunctive boiler placed at any convenient adjacent position. A pipe from the house-cistern conveys cold water into the conjunctive boiler, whence it rapidly circulates through the tubular boiler, returning at once heated to the conjunctive boiler at a higher level than that of the incoming cold water, the pressure of which forces the hot water all over the building by means of an ascending pipe that can be tapped at any part of its length. The unused hot water returns by a third pipe to

the conjunctive boiler, whence it again passes through the tubular boiler, and recovers the heat it has lost in its passage through the house. The constant circulation is thus kept up by the pressure of the cold water contained in the house-istern. Should this become empty, the cessation of pressure prevents any water from leaving the conjunctive boiler, which always remains full. The system certainly has its advantages, and is applicable to all sorts of buildings. The firm tell us with reference to "A Suggestion for Warming Apartments," in our pages recently, that they pass fresh exterior air over or through a boiler, and convey it thence to any room or rooms to be warmed having a valve in the floor of each, to admit or exclude at will. A correspondent says he has had his own bedroom (size about 20 ft. by 20 ft.), in a bleak situation in the country, warmed on this system with perfect success, and without cost after first expense, which is trifling.

DIFFERENCES IN TENDERS.

Sir,—In the impression of your paper for the week ending March 11th, there appeared an advertisement to builders and others for tenders for the erection of a shop on the forecourt of a house in Essex-road.

I sent in a tender for the same at 276*l.*, and received a post card stating merely that the highest tender, by Mr. C. Coates, was 468*l.*, and the lowest, by Mr. Gast, was 180*l.* I sent a polite request to the proprietor for a list of the whole of the competitors and their tenders, also the name of the accepted one, and received the following letter:—

"I do not wish my name to be brought into any trade comparisons, therefore avoid giving a list. Mr. Bolton has written for reference to Mr. Gast, and the lowest tenders. If that satisfies Mr. B., he will have it—J. King."

Now, sir, I think so great a difference as 398*l.* in so small a matter as this ought not to be passed by without notice.

ONE OF THE COMPETITORS.

PUBLIC PARK FOR ALLOA.

THE town of Alloa, in Scotland, is promised a public park. The Earl of Kellie will give a suitable piece of ground, subject to conditions which are likely to be agreed to by the commissioners of the town. The intended park is a district of wood known as "Arms Brae," and is situated on the Stirling road. The trees are to remain the property of his lordship, and only to be cut and lopped with his permission. The burgh commissioners will have to lay out the walks and lawns, plant flowers and shrubs, and erect gates and lodge. The length of the park will be about half a mile, with an average width of nearly 100 yards. A greater breadth, we think, would be desirable, if it be possible for the commissioners to obtain it. If not, we suppose the townsfolk must be content with what is given, and add to the length of their exercises and amusements that they are obliged to curtail in the breadth. "Alloa Ale" is celebrated over the world, and his lordship's health will be drunk in it in Clackmannan.

THE GIRALDA, SEVILLE.

ONE chapter in "Spanish Pictures drawn with Pen and Pencil," recently mentioned in this journal, relates to Seville, and illustrates, amongst its other architectural glories, the tower of the Giralda, one of the finest relics of Moorish architecture in the country. This tower rises to the height of about 350 ft. The vane or weathercock (*girandola*) from which it has its name is the figure of a woman, and weighs nearly three tons. We are enabled to reproduce the view given in the work mentioned. The vane and the belfry on which it rests are comparatively modern additions. In the time of the Moors the tower terminated with an immense iron globe, plated with burnished gold, which is said by Arab chroniclers to have reflected the sun's beams so brilliantly as almost to rival the sun itself. The tower originally formed part of the great mosque of Seville.

"MADAGASCAR AND ITS PEOPLE."*

THE MEMORIAL CHURCHES.

In 1862, the Rev. William Ellis, whose name has been largely associated with the later religious history of Madagascar, made an appeal to England for assistance in building four appropriate churches on sites which had been given by the king; and, the money having been raised, Mr. James Sibree in 1863 went out to act as architect. The first church, which was at

Ambatankanga, and is that represented in the accompanying engraving, was consecrated in 1867. Other churches followed, and Mr. Sibree remained some time in Madagascar, collecting much information as to the manners and customs, history and progress of the people. This he has now published in the shape of the interesting volume before us, which is made to have especial reference to the spread of Christianity in the country. Madagascar, which has been called the Great Britain of Africa, has an area exceeding that of England, Ireland, and Scotland together, and, considering its size, is singularly little known by Europeans. Mr. Sibree's book will help to lessen this ignorance, and would afford us many quotable passages. We prefer, however, to confine ourselves to the account he gives of the circumstances and difficulties attending the erection of his churches. They found on the site a quantity of hard white stone, resembling the finer qualities of the Yorkshire stone called Bramley Fall; and for some months derived their whole supply of material from this source. The first church was proposed to be built entirely of dressed stone, in 12-in. courses, within and without; 82 ft. by 46 ft. inside in the clear, with apse, vestry, and a tower and spire at the south-east angle of the main front. This area, together with a large gallery over the vestibule, and extending into the first bay of the church, would, it was estimated, give accommodation for a thousand people. The style adopted was a very plain adaptation of Norman, depending for effect rather upon a judicious arrangement of material than on elaborate detail. The latter, indeed, had it been desirable, was inadmissible, from the unskilled character of the labour, and the intractable nature of the stone. All mouldings had to be bold and simple in section. The two doorways, and the windows in the principal front, were the only portions where anything beyond the simplest arrangement was attempted. The former were shafted, and the arches ornamented with the chevron, characteristic of the style. The roof was pretty steep in pitch, and projected over the walls in deep eaves. The heavy rains of the wet season made such a form an imperative necessity; and the architect never afterwards felt a doubt that on this account, as well as from the rude workmanship admissible in the simple Gothic styles, as compared with Greek or Italian, his judgment was correct in adopting the architectural details of Northern Europe instead of those of the South. The interior was planned to consist of a nave divided from the aisles by wooden columns, which supported the framing of the roof. But eventually this arrangement was altered, and stone columns and arches were substituted for the timber framework, so that the interior had much of the appearance of a European church, but with apse instead of chancel. The central portion of the roof was hammer-beam in construction, and celled above the main timbers. A ventilating chamber was thus provided, and the requirements of the climate were further satisfied by filling every alternate window with wooden louvring instead of glass, so that a current of air might always be passing through the church.

Such was the design, but the carrying of it out in stone and timber was a different matter altogether; and for many months and, as it proved, even years, he was obliged to exercise patience and hope, until sometimes he despaired of ever seeing the building completed.

But the greatest hindrance was the limited number of workmen whose services were worth having, and still more, the impossibility of retaining these for long together. Stonemasonry was not an entirely new thing to the Malagasy. Tombs and gateways had already been constructed, as well as two or three stone houses for the sovereign. But a large building, which required careful scientific work, was a new thing to them; and, in the case of the majority of workmen, it was necessary to commence with the A B C of the art, and to teach them, first how to dress stone to a true face, and then how to square it accurately. The use of the level and plumb-bob and cord was a mystery which even the most intelligent but slowly apprehended, and it was necessary to inspect minutely every course, and almost every stone. Unless this was done, the third or fourth course would frequently be found to overlap the lower ones by 2 in. or 3 in.

Dull, however, as these workmen seemed to be in some matters, in others they could be as sharp as any European mason; and to save a

little trouble they would "scamp" the work, and put in rubbishy material with an ingenuity that only constant inspection could detect. This made it necessary for the architect to spend a great deal of time on the ground, and carefully superintend every part of the work, settling out every detail, and testing every stone, both when dressed and laid. Everything, except plain walling, he had to mark out, and notwithstanding every precaution, was often mortified to find a good block wasted through the stupidity of his unpractised masons.

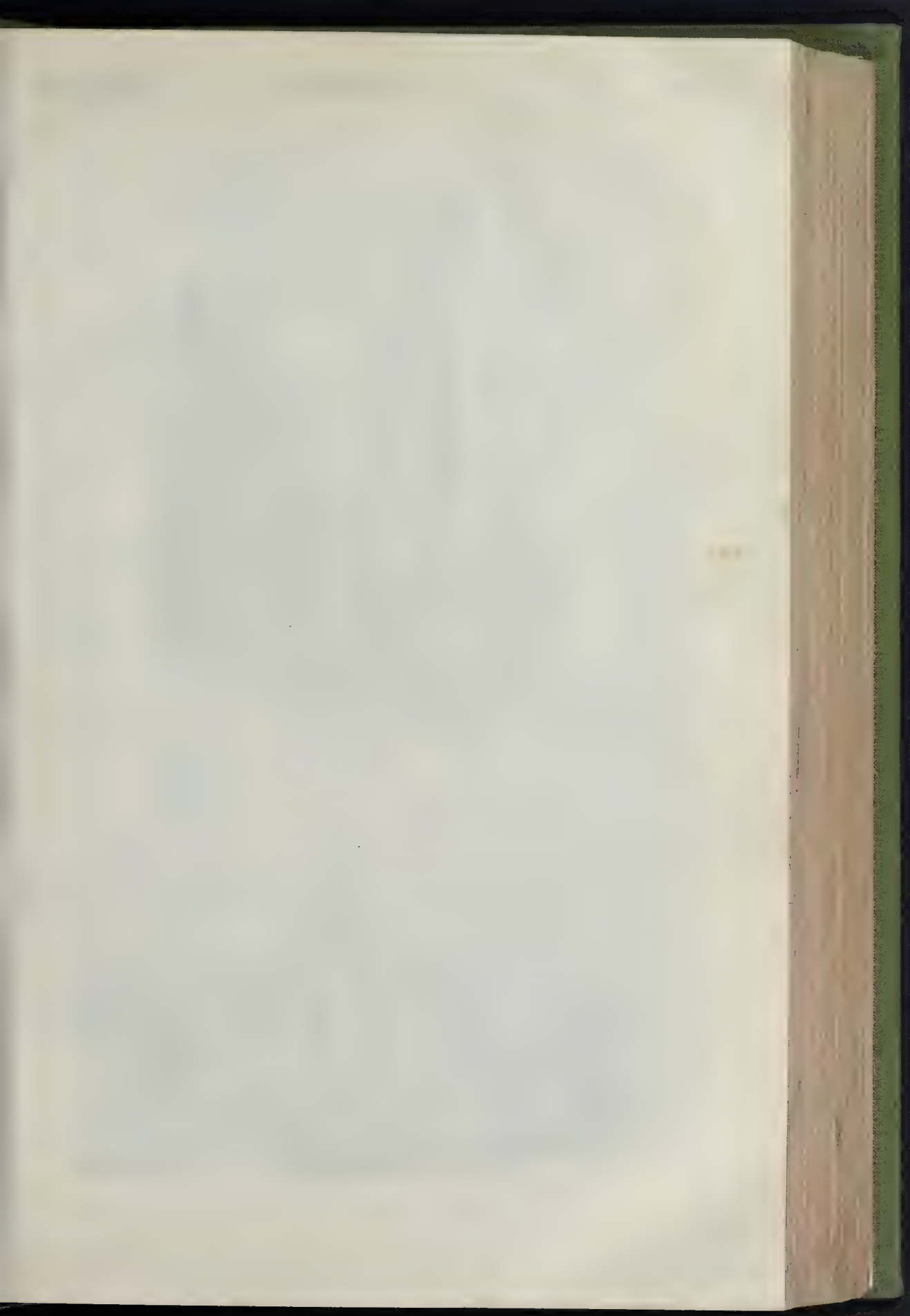
It was the same with labourers and with carpenters; centering, scaffolding, fencing, and earthwork—all had to be carefully marked out for them. Instead of being merely the architect, he found himself contractor, builder, clerk of works, and foreman.

"I was, of course," he says, "prepared for much of this; but constant interruptions arose from the difficulty of retaining the services of my workmen, such as they were. From the first, I had but from twenty to thirty men at most, at any one time, and these held certain traditions of working, by which they abided as strictly as any tradesman in England follows the instructions of his committee. For instance, every man quarried his own blocks, dressed them, and then built them into the walls; and, for a long time, I could not get a system of division of labour. Another of their rules was, that if a workman had begun any part of a building, no one else would touch that portion of the walling, but seemed to regard it as the vested right of the one who commenced. He might go away on other work for weeks, but it mattered not—it must be left for him to complete at his convenience. Through this cause some portions have occasionally been left unfinished for months, leaving an ugly gap in the walling; and as the fellows knew I could not get other help, they set me at defiance. I could not call in another body of men, as they were not to be had; I was obliged to wait until the idlers chose to go back to the water. Much of the Malagasy love money, they yet love to take their time in earning it; and so the work frequently stood still, and I could not push it forward either for love or money."

The tower and spire, modest as they were (50 ft. by 30 ft.), caused great wonder. Very various and amusing were the conjectures as to the purpose to which the tower was to be applied. Some were confident that the belfry-windows were embrasures for cannon, and that the English were cunning fellows, who were preparing a strong place of security against any time of disturbance. Others imagined some mysterious scheme for gaining political power was concocted in the massive stone walls; and others again, in utter disbelief that it would ever be completed, said, "When that is finished, I will pray," i.e., become a Christian. Mr. Sibree dared not tell the workmen how high he was really going. As it was, it was not without some difficulty that he induced them to proceed; and had he not had the same men from the beginning, and so gradually accustomed them to the increasing height, they would never have ventured up to the awful elevation of 70 ft. or 80 ft. More than once, their wives and children came to him, begging that he would give their husbands and fathers some other work, and not risk their lives by sending them up to the skies in the way he was doing. He calmed their fears, partly by a little coaxing, and partly by representing how much more their relatives were earning through their boldness, and assuring them that every precaution for their safety should be taken. At one time he almost thought he should have to complete the spire himself, with the help of a foreman and two or three labourers (slaves), who had assisted to erect the scaffolding, and had at length become very fearless.

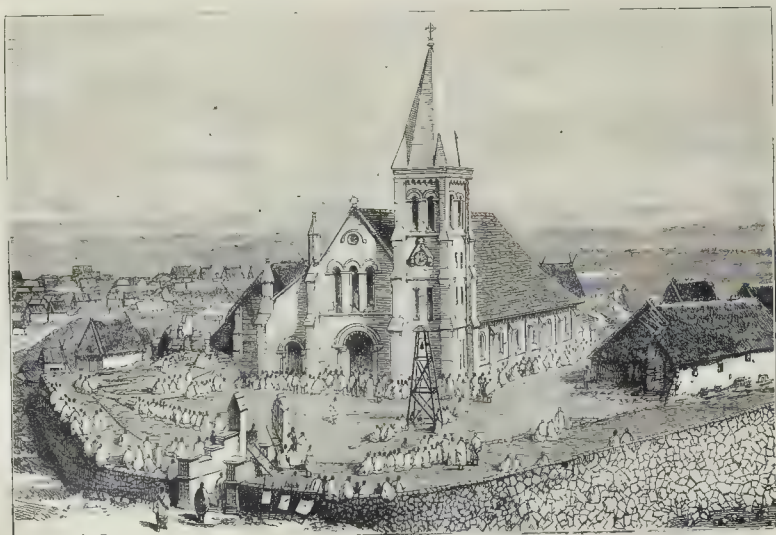
In designing the second church, our author allowed himself greater freedom, adopted the Early English style, and made the carpenter's work more ornamental in character. Mr. Sibree deserves warm praise for his persistent devotion. Four stone churches have been erected, and we agree with him in thinking, that their erection has given a very important stimulus to civilisation. The employment of many workmen for several years, and their training in European methods of construction in masonry, carpentry, the manufacture of tiles, and ironwork, has diffused a large amount of knowledge amongst the most intelligent artisan-class, and has put a considerable sum of money into circulation. They have been shown how to build, and to use their own stones, and timber, and metal; and the native ingenuity and quickness of the people will not allow all this to fall out of recollection. It has already produced valuable results; and we may be sure, says Mr. Sibree, that the building of the memorial churches at Antananarivo will be long regarded as a marked and important era in the religious and material progress of Madagascar. A large circle of readers will find much to interest them in his book.

* "Madagascar and its People. Notes of a Four Years' Residence. By Jas. Sibree, jun., architect." The Religious Tract Society, Paternoster-row.





THE GIRALDA, SEVILLE, SPAIN.



MEMORIAL CHURCH, MADAGASCAR.—MR. JAMES SIBREE, JUN., ARCHITECT.



LONDON STREET ARCHITECTURE: HOUSE IN CHISWELL STREET, FINSBURY.

MR. ROWLAND PLUMBE, ARCHITECT.

LONDON STREET ARCHITECTURE: CHISWELL STREET, FINSBURY.

The illustration we give of buildings in Chiswell-street represents some offices now in course of completion. The site was previously occupied by two structures, one of which, in the early part of last year, was destroyed by fire, and the other, being very inconvenient, the owner was advised to have demolished, and to erect suitable offices on the site. The lease was renewed for a longer term of years, on these conditions, by the Ecclesiastical Commissioners, upon whose land the buildings stand. By arrangement with the Metropolitan Board of Works, the line of frontage was allowed to be extended. Full advantage of this having been taken, it was necessary to break up the front: one side having to be played back, the central bay was placed at the mean angle between the side parallel to the street and the played side, forming rather a novel feature in street architecture. The building has five floors, with offices at the back, on the ground floor, additional rooms being formed in the back part of the roof for the housekeeper. The rooms on the ground floor and the basement are intended to be used as auction-rooms, the cellars being used for storage purposes, the upper part letting for offices. The front is faced with malm bricks, with dressings of Bath stone, red brick, and Pether's diaper bricks, the latter being depended upon for all the enriched surfaces shown. The floors are laid on a new system of fireproof construction,—viz., with trellis girders, formed of rolled joists, laid flatways (with ornamental rivets of bottom flanges exposed to view), at intervals of about 8 ft. and T-laths, 24 in. apart, bent to and acting as curved ribs, filled up to a level surface on top with concrete, cemented to form the floor, the under surface retaining the arched form, and plastered, to form the ceiling. The architect was Mr. Rowland Plunbe, Fitzroy-square; and the floors were executed by Messrs. W. & T. Phillips, of the Coal Exchange. Mr. Plunbe has shown both ingenuity and taste.

TITHES AND TITHE COMMUTATION. INSTITUTION OF SURVEYORS.

At a meeting of this Institution, held on the 13th ult., two papers on Tithes were read,—one by Mr. John Oakley, the other by Mr. William Sturge.

Mr. Oakley gave an account of the commutation of tithes in England and Wales, under the Tithe Commutation Act of 1836, by which an annual rent-charge, varying with the price of corn, was substituted for the payment of tithes in kind; and made some observations on the advantages which have accrued to agriculture from the arrangement. In the course of his instructive paper, he pointed out that the adjustment of rent is also much simplified by the commutation of tithes, and proceeded:—

The rent a tenant can afford to pay per acre for his farm is shown by first setting out its average annual gross produce in money, and deducting therefrom the tithe rent-charge, if payable by him, the rates and taxes also, and the costs of cultivation, not forgetting the interest on the capital required in cultivation. The remainder will be the fair rent payable to the land-owner. Whether the tithe rent-charge amounts to a shilling, or any other fixed charge per acre, the sum is easily worked; but if the amount the tenant can afford to pay to the tithe-owner for the tenth of his gross produce were to be deducted, a more elaborate calculation would have to be made, and thus fixing the land-owner's rent would be a matter of corresponding difficulty. In fact, none of the land-agents and surveyors, whose education commenced thirty years ago, have been called upon to make such calculations. It may not, therefore, be out of place to put before you in plain figures the advantage which would result to the tithe-owner if his tithes were re-valued according to the present produce of the land. Should I succeed in showing that the present money-payments do not represent what the tithe-owner would have now obtained had there been no commutation, it will not be with any idea of suggesting that the commutation was unfair, and ought to be revised. I know that such results would never have been produced if the tithe-owner had continued to collect his tithes in kind, and so reap the benefit of the skill and capital of the occupier. I may, however, possibly show that the land-owners and occupiers have so materially

benefited by commutation, that they may easily, and without cost to themselves, make some small concessions which will benefit all tithe-owners, and especially the clergyman of the parish, when he is the owner himself.

For convenience and simplicity of calculation I purpose blending rectorial and vicarial tithe in the following statements.

I will take, first, arable land of the poorest quality, which is under cultivation by the plough, and then arable land of the highest quality, both descriptions being farmed without the application of any manure beyond that made from what the lands themselves would produce.

Take 100 acres of poor arable land on turnip soil, and the cropping to be as under:—

25 fallow with turnips,			
12½ fallow again, or tares,			
12½ barley,			
12½ clover,			
12½ tares or fallow,			
12½ wheat,			
12½ oats,			
being 62½ of green crops at 10s.	2.	s.	d.
12½ wheat, 2½ qrs. at 56s. 3d.	31	5	0
12½ oats, 4 " 22s.	87	17	9
12½ barley, 3 " 33s. 9d.	85	0	0
	63	5	7

£237 8 4

I calculate that the sheep jobber would purchase the feed of 62½ acres of turnips, or rape, or tares, or clover, he finding all required, including labour, at 10s. per acre; and if so the net yield to the farmer would be 31l. 5s., and the tenth of this sum would be the agistment value of these crops. I apply then the prices fixed by the Tithe Act to such crops as this land thus farmed would produce, viz., 2½ qrs. of wheat, and 4 qrs. of oats, and 3 qrs. of barley, and the result shows the produce of the 100 acres, without the straw, to be 237l. 8s. 4d., or 2l. 7s. 6d. per acre. The tenth of which, or 4s. 8d. per acre, is the money value of the tithe without the straw in the fields where the grain grew. The tithe-owner could not collect the tenth of these crops for the value of the straw; hence, 10 per cent., or 5½d. should be deducted from the 4s. 8d. per acre, the balance, or 4s. 2½d. per acre, represents the money value per acre, according to commutation prices, of the tenth of the produce of this 100 acres of land.

If the 100 acres of land were heavy clay the result would be similar in money, inasmuch as the growth of corn in bushels would be larger and the value of the feed from the green crops less. Where land is fairly tilled with the plough and all moved thereby every year, except the land in clover or other artificial grasses, the tenth of the produce at commutation prices must amount to 4s. per acre.

Now take 100 acres of land which is really good, and on this will be annually produced:—

25 acres of wheat at 4 qrs. per acre, or rather more, 4½ at 56s. 3d. = 12½	£300	0	0
50 acres in barley and oats:—			
6 qrs. barley at 33s. 9d., or			
3 qrs. oats at 22s. = 10½	530	0	0
12½ acres of clover, which will be mown once			
and fed once, 6½	75	0	0
12½ acres of turnips, fed on the land, 2½	25	0	0
	£900	0	0

or 9l. per acre without straw. The tithe here, without straw, would be 18s. per acre, and deducting 10 per cent. from this to meet the tithe-owner's costs of collection—he having the straw for nothing—it is shown that the money value of the tenth of the produce of such lands exceeds 16s. per acre.

Few parishes of such land can be found; but I know of several the landowners of which admitted such crops as the above, and agreed to such a rent-charge.

Very large quantities of land in England, the rent value of which ranges, tithe-free, from 35s. to 40s. per acre, are fixed with rent-charges running from 3s. to 6s. per acre, some being arable and some meadow lands. The arable land would produce on an average in corn, taking one-fourth wheat, and one-fourth barley or oats, 4l. per acre per annum at least, showing, after deducting 10 per cent. for collection, 7s. per acre tithes. The grass land, if fed the whole year round, would keep for the winter six months 1½ sheep per acre, and the summer six months 5½, making an average of 3½, and the value of their feed, or what the acre would produce net per annum, could not be put at less than 1l. per sheep, showing 3l. 10s. per annum, or 7s. as the value of the tenth of its produce.

Though commutation has released surveyors from the task of making such calculations, the

consideration of all that bears on the produce of land is necessary when rents have to be fixed.

Notwithstanding my figures show the value of the tenth of the produce of land, and that such value does not correspond with the rent-charge, as fixed permanently, yet the commutation of tithes has materially benefited England and Wales. Permanent improvements, such as drainage, removal of fences, and enclosure of waste lands, have been extensively carried out. Capital has been largely expended, and farming has been carried on with an energy before unknown. Land has been cultivated in the way best suited for developing its resources, the fear that by so doing it might become liable to increased burdens, in the way of tithe, having been removed.

The Act for the commutation of tithes has been a great and healing measure, and has been carried out on the whole with great fairness. Much fewer difficulties have arisen than were anticipated, and although the Act has conferred a measure advantageous both on tithe-owner, land-owner, and tithe-payer, and has contributed greatly to the encouragement and improvement of agriculture, yet I think there are some matters of detail which might still be improved.

CONDITION OF WINDSOR.

At the last meeting of the Windsor Local Board of Health, Mr. Alderman Laet called attention to an article in the *Builder* reflecting on the sanitary arrangements of the town, one of the points remarked upon being the lowliness of the rooms in some of the habitations in Bierlane. He suggested that the surveyor should take the opportunity of reading the article and of visiting the localities mentioned, and see whether he could rebut any of the statements made there. Another point was the insufficiency of the ventilation of the sewers, and he should be pleased if some practical members of the Board would give that matter their consideration, and see if they could get the Board out of that difficulty.

Of course there were members of the Board ready to call the article "sensational," and to say that they did not believe it was all true. The surveyor, however, made some reports at the same meeting which should show them how wrong they are in taking such ground. It is to be hoped Alderman Laet's advice will be attended to.

MINOR NUISANCES.

READERS who study the *Builder* attentively cannot fail to observe that we have a certain and very nearly constant number of complaints registered in our columns every year upon subjects which we may group together under the category of "Minor Nuisances." Our correspondence is, of course, extensive, and our correspondents are widely distributed; hence it may occur that we hear more about "crying evils" and "intolerable nuisances" than most of our contemporaries, who are not so directly concerned with the *domus* as we happen to be; and there can be no doubt but a great many circumstances connected with our houses and our homes, which might seem to the general public to be trifling affairs altogether, and quite beneath notice, do, in fact, go to make up a large portion of our happiness or our misery. A healthy and happy home is what we all seek after; but there are difficulties in the way, for the most part. Putting out of question for the moment such a case as a bad drain or a leaky gutter on the roof, which are not only major nuisances, but evils of the most fatal and pernicious character, is there nothing less with which we have to contend? Consider for a moment the annoyances caused by a sewing-machine, or a bad piano,* or a cornet-piston in the adjoining house; or the abominable shape of the chimney-pots over the way, which define the limits of our horizon; or the appearance of the paint next door; or, worse still, the sanitary condition of the neighbouring area, or the uncovered dustbin in the back yard! These and things of a like character are precisely what we have denominated them,—minor nuisances. They cannot be said to endanger life

* One complainant is troubled with a neighbour whose musical and piano performances commence about eleven o'clock p.m. (just when he retires to bed), and are continued vigorously for hours; while on Sundays the poor piano is worked incessantly. An appeal for merciful relief resulted in offended delicacy.

or to be very injurious to health, and our common law takes no note of them in any form whatsoever. Yet will any one assert that they are not, within their range and circumspection, very intolerable nuisances?

Another complaint reached us the other day of a more sentimental character; which, however, we have no hesitation in describing as an undoubted grievance: and it was this. A respectable tradesman had had his front done up at considerable expense and with much taste, from the designs of a competent architect. A space, 1 ft. 6 in. or so in breadth of the frontage, was sacrificed in order to give effect to the Corinthian pillars and pilasters of Portland stone which formed part of the design and adornment of the basement story. A very pretty effect it would be, doubtless: that is not disputed. But, in the course of the same year, his next-door neighbour,—not an opponent in trade by any means, nor even a personal enemy,—knocked out his front also, and built up to the very boundary line (somewhat beyond, it is alleged) a shocking attempt at modern Gothic, as we are informed, in glaring red and black brick in alternate courses,—thus creating an effect of contrast and a “presumption of superiority” which vexes our poor Corinthian to the very soul! He actually writes that he has determined to remove from the locality for ever! Now, some people may feel inclined to smile at this fastidious gentleman; but, certainly, we do not. On the contrary, we most cordially and entirely sympathise with him. At the same time, we can only offer our sympathy, and nothing more; for it will never do to interfere with the time-honoured principles of British liberty; and if he or anybody else interested in the subject chooses to study the æsthetic principles which predominate in the different schools of politics in our day (this is, of course, a poor consolation), he will find the one complain as bitterly of the other on this very question as he does of his next-door neighbour!

Passing by questions of taste, however (in which, by the way, there has from time immemorial been a proverbial difference), we may notice the complaints we have mentioned which constantly reach us, and which may be classified under the head of noisy nuisances. “A Poor Artist” for example, cannot sleep on account of the screeching sound of a chimney cowl—the property of a person on the opposite side of the street, whom he believes to be a butcher. Another correspondent, “An Invalid,” complains in bitter terms of the noise made by certain iron shutters, which sound, he says, when they open or shut, “like the fearful grating of the mitrailleuse.” From Liverpool we had last year a most portentous complaint from a retired merchant, who stated in plain terms that his next-door neighbours (either the Browns or the Joneses, we forget which) got up family concerts for his especial benefit, lasting till midnight, in which they employed trombones and ophicleides! And, finally, a gentleman who, we have every reason to believe, speaks the truth, wrote, not long ago, to say that since the Metropolitan Railway had invaded his villa at Camden-town, he had not only become deaf, but his hair had turned grey!

Now, what can we say to all this?—or rather, what can we do? The law, as we have said, will not only not interfere (unless in cases such as the trombones, where positive malice could be proved), but, on the contrary, has given permission by legislative enactment to the most gigantic of minor nuisances which our generation has seen! A railway train rushing at red-hot speed, and whistling the most fiendish shriek the world has ever heard—at midnight, within 10 ft. of one's bedroom-window—is by many regarded as one of the greatest blessings of our modern legislation. And as to iron shutters, where is there such a protection to property from fire, and also from thieves? (It is steel shutters, by the way, which make the noise.) No doubt our friend the poor artist has a most just cause of complaint about the butcher's chimney-cowl; but then, if the poor butcher sleeps sounder in consequence of this squeaking—which means, of not being suffocated with smoke—who shall estimate the balance between good and evil?—that is, supposing the artist and the butcher to be alone concerned. But the real fact is, we are all concerned—society is concerned,—in getting even such small nuisances as these abated; and in this particular instance we think the remedy might be simple enough. Why could not the butcher put a piece of sheet on his chimney-cowl? And why could not the same

principle be carried out? The “trombones” might practice in the back garden as a mere question of civility; or, for that matter (since it is domestic music which he seeks to cultivate), he might try his hand on the flute. The fact is, we must all do our best in this overcrowded and artificial state of existence, particularly in great cities, to carry the golden rule into effect even upon small questions such as these. In still plainer terms, we should have more consideration, and exercise greater forbearance with each other in our most ordinary social relations.

The slamming of a door, the shutting of a window smartly, the noise of a rusty hinge, the want of a nail in the carpet, a picture hung awry, a bad picture, a disagreeable paper, a blunt carving-knife, cold plates, or a roast of beef overdone; these and a thousand other instances, which may easily be obtained from one's personal experience, or from the elaborate writings of modern authors, are, as we think, entitled to rank in the category of minor nuisances. Properly speaking, these do not belong to our special subject. But there are one or two hints on construction which (although not the least new), coming from the *Builder*, may carry with them a certain weight, or at least a recommendation to all who love peace and quietness as much as we do ourselves. In the first place an architect is bound to consider, and, if possible, to provide against minor nuisances.

“Great wit to madness sure is near allied,
And thin partitions do the bounds divide.”

This is a maxim which ought, literally speaking, to be constantly kept in mind. Secondly, the builder is bound to carry out the architect's intentions to the extent that there should neither be creaking doors, smoky chimneys, nor unworkable window-sashes. Finally, the public conscience must itself determine whether it be a proper thing to neglect towards society those small civilities in propriety, and above all in cleanliness, which no individual can be permitted to neglect; and here ends our little homily on minor nuisances.

ARCHITECTS AND BUILDERS.

SIR,—You inserted a query of mine in your number of the 24th of December last, with reference to a clause in an architect's specification, stipulating for payment for a set of drawings, &c., from the builder employed on the work. I find that the architect who inserted this clause in his specification, and who was paid by the builder, is put forward as a member of council in the recently-issued balloting list of the Institute. As I consider it would be inconsistent with the spirit of the bye-laws that an architect should, by a side-wind, lay blackmail on a builder, I think the election of this gentleman would be a tacit admission that the irregularity I allude to is not a contravention of the rules laid down in the paper on “Professional Practice and Charges of Architects.”

A FELLOW OF THE INSTITUTE, AND A
LATE MEMBER OF COUNCIL.

DIOCESAN ARCHITECTS.

SIR,—The remarks in the recent numbers of the *Builder* respecting All Saints' Church, Hertford, and “The Report,” bring before me the keen trial I recently experienced when the diocesan architect was called in to report upon St. Michael's Church, Bishop's Stortford, which church I had been restoring from time to time, as funds came to hand, under a written appointment as architect, from the rector and churchwardens. The circumstances I am relating occurred through a committee being formed to assist the rector and churchwardens, who were very short of funds; but the rector and churchwardens were overpowered by their committee, who, as I was informed, wished to have a report from the diocesan architect as to the cost of completion, &c. When the report was laid before the committee, the rector as well as others were greatly surprised to find it accompanied by a set of plans for completing the church. Strong request was made that I might complete the restoration of my parish church even in association with the diocesan architect, but the entreaty was not yielded to. A personal call resulted in my being told that the plans had already been prepared at considerable expense, but that my name should be connected in every way with the completion of the church. I regret to say that I

was, as architect, entirely ignored. If diocesan architects cannot help being called in, as will be alleged in this case, there are many ways open to them to palliate the disappointment of their untitled and less fortunate brethren, when interesting work is taken out of their hands, through change of power or through circumstances over which they have no control. Diocesan architects may assist the good cause of church restoration; but surely it was never intended that they should supersede their brother architects, directly or indirectly.

Architects of standing do not require their help in any way that I know of. Their appointment (by courtesy so called) appears to me, from trying experience, to contain most damaging powers; but in saying this I do not, for a moment even, suppose that diocesan architects in general would exercise those powers in any way inconsistent with the interests of their professional brethren.

G. E. PRITCHETT, F.S.A.

EXPRESSION IN ARCHITECTURE.

SIR,—In justice to a Scottish Academy exhibitor reviewed in a late number, will you allow me to name one redeeming feature in the executed works of Mr. Leiper, the architect I desire to refer to? I have not examined the drawings so summarily criticised, but have seen works of his, both ecclesiastical and domestic; and, although some may not admire the quaint archaic style in which he prefers to practise, his works have one most excellent quality rarely to be found in designs by our modern men,—that of expression.

The majority of architects seem unable to grasp,—I will not say the principles of design, for that is a matter of logical deduction,—but the power of imparting life to their work; they are well versed in the grammar of composition and detail, can write architectural language neatly and correctly; but their labour, like that of the fluent but superficial “littérateur,” goes no farther in its influence.

I do not refer to men without taste, of whom there are, unhappily, many in the profession, and who do more than is likely to minister to the mental culture of the public, but to the men of refinement, who labour hard, and so far successfully, to please; yet, from lack of imagination and enthusiasm, fail to make any true impression on public taste. A living dog is better than a dead lion.

A. B. C.

EARLY HISTORY OF OXFORD.

At a recent meeting of the Oxford Architectural and Historical Society in the Ashmolean Museum, Mr. James Parker lectured on “The Early History of Oxford to the End of the Eleventh Century.” He commenced by saying that most of the historians of Oxford followed each other with the unvarying description of the foundation or restoration of the University of Oxford by Alfred, but investigation into the authorities quoted by them showed what slender grounds they had for such assertions. Of the authorities quoted by Anthony Wood, none were earlier than of the fourteenth or fifteenth century. This author gravely asserts that Oxford was founded by Memphris, in the fifth year of his reign, or 1009 years before Christ. He felt bound to class with this the story of Alfred's foundation, and to include both under the mythical history of Oxford. He believed one of the earliest authors who recorded the latter was John Brompton. Rouse, too, was one of the authorities relied upon, but he was the most imaginative of all historians. Camden either relied upon forged documents, or was otherwise imposed upon when he inserted the spurious passage in his edition of Asser's “Life of Alfred.” Oxford was not mentioned in the Saxon Chronicle before the year 912, nor in Bede's history at all, though the latter authority mentions the foundation of the see of Dorchester. The first notice of Oxford was under the year 912, when Edward took possession of Oxford and London. In A.D. 924 Edward died at Oxford, but there was no evidence that he lived here. In 1010 the Danes burnt Oxford, and in 1013 the townsmen submitted to Sweyn. In 1015 Edric betrayed Sigfrith and Morcar. In this year we hear of the tower of St. Frideswide, into which the Danes took refuge. The evidence of the early existence of St. Frideswide's Priory is from a charter, which may be a forgery, executed by the monks to prove their lordship in the land

The usual date given for the foundation of St. Frideswide's monastery is A.D. 724. In 1016, on the authority of Henry of Huntingdon, we learn that King Edmund was killed at Oxford by the treachery of Eadric, and in 1018 we have the evidence of the treaty of the Danes and Angles at Oxford. In 1034 we have the earliest evidence of the existence of a church at Oxford, as Canute in that year granted St. Martin's Church to the abbey of Abingdon, that church being "situated in the celebrated place called Oxford."

In 1086 a witan-gemote was held at Oxford, and in 1039 Harold died here, and the second Harold held a gemote here in 1065. In 1071, as we learn from the annals of Oney, recently published under the direction of the Master of the Rolls, Oxford Castle was built by Robert D'Oiley, and here, in 1074, Edith, the wife of Edward, died. In the same year was founded the church of St. George-in-the-Castle, by Robert D'Oiley and Roger D'Ivry. The next church we get mentioned is that of St. Mary Magdalen, in the suburbs of Oxford, which was now given to the monastery of St. George. We also learn from the Abbey Chronicle that D'Oiley built a great bridge on the northern bank. This was Hythe Bridge. At this time Mr. Parker believed that Oxford, though surrounded by fortifications, was not enclosed by a stone wall. The term "mursagium," mentioned in the Domesday survey, he said, did not necessarily mean a stone wall. There was probably a fence of earth and a stockade, and it was this fence which the citizens were bound to maintain. The stone wall was erected during the reign of Henry III., when such extensive taxation for this purpose was recorded.

CLERKS OF WORKS.

Sir,—In the letter of a west-country architect which appeared in last week's *Builder*, there is a sweeping charge made against clerks of works. Your correspondent, in an evasive mood no doubt, describing in an imaginary manner and imaginary way the way in which leading architects conduct their works, says:—"Why depend on Mr. Bond's clerk of works, a very corruptible person, no doubt, and with his own schemes on foot besides his employer's." I cannot understand why the writer should vent his opinion on a class of men of whom he can have but little knowledge; but, while at the meetings of the President Institution of Clerks of Works, Mr. Pennington and others, who are not only respected, but respected, voluntarily express their confidence in, and the assistance rendered by, their clerks of works, I think we need not heed the vapourings of a "West-country Architect."

A WEST-COUNTRY CLERK OF WORKS.

CASES UNDER THE METROPOLITAN BUILDING ACT.

CUTTING INTO PARTY-WALL.

At Guildhall, Mr. Charles Burtwell, of Lower Norwood, builder, was summoned by the district surveyor of the northern division of the City of London, before Sir Robert W. Carden, for non-compliance with a notice of irregular works, which existed at the premises, No. 3, Copthall-court, Throgmorton-street.

Mr. Edmund Woodthorpe said that his attention was called to the state of the party-wall of Nos. 3, Copthall-court, and 6, Warford-court, by Messrs. Cawston & Co., they having noticed a strong smell of burning. Notice was then given to the owner of the premises, No. 3, Copthall-court, to discontinue the fire, and a notice was subsequently served upon the defendant to "cut into and bore," &c., to ascertain the thickness of the chimney-backs and flues. It was then found that two flues, 14 in. by 9 in., had been cut into the party-wall to within 4 in. of the face of the wall, on Messrs. Cawston's side, and that some old bond timber which existed in the wall had been also cut away, a portion of which was charred. He further stated that it was a serious matter, and would have resulted in the destruction by fire of the adjoining houses. At the same time, the defendant had rendered himself liable to a penalty of 20l. a day.

Mr. Burtwell said that he fully admitted the facts, but that he was convinced at the time the back of the flue was 8 in. thick, inasmuch as he saw a header and stretcher, and further tried the soundness of the wall with a hammer and chisel. However, he would be pleased to rectify the irregularity at once, but that the tenants in occupation refused to let him on their side, and Messrs. Cawston on the other.

Mr. Burra, of the firm of Markly, Wilde, & Burra, appeared on behalf of the tenants, and said that, in consequence of their having been put to great annoyance and inconvenience through the landlord carrying out some alterations, and having but just retaken possession of the rooms, they felt that they could not let the defendant in to carry out the notice served upon him, to their further inconvenience, unless some suitable office was obtained for their use while the works were being executed.

Sir R. W. Carden said, that as the defendant admitted the irregularity, and was prepared to carry out the works, he should adjourn the case into a week, in order that the parties might come to some arrangement.

At the adjourned meeting Mr. Woodthorpe attended, to explain to the magistrate that he had again surveyed the premises in question, and found nothing had been done.

The defendant expressed his regret that the work was not executed, he having again been refused admission; but having again cut into an agreement with the tenants' solicitors to be allowed access to the premises, he was prepared to comply with Mr. Woodthorpe's notice if the magistrate would grant six days for the carrying out of the works. The case was then adjourned.

On Tuesday, the 14th of March, the further hearing came before Sir W. A. Rose, and Mr. Woodthorpe again explained the circumstances; but as the defendant was not in attendance, Mr. Martin (the chief clerk) suggested that another summons be issued for the following Thursday.

The owner (Mr. Barker) then came forward to say the reason the defendant was not in attendance arose from the fact that the work was being proceeded with. Whereupon Mr. Woodthorpe emphatically denied such a statement.

On the following Thursday Mr. Woodthorpe was examined as to the facts already stated, and pressed for a penalty, since the promises of the defendant had not been fulfilled. He again adverted to the serious consequences that might have ensued through the illegal acts of the defendant, and trusted that an order would be made in the usual way.

Mr. Roberts, architect, of Laurence Pountney-lane, was next examined, and bore testimony to the evidence given by the district surveyor, and stated that Messrs. Cawston & Co. were very seriously inconvenienced by the irregular works not being suspended, and he hoped that an order would be issued, and that not more than six days would be allowed for the execution of the works.

The defendant, in answer to the magistrate, said he regretted his promise had been unfulfilled, but that since the tenants had given him permission to do the works, the landlord had withheld his consent until yesterday, when the works were commenced to be rectified.

Sir W. A. Rose said he had no alternative but to fine the defendant 4/6, allow the expenses of the district surveyor and Mr. Roberts, and make an order for the works to be completed within six days.

ASSOCIATED CARPENTERS AND JOINERS OF SCOTLAND.

DEFENCE, NOT DEFIANCE.

Sir,—The plausibility of the observations made by the writer of the letter on the Trade-union Bill, which you published in your number for March 25, will, if allowed to pass uncontradicted, induce not a few of your numerous subscribers to believe that he is thoroughly conversant with the statements which he has advanced.

Such not being the case, I venture, with your permission, to correct some of the perverted facts with which he has adorned his calumniating epistle.

Before doing so, permit me just to remark, that the covert attack made by your anonymous correspondent on all trade-unions in general, and the union masons and joiners of Glasgow in particular, shows that he is an adept in displaying the abuses of union to a degree beyond their utmost limit.

As he subscribes himself "A Working Man," I take it for granted that he is not one of those who are "arrayed in purple and fine linen, and fare sumptuously every day."

Being an operative joiner myself, and a member of the "Associated Carpenters and Joiners of Scotland" Society, I feel not a little surprised, in common with many of my fellow workmen, at the remorseless and sweeping allegations thrust at us in his reference to our late unfortunate strike,—unfortunate, because I consider all strikes a misfortune to both master and workman.

The misrepresentations and perversions which I most complain of refer to his statements regarding the joiners. I am content to leave the charges brought against the men of "stone and iron" to be defended by themselves as best they can. Your correspondent says,—"that last year, in the month of March, at the instance and under the pressure of their trade-union, the joiners of Glasgow inaugurated a gigantic strike for the reduction of the hours of labour from fifty-seven to fifty-one hours per week."

The real facts of the case are, that for three successive years previous to March, 1870, the union joiners of Glasgow, acting in concert with their non-union brethren, respectfully requested a reduction of their working hours; but each time it was not granted; and in avoiding a strike we contented ourselves with the refusal. That there was coercion or pressure used on the part of the union, on the occasion referred to, is a gross and malicious assumption, for which he can furnish no proof whatever. "A Working Man," in assailing the men of "stone and iron" on the part of non-union men, and in trumpeting forth his superiority and talent for outeness, ought to know that the non-union men were in a very irritable Glasgow at the time, and that out of 31,550 who struck work, 700 were non-union men. The scandalous and seductive remarks about "coarse and inflated oratory," are likewise unsupported assertions, for which there is not the slightest foundation;—doubtless the result of his overheated imagination. He also says that "twenty-seven of the largest employers in the city have, since the strike, continued their work on the old system." This is also inaccurate. The fact is, that seven of that number have, since the 1st of last month, adopted the nine-hour day. And for him to say "That it has been resolved to force all non-unionists to join the union, under a threat that, on refusal, a strike will be resorted to," is also a baseless fabrication, no such resolution having been passed at any meeting of ours since the termination of the strike.

The master in which we are lauded about our defective and inferior education is proof in itself that "A Working Man" has turned the learning that he is possessed of to bad account. In this respect he has "shot his arrow over the house-top, and hurt his brother." In proof of these corrections I send you extracts from the Glasgow newspapers relating to the subject; and as the joiners, in particular, have been rather unfairly dealt with by your correspondent, in common fairness and self-defence your insertion of the above will greatly oblige.

JOHN BRUNETT.

SCHOOLS OF ART.

The Swansea Schools of Science and Art and Oxford Local Examinations.—The annual distribution of prizes and certificates in connexion with the Swansea Schools of Science and Art and the Oxford Local Examinations has taken place in the Music-hall, Swansea. Mr. H. H. Vivian, M.P., presided, and the prizes were distributed by Mrs. Vivian. There was a large attendance. According to the report, the

school opened in January, 1870. There have been in attendance at the evening classes 109 pupils, 91 of whom were artisans, 18 clerks, or students not strictly artisans. The morning class has been attended by 22 pupils, the mid-day class by 21, and the afternoon class by 14, making in all a total of 166 pupils. The morning class is chiefly intended for the more advanced female students, the mid-day and afternoon for pupils from ladies' and gentlemen's schools, so as to afford the advantages of the Government art-teaching to those schools in the town that cannot form separate classes at their own residences. The school teaching extends to the Grammar School, where all the pupils are under instruction, to the Collegiate School, the Rev. G. P. Evans's, the Normal College, and the Kilvey Copper Works School. The same number of candidates presented themselves for examination this year as the last, namely, 62. Last year 33 were successful, 11 obtained prizes; this year 30 were successful, 16 obtained prizes. The amount of fees last year was 96l. 7s. 6d.; this year it was 83l. 3s. 6d. The subjects taught in the science school last year were building construction, inorganic chemistry, acoustics, light and heat, navigation, magnetism and electricity, theoretical mechanics and applied mechanics, in all of which, as well as in organic chemistry and animal physiology, examinations were conducted. The total number of pupils in the school was 108 at the several examinations. Twenty-three first classes and 42 second classes were obtained altogether.

The *Hanley School of Art*.—In July of last year the Department of Science and Art issued a notice to the schools of art throughout the country that Mr. Edward T. Dresden, a gentleman desirous of stimulating the exertions of the male and female students, had offered five prizes of 10l. each for designs in pottery and for porcelain painting. The first of these prizes was for the design of a vase or other large object of a similar character for the "modelled form," and this has been awarded to Mr. Joseph Ellis, of the Hanley School. The body of the prize vase is oviform, and the general design is that of the Renaissance period. On one side of the vase is a bas-relief of a draped female figure dancing, and on the opposite side the same figure in repose. There are two floriated handles, round each of which is entwined a snake, whilst near the lower end of the handle is a Cupid clambering upwards, and blowing a horn with the intention of frightening away the reptile. There are subordinate enrichments both of a natural and conventional description. The new master is Mr. Bradbury, under whose supervision the work was produced. The vase will be on view at the approaching International Exhibition.

DISSENTING CHURCH-BUILDING NEWS.

Torquay.—Up-ton Vale Baptist Chapel has recently had some extensive additions made to it. Sir L. Palk, bart., some time since, gave an extension of ground for building schools, &c. Upon this land have been erected additional class-rooms, a lecture-hall, and a cottage or dwelling for the chapel-keeper. On a level with the main school-room, and entered from Lymington-road, is the new infant class-room, containing good galleries; also all the necessary offices connected with the school. On a level with the chapel, and at its rear, are three extra, well-ventilated class-rooms; also the pastor's and deacons' vestries. The two rooms formerly used as vestries are now converted into lobbies connected with a second entrance from St. Mary Church-road. Above these rooms, and on a level with the last-mentioned road, is a very spacious lecture-hall, 46 ft. in length and 30 ft. wide, having a curved plastered ceiling, the principal rafters, collar-beam, and curved ribs being exposed to view, and the curved ribs springing from Bath stone corbels, over which runs a perforated wood trefoil frieze. The platform is in the form of a bay and two wings, with stop-chamfered newels, open framing, and sunk trefoil panels. The rail and lectern-shelf are supported by wrought-iron standards painted on ochraceous ground, and relieved with gold, which contrasts with the stained and varnished work of the building. The seats are open, and of pitch-pine, Gothic forms. In addition to these works the chapel and schools have been cleaned and ventilated, and the cornices and centres of the ceilings have been relieved with colour. The chapel and schools have been heated by the hot-

water system, from a boiler situated in the basement. A new organ has also been erected, from the firm of Messrs. Lewis & Rogers, of London. Externally, in conjunction with the Torquay Local Board of Health, the committee have given up a piece of ground for the widening of the road and footpath, which will be separated from the chapel-yard by a dressed limestone curb and iron railing, and gate of a Gothic pattern. These alterations and additions were not contracted for, but have been carried out by Mr. Joshua Chubb, builder, employing many of the men connected with the congregation, at about a cost of 1,800*l.*, including the organ, the whole of the works having been carried out under the superintendence of Mr. George Soudon Bridgman, of Torquay, architect.

Lincoln.—The old Baptist chapel in Mint-lane having been built more than fifty years, was found wanting for the requirements of the present time, so it was deemed necessary to build a new chapel. The new edifice has been erected upon the old site in Mint-lane; and although the position is somewhat retired, yet, being in the centre of the city, it is conveniently accessible, and the tower gives a reasonable prominence to the edifice. The want of space compelled the strictest economy and careful planning, so that no part of the area should be wasted; consequently no breaks could be permitted in the face of the frontage; thus precluding the use of buttresses, recesses, projecting porches, flight of steps, &c., usually adopted in chapel buildings as a means of increasing the architectural effect; nevertheless, the straight line of the façade has been so managed that the want of variety is not discernible. The entrance doorways are to be decorated with polished red granite columns with carved capitals, carved gurgoyles terminating the hood mould of the moulded and underhung archivolts. Only one of the capitals is yet completed. The large centre window has six Mansfield stone columns with carved capitals; similar columns are also applied to the centre triplet, which forms the principal feature of the corbelled coping of the great gable. The roof of the chapel is formed of open timbers with clearstory lights, which run on both sides the whole length of the chapel in the line of the break between the centre gable and the lower roof line. Galleries are provided on three sides, and an organ recess with choir seats in a narrow gallery behind the pulpit. The passages and baptistry are laid with Maw & Co.'s encaustic tiles. The seats are open, with bench-ends, and will accommodate 680 persons. All the internal woodwork is stained and varnished. All the works have been carried out by Messrs. Barnes & Wright, Lincoln, for the sum of 1,400*l.*, including the cost of heating apparatus and gas-supply, or at about the rate of 2*l.* 10*s.* per sitting. There are schoolrooms and vestries behind the chapel. The architects were Messrs. Drury & Mortimer, of Lincoln.

Burnley, Lancashire.—The corner-stone of a new Wesleyan chapel was laid at Burnley on the 4th inst. The building has been designed in the Lombardic style by Mr. W. Waddington, architect. The principal doorcases are contained in a central gabled projection, flanked by angle-turrets, in which the stairs to the gallery are formed. The interior wood-work will be of pitch pine, varnished. About 700 persons will be accommodated, and the cost will be 2,400*l.*

Aberystwith.—The building of the new English Methodist Chapel, in Newfoundland-street, has been commenced by Mr. Thomas Davies, builder, according to a plan prepared by Mr. Richard Owen, of Liverpool, architect.

Wika.—A new Wesleyan Chapel has been opened at Wika. The chapel has been erected near to the Half-Way House, a public-house on the road leading to Brighouse. It is a stone building, measuring 51 ft. by 22 ft. inside. The entrance-door, which is reached by a flight of twelve steps, is in one of the gables, and the other gable, which is octangular in its shape, contains three windows of stained glass. There are six other two-light windows, three on each side, and a tracery window over the entrance door. The roof is supported by circular principals, from which are suspended two corona gas chandeliers. The pews are open benches, made of wood, and stained. There is a wooden pulpit, the panels being made of tracery work. The number of sittings is about 250. There is also a small vestry. The place is warmed by Haden's apparatus, and the entire cost of the building is about 700*l.* In the purchasing of the site for the erection, provision has been made for an extension at some future time.

Ashby (near Brigg).—A Wesleyan Chapel has just been opened at Ashby. The style is Early Geometrical; the material is red brick, with Ancaster stone dressings; the pulpit and Communion are of pitch pine and mahogany. Accommodation is provided for 170 adults and 30 children. The total cost, including Porrett's warming apparatus and fencing, is about 420*l.* Mr. J. K. James, of Hull, is the architect; and Mr. Whitehead, of Caistor, is the contractor.

Brighton.—North-street Chapel has been reconstructed and reopened. The architect was Mr. John Wimble, of London. All the space at his disposal has been utilised in order to give the greater possible amount of accommodation. The new church has been built by Messrs. Myers & Son, of London, and is in the Early Decorated style. It has a frontage in North-street of 38 ft. 6 in.; the tower and spire being on the eastern side. The height of the tower is 55 ft., and that of the tower and spire 113 ft. Three arched doorways in front of the church are divided by polished red granite shafts, the spandrels of the arches being richly carved and ornamented with medallions, in high relief, of the four Evangelists; the carving of these, as well as of the stone pulpit and other similar work, being executed by Mr. Janson, of London. The frontage is of Keatish rag, from Maidstone; and the dressings and spire are of Bath stone. Over the doorways are two three-light windows, and over them a circular window, the whole being surmounted by a gable. The body of the building on the ground floor is 68 ft. 6 in. long, and 40 ft. wide, having upon three sides,—north, east, and west,—galleries, with open panels on the front, filled in with iron work. There is also an upper gallery at the north end intended for the use of children. The chancel at the south end of the church has an arch 15 ft. wide, and 33 ft. high; with other arches filled in with open tracery on each side. There are two stained glass memorial windows. The one in the chancel has five lights. The openings are filled with symbolical ornaments. The second is at the northern end, and is a large rose window. It is filled with rose ornaments. Both windows were designed and executed by Messrs. W. Holland & Son, Warwick. The interior of the building has a ceiled roof with open timber supports. The gas-fittings were supplied by Messrs. Packham & Son, Brighton.

FROM SCOTLAND.

Edinburgh.—The case of the North British Railway Company against the Caledonian Railway Company, in regard to the new works in course of erection by the Caledonian Company over the Haymarket tunnel, has come again before Lord Mackenzie. A debate took place on the report of Mr. Leslie, C.E., upon the operations complained of. Mr. Leslie, in his report said that,—

"Had it been intended from the first to have put so great a load over the arch in open cut as that now being done, he was satisfied that the experienced engineer who constructed it would have made the arch stronger than it was. However, there were no symptoms whatever of any part under the Caledonian Railway Company's works near Haymarket having yielded in the smallest degree. Seeing that the embankment had been already raised to within 1½ ft. or 2 ft. of its finished height (viz. the level of the rails), and that the retaining wall on the east side of the embankment wanted only a coping of about 1 ft. in thickness to raise it to its full height, except any fence or wall that might be built upon it, without any apparent disturbance to the arch, he did not think that there was any probability of the arch giving way after this."

Still he could not undertake to say under all the circumstances that the arch was amply strong to meet its possible requirements. The Lord Ordinary made a further remit to Mr. Leslie to report on the effects of the completion of the Caledonian Railway Company's works upon the stability and safety of the tunnel.

Glasgow.—A new Established church is about to be erected in the parish of Govan, Glasgow, for the benefit of the inhabitants of Whiteinch. The Rev. Matthew Leishman, D.D., parish minister of Govan, and others, have been actively engaged in procuring funds for the building. The design is by Messrs. Kennedy & O'Donoghue, by whom the work will be carried out.

Lanark.—Sir Simon M. Lockhart, bart., lately proposed to erect at Lanark, at his own expense, a hospital for the Upper Ward of Lanarkshire, provided a fund sufficient for its endowment was raised by voluntary contributions. A numerous-attended meeting of gentlemen connected with the district has been held, and a plan of the proposed hospital, prepared by Mr. Bryce, archi-

tect, Edinburgh, and relative estimates, were laid before those present who were of opinion that Sir Simon's proposal should receive every encouragement; and they appointed a committee to raise funds for the maintenance of the hospital, to prepare the draft of a constitution, and to report to a future meeting. The proposed hospital is intended to be erected on the pavilion principle, and to have twenty beds, the estimated cost of maintenance being 600*l.* per annum. Subscriptions were made at the meeting, to the amount of about 3,000*l.*, of donations to the endowment fund, and of annual contributions to the amount of about 180*l.*

Peterhead.—A deputation of the Governors of the Merchant Maiden Hospital and of the Edinburgh Educational Institution for Young Ladies, who are the superiors of the town of Peterhead, and are at present on a visit to their estates there, took the opportunity of uncovering an obelisk memorial erected by them to inaugurate the opening of the cemetery which they have laid out. The monument is of polished granite, and was executed by the firm of Messrs. McGlashan & Co. It ends in the form of a Runic cross, and about 14 ft. high. It bears the following inscription:—"The Governors of the Merchant Maiden Hospital, Edinburgh—James Sandilands Duncan, Preses—resolved in 1868 to form this cemetery, and the same was publicly opened by Thomas Jamieson Boyd, Preses, and a deputation of the Governors, on the 5th July, 1869."

Cupar.—The Duncan Institute, the bequest of the late Miss Duncan, of Edengrove, has been formally opened by the Very Rev. Principal Talloch, of St. Andrews. Externally, the building is one of the most ornate in the town. It has cusped windows, with central upright shafts; a light façade; large and ornamented doorway, decorated with granite shafts; and tall spire. Mr. John Milne was the architect. Principal Talloch delivered an inaugural lecture; and further to celebrate the occasion, the trustees got up a sort of art exhibition and museum of curiosities and articles of vertu, contributed for the most part by townspeople and others in the immediately surrounding district.

Dundee.—The Harbour Trustees have had a meeting as the Works Committee for the purpose of considering the expediency of finishing Victoria Dock, and proceeding with other works in contemplation. The Provost moved that the Victoria Dock should be completed according to Mr. Ower's plan. Mr. Gordon seconded the motion. Mr. W. Nicoll thought the trustees should delay for a time until they saw the effect of the dredging operations. If the bank opposite the west docks could be cut through so as to allow vessels of the least draught of water to enter them, the pressure on the east docks accommodation would thereby be afforded for vessels from Calcutta. He concluded by moving accordingly. Mr. Machan seconded the amendment, and suggested the addition that the south side of the dock should be dredged alongside the wall to the extent of admitting large vessels to lie along the quay. This addition Mr. Nicoll agreed to. After considerable discussion, a division was come to, when Provost Yeaman's motion was carried by a majority of twenty to four. In regard to the site of the proposed new Graving Dock, a long discussion took place, and it was ultimately agreed to unanimously that as it had been resolved to complete Victoria Dock, and thereby to shut out the water, the whole question as to graving dock accommodation should be submitted to Mr. Harrison, with the suggestion that the Graving Dock to be constructed shall not be less than 450 ft. in length on the floor. It was next unanimously resolved that the new 60-ton crane should be placed on the south side of the Victoria Dock. It was remitted to the conveners of the committee, along with the engineer, to consider and report as to the accommodation to be provided for the timber trade.

Edinburgh.—A public meeting has been held to consider the propriety of providing a public hospital for the district. A motion, approving of the scheme and appointing a committee to carry it forward, was unanimously adopted. The meeting was not very well attended.

Borax for Black-beetles.—Borax is said to be superior to everything else for exterminating the cockroach. The smell, or touch, of borax, it is said, is certain death to them.

STAINED GLASS.

St. Luke's, Liverpool.—The great east window of this church has just been filled with stained glass. The congregation have long contemplated some such decoration to their chancel, and in the autumn of last year approved of a design from Messrs. Ballantine & Son, of Edinburgh, and commissioned those artists to carry out the work. Architecturally the window may be termed a five-light window with transom and tracery in the style of the fifteenth century. The five compartments under the transom contain illustrations having reference to the life and writings of St. Luke. The three central spaces are devoted to the great event recorded only in St. Luke's Gospel, of the angel of the Lord appearing to the shepherds with the message of the nativity. Above the transom the lights are much taller, and therefore form the main portion of the whole window. The subject chosen is from St. Matthew xi. 28,—“Come unto me all ye that labour and are heavy laden, and I will give you rest.” The arched head of the window contains a number of smaller narrow openings, which are filled with figures of the twelve apostles and angels.

Christ Church, Gravesend.—A stained-glass window has just been fixed in this church to the memory of the late Rev. Charles Hind, B.A. It will be remembered that the deceased clergyman was for some time curate of Christ Church, and that he was accidentally drowned whilst performing a labour of charity, off Woolwich, a short time ago. The subjects selected for the window were full-length figures of S.S. Peter and Paul, in compliment to the mother church of the parish, with an angel above bearing a scroll. The cost was defrayed by subscription, and the artists selected were Messrs. Matthews & Cobham (late with Messrs. Clayton & Bell), of Camden Town and Gravesend.

York Guildhall.—The Guildhall of York is having its windows filled in with stained glass by liberal donors. The seventh window has just been erected by Mr. R. A. Clark, of Selby formerly of York, and the window is a memorial of his father, Sir William Stevenson Clark, Knight, deceased, Lord Mayor of York in 1840. The subject chosen by him was that historically commemorating the Norman period,—viz., “The assembly of the Barons at York to repel the invasion of the Scots in 1138.” The design has been prepared by Mr. J. E. Doyle, of London, the author of the “Chronicles of England,” and the work has been executed by Mr. J. B. Casproun, of Brussels. In the upper compartments are the arms of the city of York, surmounted by the Cap of Maintenance, and enrobed by the Lord Mayor's chain; and in the corresponding division, a shield containing the monogram of the donor, over which is his crest. The subject commemorated in this window is the meeting of the Northern Barons at York, in August, 1138, to concert measures for the defence of the country against the Scots, who, under King David I., were already in possession of the border counties.

Chadlington Church.—A memorial stained-glass window has been placed in the east end of the chancel, by Mr. A. L. Rawlinson, of Chipping-Norton. The window consists of three partitions. In the centre partition is a representation of the Saviour of the World, instituting the Sacrament of His body and blood; the right partition contains a figure of St. John the Baptist; and the left, a figure of St. Nicholas, to whom the church is dedicated. The work is from the firm of Messrs. Hardman, of Birmingham.

PROVINCIAL NEWS.

Harrogate.—The corner-stone of the new baths and reservoir for mineral water at Harrogate has been laid. To meet the increasing want of better bathing accommodation by visitors to Harrogate, the improvement commissioners have determined to erect a large suite of baths and reservoirs for the storage of the mineral waters. The site chosen is on the Victoria Baths estate, and the cost is estimated at about 11,000l.

Wolverhampton.—The new post-office buildings about to be erected on the south side of Queen-street, and to which they will have a frontage of 48 ft., will be in the Italian style of architecture. They will be three stories in height, the lower story having doorways on each side, with two window openings between them, under the eills of which will be the letter-receiving boxes, and the first and second stories a range of four window openings to each, those of the former being pediment-headed. The

building will be surmounted by a cornice and balustrade parapet, and on the cornice will be inscribed “Post Office.” A moulded balustrade string-course will divide the ground from the first story, and an enriched string-course the first from the second story. The whole of the front will be faced with Hollington stone, the total height being 56 ft. from the pavement. The arrangement on the ground floor will be a central room for the public, 35 ft. by 24 ft., and 17 ft. high, the public entrance for which will be from a lobby entered by a doorway on the side nearest the town. The corresponding lobby will provide the entrance to the postmaster's private room and to the Inland Revenue offices. Behind these will be the sorting-room, lighted from the top, being one story high, and 60 ft. by 30 ft. The first floor, which will comprise a suite of four rooms, will be devoted to the Inland Revenue Offices, and approached by a stone staircase; and over these, on the second story, will be the rooms appropriated to the purposes of the telegraphic department. In the basement will be rooms for the residence of a porter in charge, day-rooms for letter-carriers and sorters, battery-room, &c. Builders have been invited to tender for the carrying out of the work. The new building is to be entered upon at Lady-day, 1872.

Eston (Middlesbrough).—The new works of Jackson, Gill, & Co., Eston, two miles from Middlesbrough, have been opened. These works, which have been named the “Imperial Iron Works,” were commenced in September last, and consist of twenty puddling furnaces, a four-ton steam-hammer, and all necessary appliances for the manufacture of puddled bars. The works are capable of producing 10,000 tons annually. About 150 men will be employed; but it is intended to enlarge the establishment soon, and erect merchant iron finishing mills. Several ladies and gentlemen were present to witness the puddling of the first bloom and the rolling of the first bar.

Books Received.

The Seven Periods of English Architecture defined and illustrated. By EDMUND SHARPE, M.A., Architect. Second Edition. London: Spon. Birmingham: Birbeck. 1871.

THE second edition, recently published, of Mr. Sharpe's “Seven Periods” is enlarged chiefly by eight additional plates of Lincoln choir, nave and presbytery, and Peterborough choir. In these days of masterly scratches and meagre lithographs it is refreshing to see a set of well-finished, clear, and precise line engravings, reminding older readers of the days of Le Keux. Mr. Sharpe's divisions and titles have been set forth and reviewed on several occasions in these pages, so that we need not just now again discuss them. Readers, without being bound to substitute the terms *Curvilinear* for “Decorated” and *Rectilinear* for “Perpendicular,” will find the characteristics of the various periods of English architecture succinctly and clearly set forth, and will be sure to derive advantage from a study of the book. The illustrations make a capital set of copies for architectural students.

VARIORUM.

“Casell's Popular Drawing Copies,” include Model Drawing, Vegetable forms, Landscape, Animal forms, and the Human Figure. They are published in a cheap form, and will be found very useful.—The “Technical Educator” continues its course. We take a paragraph from the last number on the Structure of Wood. “Wood is composed of multitudes of fibres placed side by side. In this it differs from stone, which is a multitude of particles merely attached together. This constitution of wood is the cause of many of its peculiar properties. The fibres are extremely tenacious in themselves, but they adhere together with comparatively weak force. This produces what is called the grain in wood. If I take a piece of pine, 1 ft. long and 1 in. square, I should find it impossible to break it when the fibres, that is, the grain, run along the length of the wood: the reason of this is, that to break the piece the fibres would have to be torn across, and enormous force would be required. But if I take a piece of pine of the same dimensions, in which the grain runs across the wood, I find that it is broken with comparative ease. The reason is that in this case the fibres have not to be torn asunder, but only separated, and the force of adhesion

is not great. In different woods, the grain varies, the fibres being much more compact in some cases than in others. Splitting of wood is a separation between contiguous fibres. In fact, a piece of wood is to some extent analogous to a rope, the fibres in each being placed side by side; the difference lies in this, that in the first place the fibres of wood are not twisted like those of the rope, and in the second place that the fibres of the wood adhere together, while those of the rope do not. The fibres of wood are also short.”—The new number of the *Art Journal* is a good one. We learn from it with agreeable surprise that the Sultan has actually given sittings for a statue of himself to Mr. C. F. Fuller, the accomplished sculptor, now resident at Florence. “Hitherto, the Turks have construed literally a command in the Koran equivalent to that which was issued from Mount Sinai,—‘Thou shalt not make to thyself any graven image, nor the likeness of anything,’ &c. The innovation will make many of the Sultan's older subjects shudder. It would be difficult to overrate the horror with which such an act would have been received half a century ago; as much so as an attempt to house a herd of swine in Santa Sophia, and would certainly have caused a revolution in Constantinople. The Turks are, however, rapidly approximating to the habits of Christian states, of which this is the latest and the strongest proof.”—In the current *Fraser* the author of “Ginx's Baby” makes a vigorous appeal for assistance to those who would emigrate. Mr. Proctor writes on the “Corona.”

Miscellanea.

Whitechapel.—In the report on the sanitary condition of the Whitechapel district for the quarter ending 31st December, 1870, Mr. John Liddle, the medical officer of health, draws attention to various suggestions and recommendations made by Mr. W. Vallance, of Whitechapel, as to the compulsory registration of births; gratuitous issue, and renewal when lost, of birth and vaccination certificates; power of registrar of births to compel vaccination, or to enforce production of certificate of vaccination at registration of birth; and as to house-to-house visitation for vaccinating purposes, &c. The freest communication between the registrar of births and deaths and the public vaccinator (if not one and the same person) is regarded by Mr. Liddle as of especial importance. For the public health, buildings should be erected on ground, compulsorily purchased if need be, for mortuaries and *post mortem* purposes, for disinfection of clothes, bedding, &c., with carriages retained in them for conveyance of persons not paupers, afflicted with contagious disease, to public hospitals, &c., or to hospitals built in the districts for such persons. Houses of refuge for healthy inmates of private houses infected with contagious disease should also be erected as temporary abodes till thorough disinfection of their dwellings be effected.

Physical Science Classes for Newcastle.

A public meeting has been held in the lecture-room of the Literary and Philosophical Society, Westgate-street, Newcastle-upon-Tyne, to meet the Dean of Durham, to consider the establishment of classes in this town, in connexion with the University of Durham, for teaching physical science. There was a good attendance. The course he sketched out, involving the labours of four professors and the services of an active secretary, would scarcely be carried out for less than 2,000l. a year. The proposal the University made was this,—they offered to place here two professorships, one in chemistry and the other in experimental physics. They also offered 1,000l. a year, and trusted some would be provided by the public. The meeting pledged itself to obtain that measure of support in the neighbourhood considered by the heads of the University as essential to secure the establishment and success of the school of physical science in Newcastle. An executive committee was appointed, and 3,000l. were at once promised; Sir W. Armstrong offering 100l. a year for six years, and others 50l.

Chelsea Embankment.—Messrs. Neave & Fry have declined to carry out the contract for the Chelsea Embankment works, owing to the discovery of an error in the pricing of their estimate.

Steam Superseded by Electro-Magnetism.—The standing title of "Steam superseded," has not been much in use of late, and now when we hear of it again, there is not much novelty in the idea. It has long been thought possible, however, that electro-magnetism might supersede steam. An American paper gives now a description of the action of "a powerful magnetic sawmill" at some works at Newark, in the State of New York. The motive power is derived from an electro-magnetic battery, which was watched for nine consecutive hours without manifesting any perceptible decline of power, and with a consumption of less than half a pound of zinc. The force obtained was rated at 2-horse, and it is asserted that it could be obtained for four-and-twenty hours at a maximum cost of 5d. It is also affirmed that, by increasing the diameter and width, or multiplying the wheels, and the number of magnets, the power can be largely increased without multiplying the cells, which in this instance amounted to four. The *Chemical News* thinks that "We may yet see the Atlantic crossed by huge vessels, propelled without an ounce of coal, by a power the initiative of which the captain may place beside his writing-desk in his cabin, which a child can apply, and the smallest finger may stop."

The Metropolis Water Bill.—The Metropolitan Board of Works have discussed the subject of the Metropolis Water Bill. The three leading principles of the measure, which the Parliamentary Committee approve of, are the provision of a constant supply, the constitution of the Board as the metropolitan authority, and the enabling the Board to compulsorily purchase, if they think fit, the properties of the different water companies, at the expiration of three years from the passing of the Bill. It was proposed that the report be adopted, with the exception of the part approving this last-named feature, but it was negatived by a majority of 21 to 6, and the report was adopted in its entirety. The Court of Common Council have decided to petition against the Bill, mainly because it constitutes the Metropolitan Board of Works the authority for the regulation of the water supply in the City as well as out of it. Several members at the further end of the court said they did not hear the question put, and Mr. Frederick Cox said that if they petitioned against the Bill they would commit a great mistake. The Lord Mayor, however, ruled that the motion having been carried, there was nothing before the court.

New Bank, Gateshead.—The foundation for the new building for the National Provincial Bank of England was laid last week. It will be of a plain substantial Italian character; the two fronts to be of stone, divided by rusticated piers into eight bays, with a pierced parapet at the top of the building. The size of the banking-room will be about 43 ft. long by 27 ft. wide, and will be lighted by large semicircular-headed windows. There are also to be strong-rooms, treasury, and book rooms on the ground floor and basement. The first floor will be arranged to meet the requirements of the resident, and the clerks' rooms, &c., will be on the basement. Mr. John Gibson, of Westminster, is the architect for the building, for which Mr. Joseph Elliott, of North Shields, has obtained the contract. Mr. William Glover is the clerk of the works.

A Harbour of Refuge at Jersey.—A Bill has been passed by the Jersey States, for the construction of a harbour of refuge at the island, chiefly for the accommodation of the steam-packet traffic. Strong opposition was raised by the party in favour of a harbour at Noirmont, on the west side of St. Aubin's Bay. The plan selected is by Mr. Coode, and embraces a landing-stage on the east side, and a break-water on the west of Small Roads. The cost of the works will be 252,000l.

Asserted Roman Remains near Croydon. In the course of the works for utilising the sewage of Croydon, remains of a villa, said to be of the Roman period, have been cut into. A chamber, 16 ft. 5 in. by 9 ft. 11 in., has been uncovered. The site is about a quarter of a mile from Beddington Church.

Fine Arts at the International Exhibition.—All painters in oil colours whose works are admitted to the International Exhibition will be free to varnish and retouch their pictures before the Exhibition opens. The days for doing so will be the 20th and 21st April.

Industrial Partnerships.—The Encaustic and Tesselated Tile Works, Jackfield, Shrewsbury, have lately passed into the hands of a new company, of which, Mr. A. H. Brown, M.P., became a member on condition that the principle of allowing the men a share of the profits of the concern should be adopted. The company, according to the *Shrewsbury Chronicle*, have obtained a fresh lease of the property, and are about to expend some 10,000l. in building and machinery, which cost will be distributed over the period for which the lease is taken—which is for sixty years—in order that the men who are admitted to an interest in the concern should, over and above their wages, participate in the profits made from year to year.

Scientific Instruction and the Advancement of Science.—The first Report of the Royal Commission on Scientific Instruction and the Advancement of Science, which is presented to both Houses of Parliament by command of her Majesty, has been issued. The commissioners have heard the evidence of witnesses in reference to the following subjects, forming part of the inquiry, viz.:—

"The Royal School of Mines, the Geological Survey of Great Britain and Ireland, the Mining Record Office, and the Museum of Practical Geology, at present located in Jernyn-street; and also concerning the Royal College of Chemistry, at present lodged in a building in Oxford-street; which institutions are under one head, entitled Director-General of the Geological Survey of Great Britain and Ireland and Director of the Royal School of Mines."

The Report recommends the consolidation of the School of Mines and the College of Chemistry into one institution at South Kensington, to be called the Science School, to be available for the instruction of many science teachers throughout the country.

Concrete as a Sea Defence.—The sea broke furiously upon the concrete parapet built last year at Storaway upon the stone breast-work which protects from the encroachments of the sea the curing stations situated on the South Beach. Although large volumes of water rushed over the parapet, we are glad to say that little or no damage was sustained. Notwithstanding the ordeal through which the parapet passed, there is not the faintest sign of a break in it. This goes far to strengthen the opinion that concrete is a substance which, when properly laid, is efficient in resisting the action of the sea. Several important harbours in the United Kingdom and in France are now largely composed of concrete, and it is found to stand remarkably well.

Nottingham.—The annual reports of the highway committee and the sanitary committee of the borough council of Nottingham have been issued in a printed form. From the former it appears that the total expenditure of the highway committee in 1870 was 14,088l., most of the works in the public streets in the enclosure having been finished the year before, when the expenditure was 17,017l., and in 1869, 19,079l. The utilisation of the town sewage is to be inquired into by the highway committee. The Trent must ere long be cleared of sewage. Appended to the sanitary report are useful meteorological tables by Mr. Tarbotton, the corporation surveyor, which are published in another form by the Registrar-General.

A Conservatory for the South-side Park, Glasgow.—The Town Council are about to accept a proposal made by Mr. Kibble, of Coulport, whereby he offers, upon certain not very onerous conditions, to present to the South-side Park the fine conservatory adjacent to his villa on Loch Long. Mr. Kibble is ready to remove the structure at his own expense, and to spend a considerable sum on its enlargement and re-erection, which would, when completed, render it one of the finest conservatories in the kingdom. It has already cost its owner about 15,000l., and the outlay on its proposed removal and extension will entail a further expenditure of about 5,000l. additional.

Foreign Honour to the late Lord Donald.—A statue is to be erected in England, and erected in Santiago, in honour of Lord Cochrane, who did so much for Chilean independence. Two thousand pounds for the statue have been subscribed in Chile.

The Temple Memorial at Rugby.—One of the memorials of the Bishop of Exeter at Rugby, it is said, is to be an Observatory. It is to be under the joint management of Mr. Wilson, who gives the telescope, and Mr. Seabroke, an old Rugbyian.

Proposed Extension of Baths and Wash-houses at Liverpool.—At a special meeting of the Local Baths and Washhouses Committee, for the purpose of considering the report of Mr. Alexander Duncanson, the acting water engineer, on the extension of baths and wash-houses, the report showed that, in order to erect baths and washhouses at Kirkdale, Windsor, and in Toxteth Park, an expenditure of about 32,000l. would have to be made. It was finally resolved, "that the committee recommend the council to apply to the Lords of the Treasury for permission to borrow a sum not exceeding 40,000l. for the purpose of building baths and washhouses in Toxteth Park, West Derby, and Kirkdale districts; the details of the appropriation of the money to be borrowed to be afterwards reported to the council for approval."

Discovery of Roman Remains at Lincoln. The workmen engaged in digging for the foundation of the new church of St. Martin, Lincoln, have come upon several relics of antiquity, which are believed to be Roman. At a depth of about 5 ft. beneath the surface was found a three-quarter length stone effigy of a lady with a hare in her hand; it is in excellent preservation, and, we understand, will be photographed. The workmen also found inclosed in a roughly made stone case, about 8 in. or 9 in. square, a human skull.

Sales of Land.—At Bristol, last week, Messrs. Fergus sold by auction some closes of land, situated at Frenchay. Lot 1, comprising 2a. 3r. 27p., sold for 415l., and Lot 2, 4a. 2r. 22p., for 655l. In Coventry, Mr. T. Clarke sold by auction a piece of freehold building land, containing 1,560 square yards, and situated on the north side of Holyhead-road. The price realised was 5s. 6d. per yard.

Progress of Washington, U.S.—The year 1870 was remarkable for the unprecedented number of buildings, principally dwelling-houses, erected in Washington city and Georgetown. It has been estimated that the value of the buildings of all kinds completed during last year in Washington alone is 3,207,125 dol.; and it is believed that even these figures will be exceeded in the present year.

Hull Water Supply.—The local waterworks engineer, Mr. T. Dale, reports that the available water supply will be 15,000,000 gallons daily, the quantity actually required being only five or six millions. The new works have been completed within the specified time, and also within the estimated cost. The Waterworks Committee recommend the Town Council to pay Mr. Dale a gratuity of 100l.

The Royal Society.—The candidates for election into the Royal Society, from whom fifteen are to be chosen, are fifty in number; twenty of these belong to the medical or surgical profession.

TENDERS

For the erection of a new tower and spire, and rebuilding the south aisle of St. Mark's Church, Horsham, for the Rev. Alex. H. Bridges. Messrs. E. Habershon & Brock, architects:—

Manley & Rogers.....	£3,011	0	0
Scrivener & White	3,330	0	0
Sharp, Brothers	3,792	0	0
Carter & Son	3,666	0	0
John Perry & Co.	3,481	0	0
Newman & Maslin	3,355	0	0
Rowland	3,321	5	0
Shearburn	3,078	0	0

For schools in connexion with St. George's Presbyterian Church, Croydon. Mr. J. Theo. Barker, architect:—

Pollard (accepted)	£793	0	0
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For additions to two houses, in Bedford Park, Croydon, for Dr. Carpenter. Mr. J. Theo. Barker, architect:—

Pollard (accepted)	£1,258	0	0
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For the erection of new parochial schools, St. James's, Pentonville, for the Rev. S. D. Stubbs and Committee. Messrs. E. Habershon & Brock, architects:—

Wood	£285	0	0
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For the erection of schools, at Prior's Lee, Shropshire, for Earl Granville and others. Mr. Joseph Fogarty, architect, Westminster:—

Marrion	£1,683	7	2
Millington	1,525	3	2
A. & W. Roberts	5,857	10	9
Nevett	1,387	0	0
Cobb (accepted)	1,298	0	0

For the erection of a villa, North Wales, for Mr. T. B. Horleick, Westminster:—

Moyers	£6,350	0	0
Cockburn & Son	5,209	0	0
A. & W. Roberts	5,857	10	9
Treasure & Son	4,918	17	11
Roberts	4,389	6	4
Huish & Co.	4,285	0	0
Foster (accepted)	4,923	0	0

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Secretary of State for India in Council.—Notice is hereby given,
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for the SELECTION OF FIFTY CANDIDATES for ADMISSION to this COLLEGE.—The examination will be open to all British-born subjects of good character and sound constitution, who are between the ages of seventeen and twenty-one years. The successful competitors, after undergoing, in the case of such as may be found on further examination to be not already qualified in professional

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(signed) HERMAN MERIVALE.

will receive appointments without passing through the College.
India-office, March 22nd, 1871.

The Builder.

VOL. XXIX.—No. 1471.

How Best to Spend Money for the Public Good?

On a serious question as that we recently placed before our readers has not been asked for a long time. It is one wherein the whole kingdom is interested, and in the solution of which the best minds in it might well be employed. We have not asked it without full assurance that practical good will come out of the reply. Here are the proposer's reiterated words:—

"I desire, as I have already informed you, to devote for public and useful purposes, in some way or other, a sum equal to that given by the late Mr. Peabody. But I find much difficulty in discovering the best means and purposes to which such a sum could be devoted so as to do the greatest public good, and to avoid pauperising classes who might not be eligible in public opinion for such a gift."

The notification we made of this intention,* with invitation of suggestions, has brought us, as might be expected, a very large number of communications from all parts of the kingdom, the great majority being utterly worthless. We said that the proposer desired at present no personal publicity, and we have received more than a score of requests to be informed immediately of his name and address that the writers might make "important suggestions" to him: we specially directed our inquiry to "thoughtful minds who, without personal consideration," might feel desirous that the intention should be well carried out; and we have received at least fifty letters from individuals directing attention to their own personal case. Several incumbents say a part of the money cannot possibly be better employed than in assisting to rebuild their several churches; and the vicar of a living in Kent, who gives his name, asks for 400*l.* to enable him to get 1,200*l.* more from the Ecclesiastical Commissioners to build him a new house!

Putting on one side these, and such as these, the result of misunderstanding, we abstract some of the suggestions, and print a few of the communications, with the view of leading up to the right solution of the problem.

The want of suitable buildings for the recreation and improvement of workmen is dwelt on by several writers. The following communication, from a gentleman known in connexion with some social movements, sets this forth fully:—

Elevation of the Workman.

"It is quite certain that the 'benevolent gentleman who is prepared to devote for public and useful purposes' the sum of a quarter of a million, so soon as he can be satisfied that a way is open of doing so with real benefit to society, will be deluged with a host of suggestions, and bored with attending to the details of thousands

of crotchety schemes. It is not, then, without considerable misgiving that I venture, not indeed to propound a scheme for the present expenditure of his 250,000*l.*, but for one hundredth part of that sum.

However, as a resident in the East of London, and as knowing more than most men of the lives and habits, the wants and necessities, of a district which is proverbial for its poverty, its dissipation, and its misery, I consider that I have a right to propound, for that gentleman's consideration, a scheme of practical good, which long experience convinces me is urgently needed, which cannot possibly pauperise the people, and which, if properly carried out, would be, in my opinion, a commercial success.

'Strong drink is the cause of all the misery of our poor,' is an aphorism which, whether entirely true or only partially accurate, describes the feeling of a great many persons, echoes the experience of relieving officers and district visitors, and speaks out the sentiment of many thousands of the working classes.

'Ignorance is at the bottom of all the misfortunes of the poor,' is another sentiment which we hear sounded forth on all sides. Culture, men say,—and they say rightly,—is what our lower classes require.

The latter class of thinkers are constantly bending their energies in the direction of forming 'workmen's clubs.' This movement is one in discouragement of which I should not wish to say one word. Myself a member of the Executive of the Working-men's Club and Institute Union, I believe these clubs are destined ultimately to do a great work in the way of giving culture to working men; but I see numerous reasons why the number of workmen who belong to them will be for a long time to come very limited. What is wanted is allowed on all hands to be a substitute for the public-house. The workman's club is this only to a very limited extent. The workman's temptation to drink at public-houses is, in the first place, caused by physical necessity; and, in the second, by a desire for society. He is walking along on his road home after his day's work, and he feels thirsty and tired; or he meets a 'pal of his,' and he wants a quarter of an hour's talk with him; or he hears reports of the great world's doings, and he wants to see the news of the day. Usually all three of these motives combine, and the public-house alone supplies the means of satisfying them. It is true that there are dingy coffee-houses which profess to hold out the same advantages, minus the alcohol, which the public-houses do; but then the workman has had enough of dinginess and dullness all day long, and he wants a more cheerful and habitable place to step into in order to cheer his spirit and give the relaxation and change of scene which he is seeking for. The exclusive character and somewhat out-of-the-way situations of the clubs are against them. A workman cannot bring his pal in with him to his club unless the latter happens to belong to it. The public-house is so convenient, and accordingly he goes to it.

Now, what I want to see is the temperance public-house, established upon the model of a foreign café, having all the advantages of a public-house, minus its disadvantages—the alcohol. I want plate-glass and gas, and billiards, and a cheerful saloon, and music, and a convenient and accessible situation. I want to see the devil cheated in his own colours; to set down a palace of culture and of information, and let it compete, on at least equal terms, with the gin palace.

Such an institution should have its newspapers and its circulating library. No party or propagandist tinge should cloud its freedom. No false charity should interfere with its usefulness. Everything should have its price—the drinks, the games, and the books. There should be an active and pushing manager. It should be, 'Try our hot drinks,' in winter; 'Try our cold drinks,' in summer.

Now, the very best part of London to try the experiment is in the Whitechapel-road. A population of three-quarters of a million makes this its market, and the pavement hereabouts teems with life, backwards and forwards all day long. A suitable site could be secured for less than 200*l.* a-year rental, and the good that might be done is incalculable. It is vain for philanthropists to inveigh against the drinking habits of our poor people, and their want of culture, unless we place some such institutions within their reach, and give them 'good' to 'choose,' as well as bid them 'refuse the evil.'

EDMUND W. HOLLAND.

Assistance by Loans

has several advocates. One writes,—

"I suggest that the most productive way of doing good is to assist private enterprise, under sufficient guarantees, on worthy objects, rather than to give the money to be lavishly expended by boards of trustees. I would first consider what would do the people most good.

1st. As to their worldly necessities:—

- Cheaper and better houses and lodgings.
- Playgrounds for children.
- Open-air swimming-baths.
- Drinking fountains.
- Public dispensaries.
- Loan offices for small sums, for the honest poor, brought down by unavoidable misfortune.

To promote and encourage and perpetuate these or kindred objects, I would propose in regard to,—

- That a certain amount of the fund should be lent to individuals who built, or were prepared to build, houses or lodgings satisfying certain requirements, to be carefully considered and laid down, at a uniform rate of 5 per cent. per annum, 3 per cent. per annum being charged at interest year by year, on the capital remaining unpaid, the remaining 2 per cent. being applied in reduction of the capital until the loan is repaid.
- In regard to these, as no revenue could be derived, the first cost would come wholly out of the benevolent fund, but they should be maintained by the parish.
- To promote cleanliness and athletic sports in every district, I would lend two-thirds of the cost of economically constructed baths on the terms first above stated, and in that case to encourage private enterprise; and, to admit of cheap admission, the cost of the water used might be borne by the fund.

The principle I desire to enforce upon the benevolent is the enlistment of private energies, private enterprise, and private capital, in furtherance of their own benevolent views."

A Lady suggests,—

A Loan Fund for the Poor.

"Model lodging-houses, schools, missions, refuges, asylums, hospitals, all fall short of reaching and grappling with the heavy load of human misery daily growing and intensifying around us. What, then, remains to be tried? Surely, in this matter "there is nothing new under the sun" to be found; nor can I hope that a thought which has occurred to me can be a novelty to the world in general, or of any particular use; but such as it is, I submit it to you.

In reading that very interesting work which has just been published, and which tells in their own language 'the short and simple annals of the poor,' called 'Episodes of an Obscure Life: a Carate's Experiences in the Tower Hamlets,' I came to the chapter dedicated to the 'square dolly-woman,' a person to whom there in great want came to pledge their few remaining possessions for very small sums, even down to a few pence. The dolly-woman is represented as kind-hearted, honest, and just in all her dealings with her applicants, and has thus earned the name of 'square;' yet she, too, must live, and therefore has to get something in the way of profit out of the loans she makes. Then it seemed to me that if by any means a loan fund for the poor and honest could be started it might be of great service to those who were striving to help themselves. Even amongst our poor people in the quiet country place where I live, a small sum advanced at a moment of passing need has been of great benefit, and has been repaid entirely or in part. It has enabled a husband to undertake work which, owing to the want of some indispensable tool, he would have been forced to refuse, and remain in idleness; a wife to face a hard landlord, while the bread-winner was away for a month's contract in road-making, &c., only to be paid for his hard labour at the end of that month. The idleness would have resulted, perhaps, in the desertion of a family, the rent unpaid, in loss of home, starvation, or the union. The plan I suggest has been, I believe, adopted by the committee for the fund in aid of the Parisian poor, under the presidency of the Lord Mayor; at least, something of the kind was mentioned at one of the meetings, when it was proposed to redeem from the *monts de pitié* in Paris the tools pledged during the siege by

* See p. 220, ante.

artizans and workmen, the furniture by small occupiers, and, in short, all those articles which constitute 'the home,' for which, in hopefulness of spirit, a man works, and which make work truly a labour of love.

This, then, is my scheme,—help for the helpless, who long to show their self-helpfulness. It may have been tried and proved a failure: I know not. It may be impossible,—it may be utopian,—the way to carry it out satisfactorily; the details I do not venture upon, but I leave to your judgment my thoughts for a "loan fund for the poor," which shall not bring low and lower the poor man in his want, nor enrich those who seek to live by, or batten on, his necessity and his extremity. M. Y. PARIS."

We then get a suggester of—

Cottages for Agricultural Labourers.

"I have been all my life a medical practitioner in a rural district, and have to lament the miserable condition of the cottages of the much-neglected agricultural labourer. . . . The reports and statistics on this subject arranged under the control of country boards are unreliable.

The great philanthropist, Mr. Peabody, made more than a princely effort to mitigate the crowding of London mechanics and their consequent suffering, and had I at command the same gigantic means I would make a similar effort in the rural districts throughout England by the purchase of land and the building of cottages.

My plan would be to build two cottages under one roof, on one acre of land; these would let at 6l. 10s. per cottage per half acre.

I would not centralise the labourers on one large sereage, but buy small parcels of land in different parishes after proper inspection of site.

Having passed many nights in the deplorable homes I have alluded to, I flatter myself I could offer a cheap, yet substantial, plan of double cottage to pay reasonable interest at the rent stated.

I believe, also, the providing of such homes as these will surely solve the now perplexing problem of pauperism preying on the very vitals of the country, and here beg to observe that our Poor-law system seems wholly bent on providing for pauperism and not preventing it. On this head, why not establish in our harbours, and on all our large rivers, more training ships on less expensive principles, for the street Arabs of every town and wanderers wherever found, where discipline in all matters should be rigidly enforced, the best of education for such mortals, and where sanitary measures could be easily observed; these not necessarily to make soldiers or sailors, but the elements of many trades could be taught; and, in many instances, land might be had within an easy distance where the boys could labour and produce their own vegetables, and every parish should contribute a rate in aid as a preventive of pauperism.

One word for the labourers. As a class I believe them to be as good and moral as any other class. I also believe, to make them better, a comfortable cottage and garden (half an acre) would vastly and quickly improve them; it would not make them independent of daily labour, but would attract their thoughts in long evenings instead of the beerhouses, and if arranged with judgment would place them near their employers in most instances. The holding of their cottages should depend on industry and good conduct, not be dependent on any person, but under such rules as may be suggested by the board or trustees.

Should the quarter of a million be then applied, great good and much happiness would be secured to millions, and go on accruing for ever, staying the now deplorable emigration to foreign lands, making useful our best bone and sinew to the benefit of every individual in this kingdom.

As a medical practitioner of fifty years' standing, I served an apprenticeship under the old Poor-law. I saw the introduction of the present system, its working, its various changes, without benefit to the poor, and of late years its great increase of officialism and pecuniary loss to the ratepayer. Officialism may rest assured, however miserable, however uncomfortable the home they offer, it must and will be accepted to the full by the pauperism of the present moment.

JOHN BULBECK."

Another correspondent sends—

Proposals for a Model Village in Surrey,

and offers co-operation:—

"The pressure of poverty [he writes] weighs

heavily on the decayed members of professional classes and their widows and orphans. Possessed of a small pittance, sufficient to keep them from the almshouse or the workhouse, they live a life of miserable dullness and privation in wretched lodgings, a prey to extortion, yet destitute of comfort. The luxury of a well-cooked dinner, so necessary to an invalid, is unknown; the social intercourse of friends drops off through mutual shame at the *res angusta domi*; life becomes brutish and mean, the habits of gentle-folks are cast aside, and the monotony of a useless animal existence is only diversified by quarrels with the landlady, or visits from the doctor, frequently needless, and invited only for the sake of some little cheerful conversation with an educated person.

It is proposed to build, on one of the Surrey hills, in an open situation, surrounded by downs and heaths, and commanding extensive and beautiful views, a model village, of small semi-detached houses, of eight rooms each, to be let to chosen tenants, at moderate rentals.

Each house will be the castle of the inhabitant, who needs, unless he please, have no communication with any of his neighbours; but, if he please, he may use the following institutions:—

1. A dining-hall, where there would be a *table d'hôte*, at a moderate price, presided over by the clergyman of the model village at one end, and its physician at the other.

2. Saloons for conversation and for reading, furnished with newspapers, a library and billiard-tables, and facilities for music, adjoining the hall. A laboratory and museum might be added.

3. A church.

4. A laundry.

5. A school, where the clergyman would teach on week days, and to which all children between eight and fourteen belonging to residents would be admissible, free of expense.

6. Pleasure-grounds, with croquet-lawns.

7. Carriages for invalids who cannot take walking-exercise.

8. A dispensary, where the physician would attend at stated times, and give gratuitous advice, while medicines would be dispensed gratuitously.

9. Fishing, in an adjoining river, rented for the purpose.

Nominations might be put at the disposal of the Royal Literary Fund, the Medical Benevolent Societies, the Theatrical and Artists' Colleges, the Solicitors' Benevolent Institution, and similar bodies; and the principle of selection should be that the resident should be above the age of forty-five, a professional man invalided, or the widow of a professional man. The resident would pay rent (unless in special cases remitted), and his family could occupy the house like any other home; but the use of the above nine institutions would be gratuitous, except a small charge for the *table d'hôte*.

Impressed with the advantage that would accrue to a marvellous and very unfortunate class of persons from this institution, the owner of — Park will let 20 acres of the park for the purpose, rent free for five years, and afterwards at half the usual ground-rent, if a model village on this plan, with such modifications as further reflection may suggest, shall within five years be built by charitable persons.

The situation is within forty minutes' railway journey of London, and a mile from two railway stations, seventeen miles from London; so that youths who are members of a resident's family, and are of the requisite age, may attend the public schools of London, or, if in business, may combine daily duty at their offices with residence in their parents' home. It is considered essential to prevent the separation of families, or anything that may tend to give offensively an eleemosynary character to the model village, or may derogate from the liberty of every resident to regulate the inmates of his house."

Mr. J. Barlow Robinson, sculptor, advocates the erection of

Convalescent Homes,

in every county for patients who have just left an infirmary or hospital, and for the deserving poor.

"Each home to be erected on an elevated site, in the vicinity of the county town, with about 10 acres of land to be cultivated as gardens and orchards. By this means it might be made partly self-supporting, a moderate amount of labour, under a competent gardener, being required from each inmate able to work, and the crops to be sold in the town. Under the present

system the various hospitals discharge their patients before they are really able to work, and at a time when they require the best of food to get up their strength. If possible a master should be chosen who would thoroughly sympathise with the inmates, and converse with them on their position and prospects, giving them good advice and encouragement. The matron to act the same by the females, and to give them instruction in cooking the various articles of food, and how to select those containing the greatest amount of nutrition at the lowest cost."

Assistance to proper Persons willing to Emigrate is advised in several letters. One writer wishes the aid confined to the large surplus female population; and a second, to give the aid in the shape of premiums to those who have attended worthily for certain periods at Evening, Industrial, or Ragged Schools,—in fact, to send away the best of our boys.

The Enclosure of Uncultivated Land

is pointed to as a great field of usefulness. One writer says specifically:—

"In Devonshire and Cornwall one-third of the land is not enclosed or cultivated; the hedging and village of its many thousand acres would give employment to our industrious poor, and would prevent a great many of them from going to other countries to seek what they cannot get here,—work. Besides, it would add wealth to the country, by increasing its capabilities of producing food, and would eventually pay a better interest than many other schemes.

T. P. ROSEVEAR."

Asylums.

Lady Anna Maria Courtenay sets forth the claims of the Western Counties Idiot Asylum; and

A writer from Southampton urges that money could not be better spent than in the foundation of a hospital for the members of families of straitened means suffering from epilepsy.

We squeeze out of a dozen other letters the following separate requests:—

A home to shelter educated women while out of employment, and the establishment of a fund for granting loans to enable them to renew their wardrobes, and to go creditably into new appointments.

Life Annuities from 30l. to 50l. per annum to deserving persons of the age of 60 in reduced circumstances.

An institution to enable mechanics without means to perfect and secure their inventions.

A fund to assist secretly the clerks of London. Nurseries for infants at present confided to the elder children, who must now be sent to school.

The purchase of land for the agricultural employment of prisoners on their release. "This would give legs to the lame, eyes to the blind, and at the same time produce a good return to the country and the donor."

Mr. William Tallack, whose attention has been given to such matters, sends us a number of suggestions as to various modes in which, as he thinks, money may be used with public advantage. We quote a few of them:—

"1. Loans to landlords or to trustworthy tenants, for improving the dwellings of the poor; the loans to be limited to the amount of, say, half the value of the property, and secured by mortgage.

2. Loans to townships or corporate bodies for employing the poor on public works (as in the period of the Lancashire 'cotton famine'); the loans to be granted at a low rate of interest,—perhaps merely nominal, but on security of rates, or public property.

3. Appropriations for the purchase of land in the suburbs of towns and villages to be subdivided into plots, on the 'allotment system,' to be rented on low, though possibly recouping, terms, to agricultural labourers, mechanics, &c., as a means of cheaply supplying their families with vegetables and fruit, and also as a means of healthful occupation, and a counter attraction against injurious modes of spending time.

4. Appropriation for the issue of prizes, at

intervals (resembling the 'Montyon Prizes' in France), for special lives and careers of virtue amongst the poor and others, say to the extent of 20*l*., 40*l*., 80*l*., and 100*l*., according to the circumstances.

6. Appropriations to subsidise (to some extent) public lecturers on sanitary subjects, physiology, natural history, life insurance, political economy, domestic economy, &c."

We have left till the last of our present budget the ories rather than proposals of a score of writers who urge the

Provision of Cheap Houses, and Houses for the Very Poor.

Those who speak of the first while they see the difficulties and injustice that would attend giving for, say, 3*s*., a week a lodging worth 5*s*., consider that this advantage might be made the reward for good conduct in life up to a certain age; even to the extent of free occupation of rooms in ordinary houses. "It is a fact," says one lady who writes, "that in every minor street there are some respectable, struggling people, who shrink from ending their days in a workhouse, yet who dare not hope to keep from it; at the same time they might exist in contentment if it were not for their rent, which is the pang of their lives, and of course must be settled. But how? This is a question, indeed, to those we include, viz., widows left with young children to provide for; the lonely ones in the decline of life ailing in body and depressed in mind, yet proud in spirit and firm in principle; or the humble pairs who have worked hard to bring up a large family, and who feel to have become a burden in their old age. Surely a plan to aid the now helpless to help themselves in their own way, a movement natural and easy to be carried out, is worthy of a generous donor's consideration, and for usefulness it will insure a lasting name to him which shall be remembered by 'men and angels.'"

Those who suggest the erection of houses for the very poor, call for arrangements much less costly than those of the Peabody trustees, and the provision of two rooms at a rent not exceeding 1*s*. or 1*s*. 6*d*. per week.

Aid to Ireland

In the same direction is asked for by several writers. Dr. E. D. Mapother, the Dublin medical officer of health, says,—

"The wants of the industrial classes of Dublin in the way of decent dwellings are great. I and some other persons have invested 200*l*. each in the erection of decent houses; but the wages of the poor are so bad that they cannot afford to pay rents at all remunerative to us. There is, indeed, vast scope for benevolence in Dublin."

We have here dealt with only part of the communications in our hands. We shall doubtless have occasion to return to the subject; and correspondents may feel assured, even should their letters not be mentioned, that all wholesome suggestions will reach the proper quarter.

THE FUTURE OF TRAMWAYS.

There appears to be good reason to anticipate a considerable set of public favour towards tramways. The quiet introduction of this supplement to our extensive railway system has hitherto attracted but little attention. Persons living on the line of the several metropolitan tramways, have rapidly become accustomed to the advantages which they have offered. Speed, precision of time, comfort of accommodation, quiet from the rattle and vibration of the stones, are all matters as to which it is easy to make the best, in a practical sense, without any exuberant enthusiasm. For the first week, perhaps, the daily pilgrim to the centre of the metropolis, may be somewhat full of the subject of his improved vehicle. "Saved no less than twenty minutes this morning, my dear!" or "Got along so quietly, that I was quite astonished," will be the tribute paid by a short-lived recognition. From that time the further compliment of a punctual occupation of a seat will be the best

proof of the gratitude of the many units who compose the public.

But the commercial results of these unpretending additions to our modes of transit are now coming before the world. They are such as to command attention. The diminution of capital required for the construction of a line of tramway, as compared with one of railway, is no less noticeable than the increase of net, as compared with gross, revenue. On the four miles which are already open of the north metropolitan tramways, during the week ending on March 25th last, the receipts amounted to 624*l*. for 68,713 passengers, giving a rate of earning of 156*l*. per mile per week. The average mile earnings of the railways of the United Kingdom, during the year 1870, were 56*l*. per mile per week, or about one-third of the rate of the unfinished system of tramways. On the contrary, the capital involved in the construction of railways has averaged 34,550*l*. per mile throughout the United Kingdom. In the case of metropolitan lines, which alone can fairly be compared with metropolitan tramways, the cost is more than six times as much. Ten or twelve thousand pounds per mile will cover the cost of the metropolitan tramways. For the extension through the country of the light rail system, which is another form of tramway, the cost may be brought down to, or even below, 3,000*l*. per mile. We are not at present in possession of the definite items of expenditure, which will enable us to compare the actual unit of daily outlay, the cost per train mile of the tramway with that of the locomotive line. But no one practically familiar either with coach traffic or with railway traffic can doubt that the ordinary allowance of 50 per cent. of gross income to cover working charges, which is applicable to the locomotive system as a general rule, will be ample to cover all expenditures on the lines worked by horse-power. When these simple statistical facts have once thoroughly filtered into the public mind, we think there is little doubt that much of the money which is now dammed up by the uncertain aspect of foreign politics will be turned into this new and productive channel. Three times the return for a third of the outlay means nine times the profit. That is a sum within the capacity of a very humble arithmetician. Now taking our railway dividends, in spite of the waste of a third part of the expended capital, for which we have to be grateful to the Legislature, at 4*l*. per cent., we come to an expenditure of 40 per cent. annual profit for our metropolitan and suburban tramways. For country lines of course the income will be very much less. But here, again, we have a further reduction of capital; so that, in very many districts, a dividend of from 5 to 10 per cent. may be confidently looked forward to. As long as this lucrative return existed merely in the state of estimate, it commanded but little attention. In this country we are almost invariably in the habit of waiting for the first two or three sheep to jump the hedge. Then the flock make for the gap with a blind rush. Now the appearance in the newspapers of the weekly returns of a few miles of open tramway will supply exactly the element needed to command public confidence. It is quite consonant with our experience in past years that a very short time shall witness the generation of a large amount of enthusiasm. The fact that the railway companies had begun to divide 10 per cent. raised, in 1845, a mania that was comparable to that of the famous South-sea bubble. Some two hundred millions of pounds in hard cash, to say the least of it, were thrown to the dogs, owing to that wild access of confidence. To what a proved return of 40 per cent. per annum, no matter under what exceptional circumstances it may have been earned, may lead, it is therefore not easy to foresee. That we have grown wiser in the last twenty-five years remains to be proved. The very prolonged distrust which has strangled industrial enterprise since the Black Monday in 1866, may prove only to have prepared the way for a yet blinder access of speculating ardour. At all events, whether enterprise take the form of sober calculation or of rampant speculation, we can hardly doubt that before 1881 we shall see most appropriate, and many inappropriate, lines of internal communication linked by tramways to the main trunks of our locomotive railway system.

The importance of exercising a little common sense, in expectation of this industrial development, is supreme. Again and again has it occurred to this country, since the invention of the steam-engine, a century ago, to become

the cradle of discoveries that might have augmented the national wealth to a degree that should have raised the ordinary Englishman to a position like that of the ancient Roman. Our habits, however, have been such as to allow the conversion of all such great discoveries into private property. We have created a few colossal private fortunes, in place of having lightened the public burdens for the tax-payer. It was thus with the introduction of cotton machinery. It was thus with the introduction of railways. It will be thus, unless those who are most deeply interested bestir themselves, with every great industrial invention. "Everybody for himself, as the donkey said, when he danced among the chickens," says the proverb. The second clause of that venerable adage,—"and God for us all,"—comes temptingly after. If we thought a little more of the collective, and less of the individual, how much better it would be for the great mass of our countrymen.

It will be admitted as a feature of great interest, by those who care for the well-being of the country rather than for the triumph of any political clique, that the first success of that supplementary system of traffic which we have so long and so repeatedly advocated, should coincide with the first serious attempt to reduce to order the chaos of our local taxation. So complex and so vast has been the system of collecting public money under the form of rates, that it is only now, for the first time, that we are enabled, by the clear-headed utterance of a minister of the crown, to compare our local and our national expenditure. The money raised for the public service, and expended under annual Parliamentary grants, amounts to forty millions sterling; the interest on the public debt (twenty-six millions), and the charges on the consolidated fund (nearly two millions), being excluded from this category. The money raised for the public revenue under the comprehensive term of rates, and expended under the authority of some twenty different forms of imaginary controls, amounts to thirty millions sterling per annum. Thus out of a total national expenditure of ninety-eight millions sterling, thirty millions are expended by local authorities. We are not about to enter into the question of the policy of establishing, or rather of maintaining, the distinction between rate and tax, between the local and the general incidence of contributions. The subject is one of great interest, but it is not ripe for discussion. But a great step has been taken by the recent proposal to consolidate the numerous rates, and to organise the various local forms of control. It is as a portion of such a wise economical measure that we propose that questions such as that now before us should be dealt with. There is now presented to us a means of increasing the convenience of the public by a method which is not only self-supporting, but productive of very lucrative results. As compared with the prospects of the railway system in 1834, those of the tramway system, in 1871, are more clearly defined, and more probably remunerative. There is little doubt that the capital requisite will be readily contributed. Profit being a *fait accompli*, there is money enough and to spare. No great element, such as that of the possible spread of the locomotive, is absolutely unknown. The authorisation which is requisite for the application of this stored up capital to earn this abundant profit will, therefore, be sought from those with whom it rests to give it. The legislative authorities,—that is to say, Parliament,—and the local authorities, to be reconstituted as the new parochial boards, will, therefore, in all probability soon be beset with applications for a perfect web and tangle of tramways.

As to any expectation that a provident, wise, and statesmanlike provision for the wants of the future will emanate from Parliament, we confess to but feeble confidence. Parliament was the great cause of the waste and mischief from which all railway shareholders are but just commencing to recover. What the new Boards may be of course remains to be seen. But there is one reason for expecting something more at their hands than we can look for from St. Stephen's. The members of the Boards will have, to a certain extent, to put their hands into their own pockets. The difference in the incidence of a rate and a tax has this conservative value; and as a penny saved is a penny earned, it is probable that a parochial board, if requested to authorise a certain mode of dealing with the highways under its control, may not altogether leave out of sight the question of the probable lightening of the consolidated rate, in virtue of a little forethought,

For the persons who find the capital to be, in the first instance, fairly and even liberally rewarded, is not only right, but necessary. But that the question should be a personal one; that it should be reduced to the struggle whether A Company, or B Company, or C Company should grasp the profit of the Great Omnium Gatherum Tramway; and this (which has been our Parliamentary experience) while the public is left unprotected, would be lamentable. It would, no doubt, take place notwithstanding, unless the local Board once firmly grapple the idea that a possible means of greatly alleviating the pressure of their local burdens is offered to their grasp. Not offered, indeed,—in so many words. On the contrary, it is rather the acumen and patriotism of the local Boards that will be brought into relief by a little timely forethought. To give every facility to tramway accommodation—to allow a dividend say up to 7½ per cent. to be divided in the first instance on the capital, will be a wise economy. But, this attained, let the ratepayer be thought of. Let him be directly interested in the success of the tramway. Not only let the rate of fare be reasonable, but let the profits, beyond the first fixed return, be fairly divided between the locality which finds the land and contributes the traffic, and the company that lays the trams and conducts the omnibuses. After all, that which the enterprise contributes is but little in comparison with that which the neighbourhood contributes. Let the affair be carried out on truly co-operative principles. To suppose that the entire annual charge of thirty millions of rates might, within the next ten or twenty years, be supported by the profits of the tramways, is not inconsistent with the experience we have gained since 1833.

The ratepayers of St. George's, Hanover-square, have been among the first to appreciate the advantages to be derived from the development of the tramway system. They have urged that the control of the streets through which the tramways are laid ought not to be allowed to pass into the hands of private bodies, who will have no object but their own pecuniary profit. These bodies, again, so far from being constituted on any general and comprehensive plan, will be likely to compete with one another; and, as we now see in the case of the London and Brighton and the South Eastern Companies, to give the smallest possible amount of accommodation, at the heaviest rate of charge, to the public, and to sacrifice the general convenience to attempts to injure one another. The daily waste of time to which the rivalry of these two companies gives rise in the ill-constructed stations at London Bridge, and the unwise charges made for the Charing-cross, Cannon-street, and London Bridge traffic, may be referred to by the St. George's ratepayers as evidence directly in point.

Again, it is argued with perfect justice, that, through streets which are already formed, the expense of laying down the tramways will be small. The profit, on the other hand, is likely to be very large; and it would be unjust to the ratepayers to allow all this profit to be grasped by the private companies, who actually bear by far the smaller part of the expense.

We cannot, however, subscribe to the conclusion arrived at by these gentlemen, namely, that the Metropolitan Board of Works should undertake the construction and working of the lines. Control and execution are different elements of enterprise, and we consider it to be of great importance to the public that this distinction should be maintained. It is difficult to foresee whether the public inconvenience would be greater in the case of the competition of numerous ill-digested lines, or in that of the absorption of a new method of traffic by such a body as the Metropolitan Board. Three things have to be considered,—first, the convenience of the public; then the pockets of the public; and then the best method of raising the capital. The first consideration ought to be disposed of by the Legislature. As to this, as before hinted, our expectations are of a negative character. The usual indifference of Parliament to matters of real, and not of party, importance may be, we would hope, in the present instance supplied by the action of those locally interested. The protection and alleviation of the burden of the ratepayers, for which occasion now arises, is, in our view, a matter of more importance than is the profit to be gained by any private companies. Yet it is to the latter, in our present state of experience as to public works, that we must look both for the adequate supply of capital, for the economical application

of capital, and for that daily attention to the actual requisites of the public which is the best mode of securing a maximum traffic. The Metropolitan Board might, if authorised by Parliament, find the capital for laying the tramways. Probably no more costly and cumbersome mode of raising that capital could be devised. As to economical outlay, and as to subsequent service, the Central Board would probably be the worst machinery that could be devised; and even if this were not the case,—if the organisation contrived for very different purposes, could compete with a special carrying company in the conduct of their own business, the absence of control would be fatal to the convenience of the public. When the Tramway Board is grasping, or stupid, or ill-willed, the Parochial or Central Board may be applied to as a corrective. Let the Central Board once get into an ill-directed groove, and where are the means of correction?

We trust that these very simple views will recommend themselves to those on whom the decision of this important matter will devolve. It is not a case for bit-by-bit legislation. The facts must be fairly regarded. A system which has been long established in America, which has been localised to some extent in Liverpool for upwards of twenty years (as far as the service of the docks is concerned), is now successful in London. The most practical and provident engineers have urged the propriety of its general adoption in England. The dividend of metropolitan railways will, no doubt, ensure this result. Judging from our past experience, there is likely to be a rush to the new scheme. Rush or not, it will be very extensively carried out. Shall we derive the maximum or the minimum advantage from its success? Shall the project help the poor man, and even the ratepayers, or merely enrich the speculator? As to what ought to be the case, there is no doubt. As to what really will be the case, we fear it is otherwise. Unless, indeed, some amount of public spirit be brought to bear on the subject, waste, quarrels, and ill blood will be the most general results, to the benefit of some few dozen of long-headed men.

Let the local Boards, then, deal with the matter on sane and fair principles. Let encouragement be given to the companies prepared to lay down tramways, provided that the operations be part of a general and well-digested scheme. Let a good return be, in the first instance, paid to the shareholders. Let the ratepayers, who find land, works (in the levelled streets), and custom, be next remunerated, by the allotment of a similar sum. The profits above this margin of 15 per cent. might be divided between the company and the ratepayers, each party thus retaining a tangible interest in the support and the development of the undertaking. If joint profit and common interest be thus regarded, the upshot cannot be doubtful. If private interests alone be scrambled for, the tramway mania may prove as disastrous and disgraceful to the country as did the railway mania. Public advantage or private pelf?—such is the question before us. If the former is postponed to the latter, a permanent means of lightening the burden of taxation will be frittered away.

"ON THE MATHEMATICAL THEORY OF DOMES."

WE think it desirable to mention that No. 6 of the "Seasonal Papers" of the Royal Institute of Architects, 1870-71, contains the paper on this subject, read at the Institute by Mr. E. Beckett Denison, Q.C. It is an elaborate and valuable monograph, and demands the study of those who are capable. We print the introductory passages:—

Perhaps in this age of iron no great dome of masonry will be ever built again. Yet we must all remember that the two iron and glass domes of the Exhibition of 1862, of which one is now on a much handsomer building at Alexandra Park, though as large as any in the world, or that oval dome of the new Albert Hall, which is twice as large, being 220 ft. by 185 ft., have excited no such interest as is still felt everywhere in the comparatively unscientific fabrics of the Pantheon and St. Peter's at Rome, the Cathedral of Florence, the Gol Gornuz of Bejapoor, and even the flat segmental domes of Constantinople and St. Vitale at Ravenna, which are made of pots. I suppose everybody will agree with Mr. Fergusson's dictum that a dome is the most perfect roof that has ever been invented, especially on a large scale. But the cracks and

bands of St. Peter's, the immense thickness of the Indian domes and the Pantheon, Wren's evasion of the difficulty at St. Paul's, and the non-existence in the world of any very large complete dome of moderate thickness, have raised an impression that no such dome can exist, and that large hemispheres of masonry must either be enormously thick and heavy, or else must depend so much on ties that we may as well build iron domes at once.

The subject has naturally been discussed here several times; and I see that on nearly every occasion a wish has been expressed for a complete investigation of it, or for what was called a Monogram on Domes, which shall be at once mathematical and practical. Mathematical writers have hitherto been content with proving what can be proved much more simply, and is practically known to every man who ever turned a flat segmental dome over a well; viz., that such a dome, of above half the height of a hemisphere, has no tendency to burst if it is sufficiently tied at the bottom; and there they have stopped, and left us to conclude,—and have themselves asserted,—that below the point where the natural stability of a segmental dome and some very great thickness, almost enough to make the dome concave. Indeed, that was precisely the conclusion arrived at (without mathematics or experiments) in the paper read here by Professor Lewis in 1859, who says (p. 117), "He believes that the real secret of constructing lantern-bearing domes of large size, and others in a less degree, is to make them approach so closely to the conical form that their section shall include that powerful outline within their thickness . . . after careful attention to the goodness of the materials and the general bond of the work, it may, no doubt, be made secure with other outlines . . . but that any departure from this, the thickness requisite to contain a cone (which would be above 14 ft. in a dome 100 ft. wide) entails risk." Mr. Fergusson, on the other hand, says, "It is as difficult to build a dome that will fall as a vault that will stand" (Handbook, p. 441). Between these widely differing views it is time that we should come to some more definite conclusion as to the true conditions of stability.

My attention happened to be turned to the subject lately, and on finding that there was really no definite information on it to be found in books, I set to work to calculate it for myself, with no expectation, I confess, that it would take as much trouble as it has; partly, no doubt, from my mathematics being somewhat rusty; but I am consoled by finding that a friend of mine, who is more handy with those tools than I am, and we shall see, another mathematician also, fell at first into the same mistake as I did, and afterwards discovered that the problem is not so easy as it looks. Since this paper was substantially written, Mr. E. W. Tarn, a member of your body, has sent me a paper of his, in the *Engineer and Architect's Journal*, of Feb. 1870, containing harder mathematics than I shall venture on; but even he does not attack the fundamental problem of dome-building, the thickness requisite to make a dome of given size and shape stable when tied only at the base. By the word "stable" I shall always mean that, and assume that the dome is deriving no help from "friction and adhesion" or may be considered as cut up by any number of vertical cracks like meridians into those narrow slices which mathematicians call *lunes*, as they are like a young or old moon, except that it is only seen obliquely.

You will find in the "Penny" and "British" Cyclopedias the algebraical result of a calculation by Venturoli, many years ago, as to the proper thickness of a dome. But I confess I am unable to attach any practical meaning whatever to it, and it has not been adopted in any modern mathematical book that I have seen. I observe, too, that these and other writers say "the theory of the dome is easy compared with that of the arch;" and so it is, down to the point at which they stop. You will see whether it is so beyond that point. So far as I can see, the problem is altogether insoluble by any except tentative and approximate methods. The introduction of the thickness so deranges all the natural relations of sines and cosines, that the formulae soon become unmanageable for any direct solution; and that is doubtless the reason why it has been left untouched in mathematical books. My object is not to perform any mathematical feat,

but to obtain practical results free from any errors except small ones, and those always on the safe side. If this mode of treating a mathematical problem appears strange to non-mathematical readers, they may be informed that some of the greatest problems in astronomy can only be solved by approximation, including all the lunar and planetary disturbances, by one of which Neptune was discovered, and by another the very slight lengthening of the day in the lapse of many ages.

I just say one word to warn non-mathematical readers against the not uncommon mistake of taking a round arch for the element of a dome, or fancying that an arch may be used as a model to find domal results. A dome cannot be made up of any number of equal arches, but is made up of strips nearly triangular, but with slightly convex sides, running rapidly to 0 at the top. And that is the reason why a dome is so much more stable, or requires so much less thickness than a barrel vault, which is composed of arches. Nevertheless, a dome is "generated" (as mathematicians say) by a revolution of a quadrant or arch about one side; but that means that a single principal section of the dome is the same as a section of the arch: an "element" is the thing contained between two adjacent principal sections or sections through the axis of a body of a revolution.

THE PROGRESS IN UTILISATION OF SEWAGE, WITH REFERENCE TO THE LODGE FARM, BARKING.

A PAPER on this subject, by Mr. H. J. Morgan, was read at the ordinary general meeting of the Institution of Surveyors, on the 27th ult. In the course of it the writer said:—

I now proceed to the general questions affecting sewage farming, and, firstly, as to the laying out of the land.

The beds which Mr. Morton caused to be made, and the roads which he placed at right angles to them, were, as I have already stated, for the growth and removal of large quantities of grass, and therefore, although at somewhat greater cost, he made the beds large.

Provided that the consumption of grass is sufficiently rapid to allow the beds to be cleared and sewaged without delay, large beds have many advantages, in my opinion, over small beds. Circumstances may make it convenient, as with us, in many instances, to throw up small beds; but it would be incorrect to attribute to the large beds a greater proportionate expenditure of sewage. A few facts will make this clear.

The largest beds on the farm are 50 yards over all, with a fall of 1 in 69 in 25 yards on either side of the supply carrier, the fall in which is about 1 in 500. The small beds vary in size, some are 12 yards over all, others 16 yards over all. They have an average fall from ridge to furrow of 1 in 30.

I have carefully taken out the average quantity of sewage used in dressing an acre of grass on the small beds, and I find that it reached, last year, 590 tons; whilst on the large beds, also in grass, it did not exceed 500 tons. I have also taken out the quantity required to dress onions growing in large beds, and it also contrasts favourably with the above quantity applied to the small beds in grass, although their surfaces were protected from scouring, which the onion beds were not. Mr. Morton, irrigating grass in full vigour on large beds, consumed 5,000 tons of sewage an acre. Mr. Petre followed on the same ground; but with a falling crop he reduced the consumption of sewage to 3,600 tons an acre. If, during the last exceptionally dry summer, I have been obliged to apply more sewage to the new grass, which was out through the season, and grown principally upon small beds, I have not exceeded, over the whole of the grass in its various stages of growth, Mr. Morton's average.

The cost of labour to apply the sewage to the large beds is also less than to the small, being about 0'128, or about one-eightieth of a penny per ton, in the case of the former, to 0'147, or about one-seventieth, in that of the latter.

Experience, therefore, shows that (besides the expense of making and maintaining extra gutters) less sewage, less trouble, and less cost are needed in dressing large beds, and confirms what I stated in the pamphlet on this subject which I published in August of '69. Should necessity seem to require it, there is no difficulty in cutting one or more small gutters upon the

"panes" of the large beds, when grass crops have given way to small seed, or of striking it up, as we have sometimes done, to allow the sewage to trickle down between each row of plants. This will not interfere with the restitution of the bed to its original form, when the ploughing follows the removal of the crop; but in the case of small beds the fall from the ridge to the furrow is ever varying. While upon this question, I would draw attention to the distribution of water over land having a tolerably sharp fall, and which is generally laid out on the catchwater plan, because some differences of opinion on this subject resulted in an article in the *Agricultural Gazette*, on the 19th of last November, to which I cannot do better than refer you, and with which I entirely agree. The mode usually adopted, as being the best and most economical, is that of cutting gutters on the contour of the hill-side, at such distances apart as may be deemed best, having reference to the nature of the ground and the crop.

These gutters may be separately supplied with fresh sewage for the irrigation of the beds immediately below them, or the whole slope may be irrigated by the highest carrier, the water being caught and re-distributed by the lower ones, in succession, as it reaches them.

In both cases the word catchwater is proper; for as the carriers out on this principle cannot be equi-distant, the water which has passed over the narrowest part of the bed will run into and continue to feed the carrier below, while the remainder of the bed is receiving its dressing. Any inaccuracy or accident in the upper carrier is corrected by the catchwater gutter below it, by collecting for re-distribution any escaping sewage. The objections to this mode are to the waste of sewage which it causes; but when the gutters are separately supplied with sewage, as each "pane" is dressed, there can be no more waste when adopting this plan than attends any mode of applying sewage by irrigation; and, after all, should waste follow on matter of care in laying out, the question will then arise of the comparative value of the commodity wasted, and of the expense in preventing it. As regards the state of the crops at the top and bottom of the hill, in all cases where we have had any experience we have not seen any difference whatever.

When our farm was laid out, the beds were so arranged that any water which escaped from one set of beds should be caught and conveyed away in carriers for redistribution over some lower part of the farm, the possibility of a fifth use of the water being afforded, the object being partly to utilise the whole of the sewage put upon the land, and partly to obviate the possibility of the collection and stagnation of sewage at any point. But this precaution proved in practice to be unnecessary, for even when some water escaped for use in the second level, it became so reduced by absorption as to be quite inadequate to a dressing; whilst it induced carelessness on the part of the watermen, and a greater flow of sewage to be put on the beds under irrigation than was due to their dressing.

I, therefore, as I stated in my report, cut off communication between the beds, and limited the sewage to the land to which it was directly applied.

I may here repeat that whether the sewage has been applied to beds in ridge and furrow on the flat, or by means of catch-water gutters, none has ever passed from the surface of the land into the stream which flows through our farm, but it has all been absorbed by the land, or carried away by the subsoil drains.

The cost of laying out a farm to receive sewage is a question always put, but very difficult of reply, since cost must depend on ever-varying conditions of soil, site, &c. It can, therefore, only be met by a guess made under very wide limits. I think, however, that when we include the cost of levelling hedges, filling in ditches, felling trees, and making roads, all which must be considered in the work of laying out the land, between 6l. and 10l. per acre, exclusive of draining, will, over small farms, be found to be necessary.

The would-be sewage farmer, in his forgetfulness that he is about to establish a factory, and not a mere farm, and that his profits are to be those of the former instead of the latter, is often daunted at the outlay which he may have to make; and it is this feeling which, I fear, will cause farmers to lay out only small portions of their land at a time, in place of at first entering on a general and satisfactory plan.

The returns were shown to be large.

TECHNICAL MANUALS.*

MESSRS. CASSELL & Co. have published two more volumes of their series of technical manuals. Both are portable, handy, cloth-bound books, full of folded plates, like their predecessors; and, like them, they promise to give considerable assistance to those who are anxious to help themselves in the matter of drawing. Mr. Davidson, the author of both of them, has had a long experience in teaching, and in the course of it has noticed the chief perplexities of students, ascertained where their difficulties lay, and what would lessen them; and in these volumes he has wrought up exactly the information his experience has taught him will be useful, and told it in the plain, deliberate, minute way in which he knows it will be best understood.

The volume entitled "Drawing for Machinists" is, perhaps, a little more than it sets out to be; for it contains, as illustrations, some of Sir Joseph Whitworth's drawings, and also representations of selections from Mr. Arthur Rigg's patented machines. Some drawings were absolutely necessary for the explanation of parts and processes, and Mr. Davidson has chosen subjects of interest, such as steam-engines, Whitworth's 15-in. slide-lathe, Rigg's turning gear, a punching-machine, a drilling-machine, a corn-mill driven by a turbine, pumping-machinery, hydraulic presses, such as employed by Sir William Armstrong in his dock-crane and bridges, portable pumping-machinery, &c. Moreover, over and above the directions that would have been sufficient to enable a student to copy these drawings, and understand the various component parts of the machines they represent, the author gives a short history of the successive improvements that have led up to the present comparative perfection of each class of object. This, of course, increases the bulk of the volume; but it must also materially increase the workman's interest in the subject of his pictorial effort.

But before the student is introduced to these advanced drawings, he is led, by a gradually ascending road, through preliminary stages, in all of which it is necessary that he should sojourn for a while. Not one lesson, indeed, can be missed without leaving a gap that would be regretted. The first chapter, like that in several of these manuals, gives directions for the proper mode of using drawing instruments, making and choosing drawing-boards, stretching paper; but the second goes promptly to the matter in hand. Both linear and freehand drawing are explained; and so clearly that, it appears to us, workmen will find no difficulty in adding both accomplishments to the tools with which they work. The day, we feel, cannot be far distant, when a basket of tools will be considered incomplete without a pencil and a box of instruments in it; and we hope the good time is also at hand when every workman will be able to make the use of the former delightful by the aid of the latter. Mr. Davidson says—"The early training of foreign artisans has in this respect been superior to ours; and in the different exhibitions which have been held in this country and on the Continent, workmen were to be seen with their note-books busily employed in collecting information and sketching the appliances connected with their peculiar walks of industry." George III.'s oft-repeated wish concerning the diffusion of the Bible in the homes of his subjects appeared as unlikely to be realised when it was uttered as does the universal proficiency in technical drawing that we hope to see. Yet it has come nearly to pass. And when we hear that foreign workmen are already awake to the value of drawing; are, absolutely, first in the field of competition for the facility, excellence, and mastery it imparts, we hope that English artisans will neither rest nor happy be, as the old charm runs, till they have also realised our oft-repeated wish for its general acquisition. Such manuals as that before us are the best aids to this desirable end that they need. Whether it is the tracing of a cycloid, or the drawing of the teeth of wheels, or of a heart-shaped cam, or the elevation of a square-threaded screw; or whether it is instruction in shading, or information respecting the colours used by engineers to denote various substances, Mr. Davidson's directions are explicit, acute, and full. There are passages of pictorial writing, too, here and there, that will doubtless refresh many a weary mind. In his description of pumping

* "Drawing for Machinists and Engineers." By Ellis A. Davidson. Cassell, Petter, & Galpin, London and New York.
"The Elements of Practical Perspective." By Ellis A. Davidson. Cassell, Petter, & Galpin, London and New York.

1780. Even the *Builder*, in 1851 (ix., 311), printed "All that is old of the building we now see is the curious facade next the Strand, surmounted by the lion of the Perceys. Along the front originally there was a border of capital letters instead of the present ugly parapet." I do not remember having seen any engraving of the facade of 1619, though Cunningham mentions "a drawing by Vertue in the possession of the Rev. Henry Wellesey, D.D., Principal of New Inn Hall, Oxford: it deserves to be engraved."

This Daniel Garrett, who may now be considered to have designed this new facade, is probably the same Daniel Garrett, the author of the work entitled "Designs for Farmhouses, &c., in York, Northumberland, Cumberland, Westmoreland, and Bishoprick of Durham," fol., London, 1772, third edition; the two first being, perhaps, dated 1738 and 1760: and this is all the particulars gathered respecting him.

The notice of painted paper as a decoration carries one back to the early days of paper-hangings.

The mention of the "lanthorn" to light the staircase is somewhat obscure. At first, I thought a "lantern light" was meant; and, on looking at the sections of the staircase (25 ft. by 31 ft.) at Houghton (designed by Ripley), in the folio work upon that residence, published in 1760, they exhibit an unusual arrangement of lighting for that period. There is very little description given of the apartments; it was only by chance that a passage presented itself, under "the Hall," stating that "from the ceiling hangs a lantern for eighteen candles, of copper gilt." This elucidated the two following passages in the work from which the extracts are taken. First, "The lanthorn at Houghton appears to have been a favorite object of Tory taste at the time;" and second, a letter from Gray, the poet, dated 1737, who remarks, "We have hardly anybody in the parish but knows exactly the dimensions of the hall and saloon at Houghton, and begin to believe that the lanthorn is not so great a consumer of the fat of the land as disaffected persons have said." This evidently refers to a chandelier, and not to a skylight. The hall is a cube of 40 ft.; and the saloon is 40 ft. long, 30 ft. wide, and 40 ft. high.

WYATT PAPWORTH.

SEWAGE IRRIGATION AT ABERDEEN.

The *Scotsman* of the 7th inst. gives an account of a most successful experiment in sewage irrigation carried out last season at Aberdeen. The land put under irrigation is situated a little to the north of the city, and belongs to the late Colonel Knight Erskine's representatives. The Police Commissioners of Aberdeen are under agreement with the said representatives to supply the sewage of the city for nineteen years at the rate of 5s. per acre per annum, for the extent of land cultivated, the maximum quantity of sewage being fixed at 5,000 tons per annum per acre. The whole of the land capable of this mode of irrigation is from fifty to sixty acres. It has a pretty uniform slope, and is therefore well adapted for irrigation.

The land experimented upon last season was 11a. 3r. 2p., and was apportioned as to crops as follows:—

Date of Sowing.	Crops.	Extent.
1870.		a. r. p.
April 21.....	Grass, with mixture of bere	3 3 13
May 10.....	"	1 0 12
" 12-18	Carrots, beet, parsnips, and mangold.....	2 1 0
" 19-June 1.....	Potatoes.....	2 1 0
".....	Strawberries.....	1 0 0
" June 8-13.....	Turnips.....	1 1 3
" 10.....	Cabbages and kale.....	0 0 27
Total.....		11 3 20

The land in question is dry, the subsoil being sandy and gravelly, resting mostly on a hard pan. The sewage is brought from the city to the fields by a brick sewer, which terminates in a covered settling-tank. Thence it passes through a 2 ft. pipe to a system of carrier drains, 24 in. deep by 15 in. wide, and catch-water drains, 12 in. deep by 15 in. wide. The sewage, which can be regulated at pleasure, flowed over the land, aided by the lie of the ground, most sweetly; and the catch-water drains conveyed the exhausted sewage in a remarkably pure state into a "burn" which flows into the sea. The sewage was let on about a dozen times during the season, for about forty-eight hours at a time.

The grasses sown were Italian and Ayrshire rye-grasses, and a mixture of natural grasses.

The mixture of bere was about a bushel per acre. The first crop was reaped on the 2nd of July, seventy-two days after sowing; the second on the 6th of August; the third on the 10th of September; and the fourth, sheep were turned on to eat it off. The first cutting weighed 14½ tons per acre, the second over this, the third was lighter than the first, and the fourth was scarcely equal to the third. The turnips, carrots, potatoes, and mangolds were heavy crops, of first-rate quality. The beet was good, parsnips fair, cabbage poor, owing to canker at the roots, and kale splendid.

The turnips, potatoes, and other root crops sold well, and the yield of the crops will be fully 20s. per acre, as compared with, perhaps, 7s. per acre from the same land under ordinary cultivation. These results were attained under disadvantages from prejudice against the use of grass produced from sewage, from an unfavourable spring, and from late sowing, owing to delay in preparing the ground for irrigation.

Encouraged by these results, 32½ acres additional land are being prepared for irrigation, the land lying favourable for the sewage to gravitate over it. Sowing will be commenced directly the irrigation drains and the connecting link to the settling-tank are made. The great bulk of the land will be sown with rye-grass and oats; not bere, which was found last season to be too strong. The experiment this season will be watched with interest.

The simple and natural process of irrigation above described confirms the evidence already obtained as to the success of sewage irrigation; and it should be added, that the process is attended with no bad effect to the neighbourhood, in a sanitary point of view.

To the farmer the above experiment is most encouraging. What prevents thousands of acres of land in Essex, Suffolk, and Norfolk, and in Kent, Surrey, and Sussex, from being put under sewage irrigation? An ample supply of sewage for the purpose is continually flowing from the metropolis into the Thames near Barking and Erith. Were this sewage to be pumped into pipes laid from the reservoir near Barking, through Essex, Suffolk, and Norfolk, and also into pipes laid from the reservoir near Erith, through Kent, Surrey, and Sussex, with outlets into the sea, farmers could take branches from them for irrigating the lands in the manner so cheaply and so successfully practised at Aberdeen. This would agricultural and garden produce be increased many-fold, permanent employment created for at least double the present number of farm labourers, treble the present number of sheep and cattle bred and fed at home for the London markets, and the Thames freed from pollution.

JOHN PHILLIPS.

A WORD TO BROMLEY.

STR.—With reference to the request in your columns of the Chairman of the Bromley Local Board of Health, I venture to say that in my opinion the distribution of sanitary handbills alone will achieve about the same amount of good as the distribution of "religious tracts." A few may be found to read them with advantage, but the majority of the folks among whom they are likely to be distributed will thrust them into their pockets to light their pipes with.

If the Chairman of the Bromley Local Board desires to do practical and efficient service in the interest of the public health, he must not only preach and print, but act; he must not only hang up the sanitary "golden rules" over every poor man's fireplace, but he must, in concert with the members of the Board he represents, enforce these rules by constant visitation.

Educate by all means, but widen the scholastic range. If cleanliness could be taught by good reading alone, the Book of Books would have scored mankind from dirt. The three essentials of education, Mr. *Builder*, in my opinion, consist in making the man more manly, the woman more womanly, and the child more childlike. If we are ever to succeed in doing this we must first preserve the health of the population, and see that the middle and lower classes are better housed, and that they possess individually all the concomitants of a sanitary or healthy and habitable dwelling. Neither men nor women can be manly or womanly, nor their children childlike, who are born into dirt, nursed up in dirt, who "live, move, and have their being in filth, long dirt." The child is said to be father to the man, in sooth. Train up the child, then, to cleanliness, which includes morality, and the

future man will have a better chance of becoming "healthy, wealthy, and wise."

These are my opinions, Mr. Editor, and I believe they are also yours, and those of every other practical sanitarian. I tender them to Mr. Chambers, wishing him every success in his praiseworthy experiment.

A SANITARY INSPECTOR.

"EVANS'S," COVENT GARDEN.

A FEW years ago supper at "Evans's," after the play, where some agreeable music could be listened to, and no ladies were admitted, was a well-known wind-up to the mild dissipation of country cousins. The hotel was erected by Admiral Russell, Earl of Orford, in the year 1701, for his private residence, and the fine old staircase is formed of part of the vessel that he commanded at La Hogue: up this, in early days the members of the Institute of Architects went to their meeting-place above; Earl de Grey presiding, and divisions unknown. The staircase has handsomely carved balusters, ropes, and anchors, with the coronet and initial letters of Lord Orford.

When the music-hall mania arose and spread, the supper-room at Evans's was improved into a hall. This was done a few years ago, and we gave a view of it at the time. Still to meet the demand, it has now been extended on the ground-floor, 12 ft., by removing the wall on the east side, the space thus obtained being divided into recesses by dwarf partitions, affording a certain degree of privacy, though commanding a complete view of the stage. On the opposite side of the hall a similar arrangement has been carried out, and the whole of the hall is lined with large squares of looking-glasses.

A flooring of fire-proof construction has been formed at an intermediate level at each side, and eleven large private boxes made, running all round the hall, with an approach through the hotel. The hall has been handsomely redecorated; the panels in the cove of the ceiling are occupied by figures of the Muses, painted in oil colour, on a grey background. The hall is lighted by four large sun-burners, and the stage with the Patent Float Light, the whole of these being Messrs. Strobe & Co.'s patent. The stage has been enlarged, and lowered 12 in. Mr. Rowley was the architect, and Mr. Snowdon has done the work at the cost of about 7,000l.

TRADE RETURNS.

THE Board of Trade returns for the month, and for the twelvemonth, ending December 31st, 1870, and for the month of January, 1871, have been published. The total real value of the exports for 1868 was 249,616,302l. For 1869, the value of the imports was 250,547,468l.; and for 1870, 256,016,054l. The declared value of the exports was 179,677,812l. in 1868; 189,953,957l. in 1869; and 199,640,983l. in 1870. The imports of deals, battens, boards, or other wood, sawn or split, amounted to 2,417,411 loads in 1868; to 2,329,962 loads in 1869; and to 2,686,531 loads in 1870. The imports of timber not sawn or split amounted to 1,326,425 loads in 1868; to 1,275,447 loads in 1869; and to 1,408,775 loads in 1870. The larger portion of sawn timber in each of the three years,—1,361,911 loads in 1870,—was received from Norway and Sweden; and of hewn timber,—469,340 loads in 1870,—from British North America. The value of the timber imported in 1870 was, in deals, &c., 7,310,221l.; hewn and whole timber, 4,411,755l. The imports in December last were of deals, &c., 561,170 loads, against 476,288 loads in 1869, and 435,646 loads in 1868. Of timber not sawn the imports were 197,824 loads in December, 1869, 249,590 loads in 1869, and 262,741 loads in 1870. The imports for January, 1871, as stated in the new form in which the trade and navigation returns are published, show a great discrepancy. The quantities imported, it is explained in the new issue, are taken from the importers' entries, instead of from the landing accounts, which are not completed until a much later date. The monthly importations for the first and last months of the year are probably affected materially by considerations of account, and other influences may possibly have contributed to diminish the imports. However this may be, the figures given in the official return are as follow:—The imports of timber, sawn, split, planed, or dressed, for January, 1871, amount to 35,570 loads; and of

hewn timber, to 27,606 loads, as against 561,170 loads and 476,288 loads for December, 1870.

It is curious and gratifying to notice in the returns of imports that France, notwithstanding her sore troubles, has during the last year, in so far as the United Kingdom is concerned, largely increased the exports of some manufactures. The total value of the imports of broad silks in 1870, was 10,357,666*l.*, and of ribbons, 3,262,909*l.* France sent us to the value of 7,536,879*l.* of the one denomination, and of 2,433,341*l.* of the other. In broad stuffs (silk), the value of our imports from France, in December, 1869, was 518,709*l.*; in December, 1869, 536,109*l.*; and, strange to say, in December, 1870, 1,183,901*l.* The imports for January, 1871, show as great a discrepancy as has been noted in relation to timber, the value of the broad stuffs imported being 184,672*l.* The value of the wine imported from France was 1,875,989*l.* in 1868; 1,585,858*l.* in 1869; and 1,468,367*l.* in 1871. The value imported for the months of December in each of the three years, was 135,394*l.* in 1868; 115,702*l.* in 1869; and 120,989*l.* in December, 1870. The value of the wine imports from France, in January, 1871, are put down at 63,026*l.* The value of the exports of steam-engines, was 1,972,782*l.* in 1870, against 1,851,779*l.* in 1869, and 1,724,783*l.* in 1868. The value of machinery of other sorts exported in the three years respectively, was 3,004,699*l.* in 1868; 3,267,143*l.* in 1869; and 3,313,721*l.* in 1870. The total value of the iron and unwrought steel exported in 1870 was 21,080,494*l.*, being 5,000,000*l.* sterling above the value in 1869, and a considerable increase upon the exports of 1869. The railroad iron exported in 1870 was of the value of 8,754,488*l.*, of which the United States took to the value of 3,777,021*l.*; and Russia, of 1,873,047*l.* The railway-carriages exported in 1870 were of the value of 466,863*l.* The quantity of the coals, cinders, and culm exported in 1870 was 10,495,092 tons, and the value, 5,506,890*l.*, being a considerable increase upon the two preceding years.

Of the exports of British and Irish produce in 1870, 147,792,032*l.* in value were taken by foreign countries, and 51,848,951*l.* by British possessions. The value of the exports from the United Kingdom to the countries named below were, in 1870 and in 1869, as follows:—

	In 1870	In 1869
United States	223,334,634	224,824,311
British India	17,659,465	19,278,905
Hanse Towns	16,609,383	19,252,150
France	11,645,311	11,425,353
Holland	11,222,496	10,759,519
Australian Colonies, including Tasmania and New Zealand	9,902,116	13,411,512
Egypt	5,751,788	7,982,714
Russia	6,993,575	6,465,492
British North America	6,830,621	5,159,293
China	6,138,139	6,812,549
Hong Kong	3,496,632	2,139,337
Brazil	5,352,140	6,984,808
Italy	5,255,928	6,114,258
Belgium	4,476,513	4,903,535

IMPROVEMENTS IN GLASGOW.

THE new bridge spanning the Clyde at Hatchesonston, opposite the Jail-square, is nearly completed, and is expected to be ready for opening next month. We alluded to its progress in last year's *Builder*. The new bridge will be nearly level with the roadway. It is one of three arches; and in its structural and ornamental design it will be an improvement upon the older ones which span the river. It will be composed of a canopy of granite, the pavement being of good Caithness stone.

The outside painting of the bridge is in green and gold, and medallions are shown upon it of the Queen and the Prince Consort. The arms of the counties of Lanark, Renfrew, and Ayr, and other city incorporations, are represented upon the spandrels of the arches,—those of Glasgow occupying the central parapet. The inside of the bridge will be similarly painted to the outside. The river bank on the north side will be improved or re-formed. Extending eastward, the banks will be sloped, and planted with shrubs, and the river-wall on the south side will be renewed.

The Suspension Bridge, opposite Maxwell-street, which has been for some time under repair, is near completion; and this bridge is likely to be opened simultaneously with Albert Bridge.

Could not the Hide Market be relegated a distance away from the green bank, and "Paddy's Market," and the peripatetic fraternity of idlers,

loafers, and intermittent squatters who infest the margin of the Green, be driven farther north? There are scores of jail-birds infesting the waste grounds opposite the Jail-square, whom jail-walls should enclose, and whose hands would be more profitably employed for their country at oakum-picking than pocket-picking.

Glasgow Green, with a little expense, could be made a very tasteful park for the poor quarter of the city, near which it is situated, instead of being allowed to exist as a howling wilderness, which it is in more senses than one.

THE GLASGOW INSTITUTE OF ARCHITECTS.

ON the 7th inst. the members of this institute dined together in the George Hotel, George-square. Mr. Alexander Thomson, president, occupied the chair, and in proposing the toast of the "Glasgow Institute of Architects," delivered an address. The question (he said in the course of it) has often been asked, "How is it that there is no modern style of architecture?" This question has been so often put without receiving any answer, either by word or deed, that it has come to be considered a foolish question. But so persuaded am I of its propriety, and so sure am I that it must sooner or later be taken up in earnest, that I shall continue to reiterate the obnoxious question as often as opportunity offers, and at the same time do what I can to demonstrate the reasonableness of the demand and the practicability of getting quit of the trammels that have so long prevented our enjoying the full privileges and honours to which our profession is justly entitled. Every past period of civilisation had its architecture growing out of it as by a natural process, and exhibiting in a permanent form the more important features of its development. But with us architecture has all but ceased to be a living art, and the present age, so rich in achievement in other departments, is seen making the most ridiculous efforts to insinuate its overgrown person backwards into the empty shells of dead ages, which lie scattered about upon the old tide marks of civilisation, rather than secrete or shell for use according to the ordinary course of nature. If we have no architectural style, it is not for lack of material, for we know nearly all that has ever been done. It is not for lack of wealth, for our undertakings are most extensive, and exhibit a lavish expenditure of money. It is not for want of intellectual talent, for we have excelled all former ages in the number and grandeur of our discoveries. How is it, then, that there is no modern style of architecture? Some will answer that the field is exhausted; but genius and enterprise have converted many an exhausted idea into a stage from which deeper and richer fields have been reached and wrought. I will not say that it is easy to rid ourselves of the odium that attaches to us in allowing or contributing to the continuance of this very unnatural and unsatisfactory state of things, but it is not difficult to point with clearness and certainty to the means by which that most desirable end is to be obtained; and it is thus to abandon with all convenient expedition the whole mass of accumulated human traditions under which we have been, as it were, smothered, and take earnestly to the study of the divine laws, and by-and-by we shall find it more difficult to keep running in the old rut than hitherto we have found it difficult to get out of it. Let us once fairly comprehend the living law, and we shall at once and for ever get free from the bondage of dead forms. And yet these old forms are not to be despised; for otherwise they are there for dissection. They are there to teach us what has been already discovered,—to place us upon an elevated starting-point for yet higher attainments,—to connect our sympathies with the men whose thoughts they represent, and with the Creator whose laws they reveal to us. The great difficulty that we have to deal with is not the inability of architects to keep pace with other professions, but the obstructions which are placed in their way by employers; for, instead of giving encouragement to progress as a thing essential or even desirable, the custom is to forbid it as a thing intolerable. The public has got it into its head that it knows by intuition what is right, and utterly ignores the results of special training and life-long study. Instead of being looked up to as the exponents of architecture, we are regarded as mere agents, and instructed what to do within certain recognised limits of

commonplace. The public believe that it understands and loves art, whereas if your work has not the familiar commonplace aspect—if it does not suggest some pleasing association—if it does not resemble some other thing that has been sanctioned by some authority—in short, if it has nothing to recommend it but its artistic merits, it is unceremoniously put aside as despicable, and just in proportion to its excellence is it hated and condemned. An intelligent public cannot brook instruction, and regards anything that seems above its comprehension as offensive and insulting. While this state of things is allowed to continue, it is evident that we shall neither be respected nor remunerated as we ought to be, and so the aim of this association should be to devise means to put matters into a more satisfactory position.

BURLINGTON HOUSE.

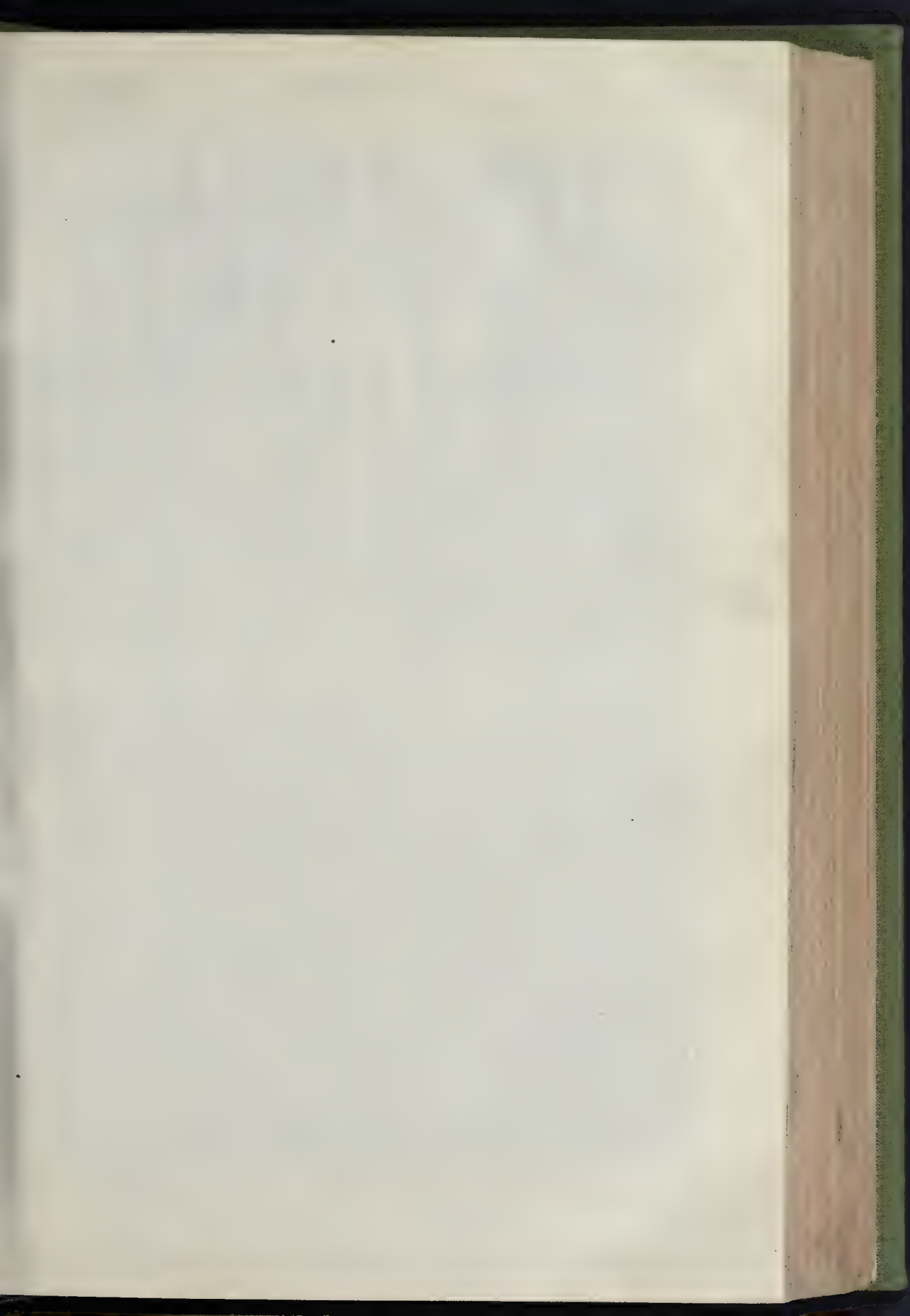
SIR,—When one reflects on the excellent design for the new Burlington buildings, it at once occurs what an opportunity offers itself by adding to the interest and grandeur of the interior quadrangle, by the introduction of statues of eminent men, who have distinguished themselves in the various sciences, and by placing them on pedestals in front of each of the buildings appropriated to each of the arts, sciences, &c., within sight and observation of the public, at the several entrances. The Royal Academy, with all their wealth, might set the example, as holding the central group of buildings, and then each of the societies might follow so good an example. Sir J. Pennethorne made a move in the right direction; and, as the Academy abuts upon his new building, they might continue the good work.

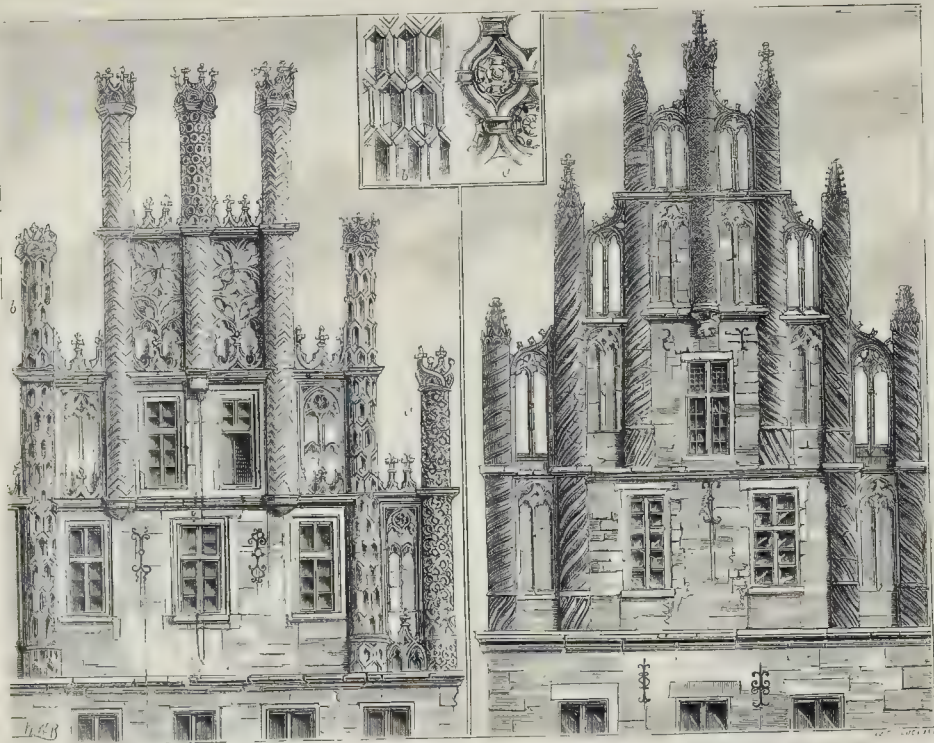
DECIMAL WEIGHTS AND MEASURES.

A BILL has been introduced to the House of Commons for the substitution of new standards of weights and measures on the metric system, in lieu of the Imperial weights and measures now the legal standards. The new units will be based upon the original standards in Paris, and will be the "Mètre" for length, the "Are" for surface, the "Litre" for capacity, and the "Gram" for weight. The following are the tables proposed in the Bill:—

Measure of Length.		
Systematic Names.	Mètres.	Value.
Myriamètre	10,001	10,000 mètres.
Kilomètre	1,000	1,000 mètres.
Hectomètre	100	100 mètres.
Décamètre	10	10 mètres.
Mètre	1	Unit of measure of length.
Décimètre .....	.1	The 10th of a metre.
Centimètre .....	.01	The 100th of a metre.
Millimètre .....	.001	The 1,000th of a metre.
Measure of Surface.		
Square Mètres.		
Hectare	10,000	100 Acres, 10,000 square metres.
Are	100	Unit of measure of surface.
Centiare	1	The 100th of the Are.
Measure of Capacity.		
Cubic Décimètres.		
Kilolitre	1,000	1,000 litres.
Hectolitre	100	100 litres.
Décalitre	10	10 litres.
Litre	1	Unit of measure of capacity.
Décilitre .....	.1	The 10th of a litre.
Centilitre .....	.01	The 100th of a litre.
Measure of Weight.		
Grams.		
Millier or ton	1,000,000	1,000 kilograms, the weight of the cubic metre of water, and of the ton.
Quintal	100,000	100 kilograms.
Myriagram	10,000	10 kilograms.
Kilogram	1,000	1,000 grams.
Hectogram	100	100 grams.
Déogram	10	10 grams.
Gram	1	Unit of weight.
Déigram .....	.1	The 10th of a gram.
Centigram .....	.01	The 100th of a gram.
Milligram .....	.001	The 1,000th of a gram.

The Bill provides for the supply of the new standards to the judges, magistrates, and other authorities that have the custody of the present standards, and authority to issue copies and models of the same. In the event of the Bill being passed, the new weights and measures will be at once recognised as legal, but a sufficient margin of time will be allowed by the Act to effect the transition, before the new weights and measures, adjusted according to the new standards, becomes compulsory. The Bill has been brought in by Mr. J. B. Smith, Sir Charles Adderley, Sir Thos. Bazley, Mr. Graves, Mr. Baines, Mr. Albert Poll, Mr. Mantz, and Mr. Dalglisch. It has the cordial support of the chambers of commerce throughout the country.





GABLES IN MÜNSTER, WESTPHALIA, GERMANY.—Fifteenth Century.

GABLES IN MÜNSTER.

It is a remarkable fact that although there is so great a similarity in the ecclesiastical architecture of Germany of any given date,—for instance, that we find churches far away in the south and east with features and detail so like portions of Cologne Cathedral or the Church of Marbourg, that they might have been erected by the architects of those two noble minsters,—yet nothing can be more distinct than the domestic architecture of different districts. Not only every province, but nearly every town seems to have had its own peculiar style of domestic architecture. The difference between the domestic work of Nuremberg, Ratisbon, and Landsbut in the south, or between examples of the same class of buildings in Hildesheim, Münster, Brunswick, Lübeck, or Danzig in the north, is so marked that a person who has well studied the subject can tell the locality of nearly any example by merely seeing it. There is, perhaps, no town in Germany where the domestic work bears such strongly-marked peculiarities as at Münster, in Westphalia; and it is most fortunate for the study of ancient domestic architecture, that we have in this town not only one or two isolated examples of old houses, but a complete and nearly unaltered street, many of the buildings of which date from the fourteenth and fifteenth centuries. In this fine street, called the "Principal Markt," all the houses are built over arcades, which is quite a southern feature; in fact, we are inclined to think that this is the only town in the south of Europe where this feature is to be seen. The "rows" at Chester are not arcades. These arcades give the "Principal Markt" at Münster a resemblance to the great street at Landsbut, in Bavaria. Some portions of the arcade in the street at Münster date as far back as the thirteenth century; the houses, erected upon it, however, are chiefly works of the fifteenth century. Many of them are excessively elaborate, but what is most remarkable about them is the treatment of their gables. In every instance the gable is turned towards

the street, and is made vertically into five, six, or even seven divisions, by circular or octagonal turrets, rising from a cornice at the base of the gable. Sometimes these gables are connected together by small flying buttresses, as in our example No. 2; at other times they run up separately, as in No. 1. The face of the gable is generally covered with tracery or blank arcading, the effect of the whole being excessively rich, in some instances even too much so. All the ancient gables in Münster are built of stone, but their style of decoration, especially the twisted cable-moulding of the turrets, would seem to lend itself rather to brick than to stone construction, and one cannot help being struck with the great resemblance of these turrets to the highly-ornamental brick chimneys of some of our ancient Tudor houses. In fact, some of the patterns upon the turrets of our example No. 2 will be found to be exactly similar to the decorations of the chimneys of East Bosham Hall. We should mention that in some of the gables at Münster these turrets are much smaller than in the examples we give, and are quite as frequently square in plan as round or octagonal; in one or two examples they are treated as small buttresses, and in some of the plainer gables they are only mullions. The most common treatment, however, is that shown in our two examples.

ANCIENT STREET ARCHITECTURE,
MAESTRICHT, HOLLAND.

The example we give of a street front in Maestricht is interesting from the fact that so very few specimens of this class of front of an earlier date than the seventeenth or eighteenth century exist. It seems to us that this "front" is suggestive, and might well be made useful. The window spaces are amply sufficient for any reasonable purpose, and the treatment of first-floor story is admirable for the purposes of a "show-room." Of course the ground-floor is not in its original condition, and was probably treated as an arcade. The whole front is

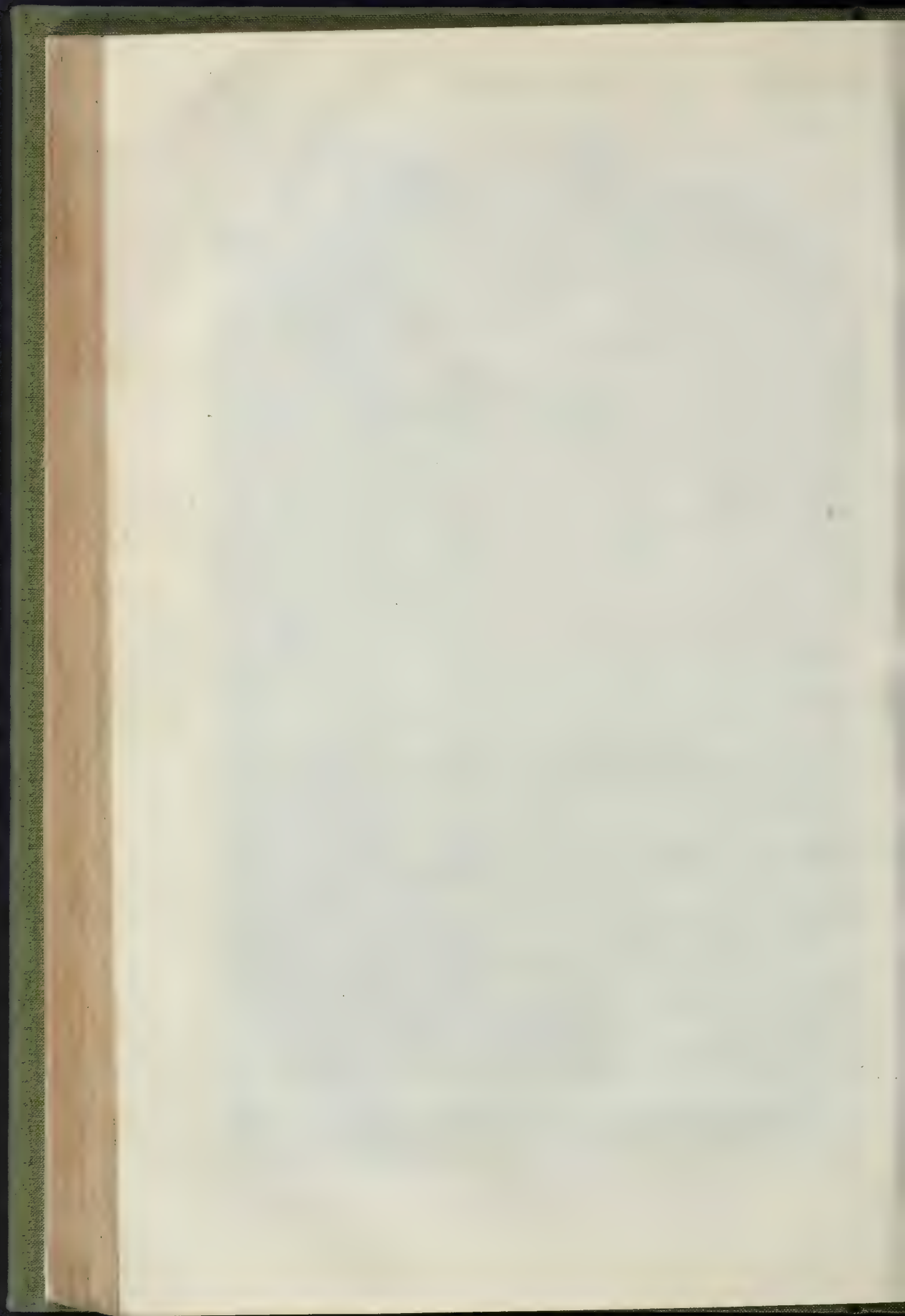
of stone, and it is said that the present building was intended only to form one wing of a larger edifice: we do not, however, know what authority there is for this supposition, and we should feel inclined to doubt it, as the building as it exists is quite perfect of itself. The interior of this interesting house has been very much spoiled, and its original arrangement disturbed. The ancient glazing of the windows, however, still exists.

The small busts, representing six of the Cæsars, over the heads of the windows of the first story are well executed, and in a good state of preservation. From the style of architecture, we should place the date of this building late in the sixteenth century: probably about the year 1590 or 1599.

Maestricht is not rich in domestic architecture; with the exception of this house, a portion of the old Rathhaus, and a house in the Cathedral-square, there is little worthy of notice in that way. The portion of the old Rathhaus is late poor Flamboyant, and the house in the Cathedral-square is of the same date, but better in detail: it bears the arms of Maximilian I. on the centre window, and the imperial arms of Germany on another. Considerable portions of the ancient city walls still exist; but the most interesting relic of all, the great watch-tower of Wyck, was destroyed last year. This tower is illustrated in Viollet-le-Duc's "Dictionnaire." It was one of the most valuable and perfect examples of ancient military architecture handed down to our time. It was about 80 ft. high, and over 30 ft. in diameter. Each story was vaulted and the whole crowned by a tall extinguisher roof. There was not the slightest possibility of reason for the destruction of this fine relic of antiquity, and it is difficult to explain how such an act of barbarity was allowed, even in the nineteenth century. There is a fine Italian Rathhaus, surrounded by a picturesque bell-turret, which contains a most unusual set of chimneys. The churches in Maestricht are far more interesting than the secular buildings, and of these we shall have occasion to speak on a future occasion.



ANCIENT STREET ARCHITECTURE: MAESTRICHT.—End of Sixteenth Century.



BREWERIES AND THEIR FITTINGS.

A PAPER "On the Machinery and Utensils of a Brewery," has been read before the Society of Engineers, in their Hall, at the Westminster Palace Hotel, by Mr. Thomas Wilkins, C.E. Mr. Baldwin Latham, president of the society, was in the chair. We must confine ourselves to a few paragraphs from it.

The size of a brewery is stated in the number of quarters of malt that can be used in one brewing; thus, a brewery having a mash-tun in which twenty combs of malt can be mashed at a brewing, would be a "ten-quarter brewery," and so on—the rest of the plant being made in proportion.

There were few very old breweries in this country until within about the last hundred years. Breweries were mostly small in size, seldom more than five-quarter plants, but in some towns there were a great many of these small breweries, and on the Continent, in German towns, it was not an uncommon thing to find a regular brewers' quarter.

Until steam came into general use as a motive power, all the labour was done by hand or horse power; sometimes a water-wheel was used; but it is believed that on no occasion has wind power been applied. Of late years steam has not only been used in breweries as a motive power, but also as a means of transmitting heat; so that the brewer having a boiler to supply steam to the engines, uses it also to supply steam for boiling both liquor and wort, either by forming the boiling coppers with an outer pan or jacket of iron, and passing steam through the space between that and the inner pan of the copper, or by passing the steam through coils of copper pipe fixed at the bottoms of vessels made of wood, iron, or copper, whichever of these be preferred.

In building a brewery every advantage should be taken of any favourable natural features of the locality, such as a hill side, where the building may be arranged so that the utensils can be placed in a position one above another in level, taking advantage of the natural slope to save labour, which might otherwise have to be expended in pumping the worts or beer about. A good supply of suitable water, or "liquor," as it is called in breweries, is also indispensable. That there is this, should always be ascertained before either building a new brewery or extending an old one.

In the building, iron columns, girders, and joists should be used in preference to wooden ones. The drains should be used in preference to wooden ones. The drains should be strongly and securely made, so as to prevent their breakage, and consequent leakiness, and they should be of such a size as not easily to be choked; above all, the foundations, both of walls and columns, should have especial attention. Nothing is more annoying to a brewer than to have vessels strained and rendered leaky by their supports getting out of level, either from insufficient foundations or rotting timbers.

The mash-tun is made either of good yellow deals or of oak, and has a false bottom, generally of iron, made of several plates, so as easily to be removed for cleansing the tun. These plates are very closely perforated with holes about $\frac{1}{2}$ in. diameter; sometimes, however, with slots that width, but about 2 in. to 3 in. long, cast in them. These slots and also the small holes are about $\frac{1}{2}$ in. on the bottom side of the plate, being made so much taper to prevent their blocking. The plates with slots are more expensive than the others, but some brewers prefer them. The mash-tun should contain from 18 to 19 cubic feet for every quarter of malt. Formerly when the crushed malt had been placed in the tun, the nearly boiling-hot liquor was run in, and the whole was thoroughly mixed together by men with poles, each having several cross pieces, about the size of the staves of a ladder, in one end. This operation is termed mashing, and these oars are still used by some brewers, more especially where a "Steel's" or a similar machine is used. A better and more certain method of mashing was required; for it was found that in some parts of the mash-tun a sort of oake or dumping would be formed, the outside of which, consisting of a pasty mass of flour, prevented the liquor reaching the inside, to extract the valuable ingredient of the malt. The machine which for many years has been fitted to mash-tuns, to perform this operation, is made as follows.—A circular crank, with radial teeth, is bolted to the sides of the mash-tun; a vertical shaft is erected in bearings in the

centre of the tun. This shaft is either carried some few feet above the top of the tun, or else passes through a stuffing-box in the bottom, and is worked by bevil wheels from a horizontal shaft. The vertical shaft supports loosely a bearing which carries one end of a second horizontal shaft, which is inside the tun, at about half its depth. The other end of this shaft has a pinion keyed upon it. This pinion gears with, and is supported by the circular rack before mentioned. A revolving motion is given to this horizontal shaft by bevil wheels from the vertical one, and upon it is hung a sort of rake, which, as the shaft revolves, thoroughly mixes up the mash. Sometimes there are two, and even three, of these rake-shafts. It will be obvious that, as these shafts revolve, the pinion gearing into the fixed rack causes the whole to revolve somewhat slowly round the tun.

Large breweries consist generally of two or more plants. It is seldom that a single plant is more than from sixty to eighty quarters, and, indeed, it is scarcely wise to have them so large as this. Two twenty-five quarter plants will be found more manageable than one of fifty. A single plant of more than forty quarters is not to be recommended.

In these large breweries, where there are sometimes a dozen or more mash-tuns, rather than have a large engine, it is best to have a small one to pump all the liquor; another to grind the malt; and these may be kept at work all day, preparing for the morrow. Indeed, a vast amount of money in first cost, and in labour afterwards, may be saved by properly planning and arranging everything beforehand.

And now, having reached the end of the paper, there is one remark which may be appropriately made applicable to other manufactories besides breweries. When it is decided to erect a new place or to make any alteration to one already in existence, it is always best to employ some competent person to prepare the plans and specifications of the same, in accordance with which various firms may be invited to tender. If two or three manufacturing firms are asked to supply drawings and tenders, it is a very unlikely thing that they will all send the same design; consequently, the comparison of the amount of their tenders will give very little notion as to which is really the cheapest; and besides, they, being uncertain of obtaining the order, cannot afford to go fully into the little details. The contract is vaguely worded, and there is no chance of the purchaser knowing whether everything is included in their estimate, unless he happens to be as good an engineer and architect as he is well acquainted with his own particular business. The chances are that, when the job is done, the amount of extras above the estimates of his builder, brickmaker, engineer, cooper, smith, &c., may have reached such a sum that he may be tempted to do as did a gentleman in Wales, some years since, put an end to his existence.

ARABIC NUMERALS ON WELLS CATHEDRAL.

MR. IRVINE has made public the fact that since the restoration of the west front of Wells Cathedral began, it has been discovered that in the line of subjects representing the Resurrection of the Dead each group has had a number marked on it. In the space over the end of the north aisle of the nave the figures of A. B. C. occur, which are Arabic numerals almost precisely as used at the present day. These sculptures are of early date, and not like those of the three top rows containing the figure of our Lord, the row of apostles, and that of angels,—all of which are of Perpendicular date, though evidently not the work of one artist. The rising figures of kings, queens, and bishops have crowns or mitres on their heads; otherwise they are naked. The tomb-slabs are all plain; but from their general shape, together with those of crowns and mitres, the sculptures cannot date later than the Early Decorated period. The general character of the other numerals seen does not agree with the figures used during the Perpendicular period. The writer observes,—The material used is the local Donkington stone, so that the work was executed at or near the spot; but the use of these figures seems to raise a doubt, in so far as, if the artists were local men, then numerals of this sort were used commonly much earlier than is generally supposed; or, if otherwise, the carvers were brought from a district where these numbers were known to a country where they were not generally used or known to execute the

sculptures. He asks to be informed of any very early examples of which the date can certainly be obtained, or at least approximated to, in England. We know of none on stone earlier than the beginning of the fifteenth century: the date, 1445, in Heathfield Church, Sussex, is an example we have often quoted. The numerals occur in MSS. of the preceding century.

CITY COMPANIES CONNECTED WITH BUILDING.

WE take the following particulars from the "City of London Directory":—

MASONS' COMPANY.

Office.—Their hall in Basinghall-street is now let, the income being devoted to charity.

Charters.—This company was originally designated the "Citizens and Freemasons of London," in 1410. They were first incorporated by 29th Charles II., December 17th, 1677, and their bye-laws were approved shortly afterwards. James II. gave them a new charter February 9th, 1686; this was, however, vacated by statute of William and Mary, and Queen Anne exemplified and confirmed their previous charter, December 17th, 1677.

Arms.—Sable: on a chevron, between three towers argent, a pair of compasses of the first. Crest: on a wreath a castle, as in arms. Motto: "In the Lord is our trust."

Fees Payable.—Upon taking up the freedom: by patrimony or servitude, 5l. 5s.; by purchase, 7l. 7s. Upon admission to the Livery, 15l. 15s. Upon election to the Court of Assistants, 5l.; Wardens, 15l.; Master, 10l.

Charities.—There are several small pensions given to decayed members of the company or their widows; for particulars application should be made to the clerk.

PLASTERERS' COMPANY.

Hall.—Their ancient hall in Adde-street was burnt in 1666, and rebuilt by Sir Christopher Wren in 1669.

Charters.—This company was incorporated by 16th Henry VII., March 10th, 1501, and this was exemplified by Queen Elizabeth in 1560, and again in 1567. James I. confirmed their former privileges, 1604, and Charles II. granted them an inexpressus in 1643.

Arms.—Azure: a chevron engrailed or, between two plasterers' hammers and a trowel argent, in chief, hammers handled of the second, and a trowel flat brush in base of the third, handled of the fourth; a rose gules, seeded or, barbed vert, between two fleurs-de-lis of the first. Crest: On a wreath a dexter arm embowed, habited or, charged with a bend gules, cuffed of the last, holding in the hand proper a hammer, as in the arms, argent, handled or. Supporters: two opimaui vert, purged or, beaked sable, wings gules. Motto: "Façtum Est," or "Let Brotherly Love Continue." (Granted January 15th, 1546.)

Fees Payable.—Upon taking up the freedom: by patrimony or servitude, about 3l. 3s.; by purchase, 8l. Upon admission to the Livery, 13l. 17s. 6d. Upon election to the Court of Assistants, 25l. Upon election as Master, 5l.

Charities.—Several small sums are distributed to the poor annually.

TILERS' AND BRICKLAYERS' COMPANY.

Their Hall is in Leadenhall-street. This building is now let upon lease.

Charters.—This ancient fraternity was first incorporated by 10th Elizabeth, August 3rd, 1568. This was exemplified and confirmed by the 2nd James I. April 20th, 1604; and their rules and constitution were created and allowed by the Lord Keeper, the Lord Treasurer, and Chief Justices, July 14th, 1570. Upon the forced surrender of their charters to James II., he granted them a new one, February 18th, 1685. This was, however, annulled by the statute passed in the next reign.

Arms.—Azure: a chevron or, in chief a fleur-de-lis argent between two brick-axes, palewise of the second; in base a bundle of laths of the last. Crest: on a wreath a dexter arm embowed, vested per pale or and azure, cuffed argent, holding in the hand proper a brick-axe or. Motto: "In God is All our Trust."

Fees payable.—Upon taking up the freedom: by patrimony or servitude, 4l. 14s.; by purchase, 7l. 10s.—Upon admission to the livery, 21l.—Upon election to the Court of Assistants, 50l.

Charities.—Thomas Fowler gave, in trust to the company, 29th November, 1670, premises

near the Tower, they paying 40s. yearly to the almshouses in Chipping Norton, towards the maintenance of the poor widows, and 40s. to the churchwardens of the same place, to apprentice poor boys of that parish in the City of London. The property has since been sold, and the proceeds invested, 799l. 12s. 3 per cent. consols.

Three poor freemen receive annually at Merchant Taylors' Hall, 4l. each. Two of them in respect of the gift of Sir Thomas Rowe, and one in respect of the gift of John Vernon.

PLUMBERS' COMPANY.

Charters.—This ancient Mystery was incorporated by 9th James I., April 12th, 1611. Their bye-laws were examined and allowed by the Lord Chancellor and Chief Justices, November 11th, 1611; re-incorporated by 32nd Charles II., December 22nd, 1655. Any person carrying on this trade was compelled to be free of this Company by Act of Common Council, February 6th, 1764.

Arms.—On a chevron sable, between a cross and a fesswise of the last, inclosed by two plumets azure, all in chief, and a level reversed in base of the second, two soldering-irons in saltire, between a cutting knife on the dexter, and a shave-hook on the sinister, argent. Crest: on a wreath a triple fountain or, issuing water proper; on the top an angel of the last, vested argent, ducally crowned and winged of the first, holding in the dexter hand a sword, and in the sinister a pair of scales, both or; over the crest a motto, "Justitia et Pax." Under the arms, the motto, "In God is all our Hope."

Fees Payable.—Upon taking up the freedom: by patrimony or servitude, 3l.; by purchase 21l. Upon admission to the livery, 15l. Upon election to the Court of Assistants, 15l. 15s.

Charities.—Samuel North, by will, 28th February, 1645 (amongst other bequests), reciting that his wife had bequeathed towards the relief of the poor widows and fatherless children of freemen of the Company 40s. annually, for the better performance of her wish he left his residence in Bishopsgate-street, in the parish of St. Helen's; and a further sum of 40s. for the augmentation of the stock of the Company; and 40s. yearly in addition for the relief of the poor widows and children, as before mentioned, 4l. yearly for the relief of the poor of St. Mary, Somerset, and 40s. to Bethlehem Hospital.

NEW WORKHOUSE FOR LAMBETH.

We are informed that the first stone of the new Lambeth Workhouse, about to be erected at the back of the new Police Court, Lower Kennington-lane, was laid by Mr. John Doulton (chairman of the Board of Guardians), on the 3rd inst. The building is to be erected upon 9½ acres of ground; the architects are Messrs. Parris & Aldwinckle, and their design was selected by the guardians in a limited competition. The builders are Messrs. Crockett, Dickinson, & Oliver; their contract amounts to 44,390l. It is expected that the cost of the new building, including the land, will be about 68,000l., and this sum will be borrowed and repaid over a period of thirty years. The works are commenced, and in active progress.

VILLAGE IRRIGATION OF INDIA.

SIR,—It is wonderful how much nature has done for India, and how little the Indian Government, since the days of Clive. It would be far better for those charged with the irrigation to select a competent staff of agricultural engineers, instead of fetching out mere theoretical clerks.

Before any grand scheme is carried out, every village in the roadless districts, where hundreds of people die annually from starvation, should have a tank for the storage of water during the rains of the monsoon, instead of allowing the useful element to run waste into the sea, and serve no useful object. In those isolated districts, during the intense heat, there are few living things to be seen; the quiet shadows in the long vista of the perspective lie sleeping on the ruins of hills; but the stillness of the solitude is broken by the murmuring of the ringdoves, and the whirr of the antelope in his wild career. Surely irrigation is not such an abstruse science; it requires no grand viaducts, with lofty piers, surmounted by the British lion; but simply drains to convey the water from an inexhaustible source

over the thirsty land. The merit of a work consists in the benefit it is the means of doing, more than in the amount of money spent broadcast upon its construction.

In many parts of India the land is so fruitful that it is assessed at 35 rupees per beegah, and 170 rupees have been paid for well-irrigated sugar-cane and cholam fields. Let India have an inexhaustible supply of water; let educated natives have a share in the administration of affairs; do away with the baneful commerce in patronage, or the unphilosophical system of filling square holes with round heads, and we shall hear less of the insalubrious of India, or the laws of blood and climate; the land of the high-caste Brahmin would be no longer the grave of the low barbarian of the West.

PIERCE ARTHUR.

"FLUE PIPES."

SIR,—In answer to your correspondent, I beg to state that I have used a good many flue pipes, and have not heard any complaint of soot coming down, neither do they smoke more than brick-built flues, and they require sweeping less often. I have never seen butt-joint flue-pipes for flues made of glazed material. One great cause of smoky chimneys is, I believe, the large space usually left between the register of the stove and the mouth of the chimney, which could be obviated by commencing the gathering wing of the chimney lower down than is usually done; a great deal also depends on the shape of the stove.

W. M.

THE MIDLAND RAILWAY COMPANY.

SIR,—I applied for copies of quantities for new station buildings on one of the branch lines of this company, now in course of construction (the Ashby and Nuneaton), and paid a deposit of one guinea per set (a pretty good haul this from thirty or forty deluded individuals), not a word being said at the time that it would not be returned. I sent in a *bona-fide* tender, was not successful, and you may imagine my disgust on finding the committee "decline to refund" my money.

Against such an unjust condition and illegitimate mode of raising capital I must emphatically protest. (I certainly shall not submit to it if there be a cure that I will not be worse than the disease.) I think they ought to be satisfied with builders giving them their time and travelling expenses,—in a job of this sort very heavy,—without making us pay for such a delightful privilege.

ONE OF THE TENDERERS.

CLERKS OF WORKS.

SIR,—The object of my letter (April 1), as must have been seen by all who perused it aright, was not to run down clerks of works, who are, when the works are of sufficient magnitude, necessary and useful; but to advocate the merits of studious and well-trained architects, who have not the good fortune to be in request,—to make them of use in their locality, rather than have recourse to men of renown at a long distance. Were this done, there would certainly be less need of clerks of works; and therefore our friend's ire is kindled,—he is alarmed!—

"Farwell the tranquil mind! farwell content!
Farwell the plumed troop, and the big wars!
Othello's occupation's gone!"

It is readily conceived that clerks of works are very useful and valuable men; but when they are charged with expressing ill-humour,—venting his spleen "on a class of men of whom he can have but little knowledge,"—he repays that he has only too much, having been a clerk of works himself, and able to testify to the temptations that spoil those men, and he would always, as an employer, prefer dealing with principals rather than subalterns; that one of his own clerks of works, engaged at a church, came to him one day, and told him to his face that a client, the clergyman of a neighbouring church, had signified his regret that he could not employ him (the architect) further, the industrious clerk having, *pro tem*, supplanted his master, and with cool effrontery, given him, as he thought, his dismissal. This, with three or four more which could be told, are isolated instances, and do not condemn the class. Still, they may show that the right man is not always in the right place.

THE WEST COUNTRY ARCHITECT.

ARCHITECTS AND BUILDERS.

SIR,—Referring to the letter which appeared under the above heading in yours of the 8th inst., in which a late member of the council of the Institute complains that an architect is now about to be elected who has been guilty of (what appears to him) a gross piece of irregularity in requiring payment from a builder for copies of drawings, I wonder if your correspondent was on the council some time ago, when that body declined to take cognisance of a complaint against a member for giving evidence in a court of law against the Institute rules, and declared that the rules were only to be "recommended, but not enforced." If so, I am afraid he is one of those who "strain at (or only) a gnat and swallow a camel." It was also then decided by the same council that "no member could be called to account for non-adherence to those rules." Such being the case, and as we find on all sides committees endeavouring to reduce the fees of architects by requiring that the 5 per cent. commission shall include all travelling expenses, attendances, and other services, &c., I think those architects simply show their sense who limit the services they will render for the 5 per cent. as much as possible, and increase their profits by charging the builders properly either for quantities or extra copies of drawings. Of course it would be different if the Institute, having issued an equitable code of practice, would take vigorous measures to ensure its general adoption, one of which would obviously be to call to account any member who may, as in the above instance, lend himself to resistance to the rules on the part of the public. It is absurd to sup-

pose that architects are to be bound by them, unless clients are to be the same.

As respects the question of copies of drawings, I know it is the practice of several public departments to require that builders who take contracts under them should take copies of the drawings for themselves. There is no reason why private architects should do otherwise, and it is no reason why they are to be rigidly held to the same or a less rate of remuneration. Of course it is most desirable that the copies for the builder's use should be prepared in the architect's office, and that it is perfectly fair that a charge should be made for them, which the builder can provide for in his estimate, just as he provides for the surveyor's and district surveyor's fees.

As Mr. Baron Bramwell recently pronounced the part of Clause 17 of the Institute scale, which specifies that "the drawings remain the property of the architect," to be "illegal, absurd, preposterous," &c., I think architects do well to let the rest of that clause, which says that "an architect is bound to supply two copies" for our use, go by the board also. I am very glad to think that we are likely to get a few sensible men on the council at last, who have some idea of the rights as well as the responsibilities of architects. For some years past I have inserted a similar clause to that so absurdly complained of in my conditions of contract, and there are plenty of other architects who do the same.

A FELLOW OF THE INSTITUTE, BUT NOT A MEMBER OF THE COUNCIL.

ARCHITECTS' ACTIONS.

PHIPPS V. ROBERTSON.

This was a case heard at Westminster Court, where the plaintiff sued Mr. William Wybrow Robertson and Mrs. Robertson, for work done as architect in connexion with the new Court Theatre, Sloane-square. The claim was for 45l. 3s. 6d., and the defendants paid 15l. 15s. into court.

Mr. Phipps, in the course of his evidence, said, after I had been told to prepare plans, Mr. Robertson said, "I thought 1,000l. would do the work, and I replied, 'Certainly not. I made proper plans, sufficient for tenders upon them to be made by the builders. The actual building work was done by another architect. The plans were fully examined by defendants; and with reference to the cost, Mrs. Robertson said it was more than she intended. No objection was raised as to my plans, &c. On October 10th, by Mr. Robertson, 2½ per cent. Mr. Embden, had been engaged; but I had no intimation from either of the defendants. The plans were returned to me on November 10th, by Mr. Robertson, 2½ per cent. my charge is usual and reasonable, and I have been paid it before without demur. I have charged this only upon 1,000l., and not upon the whole cost."

Mr. C. F. Howard, Mr. Sorby, and another architect, said 2½ per cent. was the recognised charge. For the defence, Mr. Larton called Mr. W. W. Robertson, who said, it was about the end of last year when Mr. Phipps spoke to me with regard to this matter. He asked whether he could have the building, but I said it was doubtful. Subsequently he looked over the building, and afterwards Mrs. Robertson told him that she could not exceed 1,200l. Mr. Phipps said he would see more accurately what the building would cost, and prepare plans. Afterwards he attended upon us with the plans, and the amount was 1,600l. for building, the decorations being 500l. more. Mrs. Robertson said she did not see her way to this. Mr. Phipps, however, left the plans, and Mrs. Robertson said she would think the matter over. When I returned the plans, Mr. Phipps was aware that Mr. Embden was employed as architect.

The jury gave a verdict for the plaintiff for the whole amount.

THICKNESSES OF LATHS.

SIR,—Laths are described in specifications and bills of quantities for plastering, as being half-inch, three-quarter, and double laths. But the absolute thicknesses are ever given by which to determine one from another. I should be glad if any of your surveyors, readers, or latherers, would give me the required information.

J. P.

EXTRAS AND OMISSIONS.

WILL some of your many readers oblige with a solution of the following query, viz.:—A builder having signed a contract to execute a certain amount of work for a certain sum, and the client in the same having agreed to pay the same; and further, the builder having agreed to extras and omissions to be valued by the architect,—is it lawful for the architect to value any deduction above the amount for which the builder first agreed to execute the same? I cannot imagine the law allowing a person in such a position as the architect is here placed to take the undue advantage of so doing.

It amounts to this, viz., supposing the extras to amount to a sum of 100l., and the deductions fairly put at the price the builder first agreed to execute the same, say 50l. The architect can say they are worth 100l., and do his client a good turn, as it were, by charging the builder out of his balance, which would otherwise have been 50l.

JUSTITIA.

ADULTERATION OF DRINK BY PUBLICANS.

On the 22nd of last October you very kindly inserted in the *Builder* a rather lengthy communication from me, entitled "Some of my Wants." I have been pleased to see that many of the "wants" have excited attention, and now there is brought into Parliament a Bill which promises to gratify one more of them. Want 57 was expressed thus:—

"I want publicans who are proved to sell adulterated drinks to be deprived of their licences. Samples should be tested on system."

On introducing his new Licensing Bill, the

Home Secretary is reported to have spoken of adulteration thus:—

"With regard to adulteration, the Bill would provide for samples of drink being taken by the inspectors with a view to their being tested at the laboratory at Somerset House, and heavy penalties would be imposed where offences were proved. Adulteration he considered to be most mischievous, and he believed many acts of the greatest violence owed their origin to the adulterated drink which men obtained at the public-houses. Indeed, it was difficult, morally speaking, to distinguish the man who adulterated his drink from the thief. Heavy penalties, therefore, would be inflicted, or imprisonment, at the option of the magistrate, with the deprivation of the licence on a second offence."

MITRAILLEUSE.

"THE CONJUNCTIVE BOILER."

Sir,—The conjunctive boiler noticed in your publication of the 8th is known in this neighbourhood (Liverpool) as the hot-water cylinder, and has been in use some years. It is rapidly superseding all other methods of supplying houses with hot water; the risk of explosion is less than in any other system, the cost is little, and the adaptability greater.

THOS. HOUR.

MUSIC.

Royal Italian Opera.—Some admirable performances have been given, Madame Pauline Lucoca, M. Faure, and Signor Mongini particularly distinguishing themselves. The cosmopolitan character of Covent-garden is shown by the three nationalities thus represented; even more strikingly, perhaps, when we recall that the husband of the distinguished *prima donna* has narrowly escaped with his life from the effects of a French bullet through his face, while M. Faure has to lament the loss of the greater part of his property just outside Paris, sacked by the Germans. The latter singer has taken a strong hold on the English public: his *Don Giovanni* and *Mephistopheles* have displayed high merits, dramatic and vocal. So, too, with Signor Mongini. In "La Favorita," last Tuesday evening, he sang with remarkable expression and power, and carried the house with him throughout. Madame Lucoca gave an admirable personation of *Leonora*; nor should mention be omitted of Signor Cotogini's exertions in the same opera, which called for him marked applause.

Royal Albert Hall.—The first of the Society of Arts Miscellaneous Concerts, in aid of a National Training School for Music, took place on Wednesday evening last, under the conductorship of Sir Michael Costa. The soloists were Madame Lemmens-Sherrington, Mr. Cummings, Madame Arabella Goddard, and M. Sainton. We have reason to believe that a *plébiscite* would bring from the three or four thousand persons who were assembled on the occasion a verdict of "very satisfactory" by a large majority. That there are parts of the building where damaging echoes are heard, would seem, from the statements in the newspapers, to be certain; but we are bound to say that, personally, we failed to hear them. The Sacred Harmonic Society's first concert will be given this (Friday) evening. It may be as well to make known that there are plenty of excellent seats purchasable by the public.

THE INSUFFERABLE RAILWAY-WHISTLE.

The damaging and fatal nuisance of the insufferable railway-whistle in the streets of London is by no means a "minor nuisance," but one of the most diabolical sources of mischief, trouble, and death in London.

Certain circumstances compel me to live near the dangerous Dalston Junction on the North London Railway: here, trains are rushing by from Camden, passenger, luggage, and express, on a single pair of rails, at all hours of the night and day; week days and Sundays alike. During the day, trains pass my house every two minutes and a half, each time with the most fiendish shriek it is possible to conceive. Luggage trains, empties, and engines are tearing by and whistling all through the night; and on Sunday, when the passenger trains cease, we are treated to cattle trucks and trains laden with beasts for the Monday's market.

Either because the signalling is defective, or because the drivers are reckless, the whole place, especially during the night, is one fearful tumult. As a rule, the drivers put on the whistle as soon as they leave Canonbury, and never cease until they near the critical junction at Dalston.

The consequence is that the tenants are driven away from the houses; no horse can quietly or safely approach the neighbourhood, and persons are being continually knocked down, and either

injured or killed by terrified horses. One of my neighbours had a child run over, and not long since a maddened horse jumped into an area of a neighbouring house.

Travellers by this line must know what this fiendish and incessant whistling means—*viz.*, either that the driver, when rushing at full speed, is whistling the signals down, or that he is warning the pointman to set the lines in order for his special train. Once or twice lately, as reported in the public press, trains have run off the line between Camden and Dalston; and not long since a pointman purposely turned a train off its proper rails, to avoid a fearful collision near the dangerous Dalston junction.

Complaints have been made over and over again to the directors, but without the slightest effect, unless, indeed, it has been to make this terrific and dangerous nuisance worse. Recommendations from the coroner, applications to the Board of Trade, and appeals from the inhabitants regarding this fearful whistling are quite thrown away. Therefore, sir, will you, who have done so much to abolish dangerous nuisances in London, try what the *Builder* can effect for this district?

With an assumption of hypocritical sanctity, passenger-trains are not run during church hours on Sunday mornings; but it is considered no sin by the directors to run cattle-trains during the very same time, and to allow the drivers to raise such an infernal tumult with their shrieking whistles as to cause the service of the church to stop.

Surely some means may be found for compelling railway companies to stop this fatal nuisance in towns, especially during night and on Sundays; and I only hope the effectual aid of the *Builder* may be secured for this most righteous piece of work.

B.

THE INSTITUTION OF CIVIL ENGINEERS.

The list of members of this society, corrected to the 5th inst., has just been issued. From this it appears that, at the date named, there were on the books 16 honorary members, 724 members, 1,051 associates, and 204 students; making a total of 1,995, as against 1,847 at the same date last year.

REPORT ON THE SANITARY STATE OF OXFORD.

Dr. BUCHANAN'S report on the sanitary condition of Oxford in 1870, thus sums up the sanitary requirements of Oxford, in view of the exceptionally high mortality last year:—

1. Means of thoroughly drying the soil upon which the city and its suburbs stand.
2. To every dwelling-house an ample supply of water of assured good quality, with disuse of all sources of supply that can receive impurity.
3. A system of thorough and immediate removal of all excremental matters from every house and from the neighbourhood of the city; and the disposal of such matters without polluting the river or creating nuisance.
4. Reformation of certain portions of the city in respect of their house accommodation.
5. More thorough and more frequent supervision of the sanitary arrangements of houses, internal as well as external.
6. Various provisions, of the kinds contemplated by the Sanitary Act, 1866, for preventing the spread of contagion.

Mr. Clarke's plans of main sewerage have been adopted by the Local Board, and submitted to the Secretary of State for his approval. Oxford has spent too much time in talk.

LIVERPOOL ARCHITECTURAL SOCIETY.

At the meeting of this Society, held last week, under the presidency of Mr. Vale, a paper, by Mr. Samuel Huggins, on "The so-called Restoration of our Cathedrals and Abbey Churches," was read. After dwelling at some length on the beauty and the moral and intellectual value of the edifices in question, he proceeded to the expression of his views as to the nature and effect of the operation called restoration, to which so many of our cathedrals and abbeys and ancient parish churches had been subjected throughout the land. He said it was cutting away the old familiar face that had looked out upon, and been lovingly looked upon, by a score of human generations;—the face on which the

lights and shadows of ages had been cast,—that had borne the brunt of time and change, weather and atmosphere, and other natural influences, and which had given it such tints and harmonies as rendered it more beautiful than in its prime,—tints and harmonies that lent new gladness to the sunbeam, and that beggared all the artificial polychromy in the world. It was cutting away all this, and substituting for it a feelingless mask of new stone hewn by workmen of to-day. It was putting the inside, the mere lining, of an old church into a new outside one; the new one being supposed to exhibit the design and character which the old one exhibited 700 or 800 years ago. So had many of our finest cathedrals been "restored," not only obliterating so many beautiful pictures, but wiping out so much historic record which existed for us in these stone relics of the past. It was of no use to tell him that this treatment of the edifices in question was for their preservation, because it made them not worth preserving. It was the destruction of everything in them for which we loved and prized them. So treated any building lost its identity and merged its existence in another, a new and comparatively uninteresting building. If asked what he would do with these structures, he would answer, "Let them alone," and seeing they were confessedly unsuitable forms as regards their present uses, employ the money in entirely building suitable ones, exactly adapted to the present worship.

CASES UNDER METROPOLITAN BUILDING ACT.

PROJECTIONS FROM FRONT.

At Marlborough-street, Mr. Thomas Dudley architect, was summoned by the Board of Works and vestry of St. George's for an infringement of the Metropolitan Local Management Act, by erecting a structure in front of the premises of the Co-operative Supply Association, Albert-terrace, Knightsbridge.

Mr. Bealey said the erection complained of was a covered way of glass and iron projecting from the premises of the Supply Association and beyond the general line of buildings.

Mr. Arniz, surveyor, considered that this covered way resting on iron pillars was a structure within the meaning of the Act.

Two other surveyors gave similar evidence.

Mr. Poland, for the defence, said these proceedings could have no public object; he rather suspected they originated in jealousy occasioned by the establishment of a successful undertaking. He contended that the erection complained of was neither a building, an erection, nor a structure within the meaning of the Act. The erection was nothing more than a covered way on the private property of the company, put up for the convenience of customers. It was no part of the premises; it was a kind of covering, erected on posts easily removable, and fastened to the house by means of sockets, which also could be taken away immediately. If these kind of coverings were pronounced illegal, then every shopkeeper who put up posts in the street as supports to his sun-shades was guilty of an infringement of the Act, and liable to its penalties. There was no pretence for saying that this was an erection such as to bring it within the meaning of the Act, and he relied on previous judgments and on the merits of the case for a verdict in his favour. He had another objection against the form of the summons, the complainant having summoned the architect instead of the Co-operative Supply Association. He would make one other remark. Before the association altered the premises, at a large expense, and put up the covered way to keep the rain from customers, the erection not extending beyond the common line of buildings, the cost of which was upwards of 90*l.*, there was an ugly tarpaulin in the same situation put up by a valise-maker who then tenanted the shop, and this was never interfered with.

Mr. Tyrwhit took time to consider his judgment.

INSTITUTE OF ARCHITECTS.

It is announced that applications have been received from eleven candidates for the "preliminary" examination in May next, but that none have been submitted by candidates in the classes of "proficiency" and "distinction." The preliminary examination only will, therefore, be held during the second week in May. The presentation of the Royal Gold Medal for 1871, the Soane Medallion, and other Institute prizes, will take place on Monday, the 17th inst. As to the Annual Conference of Architects, the following resolution has been passed:—

"That this meeting approves the suggestion made by the council, that an annual conference should be held during the month of May in each year, commencing with the present year; and that the council be requested to carry out the scheme, with such modifications as they may from time to time find desirable."

We are very glad to hear that Professor Donaldson has withdrawn his resignation as a Fellow of the Institute.

VENTILATION OF SEWERS.

Sir,—In your comments on the Royal Sanitary Commissioners' Report, you give expression to a feeling of disappointment that the Commissioners had not paid more attention to the proper ventilation of sewers and drains. I am glad to find you again giving heed to this important subject in your journal, for it must be evident that no system of sewers or drains will be productive of much beneficial effect upon the health of communities until some proper method of ventilating them has been adopted.

I am of opinion that no method of sewer ventilation will work efficiently and satisfactorily unless it be such as to give the sewer a tendency to draw a supply of fresh air from houses and streets, and wherever there is an opening, rather than to discharge foul air into them. How this is to be done is a fit subject for consideration, and ought not to be left in the hands of house proprietors, but should be treated as a general question, so as to arrive at what might be most beneficial to the general public, irrespective of the expense, or who is to bear it. At the same time it would be well to keep economy in view as far as consistent with efficiency.

It has been suggested that in towns where there are public works, the authorities should make arrangements with the proprietors of these works to have a connexion formed between their furnaces and the public sewers, so that the furnaces would draw their principal supply of air for combustion through the sewers, and thereby cause a continuous draught of fresh air to pass through the sewer to the furnace. By such an arrangement, if there were any accidental opening or water-traps getting out of order through evaporation in dry weather, fresh air would rush into the sewer, and have a tendency to carry the light gases along to the furnace, where they would be practically annihilated and discharged from the chimney free from poisonous qualities.

J. A. G.

CHURCH-BUILDING NEWS.

Bath.—A fund is about to be raised for the purpose of erecting a church for the new district of St. Paul's. The site of the new edifice will be the ground upon which the old Elephant and Castle stood, which has been purchased by the railway company, who have agreed to dispose of it to the promoters of the church. The site is of such dimensions as to allow of the erection of a church capable of holding 750 persons. The approach, or at least the principal one, will be from Queen-square, near the end of No. 1, and will be through a walk running parallel with Chapel-row, and separated from that thoroughfare, which will then be wider than at present, by a wall or railings. Upon a portion of the ground arrangements will be made for the reinterment of the dead now lying within the precincts of the chapel.

Bierley.—The parish church at Bierley has been re-opened, after various alterations and improvements. Mr. Edward Haley has decorated the ceiling and the east wall. He has also fitted up the entrance porch with green and gold. The seats are all lowered, the east gallery is removed, and an organ-chamber is built out on the north side. Several of the fittings were presented by parishioners. The gas standards were given by Messrs. Booth, of Dudley-hill. The tiles within the communion-rails were the gift of the teachers and scholars in the Sunday Schools. The font also was a present. In this parish 1,700l. were expended last year in building schools, and a new school for infants is to be erected.

Wirksworth.—The parish church is being restored, under the direction of Mr. G. G. Scott; and the contractor is Mr. G. W. Booth, of Gosport. The work has been divided into two divisions; the first division, now in progress, includes the tower and all east, together with the north and south transepts. This portion, according to the contract, is to be completed on the 31st December next, for the sum of 5,065l. The restoration of the second division, comprising the nave and aisles, but which are at present temporarily fitted up for the purposes of public worship, will commence on the completion of the first part, and is contracted to be finished for a further sum of 2,552l., thus making together a total of 7,617l. Already considerable progress has been made in the first division of the contract. The coping and parapet of the tower have been repaired and restored, and three new pinnacles have been placed at the corner of the tower, new stone facings inserted into the tower

walls where decayed, and the whole of the external walls pointed with Portland cement. The belfry windows have been restored with stone, and new oak louvres inserted. In the ringing-chamber a new oak floor has been laid down, upon stone corbels, the timbers being moulded. The tower arches and pillars are being cleaned, repaired, and pointed; the arcades of the chancel restored to their original form by rebuilding pillars and arches; and it has also been determined to add to the chancel a new clearstory with six cinquefoil windows. The present transept aisles, which were built about the year 1821, are to be pulled down and rebuilt according to their original form. The whole of the foundations have been underpinned and made secure. The entire roofs are to be of moulded oak, partly covered with lead and partly with grey stone slate. It has also, it is said, been in contemplation to take down and rebuild the spire. The whole of the work is under the superintendence of Mr. A. Roope, the representative of Mr. Scott, the contractor's foreman being Mr. E. Houghton. During the progress of the restorations, many fragments of encaustic tiles, supposed to be of Derbyshire manufacture, have been discovered.

Wraybury, Reigate.—The foundation-stone of a new tower and spire for Wraybury Church has been laid. The restoration commenced some ten years since, when a new (south) aisle was erected, the whole of the interior renovated, and the walls cased with ragstone. The ancient belfry, which then rested on the roof of the nave, and was supported on huge upright beams of timber set in the floor of the chancel, was stated to be in a dilapidated and unsafe state. It was therefore taken down with the intention of replacing it with a tower; and a fund, which has now accumulated to some 360l. was raised in order that the bells might be placed in a suitable tower, and the unsightly appearance of the west wall be relieved by such a building. The whole amount required for this and other works connected with the church and churchyard will exceed 1,200l.; of this sum above 950l. have been already subscribed. The architect is Mr. Raphael Brandon; the contractors, the Messrs. Wright, Bros., & Goodchild, of Croydon.

Lincoln.—The building committee of the new church of St. Martin recently met to sign the contracts and execute the bond for securities. They then proceeded with the architect, Mr. Becket, and the contractor, Mr. Johnson, to the site of the building in the Show Paddock to settle the position of the church, and to make over the site to the contractor. The length of the edifice is 154 ft., the width 81 ft., the east end will come within 3 ft. of the road in Park-place, and the west porch within 10 ft. of the vicarage boundary line. The contract stipulates that the church shall be delivered up to the committee in a finished state on the 1st of September, 1872.

Henfield (Sussex).—The church here was reconsecrated on the 25th March, by the Bishop of Chichester, having been for the most part rebuilt. It had formerly suffered very much from modernisms, in the shape of galleries, high pews, plaster ceilings, and brick additions; but there remained the original thirteenth-century nave, of four bays, portions of a thirteenth-century chancel, a fifteenth-century fine massive tower, with a chantry on the north side of the chancel. The westernmost bay of the nave is also of that date. All the rest has been rebuilt, with broad gabled aisles, and double transepts opening out of them, making the total width 85 ft. The nave has been restored, and the clearstory lancets renewed, of which only two remained. The oak roof, of fifteenth-century date, has been opened out, and was found in almost perfect preservation, and of the usual Sussex tie-beam and trussed rafter type. The chancel has been entirely rebuilt, and extended 10 ft. further to the east. On each side of it two arches open into the chantry, and a new chancel aisle, of corresponding dimensions. A large window of five lights occupies the east end. The floor is laid with Maw's tiles. The exterior is built with a facing of "chopped" sea-flints, and dressings of Caen stone, and the roofs are covered with the brown St. John's common tiles. Some traces of ancient distemper painting were found, and were copied, before the old wall was unavoidably pulled down. There were old remains of painting of Queen Mary's time, but very rough and rude. The mortises still remain in the soffit of the chancel-arch, showing where were fixed the roof, and figures of St. Mary and St. John, with the rood-beam, &c. The cost of the works

has amounted to about 3,000l. The architects engaged were Messrs. Slater & Carpenter, and the contract was carried out by Messrs. Fuller & Longley, of Worth, under Mr. Dodd, as clerk of works.

Bury.—A meeting of the parishioners of the parish of Bury has been held, for the purpose of considering what means should be adopted for securing the safety of the parish church, the principal timbers of the roof, as shown in a report prepared by Mr. J. S. Crowther, of Manchester, being so much decayed that the whole roof is in a dangerous state. The chairman, in opening the proceedings, pointed out that what they had to consider was whether they would have a new roof to the church, estimated to cost about 1,500l., or build one more worthy of the town. Mr. Richard Walker, chairman of the Improvement Commissioners, said, that because the roof was in an unsatisfactory condition, he saw no reason why they should pull down the whole structure, and begin *de novo*, which meant, according to the architect, ten, fifteen, or twenty thousand pounds. He moved, "That an architect be employed to institute a thorough and searching examination of the roof, and ascertain whether or not it was possible to repair and strengthen the roof in such a way as to make it safe, and report to the churchwardens as to the probable cost." Major Walker proposed, as an amendment, that an effort be made to build a new church, which was carried by a majority of nearly two to one. A committee was appointed to raise subscriptions.

Southborough.—The new church here has been opened for divine service. The edifice is built in the Early English style of architecture, from designs furnished by Mr. Theodore K. Green. It is of native stone, with Bath stone facings, and the interior is lined with red bricks, with black bands. The building is intended to supply the want of church accommodation in that part of Southborough, known as Brightbridge. It is constructed to seat about 350 persons, and at present only consists of a chancel and transept. A nave and a tower can be added. The work has been carried out by Messrs. Willcombe & Oakley, of Tunbridge Wells. The cost of building has been 2,390l.

Odham.—The Greywell Parish Church has been restored, and re-opened by the Bishop of the Diocese. The church, which was in a very dilapidated state, requiring extensive repairs, is very old. Some time since it was determined to restore the edifice, and an application was made to the Ecclesiastical Commissioners, who sent down their architect, Mr. Christian, of London, to examine the building. Upon receiving his report, they offered to re-build the chancel, if the nave could be restored in accordance with their plans. This offer was accepted, and steps were taken to carry the matter forward. It was estimated that the cost of the repairs would be about 500l. A contract was entered into by Mr. William Lee, of Odham, builder, who commenced operations about five months since, and the whole of the repairs are now completed. The chancel has been wholly rebuilt, and the walls pierced with three windows in the Gothic style. The east window is filled with stained glass, by Messrs. Clayton & Bell, of London, and is a present to the parish. The cost of this window (70l.), was defrayed by a subscription. New oak seats are placed in the chancel. In the nave the ceiling is taken away, the roof being opened to the rafters, and the windows restored. The aisle and chancel are paved with encaustic tiles. Instead of the old high pews, varnished deal seats (supplied by Mr. John Helli, of Odham, who also executed the remainder of the carpenter's work, under the direction of Mr. Lee), have been erected, and a new reading-desk and pulpit built. An apparatus for warming the church with hot-water pipes is fixed.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Kensington.—Workmen have been busily occupied in completing the new oratory of the Convent of the Assumption in Kensington-square. The building, says our authority, the *West London Advertiser*, will eventually form part of a larger church, with a frontage to the square, the design for the complete work being produced by Mr. George Goldie, the architect of the Roman Catholic Pro-Cathedral "of our Lady of Victories." The oratory is about 45 ft. in length, and comprises the sanctuary and space for the nuns of the convent. The roof is lofty;

it is trefoil in form, divided into sections, and is constructed of stained deal; the roof of the sanctuary being supported by a semicircle of six polished granite columns with stone capitals. The walls are pierced for Gothic windows, but those of the sanctuary have each an oriel above two Gothic lights, and thin granite pillars. In the interior are stone carvings, by Earp, the capitals of the columns being cut with floral designs and the heads of saints and religiouses. The warming of the place in winter will be effected by means of hot-water pipes. The edifice has been built by Messrs. Jackson & Shaw.

Lincoln.—The plans and elevation of St. Mary's Newminster, the proposed new church to be erected at the top of Silver-street, have been for some time exhibited in Mr. Boughton's window in the High-street. Messrs. Hadfield & Son, of Sheffield, are the architects. The style is later English, only that the church is aspend. The spire is broken up with dwarf crocketed pinnacles.

Hull.—The foundation-stone of a new chapel and schools has been laid in Mill-street. The district is one in which a great number of Irish labourers reside, and the chapel and schools are named after St. Patrick. They will occupy the site of four houses, which have been purchased for £257., and the new buildings will cost about 1,500l. It will be of two stories, the lower one including girls' and infants' schools, the upper story being devoted to the purposes of a church. Messrs. Hockney & Liggins are the contractors, and Mr. E. Simpson, of Bradford, is the architect.

Books Received.

Designs for Chimney-pieces. By GEORGE GORDON HOSKINS, Fellow of the Institute of Architects. Darlington: at the Author's Offices. 1871.

The volume consists of twenty-eight designs for chimney-pieces, in modern Medieval style, set forth very clearly in fifty-six folio plates. If Mr. Hoskins had published a selection of the designs in a smaller book the result would have been more satisfactory. Some that are given, all those, for example, with the outer lines curved, following the line of the circular-headed opening, are extremely ugly and unfit. However, a certain proportion of the designs will be found useful by masons and others, each being accompanied by details drawn to a scale of one quarter the full size. The last two designs, hooded chimney-pieces, are the best in the book. It is dedicated, "by permission," to Mr. Alfred Waterhouse.

VARIORUM.

The *Quarterly Journal of Science*, for April, Mr. Crookes, F.R.S., editor, is an exceptionally good number. Besides all the usual notes and proceedings as to the progress of science, and reviews of scientific works, it contains papers on the Theory of Atmospheric Gases, by Dr. Sansom; on the Great Pyramid, by Professor Piazzi Smyth, F.R.S. (the second part of the paper); on Steam Boiler Legislation, by Sir William Fairbairn; on the Eclipse of last December, by Mr. R. A. Proctor, B.A.; and other valuable contributions.—"The Cultivation of Land by Steam Power. Leeds: Baines, Printers." This is an essay for which Lord Wenlock's prize of 10l. was awarded by the Wenlock Farmers' Club in 1870. The author is a farmer, and his object is to promote the use of steam power in agriculture. He uses the machinery of various manufacturers, and explains their relative merits, and how to manage them.

Miscellaneous.

The Children's Gathering in St. Paul's. We are glad to learn that endeavours are being made to lead to the discontinuance of the annual meeting of school children in St. Paul's, though probably not on the same grounds that we have before advocated it. Our main objections to the present custom are the damage done to the building by the setting up and taking down of the scaffolding, and the enormous extra and unnecessary risk of fire to which the cathedral is thereby subjected.

National Co-operative Congress.—A congress of delegates for the co-operative societies of the United Kingdom has been held at the Midland Institute, Birmingham. The Hon. Auberon Herbert, M.P., presided. Delegates were present from London, Manchester, Oldham, Rochdale, Bradford, Idle, Heckmondwike, Glasgow, and other towns. The chairman urged a great campaign by means of lecturing and the formation of new societies. The hon. secretary of the central board read the annual report of the board, which related, among other things, the efforts to establish a Co-operative Bank. Wholesale co-operative societies in Glasgow and in the North of England were progressing favourably, and were patronised by the retail stores. The report was adopted. Mr. Lloyd Jones, of London, referred to the great prosperity of some of the societies in Lancashire and Yorkshire, who had thousands of pounds in hand, and did not know how best to invest their money. They could do nothing so profitable as to employ it in producing the articles for which they had already a market. A paper was read by Mr. R. Bailey Walker, of Manchester, "On the more complete organisation of the co-operative body, and further development of the movement." The great importance of supporting producing associations was urged by all the delegates. The North of England wholesale store is composed of 300 retail associations, which have combined to supply goods in the place of the wholesale houses. About 800,000l. have been turned over by this company in 1869. Mr. Nuttall, of Oldham, calculated that the total capital belonging to co-operative societies at the end of the year had been 3,000,000l., and the business done during the year, 10,000,000l.

"Mid-London Communication Improvement."—With special reference to the observations under this heading in a recent number of the *Builder* (p. 203, ante), we may mention that the Select Committee of the House of Commons have passed the Bill of the Euston, St. Pancras, and Charing Cross Railway Company, after a careful examination. It is understood that the Metropolitan Board of Works have been recommended by their Committee of Works to subscribe 200,000l. towards the new streets proposed to be made in conjunction with the railway, and a clause has been inserted in the Bill, at the instance of the Committee of the House of Commons, to carry out this arrangement. The cost of the new streets, if undertaken by the Metropolitan Board apart from the railway, was estimated by competent witnesses before the committee at half a million. The general managers of the Midland and the South-Eastern Railway Companies gave evidence in favour of the scheme, and stated their high appreciation of its value as a connecting link between the great northern and southern lines, and as accommodating the large amount of local traffic to be developed in the densely-populated district which it traverses.

Enlargement of Leadenhall Market.—At the last meeting of the Court of Common Council, the Court considered the subject of enlarging Leadenhall Market. The Markets Committee brought up a report recommending, in effect, that a poultry-market should be constructed upon the site of the meat-market at Leadenhall, at a cost not exceeding 25,000l., and that a Bill should be introduced into Parliament to obtain powers to effect that object, and to dismarket the present hide and poultry markets. They stated also that they were of opinion that a course suggested to them of enlarging the present poultry-market should not be adopted, in consequence of the great expense which would be incurred. Mr. Bonteme, in moving the adoption of the report, said the expense of the improvement would be but little, in comparison with its value; that the land to be used was, for the most part, the property of the Corporation; and that the other plans for enlargement would have cost about 200,000l. Eventually two amendments were negatived, and the report was agreed to, and referred back for execution. The consideration of a further report on the subject of Billingsgate Market and its enlargement, at an expense of 150,000l., was postponed.

The Statue in King William-street, City, and the Traffic.—It has been resolved by the City Sewers Commission to widen the street at the statue 9 ft., by removing part of the base.

Institute of Painters in Water-Colours. The Exhibition of this Society will be opened to the public on the 17th.

The New Foresters' Hall.—On Wednesday last the foundation stone of a hall as the headquarters of the London United District of the Ancient Order of Foresters was laid by the Lord Mayor. The building is situated in Wilderness-row, Goswell-road. The ground-floor is to be occupied by the hall (35 ft. by 52 ft. 6 in.), offices for the committee of management, secretary's office, sale-room, staircases, &c. A portion of the basement is arranged as a kitchen, a large reading or refreshment room, and other necessary offices. The elevation is to a certain extent Medieval in detail, having a porch of Portland stone, with polished red granite columns from Aberdeen. The building will be surmounted by a high-pitched slated roof, with iron ridge railing surrounding the flat at the top, constructed as a skylight over the grand hall. Mr. W. L. Gomme prepared the plans, and Messrs. Lansdown & Pollard are appointed to superintend the works. The contract is being carried out by Mr. Henshaw. The contemplated outlay being about 8,000l., exclusive of the cost of the freehold land, amounting to about 4,500l. The London United District Branch was established in the year 1842, and possesses at the present time about 70,000 members, and a capital of 271,822l.

New Font in St. Michael's Church, Coventry.—The interior of St. Michael's has been recently enriched by the addition of a new font, which has been erected in the centre of the Dyer's Chapel on the south side of the church. The new font is placed on a wide stone basement, forming a step all round it. The font is octagonal in plan, and is carved out of a single block of white stone, from a design by Mr. Hardman Powell, son-in-law of the late Mr. Pugin; the work having been executed by the brothers of the designer in Dublin. The subjects of the carved panels on the eight sides of the font are the Virtues overcoming the Vices, the former being arranged around the body of the font, the latter round the pedestal. Each subject occupies a separate panel. All the figures on the font are in high relief, the background of the larger panels being diapered. The alterations have been made under the superintendence of Mr. Marriott. Two new brass gas-standards executed by the Midland Art Works Company, are placed at the entrance of the chapel; and it is in contemplation to add a stained-glass window.

The Ventilating Window and Spark Protector.—This is an American invention. In place of the present single-pane square window there is a double window, which opens on either side as far as permitted by a frame above and below in the form of a bay window. When fresh air is desired by the occupant of a seat, the half of the window toward the forward part of the train is pushed out, the other half remaining closed. Immediately an outward current is produced by the motion of the train, and the impure air passes out; but there can be no such thing as an inward draught, permitting the entrance of dust and smoke, and endangering the health of the passenger. [But are not negative draughts, if we may so call them, as bad as positive ones?] With the windows opened in this manner, there is said to be a perfectly free ventilation, and one passenger who may desire fresh air is not liable to promote the discomfort of others in the seats behind him, by creating a draught in opening his window. The ventilating window can be attached in addition to the ordinary window, thus forming a double window,—an advantage in the winter season. Mr. W. G. Gilbert, of Oswego, is the inventor.

Migration of Labour.—Mr. E. G. Davenport, 28, Lancaster-gate, says he is desired by a firm of contractors, who are now constructing some railway works in the Midland Counties, to make known as widely as possible that they are ready to engage, at 3s. to 3s. 9d. per day, any number of navvies up to 1,500 who may apply to them on the works. Further particulars can be obtained by application at any of the district offices of the Society for the Organisation of Charity, of which the addresses can be learnt from any policeman or at any workhouse, or by written application to Mr. E. G. Davenport. It is necessary to state that none but thorough navvies or outdoor labourers accustomed to the use of pick and spade will be taken on.

Admission of Painters and Sculptors to the International Exhibition Building.—We are requested to state that the days have been altered from the 20th and 21st to the 26th and 27th instant.

The Proposed National University for Industrial and Technical Training.—A programme has been printed in the form of a pamphlet explaining the purposes and principles advocated by the Provisional Executive Committee of the proposed University at South Kensington, which the prospectus previously issued could not well do. Two orations, by Dr. John Mill, the secretary, titled "What is Industrial and Technical Education?" have also been published (Simpkin, Marshall, & Co.). The list of office bearers, committee, &c. contains some good names, but we should have liked better to see more men of practical and theoretical science and art on the committee than so many mayors and provosts, although these too, will be useful in their way for the promotion of the objects in view. The committee contains, besides, some presidents of chambers of commerce.

The Bee-hive Fire Insurance Company, Limited.—The objects of this company are to place within the reach of all, but more especially the industrial classes, the power to insure against loss from the destruction of furniture, wearing apparel, and working tools, by fire, by weekly or other small payments from one penny upwards; and to assist by annual donations and otherwise in the formation and maintenance of working men's clubs and institutes, a special provision having been made by the articles of association of the company that the profits of the undertaking shall be devoted to these purposes, after payment of a moderate dividend to shareholders. The offices of the company are at 25, Finsbury-place, E.C. Mr. Philip Dyke is the secretary. The first general meeting was recently held, Mr. Baxter Langley in the chair. The objects in view seem to merit support.

The Trades Movement.—The masters' labourers of Bradford and neighbourhood have given notice to their employers of a demand of advance in the rate of wages, to commence on the first Monday in July. They ask for 11. 1s. per week during the summer, and 11. during the three months of winter. Their present wages are 11. and 18s. Between 500 and 600 carpenters and joiners at Newcastle-upon-Tyne have left work, the employers refusing to recognise the nine-hours movement, and to make certain concessions as to overtime. A strike in the engineering trade for the nine-hours day's work, by which more than 1,000 persons will be thrown out of employment, is in progress at Sunderland.

Destruction of the Twining Museum by Fire.—The valuable economic museum of food and other products at Perry House, Twickenham, the property of Mr. Thomas Twining, has been totally destroyed by fire. The building and its valuable contents were estimated to be worth from 7,000l. to 10,000l. It appears that on the afternoon previous to the disaster, a fire broke out in the cellar of the building, which seems to have been used as a lumber-room, but by timely aid that fire was got under. It is now supposed that some of the joists beneath the floor of the building had been left smouldering, which was the cause of the second outbreak which has destroyed both the building and the museum.

Memorial of the late Earl of Derby.—There has been a meeting of gentlemen in Preston with reference to promoting a suitable memorial of the late Earl of Derby. A considerable nucleus fund is already in hand, the money having been raised in penny subscriptions from working men and others, through a central committee in Preston, prior to the decease of the earl. At the meeting various suggestions were made as to what form the memorial should assume and where it should be placed, and eventually it was decided that it should be raised in Avenham-park, Preston, but the character of it was not specified.

Metropolitan Gates and Bars.—Messrs. Boodle & Partington, solicitors to the Marquis of Westminster, in answer to a request that his lordship would remove the gates and bars from his estates in Belgravia, say that, having considered all the circumstances of the case, his lordship is not able to accede to the request.

London Institution.—At the last conversations of the above Institution for the season, held last Wednesday evening, Mr. Tom Hood gave an admirable dissertation on "Edmund Waller, as Poet, Courtier, Wit, Lover, and Sinner," which was listened to by a very numerous audience with great interest.

Tramways for Ireland.—The prospectus of the Belfast Tramways Company is before the public. The capital is fixed at 25,000l. in shares of 10l. each. Contracts have been entered into for the construction of the proposed tramways, which will pass through the most thorough-fares of the city, including the supply of all necessary plant, horses, &c., for working, for the sum of 22,750l.; the contractors, moreover, agreeing to lease the tramways for a period of seven years at a rental of 12 per cent. per annum on the capital.

Burlington Fine Arts Club.—The works by Old Masters, which have been removed from the collection recently exhibited in Burlington House, are eighty-two in number, and belong chiefly to the Marquis of Westminster and Mr. Alexander Barker. Lady Eastlake has lent her fine Bellini (Virgin and Child), and Mr. Wynn Ellis two or three capital pictures. The club has moved into commodious premises in Savile-row, and the rooms afford good wall space.

Unhealthy Buildings.—The Holborn Board of Works have resolved to take proceedings under Mr. Torrens's Artizans' and Labourers' Dwellings Act. At the meeting of the Board, held on Monday night last, the surveyor recommended the total demolition of some dilapidated and unhealthy dwellings in Union-court, Safford-hill, and the owners are required to show cause why the buildings should not be accordingly razed to the ground.

Royal Horticultural Society.—On the 5th there was an exhibition, in the great conservatory, of roses, odontoglossums, and cyclamens, which excited great admiration. Amongst other matters of interest were the terrestrial orchids from the Comte de Paris. Mr. Bull has also a very interesting group. There was a considerable attendance of members and their friends, altogether a very gay meeting.

Old Water-Colour Society.—The gallery of this Society will be opened on the 24th.

TENDERS

For the erection of residence, Canterbury, exclusive of any outbuildings. Mr. John G. Hall, architect:—
Shrubsole £3,098 0 0
Adcock & Bees 3,028 0 0
Epps 2,953 0 0
Gaskin & Golden 2,970 0 0
Richardson 2,946 0 0
Cosens, Brothers (accepted) 2,926 0 0

For the erection of offices, board-room, &c., at the Canterbury Gas and Water Works, exclusive of bricks (which are found by the company). Mr. John G. Hall, architect:—
Knowler £1,990 0 0
Wiltshire 923 0 0
Adcock & Bees 874 0 0
Epps 863 0 0
Cosens, Brothers 797 0 0
Gaskin & Co. (accepted) 789 0 0

For alterations to residence, Harbledown. Mr. John G. Hall, architect:—
Gaskin & Co. (accepted) £560 0 0

For new malt-house, &c., at Nine Elms, for Messrs. Swinnell & Son, Mr. Newton Jennings, architect:—
Gammon & Son £1,185 0 0
Haylock & Son 1,169 0 0
Lathey, Brothers 1,017 0 0
Fakner (accepted) 1,014 0 0

For rebuilding St. Benet's Church, Mile End-road, Stepney. Mr. Ewan Christian, architect. Quantities supplied by Messrs. Goodman & Vinall:—
Brass 27,628 0 0
Myers 7,652 0 0
Jackson & Shaw 6,937 0 0
Dove, Brothers 6,785 0 0
Leatherdale 6,339 0 0
Lathey, Brothers 6,330 0 0
Ennor 6,313 0 0
Manley & Rogers 5,850 0 0

For cottage hospital, Shaftesbury, Dorsetshire, as a memorial of the late Marquis of Westminster, K.G. Mr. J. B. Corby, architect, Stamford:—
Tudley £1,909 0 0
Thompson 1,793 13 0
Richardson & Roberts 1,769 16 0
Halliday & Cave 1,713 10 0
Law & Son 1,682 0 0
Miles (accepted) 1,431 11 0

For Sandy-hill and Fox-hill Sewer, Plumstead, for the Plumstead District Board of Works. Mr. F. F. Thorne, Surveyor to the Board:—
Lewis £3,330 0 0
Mynne 3,300 0 0
Lonsger 3,914 0 0
Young 3,000 0 0
Blomfield 2,985 0 0
Tungue 2,967 0 0
Brown 2,762 0 0
Coles 2,729 0 0
Gusford 2,650 0 0
Wigmore 2,700 0 0
Stiff 2,423 0 0
Kirk (accepted) 2,276 0 0
Hubbard 2,600 0 0

For the erection of premises in Carlisle-street, for Messrs. Edwards & Roberts. Mr. Theodore K. Green, architect:—

Cock £2,890 0 0
Hendley 2,343 0 0
Wicks, Bangs, & Co. 2,187 0 0
Sharpton & Cole 2,173 0 0
Hill, Keddell, & Co. 2,160 0 0
Barnes & Robinson 2,136 0 0
Srivener & White (accepted) 2,105 0 0

For additions to house at Clapham Park, for Mr. D. Marneux. Mr. A. Wilson, architect:—
Walls £500 0 0
Thorpe & Son 330 0 0
Warwick (accepted) 297 10 0

For additions to house, &c. Ewell, Surrey, for Mr. Croxson. Mr. F. J. Dibble, architect:—
Hards (accepted) £280 0 0
Plumling, Glassey, Painting, &c. 234 0 0
Killick (accepted) £20 10 0

For alterations and additions to house, Harrow Lands, Dorking, Surrey, for Mr. Jas. Dixon. Mr. F. J. Dibble, architect:—
Lynn & Dudley (accepted) £1,500 0 0

For alterations and additions to the steward's house, building coach-house and stables, and sundry other works, at Randall, Leatherhead, Surrey, for Mr. Robert Henderson. Mr. F. J. Dibble, architect:—
Godard £274 0 0
Hards 740 11 0
Ratchelair 738 3 0
Hamblin 672 0 0

For the enlargement of Great Barford School. Mr. James Horsford, architect:—
Twelvevrees £279 10 0
Potting 371 10 0
R. Haynes 351 0 0
Watford 341 0 0
Field 334 0 0
W. Haynes 318 0 0
Carter 305 0 0
Wade 300 0 0
Vickers 297 0 0

For the enlargement of Roston School. Mr. James Horsford, architect:—
Potting £214 10 0
E. Haynes 212 16 9
Twelvevrees 199 0 0
Cuvnia 189 0 0
Carter 197 0 0
W. Haynes 180 0 0
Bond & Brimley 181 0 0
Field 183 14 0
Wade 180 0 0
Vickers 177 5 0

For the erection in carcass of a mansion, Marlborough-place, Brighton. Mr. John Hull, architect. Quantities supplied:—
Kelly £1,739 0 0
Pott 1,686 0 0
Hall 1,673 0 0
Reynolds 1,673 0 0
Snowdon 1,602 0 0
Lockyer 1,550 0 0
Newham 1,486 0 0
Barnes 1,386 0 0

For the erection in carcass of two mansions, Marlborough-place, Brighton. Mr. John Hull, architect. Quantities supplied:—
Kelly £1,658 0 0
Pott 1,609 0 0
Reynolds 1,676 0 0
Nightingale 1,555 0 0
Lockyer 1,522 0 0
Snowdon 1,600 0 0
Barnes 1,465 0 0
Newham 1,187 0 0

For sewer works at Putney:—
Aries £261 0 0
Wigmore 424 10 0
Aries 416 0 0

For finishing five houses at Twickenham, the property of Mr. H. T. Edwards, Mr. F. Allen Edwards, architect:—
Wigmore £2,620 0 0
Spicer 2,587 0 0
Ebbs & Son 2,190 0 0
Spearing & Stewart 1,323 0 0

For rebuilding Nos. 277 to 279, Oxford-street. Messrs. Landerson & Folland, architects. Quantities supplied:—
Biggs £8,070 0 0
Howard 7,813 0 0
Macey 7,773 0 0
Faiman & Polkingham 7,612 0 0
Hill & Son 7,243 0 0
Adamson & Sons 7,228 0 0
Newshaw 7,083 0 0
Morter 6,947 0 0

For reredos, St. Mark's Church, Lewisham. Mr. W. C. Banks, architect:—
Barr £400 0 0
Field & Co. 391 10 0
Wittingham 345 0 0
Williamson 365 0 0
Lovelock 356 0 0
McCarthy 356 0 0

For rebuilding the "Horse and Groom" Leicester-square, for Mr. Samuel Nye. Mr. H. R. Cotton, architect. Quantities by Mr. A. J. Gate:—
Manley & Rogers £2,313 0 0
Patrick & Son 2,238 0 0
Braas 2,124 0 0
McLachlan 2,030 0 0
Ennor 1,894 0 0
Newman & Mann 1,825 0 0

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THE Advertiser is open to enter into ENGAGEMENT immediately.—Address, A. THOMAS, 24, King's Street, W. C. Southampton.

The Builder.

VOL. XXIX.—No. 1472.



*In what Way can
Good best be done?*

LAME will scarcely attach to us if we again give special prominence to the weighty and important problems we have been permitted to offer for solution, and to some more of the replies the inquiry has elicited. The proposer himself writes,—

"Referring to your article, 'How to Spend Money for the Public Good,' I find a number of suggestions made by correspondents, setting forth their views as to the best means of dealing with a Quarter of a Million of money for beneficent purposes. I would here observe

that I intend to devote HALF A MILLION to public benefit. A large sum might readily change from my hands to those of others; but it is my duty to provide that it be taken care of for the benefit of the present and future generations, which could not be done unless the gift be invested in one or two great objects of national utility, which the public could not lose sight of. In my opinion, then, it would not be desirable to apportion the half-million to a variety of small schemes."

Let us look to some of the additional letters received. Mr. F. R. Wilson proposes,—

A Working Man's Town.

He writes thus:—

"What a magnificent and munificent project you have set before the world, in the project of this truly regal proposer. There is no instance in the world's history of such a grand question being asked by an individual. I should like to see your Croesus take the vilest spot in the centre of London, clear twenty or thirty acres or more of the wretched tenements upon it, and build thereon a complete 'working man's' town, where there should be no stint of light and air. Cottage dwellings, surrounding boulevards, and the 'town' to include play-grounds, recreation-grounds, reading-room *cafés*, lecture-halls, baths and wash-houses, cottage hospitals, and convalescent retreats. A complete 'Saltaire' set down in the heart of London."

The following advocates striving for the same end by different means:—

"It ought naturally to occur to those who think on this subject to determine, firstly, what, in their experience, is the greatest evil amongst the poor. I venture, in giving suggestions for a beneficial appropriation of the large sum of money you name, to point out some of the drawbacks which keep the poor miserable and poor."

Foremost amongst these are thorough dependence, almost amounting to helplessness; ineradicable uncleanness, and lamentable ignorance, even when accompanied by a certain amount of ability to read and write; and all these are either engendered or kept alive by the failure of

the better classes to obtain the confidence of those below them. I believe the clergy try their best to do good, but their efforts are made in a manner, as a rule, and in a direction, which neither gains respect nor genuine gratitude, and even causes a greater feeling of dependence. It may sound improper, but I am convinced that religion, as much as the workhouse, must be eliminated from such help before any real good will be done, and more friendly intercourse must take place ere any advance will be likely to be made. I know, too, that an angry feeling exists amongst the cleaner and better sort of the lower classes, who, not being 'lost sheep,' do not receive any attentions; and although the ministers of religion are sent unquestionably 'unto the lost sheep,' it would be as well to look a little after those who might become lost through being uncared for.

The chief difficulty amongst the lower classes is unquestionably that of wholesome residence and cleanliness. Those who have seen, as I have, the homes of hundreds of the poorest, have seen the utter want of self respect and independence attaching to them. It appears to me that if in various quarters of large towns, clean, comfortable, and *separate* dwellings, could be given (or even let at nominal rents), to those who are clean; free from drunkenness; not belonging to any combination of workmen (as inimical to the employers of labour); industrious and not receiving parish or other relief, it would tend much to elevate the classes who most require it. Any breach of the rules (as indicated in the preceding few lines), should involve ejection; and it should be thoroughly understood that residence should be a reward for independence, cleanliness, honesty, and industry; religion should be recommended, but not enforced. Education (the three R's, together with any special acquisitions suitable to the occupation of the resident), should be required to be pursued, especially in the case of children.

A club, really on the principle of the West-end clubs, might usefully be appended, for the purpose of reading, writing, games, and possibly even for meals, for those who would choose to avail themselves of it, with power in the residents as a committee to admit outsiders to the club, on payment of a small entrance fee and subscription, the loss of which, on the occasion of any ill conduct or uncleanness, would possibly suffice to keep the members in good behaviour.

Should buildings be erected for such a purpose they should be essentially plain and unpretending, but substantial. No walls should be so thin as are those usually applied to small dwellings, which neither keep out cold in winter nor heat in summer. Water should be in plenty; all conveniences should be attached to each dwelling, and the occupants taught to avail themselves of every appliance leading to self-respect and self-help.

Such a system, leading the world to look upon the residents as selected from their class for superior behaviour and acquirements, would, I venture to think, be immensely beneficial to themselves, and to the rest of the world.

There would necessarily have to be a limit to the class of persons admissible,—they should be essentially those who usually inhabit wretched and unhealthy lodgings in overcrowded neighbourhoods, and earning wages not exceeding a sum to be fixed.

E. ROBERTS."

"C. B. A.," working in the same direction, says:—

"I have read your notice of 'What to do with a quarter of a million.' No one will, perhaps, dispute that the provision of better houses is the best thing to do. My proposition is to improve those houses that are *now in existence*. More might be done for those who need it with 1,000l. than with 10,000l. on the Peabody plan. I have gone into these matters 'on the spot,' and really know what it is that 'poor' people want. The proposer might look on it in yet another light,—not as a matter of poverty merely, and charity, but as a new social policy. How much might be done with a little, provided there be a little personal trouble in the matter!"

Then comes a "Consulting Accountant" to show:—

How 31,000l. may produce Comfort, Health, and Independence to Hundreds, and yet the Fund continue to be a permanent one.

"Purchase," he says, "in a commercial locality

or localities, ten acres of freehold land, at, say, 500l. per acre, including cost of drainage, roads, &c. Erect thereon 200 six-roomed cottages, which may be done for 125l. each. Calculate the cost of each conveyance, with its covenants, &c., at 3l. You will see the amount to be,—land, 5,000l.; houses, 25,000l.; law costs, 600l.; total, 30,600l.; or 153l. to be the cost of each freehold cottage.

Let these cottages to respectable tenants on the following covenants:—

1. To pay down a deposit of 23l.
2. A quarterly rent of 3l. 18s. for a term of eleven years and a quarter.
3. To keep the same insured, and in good and tenantable repair and condition.
4. To occupy the same as a dwelling-house only.
5. Not to commit or permit any nuisance therein, or on the premises.
6. The rent being regularly paid, and the other conditions performed, at the expiration of the eleven years and a quarter, the house shall become the actual property of the lessee, and the freehold conveyed over to him or her.

It will be seen by calculation that a respectable, steady man, who has had forethought sufficient to lay by a few pounds previously to his marriage, may, by paying a deposit of 23l., secure to himself the freehold of the dwelling in which he may pass the commencement of his home life. Unlike others who pay the same amount of yearly rent in order that they may keep up the property of a landlord, our provident friend will feel that in making his residence convenient and respectable he is raising the value of his own investment, and providing an annuity of 15l. 12s. per annum, secured on a freehold house, by the punctual payment of his own rent for a term of eleven years and nine weeks.

Should he reside in the erections of a Coutts, Peabody, Waterlow, or other similar investors in modern dwellings, the surplus accumulations of whose rent-payers only tend to swell up their respective capitals, he will not have been taught half the real lesson here inculcated, that economy and thrift are the sure friends of independence, and will not see before him the hopeful prospect of spending the last moments of his life in his own house, and not in the union house."

Save the Children,

may be called the text of another writer, who speaks thus:—

"At a time when so much labour and skill is employed in working up old materials to represent new productions, I am not surprised to find amongst the projects for spending a quarter of a million many which suggest this practice. Let me ask a little consideration for a scheme for which the proposed sum would form a noble nucleus, though perhaps insufficient to fully carry out all my views in connexion therewith. My plea is for the little ones,—new material, as it were, to make perfect and lasting work; little hearts to be taught to love daily work on principle; little hands to be educated to become art-workmen or good servants, according to the talents with which Providence has blessed them; little ones, not chosen from the waifs and strays, offsprings of folly and vice, nor from orphans, whose helplessness invites the pity and care of all good men with whom they come in contact, and is an actual protection to them; but from the ranks of real poverty, the 'poor Joes' of the ragged and the night school, who before vice has become a trade to them, may be saved for better and happier lives, and become useful,—may be, ornamental—members of society. These I would help, and will endeavour to show how."

I would choose from each school a number of both girls and boys from six to twelve years of age, who should be particularly noticeable for veracity, industry, and general good conduct, *quite irrespective of talent*. These I would remove to central schools,—one for boys, the other for girls, situated in a healthy part of the country, and standing, as regards the former, in the midst of cultivatable ground. In these institutions a sound education should be given, till the age of twelve is reached, after which it would be necessary to commence learning some means of gaining a livelihood, in some form of manual labour, according to intellectual capacity,—the boys as ordinary or art workers in iron, stone, and wood, and farm servants; the girls as servants for the hospital, house, or farm. At proper times they should be put out as improvers (I think there would be no difficulty in getting places), where they could be still under the protection of the institute, for a certain

specified time, till old or advanced enough to do without its aid. It may be objected to my scheme, that Government has already provided for the education of the people. It, no doubt, has done so in a measure. It does not, however, attempt to winnow the grain from the chaff, or offer a premium to *principia*.

I advance my scheme in the sure hope that parents would be more careful in instilling into the minds of their children good principles, truth, honesty, and habits of industry; that a spirit of emulation would be nurtured in the minds of the children themselves, which would so far act for their good that, though they might not gain the prize of removal, their lives would have been set towards a good direction, they would be all the better for having subdued many an evil wish or act, in hopes of grasping that prize, becoming better men and better women, seeking, in their turn, to make their children worthy of those blessings they themselves failed in obtaining, whilst it would save thousands of children whose energies are at present wasted, from drifting into crime, and benefit the whole community, by discharging annually a very large body of good and earnest workers to influence for good every branch of mechanical labour.

J. J. A."

The great Value of Loans

to the deserving poor at the right moment is urged by fresh correspondents, and schemes are submitted for the establishment of a great institution with that purpose in view.

One correspondent says,—

"I beg to draw the attention of the philanthropist who wishes to know how best to spend a quarter of a million to the scheme of a Loan Society for working men, put forth by Eugene Sue in his 'Mysteries of Paris.' I have always thought, from the enthusiastic manner in which he writes about it, that it must have been a great 'hobby' of his.

JOH. B. COHEN."

Another takes a very different view from the rest, and we will let him be heard,—

"In reference to your leading article in last week's *Builder*, dealing with the most important question as to 'How best to spend money for the public good,' I wish merely to say, that how valuable soever some of the suggestions you offer, or have received, may be, yet I totally differ from them all; and although you yourself may say that my views are fanciful, still I intend to act on them, by disposing of many thousands of pounds in the way which I believe to be best.

I believe there is nothing which will put down Red Republicanism, Communism, and other Atheistic and Satanic theories, and their destructive practical results, but true religious principles; and I believe irreligion to be the foundation of all the vice, poverty, ignorance, venality, drunkenness, and misery on the face of the earth. Let others, then, build what houses, hospitals, asylums, &c., they please, I intend to leave the entire of my spare money to different Protestant Evangelical Societies, who are the true caterers for the public good—both temporal and eternal."

Aid to Farm Labourers

is pointed out as a right means of employing money intended to do good:—

"Allow me to bring under your notice a class of persons perhaps more neglected than any other in the kingdom. I mean *farm labourers*. These men, as a rule, are honest, hard-working, and industrious. They are generally married, and upon 10s. or 12s. per week manage to pay their way, and bring up their families decently. This goes on year after year, until at last old age, with its consequent incapacity for labour, overtakes them, and then there is no resource for this honest and industrious class after a life of constant toil, but the workhouse, or the small pittance of parish pay. I think no one will contradict me when I say that it is clearly impossible for a married man to lay by anything out of 10s. or 12s. per week, even supposing that during all his life he had no extraneous expenses, such as medical men's bills, &c., to pay.

There are almshouses for workmen in cities, and I want to see them established in the country (where they are very rarely seen), so that the farm labourer should have something to look forward to, and an inducement held out for industry and good conduct,—such inducement to be a refuge and comfortable subsistence during his old age, and amongst his old neighbours. Of course, but comparatively few could be thus provided for, but it would give a great

stimulus to the working population of the parishes in which these houses were situated.

WM. ADLAM."

With reference to the same class, the value of Allotment Grounds

is advocated thus,—

"I live near the border of two parishes. Worpleston, according to returns in Home Directory, containing 7,140 acres, nearly 9 miles in length, and touching 9 parishes with a population of 1,753, or a little over one soul (man, woman, or child) to each 4 acres; and Pierbright, with acreage of 4,579 and population of 599, or 7.64 acres per soul; in neither of which parishes can I learn there is allotment ground for the labourers. The adjacent parishes are also thinly populated, and with very small portions, if any, applied to that purpose.

Now, as the child is father to the man,—which is most beneficial to the species, to have healthy profitable occupation in an allotment field for the boys, or let them lounge in the lanes? One fact being better than a bushel of argument, let us endeavour to learn from history what the grade of the great benefactors of society has been. To take our great exemplar, Christ: He, by divine appointment, was cradled in a manger, and when carrying out His great works, had not where to lay his head. Through the dim light of history we also discover Homer moving in poverty from town to town; Æsop as slave and camp follower loaded with bread for the army; Wolsey and Luther in the Early Church, Cromwell in the state, Watt, George Stephenson, Faraday, Wedgwood, Martin, and a host of others, besides Cobden, at one time a farmer's boy.

It thus seems evident that one great thing is to find healthy fields of profitable employment for the rising generation, and if even one great man is formed thereby, what may be done?

My proposition may be jeered at, but risking that, I would suggest to your benevolent friend and others the policy of purchasing ground and allotting it. Near Godalming new station you may see what spade culture has done for the side of an extremely steep hill; near Walton-on-Thames some of the common is being broken up; and why should not part of the Necropolis ground near Brookwood Station be taken up? some also near Guildford, in Worpleston, and in Ash, near station on Reading and Reigate line?

JOSEPH CHRISTEN."

Aid for Widows and Widowers

is asked for:—

"Amongst the most forlorn are the widowers and widows, especially the former. For instance, an old shepherd or farmer's carter—men who have been used to out-of-door work all their lives; their children married, and with young families; the wife dead. The old fellow has not been used to housekeeping matters, and does not know how to make the most of his 'half-a-crown and a loaf.' For such I would build homes, consisting of a single room for each man, and one room where they could meet in common, these rooms being built in groups, with a cottage attached for a decent woman, who would have the care of the whole; the old people paying a small sum weekly for the lodging, and 'being done for.' In most parishes there are widows with two or three children, who get 'parish pay,' who could be the matrons of these little establishments. The rooms need not be large, and may be built at little cost,—comfortable, but plain. If made too smart, they would not be suitable to the habits of the inmates. I would make homes suitable for them, and they should pay their mite for their lodgings, washing, &c. I have been a guardian for many years, and I know that the wards of a workhouse are not homes for such as these.

THOMAS RICHARDS."

We will end our present selection of suggestions with the statement of a few 'principles' that have reached us, and deserve consideration:—

A. The best help to the poor is aiding them to help themselves.

B. Any "help" which lessens or deadens their energies, or pauperises them, is worse than no help at all, and absolutely injures.

C. All aid to the poor (irrespective of the sick, very aged, or very young) should therefore be strictly conditioned on some form of exertion or improvement on their part.

D. Such aid should also aim at fostering the good habits of providence, temperance, cleanliness, self-instruction, sanitary care, observance of religious worship, honesty, and humanity (to man and beast); and

E. Aid should not be so superior in quantity or quality as to discourage, or show in a less desirable aspect the results of the self-help of the industrious, provident, and honest members of the community.

The proposer of the munificent gift to the public, of which we have been speaking, might now advantageously invite a small number of capable and well-known persons to discuss with him, as a committee, the form in which his desire to do good should be manifested.

PRESENTATION OF THE MEDALS: ROYAL INSTITUTE OF BRITISH ARCHITECTS.

AFTER some ordinary business at the meeting on Monday, the 17th inst.,

The President, Mr. T. H. Wyatt, proceeded to present the Royal Gold Medal to Dr. James Fergusson, and in the course of his observations said,—It is not, I believe, generally known how this medal has been appropriated by the Institute. Though no definite rule is laid down, the custom hitherto has been to award it,—first to a foreign architect or archaeologist, or antiquary of distinction; secondly, to an English architect who has executed or designed a work of great merit; and thirdly, to one who has contributed works on the history of the profession, or on subjects connected with architecture; or on one who, as Mr. Beresford Hope happily expressed it, "has unfolded the secrets of old times, and led us back to the thinking of other days." Happily for you, sir, it may be you have not had occasion to follow the arduous and anxious practice of the working architect, but your drawings, and some of the works you have executed, show what you were capable of doing in the way of practical architecture. It is not in that capacity that this medal has been awarded to you. It is for your patient, zealous industry and power as an architectural historian, and for the faithfulness, ability, and truthfulness with which you have fulfilled the task you undertook, that you now receive it. I am happy to say in the present case, as in almost every other, Her Majesty has been pleased graciously to signify her cordial approval of the presentation we are now about to make. It cannot be necessary for me in this room, in the presence of English architects, and in presence also of the works which Dr. Fergusson has contributed to the history of our art or to its progress, to read any eulogium upon his merits to this distinction. If I may be allowed to use the old quotation, "*Si monumentum quis, circumspecte*,"—I will not finish it; but I would say, "Look on this table;" for here, I believe, are all his works, or, if not, I am sure Dr. Fergusson would wish they should all be here. And it is not alone for his architectural researches that we are indebted to Dr. Fergusson, but we are greatly indebted to him for the labour he has bestowed, and the instruction he has imparted, upon a subject which is one of deep interest to every member of the community,—viz., our national defences. As a member of the Royal Commission on the defences of the country, Dr. Fergusson's labours have been fully appreciated by the Government. The high honour conferred upon him recently at Oxford, shows the feeling entertained by the learned bodies of the University of his varied powers; and his appointment to the office of Secretary to the Commissioners of Her Majesty's Works and Public Buildings, I think, reflects the greatest credit upon the late Chief Commissioner, Mr. Lysard. I am sure that appointment was one which was universally approved by the profession and the public at large, and we have felt excessive regret that circumstances should have induced Dr. Fergusson to resign that appointment. It is not for me to ask Dr. Fergusson to stand to listen to a long speech from me; but I venture to express a hope that he will be good enough to favour the meeting with a brief history of the circumstances under which he was first led to turn his attention to matters so interesting to us. I will not detain you further than to request Dr. Fergusson to accept, in the

name of the Institute, the Royal Gold Medal, and I am sure you will all join me in the sincere hope that he may long live to wear it.

Dr. Ferguson said: Mr. President and Gentlemen,—Although I cannot but feel extremely flattered and gratified by the presentation of this medal, and by the kind manner in which you have received me, I will not trouble you with any laboured expressions of feelings which are usual on such an occasion; but if you will allow me, at the risk of being somewhat egotistical,—and perhaps one may be pardoned for being egotistical on an occasion like this,—I will at once, and with great pleasure, comply with the wish expressed by your President, that I would explain how I came first to take to that course of life which has resulted in the flattering mark of distinction that I have received at your hands to-right; and in so doing I will also explain why I feel more than ordinarily gratified by the honour which has been conferred upon me. To begin, then, I may say, born an architect. From my boyhood architecture was the pleasure and delight of my life, and my one great ambition was to be an architect. But being not the master of my own fate, I was destined for the counting-house. I bore that with equanimity, because I saw that the counting-house might be the means of leading me to India; and I was in hopes that I should be able when, in India, to study the architecture of that country, and to solve some of the mysteries which hung over it. During my ten years' residence in India, I was brought into contact with men who were erecting buildings in what I believed to be the mode of the Middle Ages. I saw men working in true styles, as true architects worked in those days; and I thought I had really got at the secret of the art, when I came to the determination to follow the virginal ambition of my life, and to become an architect. But before doing so, I reflected,—and there were two considerations, in particular, which made me pause. The first was, that architecture in this country was not treated, whether by the Government, or by the judges of competitions, or by the public, in the manner in which I considered it ought to be, simply because the upper classes in this country did not appreciate the art itself, or the position of the professors of that art; and I wished to avoid exposing myself to the treatment which architects were too often exposed to. In the second place, I discovered that my principles of architecture were opposed not only to the practice of the architects of the country, but to the general feeling. What I believed was, that the copying system, the copying of Italian and Greek architecture, was a mistake; and I was not prepared to follow that system; and I felt that holding this strong difference of opinion to that of the profession generally, my prospects of employment as an architect were very small indeed. Having come to these conclusions, I determined to abandon the idea of becoming a practising architect, and devoted myself thenceforward to the literature of the art. I thought I might, perhaps, be able to put architecture in a truer light before the public, and in that way probably do more good than by attempting to practise myself. In consequence, I set myself to write these works. They have been written, not with the view to enrich architecture, but to teach the general public what architecture was, and to lead, if possible, to correcter views and higher appreciation of the art, as a real, living, and important art. How far I may have succeeded in that I cannot say, because it must take time. But the one object I have had has been to place the art in a popular and straightforward manner before the public, and to try to get them to believe in it, and to appreciate what was due to it. In doing this, I believe I have to some extent been misunderstood. I held then, as I do hold still, what may be considered strong opinions with regard to the general practice of architecture. On what I call the copying system, I have expressed myself strongly, and have been misunderstood. I do not complain, because no man can put himself in opposition to a body of men without treading upon people's toes; but what makes me prize this medal more than anything else, is, that I have reason to believe that gentlemen begin to see that I have been actuated in what I have written by no other motive than the good of the profession, and the presentation I have received this evening I esteem as an evidence that those motives have, to some extent, been recognised by this large body of the profession. In that sense, Mr.

President and gentlemen, I feel particularly grateful to you; but without saying more with regard to myself, I should like, before I sit down, to state, in a very few words, what my own views are on the matter of architecture—what I believe to be its origin and its end. I have in this room heard eminent men recommend students to fill their books with copies of works so as to have materials for labour hereafter. My own advice would be—copy till you learn to appreciate and know what has been done; but when you begin to practise leave your copy-books and think for yourselves, and think only, for I feel convinced it is only when a man thinks he can arrange his building best, and make it convenient for the purpose for which it is intended, and ornament it most appropriately for the age in which he lives,—it is then only that architecture will be a living art. Amongst the books that are before you, there are two volumes treating of architecture, from the time of the Egyptians down to the building of St. Peter's. The whole of those buildings are beautiful, and appropriate to their purposes. The third volume contains the style since the building of St. Peter's, to the present day, and of these I may say there is scarcely a work which has been really satisfactory or permanently pleasing and beautiful. On that broad induction therefore I say, unless you go back to the real, earnest style, you cannot make a building appropriate to the day or permanently pleasing. That is the theory I have inducted. I have done it honestly and earnestly, and I feel extremely grateful at this time to receive this medal, which I accept as a testimony on your part that my motives in what I have done have at least been straightforward and honest. I thank you very sincerely for the award of this medal, and I assure you I shall always esteem it as one of the most gratifying testimonials I have ever received, and I shall value it accordingly.

The Soane Medallion and the Institute medals and prizes were then presented to the gentlemen whose names have been previously announced.

THE AREA IN FRONT OF ST. PAUL'S.

A CONSIDERABLE improvement is about to be made at the west front of St. Paul's Cathedral, by removing the present iron railing as far back as the face of the building on each side, widening the roadway, and throwing open a paved place, either with or without granite steps or other low line of demarcation. The question not yet settled, and which greatly concerns the public, is the width which shall be given to the road. Mr. Penrose, the architect of the dean and chapter, in conjunction with Mr. W. Haywood, acting for the City Commissioners, had laid down a curve, which extends from the west front to just outside the enclosure of the statue of Queen Ann, and would materially improve the traffic-way. It was objected, however, in influential quarters, that this would not give a safe standing-place to view the west end of the cathedral at a sufficient distance from it to see it properly, and that the present line of the enclosure should be made the line of the new curb of the place; the roadway, it was contended, being already quite wide enough in proportion to the roads that supply it. A committee of the Institute of Architects was invited to examine the ground and assist with its opinion. It met there on Wednesday last, including Mr. T. H. Wyatt (President of the Institute), Mr. William Burgess, Mr. Talbot Bury, Mr. Christian, Mr. Cockerell, Mr. Godwin, Mr. P'Anson, Mr. Horace Jones (City architect), Mr. Pearson, and Mr. St. Aubyn; the Dean of St. Paul's and Mr. Pearson receiving them. It was moved and seconded, that the line first laid down (giving the greater width to the roadway) was the best; but, after long discussion, the committee came to a resolution in favour of an intermediate curve between that and the line of the existing railing. The majority appeared to think, as we do, that no inclosure whatever was necessary.

We are strongly of opinion, in view of the constantly increasing traffic of the City, that the line nearest the statue is incomparably the best. With the greatest possible respect for the motive which guided the majority of the committee, we are unable to recognise a single argument against the adoption of that line; and we sincerely hope that it may yet be adopted. The fact that adjoining roads are narrow is surely no reason why new driftways, when they can be made, should not be formed of ample width.

THE INSTITUTE OF PAINTERS IN WATER-COLOURS.

WE can scarcely congratulate the members of the Institute of Painters in Water-colours on their thirty-seventh annual exhibition. It is below the level of former years. The drawing which, in spite of varied faults, struck us as possessing the greatest amount of human interest is No. 100, "The Lover's Disguise," by James D. Linton. The incident is adopted from the Taming of the Shrew, although the long gown, of the colour sacred to the princes of the Church, and the order of the Golden Fleece, worn as an every-day ornament, are inappropriate to the father of Bianca. A well-drawn, charming woman, in the lofty headress of the fourteenth century, is seated, looking with praiseworthy steadiness into vacancy. The ghost of a smile hovers on her upper lip, and is with difficulty repressed, as her lover, introduced in the assumed character of a music-master by her grave father, bows profoundly before her. The arrangement of the picture is such as to give too much blank and unoccupied space. The rough plaster and wainscot of the rooms are unworthy the abode of persons of such dignity. The dress of the nobleman is, as we before hinted, more than questionable. The colouring is somewhat muddy and sombre. But, with all this, there is so much of real merit in the expression of both faces and figures that it leads one to hope much from an artist who has a gift that no study can impart. In No. 120, "The Reproof," Mr. Linton passes the line which divides the quaint from the grotesque, and gives a background resembling chopped hay.

It is provoking to see the most successful efforts of the artist, regarded as an imitator or mirror of nature, directed to such subjects as (45) "Nest and Plum Blossom," by J. Sherrin. It would be difficult to paint a nest and a flower better. The blue eggs gleam as if the mother bird had left them warm, and are stippled with a touch that reproduces the very texture of the shell. But, after all, what is such a subject but a bit of academical practice? There is another of those morsels of natural history (231), "Branch of Plums," by the same artist, to which similar remarks apply, as also to his "Rabbies" (35), of which the eyes are rather dead and heavy; but the fur is admirable.

Egypt is illustrated, as was the case last year, by Carl Werner and Charles Vacher. No. 167, by the former artist, represents the entrance to the Great Khan at Kénah, and is appropriately described as a very picturesque bit of Arabian life. The admirable representation of texture (including under this term the rendering of the surface of stone), in which Mr. Werner excels, may be noted in this drawing. The architecture and accessories are, however, far better than the figures. In "The After-glow, Upper Egypt" (177), Mr. Vacher has given us a fine piece of characteristic colouring. There is, however, a wooliness in the delineation of the capitals of the pillars which is not true to the scene. In No. 48, "Southern End of the Sacred Isle of Philæ, on the Nile," by the same artist, we find the like reason for praise and for criticism.

Mr. Skinner Proat will owe us sincere thanks if he lays to heart the lesson that it is unworthy of an artist with an admirable eye for form, for colour, and for happy choice of subject, to be absolutely slovenly in architectural draughtsmanship. His "Lausanne" (181), and "Ypres" (67), are each sketches of considerable merit. But the persistent crookedness and want of perspective alignment of the cusps of the picturesque Gothic windows in the latter drawing are such as to destroy any pleasure in looking at them, when the attention is once called to the blot. The result of very considerable skill is destroyed by such unpardonable eccentricity.

Mr. L. Haghe has invaded the dominion first grasped by Alma Tadema and Gérôme, in such scenes as the "Atrium of a House at Pompeii" (151), and "The Tepidarium of the Thermæ at Pompeii" (47). We wish he had rather recalled to us the ideal of Roman life than that of its modern representation. Augustus Bouvier has approached the same locality, with somewhat more success, in "First Arrivals" (9). But the ladies, who are taking their seats and arranging the cushions and mats in the theatre, are not Pompeian women, Mr. Bouvier! They are pretty and graceful, and classically attired, but they are palpably French. They want the queenly port of the women of Sorrento, that stare of a startled fawn, which may be noted alike in the frescoes unearthed at Pompeii and

in the girls of the *Piano*—the very garden of Italy—of to-day. Physiognomy was, and is, rigidly and intensely localised in these little Italian centres of city life, where deadly fends often separated closely adjoining communes.

Mr. Henry Tidy's "Sea-weeds" (97) are rather operatic than natural flowers. We like his "Flowers of the Forest" (199) better. Under protest against the introduction of Americanisms into our language (in spite of the invariable use of that dialect by the Court physicians, in their bulletins), we cannot help observing that our cousins would say that observing that "our potatoes," by William Small, were indeed very "small potatoes." Mr. Jopling is to be congratulated on the photographic accuracy with which he has depicted the nails on the chair in No. 107, which are more successful than the "sweet eyes of starry tenderness." We turn with a sense of relief to the wild Irish nature of "Killarney," by Mr. Edmund G. Warren, one of the best landscapes and best drawings in the room. No. 28, "Lough Bray, Wicklow Mountains," is another good scene by the same artist. "The Castle of Iechia, Bay of Naples," may be seen at times of the colour painted by Mr. Rowbotham, in No. 75, but not at the time when, driven by the sirocco, the sea breaks on the shore, as he has very faithfully represented it as doing. The two parts of the picture are each good, but their combination is an anachronism. We have a pleasant recollection of No. 4, "The Church of St. Maclou," Rouen, by L. J. Wood; "Harvest Time on the Llugwy, North Wales," by Philip Mitchell; No. 89, "Sunning," by J. C. Reed; "The Entrance to the River Tyne" (63), by E. Richardson, photographically clear and distinct; "North Sannox, Isle of Arran" (126), by J. C. Reed; "Llanghorne Castle, South Wales" (184), by J. W. Whymper; and a clever bit of genre, "Plucking a Pigeon," by Andrew C. Gow, (141), in which the expression of countenance is admirably given, and the half-perplexed, half-confident look of the dupe, and the various phases of rascality evinced by his plunderer, are rendered with care, with fidelity, and with considerable power.

REPORT OF THE COUNCIL: ROYAL INSTITUTE OF BRITISH ARCHITECTS.

The report to be read at the annual meeting, on the 1st of May, shows that the number of fellows is now 276 and of associates 243, making a total of 519, or thirteen in advance of last year. There are also eleven students, of whom six were admitted gratuitously as passed candidates in the voluntary architectural examination.

We give a few passages in the report:—

"In reviewing the events of the past session, the Council need scarcely dwell on the extreme gravity of the difference which arose last year between Mr. E. M. Barry, R.A., and her Majesty's Office of Works, respecting the ownership of drawings prepared by the late Sir Charles Barry and by Mr. E. M. Barry himself, for the erection and subsequent alterations of the New Palace of Westminster. Apart from the interest which the Institute as a corporate body was likely to feel in the solution of a question materially affecting the position and private rights of one of its members, the point at issue was one in which every architect felt concerned who cared to maintain a principle of professional practice long sanctioned by custom.

The special general meeting convened to consider the subject was a full one and almost unanimous in its opinion. A series of resolutions was passed in support of Mr. Barry, and in deprecation of the unreasonable claim made upon him by the Government. Meanwhile a mass of evidence as to local custom, confirming the views then expressed, had been contributed by the principal architectural societies and practitioners throughout the kingdom. A deputation from the Institute waited on Mr. Gladstone, and explained the feelings entertained by a large majority of its members, both on the subject of Mr. Barry's dismissal from his official position as architect to the Houses of Parliament, and also on the general question as to the right of ownership to architects' drawings. Mr. Gladstone promised that the Government would give the matter due attention, and Mr. Barry has since received from the Office of Works a communication, which to some extent modifies the original claim of the Government. But the broad professional question still remains to be settled, and until some decision shall have

been arrived at in one of the Superior Courts, where evidence of custom may be produced, doubt on the legal aspect of the matter must prevail. Under these circumstances, the Council, having consulted the honorary solicitor and taken counsel's opinion, can only recommend that the ownership of architects' drawings should be secured to them by a special agreement between themselves and their clients, before any work is undertaken. The necessity of this course might be supported by many arguments, but it becomes doubly obvious while an impression exists on the part of the public, that an architect, in parting with his drawings, gives up the copyright of his design.

The International Exhibition of 1871 is too important a subject to be passed over without notice. In the early part of last year the Council received from Lieut.-col. Scott, R.E., an intimation that the Commissioners were willing to receive any suggestions on the scheme which the Institute might consider it desirable to offer. This was followed by a proposal to place on the Committee of Selection (for Class IV.), an architect, to be nominated by the Council. A similar proposal was at the same time made to the Association and other architectural societies. But the Council considered it only due to the Institute that the name of the president for the time being, which by some unaccountable omission had not been included in the original Royal Commission of 1851, should now be added *ex officio* to that body. A suggestion to this effect was accordingly made, through Mr. Beresford Hope, M.P., Past-President, in the proper quarter. But the Commissioners did not adopt that suggestion, though they offered to place Sir William Tite and Mr. Beresford Hope, as individual members, on the Commission.

The Institute therefore acting on a resolution, passed at a general meeting on the 30th of May last, declined to be put, as a body, in official relation with the International Exhibition, and it was left open to individual members to contribute and co-operate as they might think desirable."

"In connexion with the examinations, the Council cannot overlook the frequent allusions which have been recently made, both in the Institute and elsewhere, to the necessity for modifying in a more practical manner the course of professional education by the establishment of lectures, drawing classes, and an organised curriculum of study. It is popularly supposed that the Institute might with facility, and should with willingness, undertake these functions. The truth is that the causes which at present deter it from doing so have never been clearly understood.

It can scarcely be supposed that the Institute could ever hope to offer advantages to the student which are not already afforded at the two principal London Colleges, at the Royal Academy, and at the South Kensington Museum, to say nothing of private offices. But even if this were possible, and if the general body of members were of one mind on this subject, there would still remain the practical difficulty of ways and means. At present the annual income of the Institute is no more than sufficient for its ordinary working expenses. If it is to become an educational body, funds must be available for lectures, drawing classes, and the establishment of the Institution of Civil Engineers—a far more numerous and therefore wealthier Society—attempts, no further than this Institute, to provide instruction for its students, who are numbered by hundreds, while the students' class at the Institute is, by comparison, a merely nominal one.

"The list of prizes offered by the Institute for 1871-72, will shortly be supplemented by private generosity. Mr. H. W. Peek, M.P., after having communicated his intention through Mr. Beresford Hope, M.P., past president, has kindly placed the sum of £72, at the disposal of the Council for distribution in money prizes, to be awarded to architectural students, under certain conditions, for the three best sets of drawings illustrative of the restoration of Eastbury Manor House, Barking, and of an ancient gateway in the neighbourhood. Full particulars of this competition will be issued in due course, and it is hoped that Mr. Peek's liberal offer will meet with an adequate response.

"There remains but one subject more which calls for special mention in this report, viz., the

change in the official management of the Institute, which has recently been decided on. It will be in the recollection of members generally, that at the special meeting held on the 13th of March last, it was resolved 'that there be two secretaries' of the Institute elected annually; one of whom shall be paid such salary as the Council may from time to time determine, and that the word 'Assistant' be omitted from Section viii. in the Bye-laws.' Acting upon this resolution, the Council have nominated F. P. Cookerell, Fellow, as Honorary Secretary for Foreign Correspondence, and C. L. Eastlake, Fellow, as paid Secretary for Home duties. It will, of course, rest with the general body of members to confirm this nomination or otherwise, as they think fit. The Council cannot but hope and believe that the change recently sanctioned and carried out will tend to increase the usefulness and energy of the Institute.

In recognising the expediency of this change, the Council cannot forget the long and valuable services rendered by those gentlemen, who, during past years (and while the finances of the Institute did not justify the appointment of paid officers on the present footing), gratuitously devoted so much time and attention to the affairs of the Institute as Honorary Secretaries. The welfare of every society, similar to this in origin and constitution, must depend on such kindly help in its early progress. But as the field of its labours widens with its growth, official duties multiply, and require more direct responsibility, as well as undivided attention. It is then that the experience of those who have relinquished their control in matters of detail may become useful in aiding them to guide the general body on broad questions of principle or policy, by their advice and influence, as private members."

SOME OF THE HOMES OF THE CITY POLICE.

AN unhappy incident often leads to wholesale improvement, and we trust it will be so in the case under notice. The attempted suicide of the wife of one of the City constables has brought the domestic and sanitary condition of their homes before the public in a manner that will not admit of suppression, although suppression has been indirectly attempted. It is desirable, however, the truth should be known in such matters: the public health concerns us individually as well as collectively. Married constables in the police-force live mostly in their district in homes apart from the station. The restriction upon the City police proper obliges them to dwell within the City bounds. Some live in districts near to each other, and others form a kind of a colony in a certain street or in courts, where they outnumber other residents. Not a few live otherwise scattered here and there apart, in some cases paying a nominal rent, and in other cases living rent free in "houses to let," or in houses that are shortly to be pulled down owing to extensions or improvement.

Rose-alley, the place under notice, is within one house-breadth of Bishopsgate Police Station. It is, we believe, corporation property, and for the last five years or so has been occupied solely by married policemen. The entry to the inner court is through an outer one of not more than 3½ ft. wide. After several yards it winds round and widens in the middle passage before the fronts of the policemen's dwellings, and immediately beside the back premises of the police-station. The houses are twelve in number, ranging in one line. The entrance-doors of these houses run in pairs. Each house consists of six rooms, two on the ground-floor, two on the next story, and two on the top. The passages are narrow, and lead directly by the foot of the stairs to the back-door. The walls of the rooms in Rose-alley have an old wainscoting upon them rotten with age, and those we examined were spewing forth an ooze from dampness and wet. When they last received a coat of whitewash or distemper we do not know, but from their appearance it must have been a long time ago. The upper rooms of these houses are in somewhat better or drier condition. They are larger, of course, in consequence of the deduction of the entrance passage below; but otherwise, when taken in connexion with the lack of proper domestic convenience, and the condition of the back-yard, they cannot be pronounced healthy places to live and sleep in. Three families occupy the most of the houses, but there are some only occupied by two. The former, however, is the general division, a family for each two rooms.

* We are not so sure as to the "liberality" of this offer.—Ed.

The back-yards would be under 6 ft. square even if entirely unencroached upon, but one angle of each, right before the back-door, and within less than a yard of its threshold, is occupied by the privy. These receptacles belonging to each house are wooden constructions or boxes put together as one, but answering as two, by being divided in the centre, and made to project half-way into each yard, a wooden partition forming the party wall, that abuts centrally against them. Another wooden box or cistern surmounts this double privy, supplying water to both, and perhaps by its connections of pipe no way improving the water for domestic purposes. No ash-pit, water-barrel, nor dust-bin is possible in these Liliputian back premises. One ashpit, situated in the front of the row of houses, is made to answer for the twelve or more houses. What house refuse and ashes that do not go down the water-closet have to find their way out to the single dust-heap.

From No. 1 to No. 8 the back-yards and houses are not in good condition; and, to speak plainly and truthfully, not one of the whole number is fit and proper for the residence of the City police and their families. The structures are old, unhealthy, and ill-constructed. The houses in Rose-alley should not be occupied by more than two families in each where there are children. Instead of two rooms each for three families, there should be three rooms each for only two families. What the washing-day must be like in these contracted dwellings we can only surmise. It must be a happy release for the husbands if they are on day duty. The vista from the darksome windows in the angular bottom kitchen of Rose-alley is by far less pleasant and healthy than a gaol-bird's view through an iron grating. He may have a mouthful of fresh air, but the denseness of the under-kitchens may gaze in vain for that pure life-giving element in the quarters of the police in Rose-alley. One of the policemen told us that he would not live there if he was paid for it. The one we visited first justified his remark. The police are naturally reticent about the condition of their dwellings in Rose-alley; so if the visitor desires to obtain useful information he must examine for himself, or inquire on the spot of the constables' wives, who have not the fear of a rebuke before their eyes.

There is a large colony of young children in the Alley, and the conditions under which they are housed and reared are not at all conducive to their health.

Why do not the Commissioners provide stations for married men, as quarters and barracks are separately provided for married soldiers? This would be no more than a large model lodging-house, with convenience for the comfort and health and social welfare of the force. As it is, the condition of the married City policemen is an anomaly. They are looked upon, one and all, as our guardians; they are required to be everywhere, vigilant and ubiquitous. They are expected to be civil, obliging, meek, handsome, active, and strong. Furthermore, they are expected, in some sense to be sanitary officers,—observing, if not *de facto* ones. Alas! the force are driven by force of example to be what they they are in reality, and not what they seem.

Chain a man's neck to a dog kennel, or compel him for five times three hundred and sixty-five days to live over a cesspool, and breathe its odours, and what do you make him? Such has been the tenure in Rose-alley; and a policeman, though with helmet and baton, and in livery, is still but a man.

As Rose-alley does not smell sweet, nor indeed could do so with a change of name, without a radical change of condition, we hope the Police Commissioners will order at once some radical improvements.

THE ARCHITECTURAL ART CLASSES.

We desire again to call the attention of our readers to the work of these classes, which have now for some time been carried on at the Architectural Museum, Westminster. The figure class seeks to enlist the support of the more advanced students, who, after giving proof of fair proficiency in drawing from the antique, proceed to study from the living model. Draped and costume models have lately been introduced, tending to the exertion of the members of the class themselves. The subjects are selected and set with due regard to archaeological correctness, and the course of study is, we believe,

specially adapted for architects. The committee anxiously look forward to a more general support from the members of the architectural profession. The subscriptions are paid monthly, and all particulars can be had of the honorary secretary, Mr. Lucy W. Ridge, 23, Bedford-row, W.C.; or at the Museum on Tuesday, Thursday, and Saturday evenings, when the class meets.

The Ornament Class furnishes opportunities for study every day, and during three evenings in each week. It is intended, for pupils and those but little advanced in drawing; and experience has shown that many of the students require instruction of the most elementary character. The fee is but 2s. 6d. per month; and yet it is not found that many avail themselves of the opportunity thus offered. This is the more remarkable, as the inspection of any collection of drawings made by architectural pupils shows that, with but few exceptions, they have not attained the power of expressing architectural ornament to the extent that even a working drawing may be fairly considered to demand. Arrangements are proposed for those who can attend in the evening only, and such are requested to communicate with the Honorary Secretary.

A water-colour class is being formed under the instruction of Mr. Naftel, of the Old Water-colour Society. The class will have seven lessons at Conduit-street, and five out-door lessons on Saturday afternoons. Applications should be sent at once to Mr. Florence, 10, Craig's-court, S.W., who acts as secretary to this class.

The committee of the Architectural Art Classes still find it necessary to appeal to those members of the profession who have not already subscribed, to place their names on the list of donors to their funds. They have been put to very heavy expenses in fitting up and completing the museum for the accommodation of the students; while the classes themselves have, as was almost inevitable at the commencement, been far from self-supporting. Additional donations will be thankfully acknowledged through the hon. sec.

Students who write and talk of their anxiety to obtain skill and knowledge, and do not take advantage of opportunities to advance themselves, such as those now opened to them at the Architectural Museum, are mere wind-bags. It is of no use people merely saying, I wish I could do this, or I wish I could do that; they must go to work vigorously and continuously, and then they will not fail to acquire the power they desire. "Nothing is denied to well-directed effort."

THE GROWTH OF TASTE.*

"MUTABILITY is a law of Nature: whatever remains stagnant dies, and a new life springs from the germs of decay."

Almost every scrap of detail in the old styles has been used up, and the call for something new is gaining in intensity; reverence for mere dogmatically asserted authority is gradually disappearing, and men are becoming more earnest in the search after truth. It is, indeed, a great thing to have noble aims, even though you despair of attaining one iota of them: it raises a man in his own esteem, it enlivens the prosaic routine of ordinary work, improves the tone of the mind and gives a charm to life; and there is no greater aim than the endeavour to attain the beautiful. "The beautiful," says Goethe, "is greater than the good, for it includes the good and adds something to it; it is the good made perfect. This sense of perfection would make us demand from every creation of man the very utmost it ought to give, and renders us intolerant of the smallest fault in ourselves, or in anything we do. No other human productions come so near to perfection as works of pure art. In all other things we are, and may reasonably be satisfied if the degree of excellence is as great as the object immediately in view seems to us to be worthy, but in art perfection itself is the object." Every day's experience teaches us how much man is affected by external influences, and no wise man will neglect to cultivate so powerful an agent for good. The culture of art, the pursuit of an ideal perfection, a perfection of which harmony is an essential part, necessarily leads to a like endeavour in our lives and characters, so that the harmony may be complete. It elevates the feelings, purifies the soul, brings

man more in *rapport* with external nature, with the Creator of all things. Truthfulness is the foundation of all excellence, whether in morals or art. Where that is wanting real beauty is absent. A liar is the producer of shams; the producer of shams is a liar. If he say "I proclaim this to be false; I do not pretend it is real," so much the worse for him if he glory in his shame. The work must be done in the spirit of love, not as a piece of task-work; it must bear upon it the impress that it is the best that could have been produced in the circumstances, not merely that it is sufficient for the purpose for which it was made.

"All arts," says Fergusson, "are the reflex of the individual or the nation practising them, and the improvement must come from within, either from more sedulous cultivation of purity and the higher emotions, or by a more honest and straightforward mode of expression than has hitherto been adopted. On the other hand, we may feel certain that all that is bad in the individual or the nation will come out in their art, however much they may attempt to disguise it by foreign costumes or plumes borrowed from those who were artists, not only in form but in spirit. Art comes from the heart, and can only come from thence."

To attain originality, there must be individual freedom of action; the worship of precedent, the slavish adherence to dogmatic rules, is destructive to originality. Each man will ultimately be judged of by the amount and value of the originality displayed in his works; and the value of this originality will depend upon the power to create, and the good taste and judgment displayed in execution. Mere fluency of expression and elegance of diction will not suffice; unless there are ideas to be conveyed, the result will only be

"A tale of little meaning, though the words be strong."

He will be the greatest who, filled with the spirit of the times, gives expression to them; not he who repeats, in however dignified a form, the expressions of a bygone period. True it is that the new in art is always formed from the old; but "it is the genius of the hour which always sets his ineffaceable seal on the work, and gives it an inexpressible charm for the imagination."

Eccentricity is too often mistaken for originality; but there is always something in eccentricity which is offensive to good taste. Indeed, it is frequently the product of mere personal vanity; and when it is so, the flimsy covering is transparent enough to the observant eye. He who acts with modesty and reserve, who does not display all that is within him at once, is more likely to succeed than he who would at one bound reach the summit.

I have said that the art of a country is a reflex of the mind and manners of a people; that they act and react upon each other; that you may judge of a people by their art; and that art purifies and refines the manners of a people. Exception may be taken to this proposition, and, pointing to recent events in France, you may say, "What has art done for that nation?" Art, like every good thing, may be abused; it may become sensuous and impure, the fosterer of egotism, vanity, and moral debasement; and such has been the tendency of French art. Lavish, rank luxuriance rather than purity and ideal beauty, has been its characteristic, and in the new Opera-house in Paris we have a noteworthy example of this: a building so lavishly adorned as to pall the taste, and so gross in some of its adjuncts as to shock the feelings of the otherwise not too sensitive Parisians. This is not the place for introducing politics, but, as it bears upon my subject, I may be pardoned for saying that our desire to possess ourselves in peace, and to cultivate the interests, prosperity, and welfare of the people is a nobler aim than the desire to be the arbiter of the world, the craving for glory, and the undergoing a "baptism of fire," which has produced a deluge of blood, and ended in a galling and forced humiliation. We must no longer adopt the fashions of our neighbours, but act a noble, independent part, not heeding the sneer that our glory is departing from us, but, conscious in our own integrity and desire to do what is right, press steadily on in the path that lies before us. One of the most hopeful signs of our revival in architecture is the leaning towards severity and archaic simplicity of treatment displayed by most of the leading architects. We are in a transition state, and if many more years of peace and prosperity are allowed us,

* From a paper read by Mr. W. G. Shiels, at a meeting of the Edinburgh Architectural Association, on the 12th of April.

our art may yet vie with the most favoured period of the Middle Ages.

A demand is sometimes made upon those who maintain principles such as I have endeavoured to advance, that we should give a practical example of what we would have. Such a demand is manifestly absurd. An excellent critic of poetry may not be able to write a verse himself, nor is he required to do so, and yet such a request is more reasonable than the other. The result sought for cannot be attained at once, but only by a gradual process; and it is sufficient for the writer that he points out the way towards the goal, it is for the practical architect to follow it. One thing you must do if you desire to succeed, you must by steady cultivation of the taste. "It is known," says Burke, "that the taste is improved as we improve in our judgment, by extending our knowledge, by a steady attention to our object, and by frequent exercise. They who have not taken these methods, if their taste decides quickly it is always uncertainly; but they who have cultivated that species of knowledge which makes the object of taste, by degrees, and habitually attain not only a soundness, but a readiness of judgment, as men do by the same methods on all similar occasions." Cultivation is absolutely requisite in the formation of good taste, and it is one of the most vulgar of vulgar errors, to suppose that every one is entitled to express an opinion in a matter of taste. True it is that some may possess a better natural taste than others; but, like every other natural gift, if it is not cultivated it will be of no use to the possessor. Still, as there is no disputing upon matters of taste, you cannot convince the ignorant that he has it not, and a man who would not dare to give an opinion upon a scientific matter of which he knows nothing will, without hesitation, assert his right to express himself upon a matter of art of which he knows as little. The only remedy for this is education, and I trust that when the new educational scheme is in full operation, art will receive the attention it merits.

What then is required of the architect is, that he shall be a man of culture, having a knowledge of literature, science, and art; that he know the technic requirements of his own particular branch of art; and that he shall practise that art in a spirit of truth and propriety. Having such accomplishments, and following such a course, he can hardly produce a work that is in bad taste. Whether or not it may be an original work depends altogether upon whether he has genius; and genius is not an acquirement, but a gift.

If I am asked to point to any recent works possessing originality, I would refer you to works done by engineers, and having an architectural character, such as the New St. Pancras Station and Westminster Bridge. Having new problems to solve, the designers were compelled to deviate from established practice. The problems have been solved in a satisfactory manner, and as much artistic effect has been given to the structures as was possible in the circumstances.

KING ARTHUR'S CASTLE.

On a small peninsula at Tintagel, on the north coast of Cornwall, are the romantic ruins of an ancient castle, majestically placed on the summit of a bold and rugged precipice jutting into and overlooking the Atlantic ocean. This is the spot that tradition and Tennyson have assigned as the birthplace and residence of the king of chivalry and romance, whose heroic and generous deeds will be the theme of song to the end of time. Some 300 ft. beneath the castle is a long narrow cavern extending through the entire promontory. Here, at high tide, the restless sea dashes and surges through with unearthly noise, doing its utmost to destroy and carry away the soft foundation rock of the royal fortress above. The formation of this cavern has given rise to much speculation among geologists; but recent discoveries have now determined its origin. It would appear that a vein or lode of argilliferous mineral passed through it, as along the roof may be seen a thin layer of malachite, with spots of silver ore (*polytelite*). It was hence, no doubt, that in bygone days, the mineral was derived, from which were coined King Arthur's "silver crowns" in the Royal mint overhead. The date of this exploration, like that of the castle, there is no means of now discovering; but there is evidence enough to show that the excavation was done by the aid of

fire and water, before the invention of gunpowder,—a method sometimes adopted at the present time in prospecting in remote regions. An examination of the strata by Mr. T. A. Masey, F.G.S., has led to the finding of a parallel vein to that in the cavern. This discovery is attracting as much attention as the castle itself, as from the underlie of the veins being seaward, explorations are now being carried out under the castle and also beneath the sea. The miners appear to have no fear of the ocean breaking in upon them, although they can hear the rattling of the shingle on the beach, nor of being inconvenienced by water, as, strange to remark, the excavations are drier than would be the case at a similar depth on land, probably owing to the absence of springs under the sea.

THE LOCAL GOVERNMENT AND LOCAL TAXATION BILLS.

We accept with gladness these two Bills; for years, in spite of all abuse, we have urged the necessity of a revision of our laws of local government, and we have not hesitated to point to individual cases of towns or of highway districts. From these cases the deduction has been painfully obvious that a system was required in our local laws, and, whether it was how the money was expended, how the accounts were made up, or how the business was conducted, that a directorate was required. When the local authorities did act, they acted, for the most part, as in a fog: we hope now for a better state of things. That our civil engineers will now have a better time of it than they have had for some years, we also hope and believe; at any rate, we congratulate them on the prospect.

The intended County Financial Boards can be made a very valuable power, even as a county board of censors appointing inspectors or auditors (subject to the approval of the Central Board, however, in every step) for sanitary and highway purposes. The well-working of these Bills will depend in a great degree on the men appointed as inspectors and auditors: it will not do to have for medical inspector a man who was speaking to me on a hot summer-day in a country market-place, though I did not know he was an inspector until afterwards. Discovering a smell of putrid fish, and finding it proceeded from a hawk's barrow, a short distance off, I pointed it out.

"Do you believe those fish are bad?" asked the medical inspector.

"There cannot be a doubt of it; the look is sufficient, even if the smell did not suffice."

"The inspector hailed the hawkier. 'Hello! are those fish stinking?'"

"They are for salting, sir," was the answer.

"Oh! ah!" and with an imparting-of-knowledge air, the inspector turned to me, and repeated, "They are for salting; all right, you see."

Neither will it do to have, for inspectors of nuisances, or as assistants to our relieving officers, any individual member of our police-force; if at all, the whole force should be inspectors and assistants, and the salary distributed among the force. A particular sergeant, inspector, or superintendent, should not receive any particular pay or reward for such work; for the recipient gets wonderfully blind to many a flagrant breach of the laws by his patrons. Neither will it do to appoint our town surveyors inspectors of nuisances; they would subject themselves to much annoyance,—perhaps loss of office,—if they were to do their duty as such. No, our future inspectors and auditors must be men of ability, free from social taint, well paid (on that we lay emphasis), and holding their offices independent of local favour; they should also, as we have always particularly pressed, know the county for which they may be required; for these measures (for instance) will not make the labourers in every county alike in their mode of work.

Labour in every county, or nearly every one, has its idiosyncrasies, and therefore we would suggest that in the County Board should rest the election of the auditors required for the county. It would be well for England if these Bills were already Acts. To refer to cases that have been particularly alluded to in the *Builder*: it would be well for Newlyn, where the local authorities fell foul of the county surveyor: the local magistrates fined him, the Court of Quarter Sessions dared them to levy the fine, and have now referred the case for

counsel's opinion. It would be well for Falmouth, which, last year, suffered from a scourge of scarlet-fever and choleraic complaints, and is now suffering from small-pox; and it would be well for all the neighbourhood of Falmouth, into which the small-pox will be sure to spread. It would be well for Truro, where the authorities, taking a sport with no coxswain or stroke, are catching crabs, turning turtle, knocking their heads against each other, quarrelling, and making great fun for us who are standing on the banks. It would be well for Glastonbury, not yet out of its mourning for deaths by scarlet fever. It would be well for our rural districts, suffering from incompetent highway surveyors, who for the most part could not write a letter of ordinary length without breaking the simplest grammatical rules, and who get their experience at the cost of the rate-payers, who have not yet learned that an uneducated officer, even if he has a very low salary indeed, is a far more costly servant than an educated, experienced man at three times the salary.

Highway surveyors, like one we recently noticed, will have small pity at the hands of an independent inspector: the attention of this one having been directed to a road that was being injured by storm-water, owing to a drain under his care being nearly silted up, he set the siltling up was owing to the mouth of the drain being too big, and accordingly contracted it until it would barely admit a man's boot; to put in a catch-pit, with a grate, required an effort of brain far beyond him. Yes, we must be thankful for these measures, full of imperfections as they may be.

THE ROMAN WALLS OF DAX.

We learn with infinite regret, from the last number of the *Bulletin Monumental*, that the new prefect of Les Landes has, at the instigation of the mayor of Dax, ordered the demolition of the eastern part of the fine Roman walls enclosing the town, called "The Rampart," in order to exercise better "une influence électorale favorable au Gouvernement!"

Some ten years ago Mr. C. Roach Smith visited Dax under a like emergency, and making a representation direct to the Emperor, got the walls respited,—saved, as was thought. They have been engraved in the *Bulletin Monumental* by De Camont, tom. vi., 3e série; and in vol. v. of Mr. Roach Smith's "Collectanea Antiqua," in which (plate xxv.) the portion they have commenced pulling down is, we believe, shown.

We hope the Society of Antiquaries, the Archaeological Associations, and other bodies interested, will at once address M. Thiers, and endeavour to prevent this threatened vandalism.

AMERICAN CAPITOLS.

Our volumes contain views of several of the large and costly "capitols" recently erected in the United States. The *Capital*, a new American paper, gives in its first number particulars of many of these buildings. Part of the account will interest our readers:—

At the present time no less than three of our States are constructing new capitol edifices. New York will attempt to rival the National Capitol itself by a structure at Albany, to cost, nominally, five millions; but probably by the day of its completion it will have consumed twice as much. This capitol is to be a Renaissance edifice, with domes, pavilions, and statuary. Illinois ventures, after much debate, to spend four millions upon a classical capitol at Springfield, and Iowa is ready to spend one million and a half upon a Corinthian structure at Des Moines, and to ornament it with a wrought-iron dome, at some future day, to cost half a million more.

Some States, as West Virginia, have no capitol-house at all; others, as Connecticut, have two; but the agitation is rife there for their consolidation at Hartford. Two of the States only contain state-houses in present legislative use which date to the revolution,—Rhode Island and Maryland. The noblest State capitol now complete is at Nashville, and the most expensive is at Columbus. The following data have been collected from various sources, chiefly from members of Congress, upon the majority of the remaining state edifices.

The State capitol of Maryland, at Annapolis, is a handsome specimen of the brick architecture of the last century, and it is surmounted by a dome and spire of stanch timber which attain

the height of 200 ft. From this eyrie is afforded the very best view possible of the Chesapeake bay. The governor's room and legislative chambers at Annapolis are 34 ft. by 40 ft. each, and, like all the edifices, they are light, quaint, and substantially built. An appropriation of 7,000*l.* sterling was passed in 1769 for this edifice, and its foundation-stone was laid in 1772.

The State capitol of Maine, at Augusta, cost 170,000 dollars, and is built of granite, columns in the centre and plain wings. It stands upon a green elevation, and near it is the pleasant residence of Speaker Blaine.

The Pennsylvania State capitol is 180 ft. front by 80 ft. deep, built of brick, with an Ionic portico and an ugly dome. In adjacent separate edifices are the governor's and other state offices. There is no room in this edifice capable of accommodating Rothermel's painting of Gettysburg battle. The view from this capitol is exquisitely bounded by mountain and river scenery. Near this point was the once mooted place for the National Capitol.

The Massachusetts State House was completed in 1798, and it is the most conspicuous edifice in Boston. Its dome is 120 ft. above the ground, and 230 ft. above the level of the neighbouring sea. This building, though old, is entirely worthy of our most historical city, and it is kept in a state of military order and cleanliness, as if it were really the headquarters of the Commonwealth. Bronze statuary stands on the flights of terraces leading to it, and in the rotunda are busts of distinguished Bostonians. This is the only State capitol which remains in a city of the first class.

The State capitol at Albany stands 130 ft. above the Hudson river, and cost 120,000 dollars, the city of Albany contributing to build it more than one-fourth of that amount. It is made of stone, and has an Ionic portico built against the side of the building, surmounted with urns; a balustrade runs along the roof, and an effigy of Justice surmounts the cupola. This small but pleasing structure is directly beside the excavation for the new capitol.

The Vermont State-house at Montpelier is 150 ft. by 100 ft., and 100 ft. high, built of dark Barre granite, with a copper roof, in the Doric style. It cost 132,000 dollars, the people of the town contributing 16,000 dollars. A statue of Justice Allen, by Larkin Meade, is one of its attractions.

The Virginia State capitol, next to Washington, the most suggestive and best commemorated legislative edifice in the country, is an unsuccessful adaption of the *Maison Carrée* at Nîmes, France,—one of Jefferson's hobbies,—beset with Ionic pilasters and columns, depending upon a basement. Being of brick rough-cast, it does not affect the eye pleasantly.

The State capitol of Ohio, at Columbus, is 304 ft. long, 184 ft. wide, and to the summit of its dome 157 ft. high. It is built of hard limestone, resembling a shade of white marble. In architecture it might be called the Classical Provincial. A demure false pediment rises in the middle over the flat, chimneyed roof. The rotunda is depressed, and resembles a boy's cap, and the fine columns and pilasters which surround the edifice only make these meannesses conspicuous. It cost about 4,000,000 dollars, and was once likened by the celebrated William Corry to a teacup standing on a brick. He made this illustration in a speech, producing the cup and the brick. A grass park incloses the capitol, which is certainly a colossal pile.

The Kentucky State Capitol is a white marble building, with a gable portico of six Ionic columns, and a cupola in style resembling the average Virginia Court-house. Some monuments are appendages of this edifice.

Madison, the capital city of Wisconsin, has a superb site upon a commanding isthmus, between lakes. The State seat was fixed here in 1837, from original convictions of the fitness of the place. The capitol is built of limestones, in the centre of a park of fifteen acres, and the streets radiate down-hill from this high point. It is related that for many years the hogs used to get under the legislative floors and grunt at the orators.

The State Capitol of Missouri, at Jefferson City, stands on a bluff almost overhanging the river, with its base 80 ft. above the water. This State house cost 250,000 dollars, and is built of stone in fine style, and looks well as one ascends the river towards it.

The Tennessee State-house cost a million of dollars, and stands 175 ft. above the river on the highest ground in Nashville. It is an Ionic

edifice, with a cupola, prominent as the Acropolis, and the best State edifice in America.

The capitol of Texas, at Austin, is 145 ft. by 90 ft., with a dome reaching an altitude of 101 ft. The building is of an oolite, of a soft white colour, and cost 150,000 dollars. It is Ionic in order.

COMPETITIONS, ANCIENT AND MODERN.

In these days, when the system of competition for public works is for better or worse increasingly popular, it may be interesting to recall the circumstances of one of the earliest in Italy;—a competition which not only brought to the front one of the noblest artists the world has ever seen, but produced a marvel of artistic skill altogether unrivalled. When we contrast "the conditions" of this competition with those which are brought before artists in the present day, we can scarcely wonder that the results of the modern system should be generally so unsuccessful. In case any one should suspect special pleading in the narrative, I have restricted myself to simply quoting from the account given in Mrs. Jameson's "Memoirs of the Early Italian Painters." In the chapter on Lorenzo Ghiberti, and the Gates of San Giovanni, we are told that the Signoria, or members of the Chief Government of Florence, acting in conjunction with the consuls of the Guild of Merchants, having determined to erect a second gate or door of bronze to the Baptistery of St. John, made known their resolve through all Italy; "and in consequence not only the best artists of Florence, but many from other cities, particularly Siena and Bologna, assembled on this occasion. From among a great number, seven were selected by the Consoli as worthy to compete for the work, upon terms not merely just, but munificent. Each competitor received, besides his expenses, a fair indemnity for his labour for one year. The subject proposed was the Sacrifice of Isaac; and at the end of the year each artist was required to give in a design, executed in bronze, of the same size as one of the compartments of the old gate; that is, about 2 ft. square.

There were thirty-four judges, principally artists; some natives of Florence, others strangers; each was obliged to give his vote in public, and to state at the same time the reasons by which his vote was justified."

The competitors "had each his workshop and furnace apart; and it is related that most of them jealously kept their designs secret from the rest; but Lorenzo, who had all the modest self-assurance of conscious genius, did not. On the contrary, he listened gratefully to any suggestion or criticism which was offered, admitting his friends and distinguished strangers to his atelier while his work was going forward.

When the seven pieces were exhibited together in public it was adjudged that but three among the number united the various merits of composition, design, and delicacy of workmanship, and were at once preferred before the rest. These three were the work of Brunelleschi, then in his twenty-fifth year; Donatello, then about eighteen; and Lorenzo Ghiberti, not quite twenty-three. The suffrages seemed divided; but after a short pause and the exchange of a few whispered words Brunelleschi and Donatello withdrew, generously agreeing and proclaiming aloud that Lorenzo had excelled them all, that to him alone belonged the prize; and this judgment, as honourable to themselves as to their rival, was confirmed amid the acclamations of the assembly.

The citizens of Florence were probably not less desirous than we should be in our day to behold the completion of a work begun with so much solemnity. But the great artist who had undertaken it was not hurried into carelessness by their impatience or his own; nor did he contract to finish it like a blacksmith's job in a given time. He set about it with all due gravity and consideration, yet, as he describes his own feelings in his own words, *con grandissima diligenza e grandissimo amore*, "with infinite diligence and infinite love."

Such was the glory which this great work conferred not only on Lorenzo himself, but on the whole city of Florence, that he was regarded as a public benefactor, and shortly afterwards the same company confided to him the execution of the third gate of the same edifice.

Regarding them we shall be able to appreciate

the astonishing fertility of invention exhibited in the various designs; the felicity and clearness with which every story is told; the grace and *naïveté* of some of the figures, the simple grandeur of others; the luxuriant fancy displayed in the ornaments, and the perfection with which the whole is executed; and to echo the energetic praise of Michelangelo, who pronounced these gates "worthy to be the gates of Paradise."

* * * * *

Lorenzo Ghiberti died about the year 1455, at the age of seventy-seven. His former competitors, Brunelleschi and Donatello, remained his friends through life, and have left behind them names not less celebrated,—the one as an architect, the other as a sculptor.

This is the history of those famous gates—

"So marvelously wrought

That they might serve to be the gates of heaven!"

When shall we again see patrons of art so munificent, a public so appreciative, or artists so noble? When that time comes, and not till then, can we fairly expect such satisfactory results from competition. As at present conducted, need we say they are most hurtful to true art, when the judges are generally men who, when outspoken, confess they "don't know much about that sort of thing," and naturally seek for some other mode of coming to a conclusion; and the result is the best framed and most effective view; the lowest estimate, however ridiculous; or the local man wins the day.

But art is revenged when, after long delay, the contractor's estimate arrives so wonderfully different from the delusive approximate, and the committee, finding themselves let in for something they little expected, begin to understand that even in competitions "honesty is the best policy."

To architects the system is likewise most hurtful. The young architect is disheartened and soured when, after a lavish expenditure of time, money, and brains, he finds that a strict adherence to the terms of the condition (which has cost him so much labour) is not apparently considered of much importance, or that the successful design is one which no architect would for a moment consider worthy of a place. Then comes the professional dilemma. To be scrupulously honest is certain failure—the points of the competition he has discovered really lie in influence skilfully worked, in estimates curiously "doctored" in the debasement of his art to the vulgar tastes of incompetent judges. Other people do it, he thinks, and why not I? If successful, other work will follow, which may be honestly carried out—"It is the spirit of the times, and one must be abreast of the times, or sink into neglect and ruin." There is little or nothing doing otherwise, and he has tempting visions of premiums and per-centages, of silver trowels, of opening dinners, of work, fame, success! So unless his good angel help him in his time of need, in he goes with brilliant views and gorgeous frames, &c.

The means of avoiding all this immorality on the part of the architects, and difficulties well deserved for the clients, are not far to seek. They have been pointed out in the pages of this journal repeatedly, and in some cases not without good effect. We have quoted the example of the Ghiberti gates as being an example of the ideal of perfection in competitions well worthy of study by architects and their clients. A.

THE CHICHESTER NEW CATTLE-MARKET.

THE New Cattle-Market in the city of Chichester is now all but completed, and is to be opened for use on the 10th of May next. The Town Council, seeing the advisability of removing the market from the streets, selected a site of between five and six acres at the east end of the city; and here, about twelve months ago, Mr. Frederick Furniss, of Havant, commenced the work of executing the designs of Mr. Hawley, of Westminster, C.E. Mr. Furniss's contract, together with that of Messrs. Cliff & Co., of Bradford, who took in hand the fixing of the iron pens, &c., amounted to nearly 7,000*l.*; and now the market is complete, with the exception of "settling-rooms" which will shortly be proceeded with, and be completed by the day of opening. The market is approached by two wide entrances, from Eastgate-square and the new road running from Southgate, the construction of which formed part of Mr. Furniss's contract. Nearly or quite half the space is devoted to pens for sheep, which are made of various

sizes, to accommodate from ten to about eighty. It is estimated that there are pens sufficient to accommodate 2,800 fat sheep, and 4,500 store sheep. For pigs 125 pens have been set apart; and there are also seventeen pens for lean calves. The total number of pens in the market is 552. Then, on the south side there are six bays constructed for the reception of about 900 lean stock. The fat stock and fat calves will be tied to rings fastened into the boundary-walls of the market. Similar provision is made for horses, accommodation being provided for 180, with a good ground for showing off their paces. All the roads, avenues, and cattle-stands have bottoms of rolled gravel, while the pens for sheep and pigs are asphalted. Attention has, of course, been paid to the drainage. Accommodation for the reception of the sewage has been provided by means of cesspools, &c., and by a large egg-shaped drain which carries any overflow under the new road into the Lavant course in the fields south of the cathedral. Water-pumps, with troughs, &c., for cattle, together with other conveniences, have also been provided.

HER MAJESTY'S OPERA, THEATRE ROYAL, DRURY LANE.

The interior of Drury-lane Theatre has undergone a complete transformation. The stage has been cut back about 7 ft. to the original line. The orchestra has been much enlarged, and the screen dividing the orchestra from the pit has been entirely dispensed with, the orchestra being left quite open.

In the auditorium the whole of the pit floor has been taken up and relaid to a lower level; a corridor and a tier of "pit boxes" formed underneath, and ranging with the present circles; a new floor has been laid in the pit corridor on a level with the entrance stone floor, and the very objectionable slopes and steps dispensed with. The rest of the pit is fitted with stalls, covered with the conventional crimson damask.

The grand tier is fitted entirely as private boxes, and the upper tiers with about ten boxes on each side, leaving the centre portions for dress-circles and amphitheatre stalls, &c., open numbered seats. New doorways and passages have also been formed from the lower gallery corridor to the back staircases, which will facilitate the means of egress and access, and will add to the ventilation (we hope not the draughts) of the house, and this latter has been done at the expense of the committee.

The whole of the boxes and corridors are lined with chintz, and the boxes, circles, and arm-rests furnished with the amber satin curtains and draperies preserved by Mr. Mapleson from the fire at Her Majesty's Theatre. The whole of the works have been carried out by Messrs. Bracher & Son, in the short space of eight days, under the direction and superintendence of Messrs. Marsh Nelson & W. Harvey, the architects to the theatre.

FLOATING SMALL-POX HOSPITALS.

We are glad to perceive that the suggestion which we made in the *Builder* is about being carried into effect. At the first meeting of the new Metropolitan Asylums Board held on Saturday, under the provisions of the Metropolitan District Asylums Act, at Spring-gardens, Dr. Brewer, M.P., in the chair, it was reported that 607 new cases of small-pox had occurred in the metropolitan parishes, exclusive of St. George's, Hanover-square, St. George's-in-the-East, and Kensington, from which parishes returns had not been received. An important report was then presented from the General Purposes Committee, stating that, in consequence of this sad and extraordinary increase in the epidemic of small-pox, an interview had taken place with the Lords of the Admiralty on the subject of utilizing the Dreadnought Hospital Ship on the Thames as a convalescent establishment for small-pox patients, and that their lordships had consented to its use for such a purpose. The ship would accommodate 200 male patients, and could be got ready for their reception in the course of a fortnight. If the Board would entrust the necessary arrangements to the committee, they would endeavour to discharge their duty satisfactorily. Sir James Hamilton moved, and Mr. Taverer seconded, a resolution to the effect that the offer be accepted, which, after some remarks from other members of the Board, was carried.

We may add that the *Dreadnought* has been

for a considerable time unoccupied since it was last used as a "Hôpital Universel" for home and foreign seamen.

There are other idle hulks, too, at present lying unutilised in our several dockyards, which the Admiralty might kindly lend during the present crisis. They would thus subserve a commendable and useful purpose in the preservation of the public health. Though useless as war vessels, before breaking up they would answer admirably for temporary small-pox hospitals, or for other epidemic diseases.

STAINED-GLASS WINDOW, IN ST. MICHAEL'S AND ALL ANGELS' CHURCH, ASHTON-UNDER-LYNE.

An elaborate and costly stained-glass window has just now been placed at the east end of the parish church of Ashton-under-Lyne.

The window is of seven lights, divided into three compartments by larger mullions running the whole height. The centre compartment is of three lights, and the side compartments of two lights each. The height is divided into two stories—the lower about 11 ft. 6 in., and the upper 5 ft. The original stained glass is of the fifteenth century; and some of it is very good, but in a sad state of decay and neglect, and marred by careless and incompetent patching. Of the original design nothing is known with certainty; but we have heard that it exists—some say in Tabley Hall, Cheshire; others say in the Advocates' Library, Edinburgh. The ancient glass of the north window of the chancel is said to have been a representation of the departure of the Lord of the Manor of Ashteton with his "tall yeomen" to the field of Flodden—

"Where shatter'd was fair Scotland's lance,
And broken was her shield."

This glass seems to have been removed when the vestry was built in 1818, and inserted in the east window to make up gaps and dilapidations.

The idea of restoration was hopeless when Mrs. Radley, wife of the Rev. Thomas Radley, curate of the parish church, proposed to dedicate a new window which should be worthy of the situation in this fine old parish church. Mr. Eaton, architect, was consulted, and the edifice being dedicated to St. Michael and All Angels, the feeling was expressed by Mr. & Mrs. Radley that a series of illustrations should be selected from angelic actions or manifestations as described in sacred history. This was done, and a drawing of the stonework was made. Among others applied to were Messrs. Ballantine & Son, of Edinburgh, who, from the above suggestions, produced the design we illustrate now completed, of which the following is a description:—

The lower tier illustrates the triumph of St. Michael over Lucifer. St. Michael is represented in the centre, overcoming Lucifer and casting forth rebellious angels, who are seen on the sinister side retreating from his presence, accompanied with representations of the various evils of mankind, viz., Vain-Glory and Hypocrisy, Sloth, Avarice, Profanity, Enmity, Pleasure, Folly, and Intemperance. On the dexter side are angels of St. Michael, guiding and protecting the good and faithful, viz., Charity, Piety, Fortitude, Purity, Affection, and Friendship.

Text—Rev. xii. 10: "Now is come salvation and strength, and the kingdom of our God, and the power of his Christ; for the accuser of our brethren is cast down, which accused them before our God day and night."

Angels visiting the earth at the birth, agony, and resurrection. In the dexter two lights are angels worshipping the infant Saviour. In the central light is our Saviour in the garden, ministered to by the angel supposed to have been St. Michael; while in the adjoining two lights at either side are attendant angels (as is common in the works of many of the early masters), bearing the emblems of the passion, viz., the Cup, the Pillar, the Scurge, the Crown of Thorns, the Cross, the Spear, the Nails, and the Palm Branch, significant of the Grave. In the sinister lights is the angel seated at the Sepulchre, announcing to the Marys, "He is risen."

Upper tier, Christ enthroned. Christ holding the sceptre and Book of Life is seen seated amid cherubim and seraphim, with seven arch-angels, St. Michael holding the sword and the balance, St. Raphael as the Pilgrim, St. Gabriel as the Messenger of the Annunciation, the apostles headed on one side by St. Paul, bearing his emblem of the sword, and on the other side by St. Peter with his keys; beside these are the four evangelists bearing books, the prophets

with scrolls, the martyrs with palms, and crowds of saints, all illustrating "The glorious company of the apostles, the godly fellowship of the prophets, the noble army of martyrs, and the Holy Church throughout the world."

Text—Rev. xvi. 14: "It is the Lord of lords, and King of kings; and they that are with him are called, and chosen, and faithful."

In the tracery is the heavenly choir of angels. Along the bottom of the window is the following inscription:—"To the glory of God, in honour of St. Michael and All Angels, and in pious memory of her mother, Sarah Ann Ollerenshaw, and daughter, Ada Beatrice Victoria, this window is devoted by Elizabeth, wife of the Rev. Thomas Radley, curate of this church, 1871."

The arrangements and blending of colour throughout the whole window are admirable; the depth and richness of some of the shades, relieved by the delicacy of the whites and lighter tints, produce an effect harmonious and brilliant; the drawing of the figures, the expression of the different countenances, and the richness of the draperies, with the appropriate character of the ornaments, symbols, and accessories, leave nothing to be desired.

This window must increase considerably the fame of Messrs. Ballantine & Son, the artists.

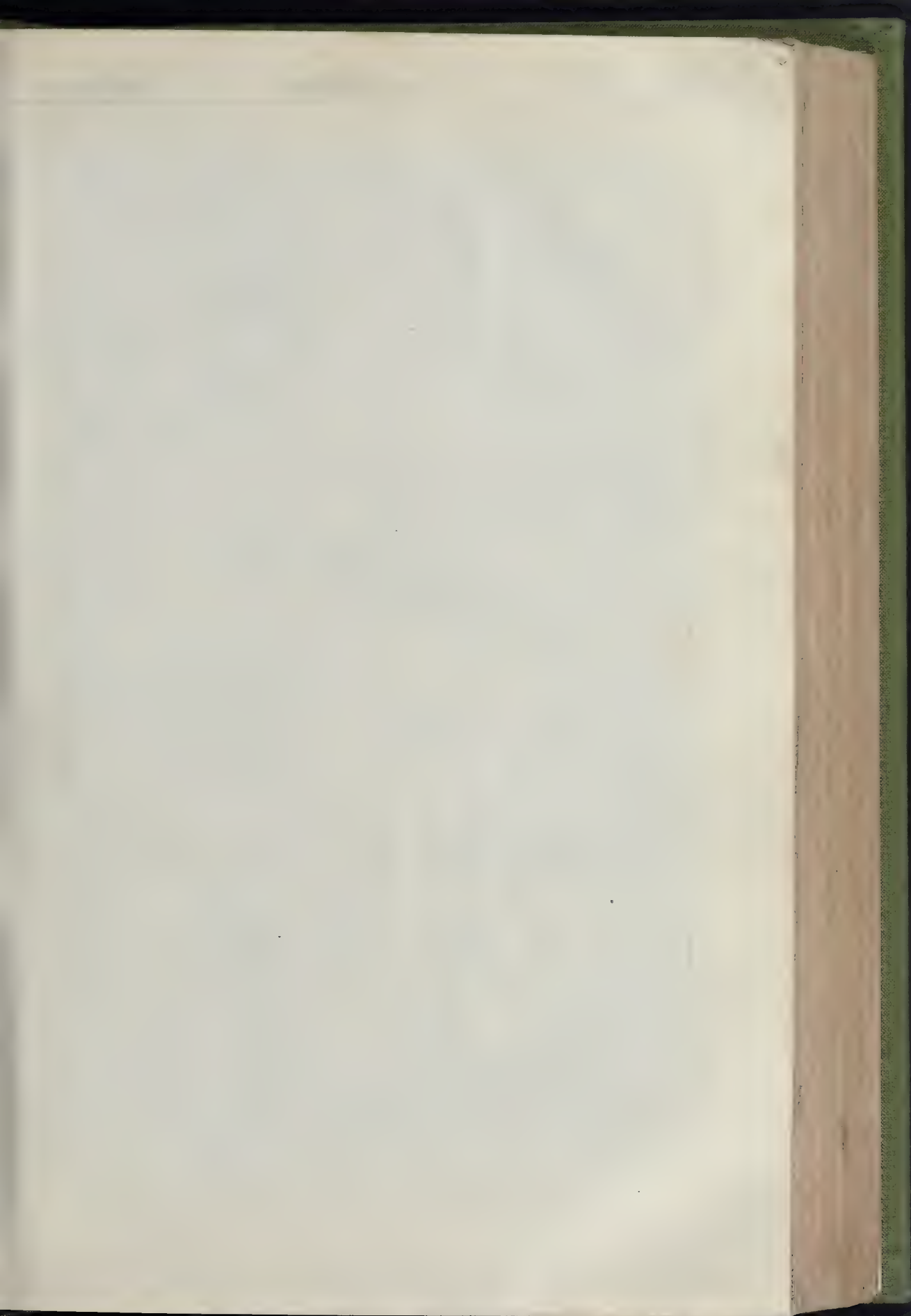
THE INTENDED CITY HALL, SAN FRANCISCO.

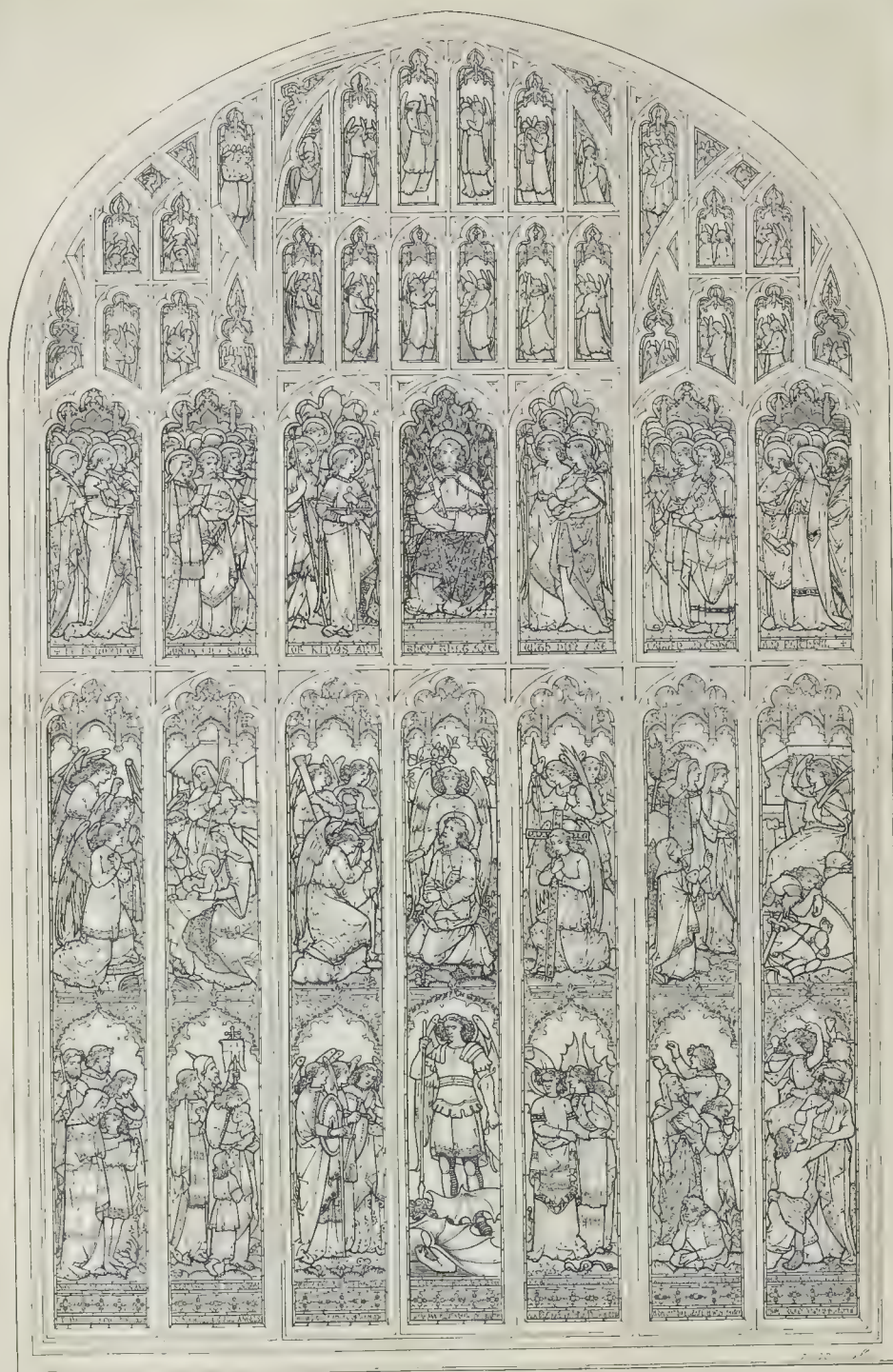
It is intended to build a new city hall in San Francisco, California, and we publish a view in our present number of the design which has been selected. The architects are Messrs. Fuller & Leaver, of New York.

The extent of the façade is 576 ft. in a straight line, facing Park Avenue, but considerably more when the angles are taken into account. The centre and main entrance is stupendous, and approached by a noble flight of steps. A row of columns supports the porch leading to the principal hall, on the right of which and part of honour are the offices of the Mayor, with the several minor rooms appertaining to them. On the opposite or left side of the entrance-hall are the various departments of the Sheriff's office, these two divisions flanking the portico. On the right of the Mayor's office, in the recess of the building, is the tax-collectors' suite of rooms, whilst the extreme right wing abutting on the lot will be devoted to the city auditor. Immediately back of these two last, fronting on McAllister-street, are the offices of the treasurer and assessor. At the extreme left wing the county clerk will have his range of offices, behind which, and fronting on Larkin-street, is the presiding justice's court, followed at the corner of Larkin and McAllister streets by the police court, in the basement of which, and extending under the justices' court, it is intended to place the city prison. The various rooms of the second story have not yet been definitely appropriated to their different purposes; but portions of the basement are assigned to the store-room of the property clerk, wardrobe chambers, other store-rooms, cells, and all the appurtenances of the chief of police. In the centre of the building is an open quadrangle, 120 ft. by 115 ft., with fountain. Corridors will run all round this opening, communicating with the various offices, and insuring the two desiderata of light and air.

A contract has been made for excavating for the foundations of the proposed building. In their advertisement for tenders the commissioners said,—"The statute provides that no Chinese or Mongolian shall be employed in doing any of the work bid or contracted for, and a failure to comply with this provision shall work a forfeiture of the contract."

Commenting upon the fact that a New York architect has won the first premium offered for the best design for this Hall, the *Overland* says:—"We have the usual protests that the prize should have been given to 'home talent.' Certainly so, if that wins in a free competition, and not otherwise. We want no more concessions to the provincial weakness which babbles about the 'favour of the soil,' and the necessity of doing something for the encouragement of local genius. If it cannot win in a hand-to-hand struggle with the best of any land, then no amount of paternal coddling and warm drinks can help it. We have some good architects—competent, we suppose, to furnish acceptable plans of public and private buildings. If the prizes had been offered for the best design for a City Hall in New York, possibly a San Francisco architect might have distanced local competitors."





GREAT EAST WINDOW, ST. MICHAEL'S AND ALL ANGELS' PARISH CHURCH
ASHTON-UNDER-LYNE.—By MESSRS. JAMES BALLANTINE & SON.



THE PROPOSED CITY HALL AND LAW COURTS, SAN FRANCISCO.—MESSRS. FULTON & LAYNE, ARCHITECTS.

CONCRETE v. BRICKWORK.

SIR,—In reply to Mr. F. F. Rowley's letter in the *Builder* of April 1st, on the question of concrete or brickwork as lining or backing for stone-faced walls, I shall be glad, with your permission, to submit an opinion. The firm for which I act as manager having executed many works in concrete, where stone and brick quoins, dressings, string-courses, &c., have been built up with the concrete, my opinion is formed with the aid of practical experience. Although I have never seen a wall built with a stone face and concrete backing, yet my opinion coincides with Mr. Rowley's in being opposed to a cement concrete backing for a stone and lime mortar-faced wall, but from very different reasons. The points on which I differ are,—1st. Concrete backing, if properly worked and care be taken that the stone with which it comes into contact is well wetted, will unite much more firmly to the stone facing than will brickwork backing. The great adhesive power of the cement will bind the two parts of the wall together better than the bond of brickwork and lime-mortar. 2nd. The cohesion of the concrete and stone would be the same in random courses as in ashlar-coursed work. 3rd. Mr. Rowley's architect is certainly correct in his opinion as to the economy and also the strength of the concrete backing. Therefore I hold that Mr. Rowley's opinions are in error respecting—1st. The walls wanting strength. 2nd. That it would be necessary to lay the stone in ashlar courses. 3rd. That the walls would not be well united.

In building a villa residence last year a number of old bricks were used as core-filling in the concrete walls: one of the inner walls having to be stopped for a large doorway, was raised to the proper height; but one of the labourers, thinking the wall was to continue, laid in old bricks (wet, of course,) on the top of the concrete, but no more concrete was added.

The bricks remained undisturbed two or three months, when it was necessary to remove them to make room for laying a floor. The architect and myself were passing as the workmen were endeavouring to knock these bricks off from the concrete; but although only in contact with one side of the bricks, such was the adhesive power of the cement that the bricks had to be broken off bit by bit, and thin pieces still remained held on by the cement.

Mr. Rowley may be right in saying, "to make a strong wall of mixed materials, the facing stone or bricks should be of the same relative weight as the inside lining and the outside." But is this condition ever fulfilled in building brick-backed stone-faced walls? And would it not be fulfilled if the backing were concrete, composed of cement and stone chippings, or cement and gravel? the weight of which would be equal to the stone face. And even if burnt clay ballast, and cement were used for the concrete, the weight would be equal to bricks (which are simply burnt clay) and mortar.

However, in my opinion, the relative weight of the material has very little influence on the matter. The real objection is, in my opinion, the difference in the liability to compression or settlement between the stone facing set in lime mortar and the concrete backing set in cement. The Portland cement sets and hardens so rapidly that there is practically no compression, whatever weight is superadded; but lime mortar sets and hardens slowly; and when ton upon ton of stones or bricks are rapidly laid on, it is evident that considerable compression must result. Hence the almost invariable vertical crack at the junction of new brick or stone walls with the old walls, in additions to old buildings. Having witnessed the results in several additional works in concrete, I have seen ample proof that there is no settlement with concrete walls.

Having now shown the weak point, I beg to suggest a remedy, or rather a choice of remedies. Probably by building up as much of the stone facing as could be safely worked at a time, and allowing it to stand some time before the concrete backing were added, and so working slowly, and giving time for setting of lime mortar, the evil pointed out might be avoided. But would it not be more satisfactory to expend a portion of the 100l. calculated to be saved by the concrete backing in Portland cement, and set the stone face in cement, instead of lime mortar? I presume, no one with any knowledge of the subject will deny the superiority of such a wall; and it would be free from the weakness of unequal settlement. By far the best remedy, however, is to build the walls entirely of concrete.

In so doing, there is no necessity whatever "to sacrifice either strength or beauty." As to strength, that would be very much increased; and as to beauty, well, that (being, to a great extent, a matter of individual taste, or individual education, or capability of appreciation) is not so easy to speak positively on. But I feel assured that either Mr. Rowley's or any other competent architect will have no difficulty in giving to a concrete stuccoed building as much beauty as we are accustomed to find in any other class of building. Now, pray, do not raise a howl *instantly* at the word stucco; because the only real objection to stucco, as ordinarily used upon brick and stone buildings will not hold good against stucco on concrete buildings. It is objected to stucco, as applied to brick or stone walls, that it is liable to peel off. The reasons of its peeling off are, first, that brick and stone walls, even when stuccoed, often absorb and retain moisture, which is acted upon by changes of temperature—especially by frost—causing a separation between the bricks or stone and the plaster; also the thin coat of stucco peels off from the rendered coat from various causes (mostly due to bad workmanship and bad materials). Now stucco on concrete having none of these difficulties to contend against, does not peel off. The concrete wall does not absorb moisture, gives a very much better key to plaster on than brick or stone, and requires no rendered coat to take the stucco. Another reason often advanced against stucco on brick is that it is a sham, making buildings appear to be something which they are not. I know there are two opinions on this point; but as the natural and proper finish for a Portland cement concrete wall is Portland cement stucco, there ought to be only one opinion, viz.,—that the "sham" objection does not apply against stucco on a Portland cement concrete wall. May I mention, in conclusion, that some of our best architects are now employing brick and stone for ornamenting concrete walls. We are now building concrete walls for large extensions of Marlborough College. Brick bands, string courses, &c., are being built into the concrete. Mr. G. E. Street is the architect. We are also building concrete walls for a new mansion for Sir H. Selwyn Ebbatson, M.P., Mr. F. P. Cockerell being the architect, and in this case a large quantity of brick and ornamental stonework is being built into the walls.

C. DRAKE.

ENGLISH BELLS AND BELFRIES, AND BELGIAN CARILLONS.

THAT our architects should design larger and more suitable towers for the reception of peals of bells, the writer of these lines has often said. He has also stated over and over again, in the *Builder*, that very many of the single bells in use for calling the people to prayers in our metropolitan churches, are truly disgraceful. And as musical bells could be substituted for these noisy "corrupters of the public ear" for a mere trifle, all such offensive things ought to be broken to pieces and cast into the furnace.

I have asserted, too, that we find discordant and offensive church bells in many country towns and villages. But that all our English bells deserve the extremely censorious remarks of a clever writer—the Rev. H. R. Haweis,—in the last number (April) of the *Contemporary Review*, I deny.

In the article alluded to, the author takes occasion to say,—“Let us supply some simple machinery for the common ringing of the bells.” He also boldly asserts:—“There is no reason whatever why, with a better tolling mechanism, one man might not ring half a dozen bells, instead of, as at present, half a dozen men being often set to ring a single big bell.”

Now, the term *ringing*, when used with reference to church-bells, always implies *swinging to and fro*. It will, therefore, be found impossible to construct a machine that can ring any number of church-bells with precision, and bring out the proper tone.

As to “better tolling mechanism,” I will only say that should Mr. Haweis ever become practically acquainted with bells in general and their gear, he will certainly abandon his present opinion on the subject, and never again intimate that one man might ring half a dozen bells.

A word now on “Carillons aux claviers et aux tambours,” or, in plain English, musical chimes played by a barrel, and played from a key-board.

“Belgium,” said a writer in 1862, “is the

classical land of bells and chimes. In no part of Europe have they thought of poetising the striking of the hours, and of offering as we do, to the populace a brilliant and aerial music which, both night and day, soothes them by its sweet melodies and harmonious concord. All our towns possess musical mechanism for announcing the hours.”

“Although the chime-bells are left free for a performer (*carillonneur*) to play tunes on them according to his fancy, yet they play automatically a different air every quarter of an hour. The half-quarters even are indicated, either by a melodious roulade or by a succession of brief modulations.”

In 1837 Victor Hugo was lodging at Mechlin, and during the night he found it impossible to sleep. The music of the tower of St. Rombaud caused him a most agreeable, though a most extraordinary, sensation. Tired of vainly invoking sleep, it is said that he rose, and with the diamond of his ring inscribed certain lines on the window of the bedroom of his hotel, a few passages from which have been thus rendered:—

“How I love to hear the chimes in thy ancient city, Oh, veritable country, guardian of thy domestic manners . . . Chimes, you are the wild and wandering spirit of the hours, which fancy pictures to itself in the costume of a Spanish dancer; an apparition dashing suddenly upon us as though the gates of light flew open at her approach. . . . Now like a joyous bird flitting from spray to spray, now quivering like an arrow on reaching the target.” . . .

“By invisible crystalline steps she descends, And sweetly with melody harmony blends.”

I may here state that having examined the bells and machinery of the finest Belgian carillons now in existence, I gave a descriptive account of them some years ago; and subsequently quoted Dr. Burney's account of the wonderful performances of M. Pothoff upon *le carillon à clavier* at Amsterdam, on which I made some remarks.

But in the opinion of certain writers, Matthias van den Gheyn, of Louvain, who died in 1785, was the greatest organist and *carillonneur* Belgium has ever produced. He played fantasias, fugues, &c., the difficulties of which probably no other person could have conquered. Here is a story of one of his performances:—“A wager was decided at Louvain. A violinist of great talent boasted that he alone could execute certain passages on the violin. The *carillonneur* proposed a trial, and undertook to play on the bells all the passages that the other would perform upon his instrument. The proposal was accepted, an honorary jury was appointed, and the *carillonneur* gained the wager in the most brilliant manner.”

Now this may amuse those who believe everything they see in print. But, as an amateur musician, knowing the characteristics and capabilities of both instruments, I do not hesitate to say that however astonishing the performances of Van den Gheyn may have been, the story in question is nonsense. It is about as absurd as to say that the most difficult passages written for a violin were executed upon a dulcimer.

Respecting periodical chimes worked by a cylinder, I suggested long ago that it appeared very desirable to introduce improved machinery equal to that of the carillons in Belgium, in many of our large church towers, and in certain other lofty structures, to play appropriate melodies upon the ordinary peals of eight, ten, or twelve bells; and if in any case the number of bells could be augmented to fifteen or more, so much the better. Certain instruments in Belgium have from 40 to 48 bells, tuned to the chromatic scale.

But the writer in the *Contemporary Review* intimates that certain eminent horologists in England have invented carillon machinery which he prefers to any other.

Now, those well-known and respectable mechanicians require no extravagant puffs. I will, therefore, merely repeat the substance of what I said in the *Builder* some years ago:—If any of our skilful countrymen can construct a carillon machine superior to the finest in Belgium, when such a machine is playing upon a proper set of bells, may I be there to see and hear.

THOMAS WALESEY.

Leeds Bridge.—The committee of the council having charge of the arrangements for the reconstruction of the Leeds Bridge have recommended the council to accept the tender of Mr. David Nicholls, to execute the work for the sum of 15,319l. 6s. The engineer is Mr. T. Dyne Steel, C.E., Newport, Monmouthshire, to whom the second prize in the competition was awarded.

MODERN PAINTED WINDOWS.

SIR,—In several Surrey churches which have come under my observation, there have been recently placed stained-glass windows, most of them in memory of individuals for whom great regard is felt; and, as tributes to them, affectionately dedicated by sorrowing relatives, they awaken the tenderest feelings of respect, and receive due honour and admiration. But intrinsically, and for themselves as works of Art, they suggest questions to one but little acquainted with rules and technicalities, which I should like to have answered; and perhaps others who may have felt the same difficulties may not be uninterested in the subject. The windows to which I refer have been furnished by the best makers; the colouring is rich, and sometimes harmonious, and some of the faces beautiful; but the forms are too often such as to suggest painful feelings to those who would shrink from the bare possibility of a ludicrous thought thrusting itself into their minds, when called to the contemplation of these representations in such a place. On making remarks of this kind to those whom I considered able to give me a sufficient reason, I was told that they followed the ancient style, to which I was evidently expected to bow my head in meekness. I did so at the time. But since then the doubts have again and again recurred to which I now venture to give expression,—ought the defects as well as the merits of the ancient masters to be copied? Granted that they are good teachers in most things, need we blindly follow their ignorance as well as their wisdom?—or, this last being unattainable, is it well to follow their mistakes because these are within reach? Must the conventional treatment be followed persistently, even when it causes a smile? Does the plea of Mediaevalism sanction dislocated necks, feet that neither walk nor stand, hands that cannot hold, a Holy Babe utterly without resemblance to a living human child? and, to crown all, these shortcomings are usually most prominent in that sacred figure to which our eyes should be lifted in humbleness of spirit, and with mingled feelings of love, awe, and reverence? These are, sir, questions which trouble the mind of an ignorant lover of the holy and the beautiful.

CHEAP FARES.

SIR,—It is astonishing to see the reluctance of railway companies and others in introducing cheap fares, when almost every case of such reduction has been attended with success to both sides. A tramway conductor told me the other day that he took about four shillings more during the hour and a half or so that the 1d. fares were charged than in any other part of the day.

Now, I think it would be a great boon to travellers, and certainly a gain to railway companies, to include a third-class carriage or fare in every train.

T. H.

THE PAISLEY FREE LIBRARY AND MUSEUM.

It may be remembered that recently Sir Peter Coats presented the town of Paisley with the above gift of buildings. The inauguration ceremony took place last week, in the presence of a very large assemblage of persons, the invitations alone amounting to nearly 700. The Reference Library and Museum formerly belonged to the Philosophical Institution, and that body received and expended in getting it together upwards of 1,600*l*. The library contained about 5,000 volumes, and, in addition, there was a lending library containing 9,000 volumes. The museum is somewhat extensive in character, and contains a variety of specimens in the several departments of geology, ornithology, botany, entomology, manufactures, &c. The old Philosophical Institute was founded in 1808, but after meeting with many ups and downs, and struggling hard, was obliged to succumb at last. A resuscitation in its existence took place in 1857, and from that period it had made fresh progress, and increased until the building it occupied became too small for the different pursuits it embodied. The ultimate fate that probably awaited the society by lack of means, was happily removed by a pleasing concurrence of circumstances. First Sir Peter Coats provided a new building, and the townspeople imposed a tax upon themselves, and the result is, now, that Paisley can boast, like its bigger neighbour,

Glasgow, of a Free Reference Library and Museum. In the formal handing over of the building to the town council, the Rev. Mr. Fraser, the President of the Philosophical Society, gave a short history of the labours in the past that led to the present event.

ARABIC NUMERALS ON WELLS CATHEDRAL.

MR. EDMUND B. FERREY writes,—"As it might be thought from the paragraph in last week's *Builder*, that the discovery of the Arabic numerals in the west front of Wells Cathedral had been quite recently made, I may state that my father found them out about a year ago, very soon after the scaffolding was erected. In the paper read by him before the Institute of Architects last November 21st, the fact was thus alluded to:—"Curiously enough, also, each group (i.e. of the tier of sculpture representing the Last Resurrection), has an inscribed number, still distinctly visible, showing the order in which they were to be placed to the south of the facade."

Mr. Ferrey, however, did not happen to say these were Arabic numerals, or to point to the very interesting inquiry they raised. If contemporary with the execution of the statues, they serve to prove one of two things,—either these figures are not so ancient as they are believed to be, or Arabic numerals were in common use in this country very much earlier than we have been led to believe.

WESTGATE-ON-SEA.

THE Westgate Station on the Chatham and Dover Railway has been opened for traffic. We have already spoken of this new and promising suburb of Margate,—Westgate-on-Sea. The station is capable of receiving the longest trains, as nearly all, both up and down, will stop there; and ample space has been secured to increase the station in dimensions if requisite. The building estate, as at present laid out, comprises altogether about a mile and a half of sea frontage, of which one-half is already laid out for building. The roads, absorbing at least 10 acres of land, are spacious, with footpaths 8 ft. wide in addition, so that any part of the estate can be built upon, with finished and handsome approaches to it. Drainage has been constructed; 10 acres of land have been devoted to promenades; and 8 acres to open squares and gardens. Two sea-walls,—together little less than half a mile in length,—have been constructed round the two pretty bays, with promenades 20 ft. wide surmounting them. Independently of the sea frontage, there is a large extent of land skirting it, on the south side and adjoining the high road—some portions close to the station—which may be acquired by parties desiring to build villas with grounds attached. There is in contemplation the erection of a first-class hotel on the promontory fronting the east side of Westgate Bay—probably one of the finest sites on the coast. Gas and water works are also arranged for. The water is of the best quality, and at present is got from deep wells in the chalk.

ON BOILED OIL AND VARNISHES.

A PAPER has been read by Mr. C. W. Vincent, at the Society of Arts, on this subject. Mr. Vincent explained that there are secrets in the processes whereby oils and varnishes are prepared; and, indeed, he himself uses a process in which there seems to be some secrecy. He steered clear of his secrets, of course; but nevertheless gave an interesting account of the processes whereby linseed oil and varnishes are prepared. His process of linseed oil boiling is by steam. He must use, of course, either driers or the bases of driers.

"Where the steam process is used [he said] the oil never reaches a sufficiently high temperature to produce carbonisation. By judiciously mixing one of the substances acting catalytically [probably by taking more oxygen from the air after banding over what it has, or some of what it has; and of again and again so handing it over, after absorbing it], and a lead salt, a drier is obtained, by altering the relative proportions of which the boiler is enabled to produce any required shade of colour. The larger the quantity of litharge, the darker the colour of the boiled oil. A lesser proportion of

litharge, accompanied by a greater quantity of the catalytic drier, gives as the product an oil which will dry in the same time, and has less colour. These are the principles of oil-boiling by steam."

Varnishes, Mr. Vincent explained, are generally made by combining gum resins (and of late "kauri," a New Zealand gum, has been in use) with boiled linseed oil, the composition being afterwards thinned by turpentine, with no advantage to the varnish.

We would recommend experiments with the beautiful white oxide of antimony, or antimonious acid, in the preparation of linseed oil, especially by the steam process; and may remark that we have found certain varnishes, used, instead of oil, with white-lead, preserve the whiteness of the lead for several years, in a remarkable way, as well as give a beautiful enamel-like surface to the paint. The "painters' desideratum," no doubt, acts in this manner, as well as by being a rapid drier.

COVENT GARDEN MARKET.

SIR,—At last the Duke of Bedford has made up his mind to repair the above-named market, which has long been in a disgraceful state. I wish, through your valuable paper, to suggest to the Duke, or to his advisers, that they should remove the ugly iron roof at the western end of the market, and substitute a light iron and glass one, which would not only improve the appearance of the market, but it would be a great boon to the standholders, and also to the public who patronise them, for as the roof stands at present the covered way is miserably dark.

And while the repairs are about, I think it would be an improvement to renovate the beadles. Their clothes are a disgrace to Beadledom. Now this is a pity, for the beadles, physically speaking, are fine men, and are no doubt a credit to the cloth they get so little of.

A BUILDER.

BIRMINGHAM MUNICIPAL BUILDINGS COMPETITION.

THE Corporation, we believe, have not yet made the final selection. The following are the mottoes of the designs recommended by Mr. Waterhouse:—First, "No motto;" second, "Perseverantia;" third, "Forum;" fourth, "In uno;" and, fifth, "Desideratum."

A competitor has, we understand, entered a protest against the referee's decision, on the ground that most of the competitors selected by him have ignored the committee's instructions, especially as regards the site.

A PUBLIC HOUSE WITHOUT THE DRINK.

SIR,—To follow up the proposals of Mr. Holland that the *Elevation of the Workman* is a fit object for the consideration of the gentleman who desires to devote a large sum for the public good, I would quote the following lines from *Notes and Queries* for April 15th, 1871, p. 320, under the heading "Signboards."

"A public house without the drink,
Where men may read, and smoke, and think,
Thou' other home return;
A stepping-stone this house you'll find,
Come, leave your rum and beer behind,
And truer pleasures find."

The above is from a signboard of one of several houses established, with some success, in Liverpool, with the very object, apparently, that Mr. Holland advocates.

J. P. S.

ARCHITECTS' CHARGES.

SIR,—Some attention has recently been attracted to cases of dispute to which the present scale of the Institute cannot be satisfactorily applied. Doctors differ, and so do architects, and lawyers step in between to decide. Result: worry, harass, delay, tribulation, and cost, added to loss of time. Now, this ought not to be. The scale should be clear and distinct, which it is not; and, moreover, it should be binding on all legitimate practitioners.

I have attempted, with the aid of hints and correspondence, which appeared in your columns some time since, to amend and extend the existing scale, and herewith give you the result.

Those who desire to use the document are welcome to it, and can have any number of copies, at their own expense, by applying to Mr. Young, printer, 24, Great South-street, Westminster.

At first sight it does not seem to us desirable to publish the scale in question, which, by the way, is sufficiently stringent to frighten away, we should think, the majority of would-be employers. The way to make the

Institute scale respected and recognised out of doors as binding is surely not for architects individually to set up scales of their own, and so show that it is not considered binding in the profession. If it be erroneous or incomplete, by all means rectify it: the course is open; but days that tend to render it valueless in the eyes of the public are suicidal.

"CONTRACTS."

I WANT an opinion in the following matter. I am now doing some work under an architect and surveyor, who specifies a certain price prime cost per piece for paper in the contract, and claims (now he is to choose the pattern) my trade discount (which I, in pricing my estimate, took off to arrive at prime cost) off for prime cost specified; that is to say, if a paper is marked 2s., he expects this for specified at 1s. 6d. Is this fair or to be substantiated? I never heard of it being done before.

A BUILDER.

ARCHITECTURAL EXHIBITION.

SIR,—As Her Majesty's Commissioners for this year's Exhibition have refused numbers of architectural drawings from want of space, I would venture to suggest, through your paper, that the South Kensington Museum might take advantage of the opportunity afforded to form an Architectural Gallery, by obtaining a selection from the best of such rejected drawings, which I have little doubt would be willingly lent by the owners for the occasion, and the same would lead to the pleasure and education of many.

RESPECTED ONE.

SOCIETY OF BIBLICAL ARCHAEOLOGY.

At a meeting on the 4th of April, Dr. S. Birch, president, in the chair, the secretary read a paper communicated by Mr. Henry Fox Talbot, F.R.S., "On an Eclipse mentioned upon an Assyrian Tablet."

The tablet in question is preserved in the British Museum, and is marked 154 and 1226. The translation runs thus:—"To the King of the World, my Lord. Thy servant Kikurnu sends this. May Assur, the Sun, and Marduk be propitious to my lord the king in his journey from his kingdom to the land of Egypt. I inform his Majesty that in the month of Su there was an eclipse. Five portions of the full orb were obscured. Let the king be of tranquil mind, since the eclipse of the month of Su portends good fortune to the king." The translator proceeded to identify the eclipse thus accorded with one which took place in the seventh warlike expedition of Assur Banipal against Tiumman, king of Elam.

A lengthened discussion ensued, in which the chairman, the master of the Charterhouse, and Messrs. Boyle, W. R. Cooper, Call, Draoh, Gorman, Rassam, and G. Smith, took part.

CHURCH-BUILDING NEWS.

Oxford.—The renovation of the interior of St. Clement's Church is now all but completed, and a new effect has been produced by the substitution of low open woodwork seating instead of the old high-backed pews. Altogether there are 102 benches erected, capable of affording 680 sittings. The design of these is in keeping with the architecture of the church, the ends being carved in Norman style, and supporting a low door. The whole of this part of the woodwork is of pitch pine, and it is intended to give all a coat of varnish. The chancel is confined within a low wall of Bath stone, dressed, and within the choir seats are of open oak work, the lectern being also of the same wood. The vestry has been removed from the eastern to the western end of the church, and as the room is now under the gallery, greater space is afforded in the body of the edifice. The whole of the church has been refloored with pressed Staffordshire tiles in place of the old stone flooring, and within the choir polished tiles have been laid. These tiles are from the establishment of Messrs. Maw, of Broseley, in Shropshire, and are raised above the height of the nave. Hot air is supplied from two stoves, and, by means of simple piping, is carried round the whole building. The new pulpit-base is formed of Bath stone, ornamented with three clustered columns of Devonshire marble. Above these is the podium, on the summit being an open pulpit formed of polished ebony, rosewood, and walnut columns, with carved oak capitals, interlaced with Norman moulded arches, carrying a broad oak top, with brackets and book-board. The whole of the works have been carried out by Messrs. Honour & Castle, of Oxford, at a total cost of about 1,100l.

Laver Marney.—The chancel and east end of the north aisle of the church of Laver Marney have undergone a restoration, and the church has been re-opened for divine service. The east

window has been entirely restored and filled with stained glass, as also one of the windows on the south side, from the studio of Mr. De Morgan (a son of the late celebrated Professor of Mathematics); and it is hoped others will soon be filled with glass of a corresponding character. It is simple in its style and tone of colouring, says a contemporary, describing it; and, while avoiding the vulgar kaleidoscope glitter of ordinary modern stained glass, is full of artistic work and good drawing, and combines novelty of treatment with truth to the old style. The south window represents David the type of the Good Shepherd,—as Prophet, Priest, and King; while a Jesse tree below refers to the "root and offspring of David." The subjects of the east window are chiefly emblems and ornaments. A carved rearedos, partly gilt, occupies the east wall beneath the window, together with some wall lining of encaustic tiles; and there is a credence-table on the north side corresponding to the piscina on the south, which was found plastered up in the wall. The side paving of the platform and space within the communion-rail is of rich design; that of the chancel of plainer character,—still plainer in the nave; but in the north aisle rather richer in design. The stalls and benches are of oak, carved, as is also the communion-rail. The pulpit is of a later character than the screen or the rest of the building. The whole of these works have been designed by the architect, Mr. C. F. Hayward, of London, who some time ago described the Laver Marney tower to a meeting of the Essex Archaeological Society. The works generally have been executed by Mr. Grimes, of Colchester, assisted by Mr. Polley, of Coggeshall, for the carved woodwork. Mr. Thomas Earp, of Lambeth, has carried out the rearedos. It should be noted that remains of original colour decoration were discovered on the chancel screen; but these, unfortunately, were not reproduced in the new work, though a little more colour is wanted on the walls and roofs, to harmonise with the stained glass and the ideas of good ancient architectural decoration; but in these days such work is often misunderstood, and some even prefer whitewash to any other wash of colour in such a building, while not objecting to any amount of colour in their own dwellings, and never satisfied unless a stained-glass window is full of all the colours of the rainbow. It is to be hoped we may have soon to record that the dilapidations of the nave are as things of the past, and that there are no more unsightly or dangerous cracks and rents in the roofs and walls. The parishioners ought to follow the lead of their rector, to whom they are indebted for the present restorations. The total cost of restoring the chancel is estimated at 1,200l., and of this sum about 350l. remain to be raised.

Reading.—It has been resolved to restore St. Giles's Church, at Reading, from plans prepared by Mr. St. Aubyn, architect.

Gloucester.—The restoration and decoration of St. Philip's Chapel, in Gloucester Cathedral, in memory of Sir C. Codrington, bart., M.P., the late representative for East Gloucestershire, has been completed.

Kirby Underdale.—After being closed exactly a year, the ancient church of All Saints, at Kirby-Underdale, on the western foot of the wolds of East Yorkshire, has been re-opened for divine service. The church has undergone restoration by Mr. W. G. Street, of London, who has preserved the features of interest to the archaeologist, ecclesiologist, or the architect. The work led to the discovery of the plinth and foundation of the first church, which has apparently consisted of nave and apsidal chancel. In the excavations for the new chancel, near the apse, a coin of Canute was found, and also a very fine and large flint arrow-head (at a depth of 9 ft.), of the now well-known Danish type. Hanse Town Settlement coins were also found. In the exterior, the restored church shows Early Norman and Transition work, the west face of the tower having a Roman doorway and window over, and the herring-bone masonry. Internally, the plan is a nave, with north and south aisles, a baptistery under the tower, and a chancel. Lord Halifax bears the main cost of the restoration, except that the Early English chancel is new, and is built entirely at the cost of the rector, the Rev. T. J. Morson. The chancel has an east window of three lights, filled with stained glass; a north window, of one light, and a recess for the organ; and in the south wall a piscina and credence, sedilia, surmounted by a two-light window, and another window of two lights. The east window is by Hardman, and is given by the

Hon. C. Wood. The base of the window is carried down to the cornice of the low rearedos, forming a super-altar. The rearedos is of serpentine, with marble styles, and at each side filled in with Milton's tiles. The table is of oak. The steps of the sanctuary are of Derbyshire marble, and the spaces are paved with Milton's tiles. The whole is the gift of the Hon. Stephen Lawley. The chancel-seats, desk, and lectern are of oak, with carved finials, and the chancel is lighted by a corona, presented by the servants at the rectory. The organ, by Holditch, is presented by friends of the Hon. Mrs. Monson. The nave and aisles are fitted with plain oak stalls. The north aisle has two three-light windows, and a one-light window at the east end, the north door being walled up. The south aisle has an eastern two-light window, and a southern three-light, with porch. The baptistery in the tower has a new font of Caen stone and Irish marble, presented by Archdeacon Long. Above is a new belfry, and bell, of deep tone, replacing two old seventeenth-century bells. The church will be lighted by six coronas in all. The church is heated by hot air, on Porritt's principle. Messrs. Bellerby & Bailey, of York, have been the contractors, and Mr. Jordan clerk of the works.

Berkhamstead.—Berkhamstead Church, a beautiful relic of early architecture, has been reopened after a restoration by Mr. W. Butterfield, the well-known ecclesiastical architect. This church is of various dates of architecture, from the twelfth to the sixteenth centuries, and is of fine proportions.

Shrewsbury.—The chancel of St. Mary's Church has been re-opened, after a restoration. The work, commencing with 1858, in the entire re-building of the east window and north-east angle of the chancel, has been followed in 1869 by the reconstruction of the roof, the repair and renovation of the masonry, and the introduction of arcades to the sacristy. The north chapel of St. Catherine has been restored; and lately (1870-71) the great southern chapel of the Holy Trinity has been cleaned, repaired, and re-roofed. The great east window of the chancel, 42 ft. high by 22 ft. wide, came down to our time as rather a rude attempt at a Perpendicular window,—in some measure no doubt a copy of the fifteenth-century work, which it replaced, but most noted for its glass, a very beautiful and valuable "Jesse" of the fifteenth century. The stonework being decayed, the whole had to be taken down and rebuilt in 1858. The triplet of the north-east bay—a relic of the twelfth century—has been under-built, repaired, and the freestone shafts substituted by Purbeck marble. The roof framing of the chancel is entirely of oak, and covered with lead, and is moulded in rectangular compartments. The intersections and cornice have carvings in clear relief, brought out with gold. Mr. Cross in 1868 rebuilt the east window. Mr. Treasuro did the work of restoration, including the roof of the chancel, in 1869; and Mr. Cross has brought the restoration of the Drapers' Chapel down to this year. The stained glass artists have been the late Messrs. David Evans & Son and Messrs. Done & Davies. Mr. Landucci has executed the sculpture, and Mr. Sheppard the painter's work. The whole work of restoration has been designed by and under the control of Mr. Pountney Smith.

Harrogate.—The recently-erected church of All Saints, at Harlow-hill, Harrogate, has been opened for divine service. The architects were Messrs. Shutt & Thompson, Harrogate and Leeds. The building itself is unostentatious, and designed in the Continental style of Gothic architecture. The tower is surmounted by a spire, which is a landmark for a large distance round. The church will hold about 230 or 240 persons.

Linton-on-Ouse.—A building adapted to the double purpose of a church and school has been erected here. The structure has been opened. The edifice on weekdays will be used as a school, and on Sundays it will serve as an Episcopal chapel. The style of architecture is modern Gothic, and the material employed for the exterior of the building is red brick with black bands, whilst the interior is faced with white bricks and red bands. The structure consists of a nave, 40 ft. in length by 21 ft. 6 in. in breadth, with a chancel, apsidal in character, measuring 18 ft. by 21 ft. 6 in. The nave will be used as the school, and on weekdays a curtain will be drawn to separate it from the chancel. The division between the nave and the chancel is marked by having the two principals so arranged as to form an arch, above which is a small

bell-turret, surmounted by a *flèche*, or what may be termed a spirelet. The extreme exterior length of the structure is 63 ft. by 25 ft. in breadth, and the height of the building from the floor to the centre of the roof is 30 ft. The roof is open-timbered and plastered between the rafters, the whole being covered in with slates, the ridge being provided with ornamental red tiles. The floor of the nave is boarded, except the part which forms the aisle, and that is of stone. The chancel floor is laid with coloured tiles. The windows have stone sills, and the slopes of the buttresses are also of stone. The chancel has five single-light gable windows, and the nave has on each side two-light windows, and the nave has a quatrefoil window, above which is a circular window composed of a series of trefoils, with a quatrefoil in the centre. Cathedral glass has been used in the filling in of the windows, which have coloured margins, except the centre window of the chancel, which is of stained glass, by Mr. Knowles. The subject is Christ in the Temple, "sitting in the midst of the doctors, both hearing them and asking them questions." This window has been presented by the tenants at Linton occupying their farms under the Oxford University College. Under this window there is a small tiled reredos, also by Mr. Knowles. The chancel is fitted up with stalls, and the nave is provided with Sidebotham's reversible school-desks for weekdays, which can be altered so as to make seats for the congregation on Sundays. The building is capable of accommodating 200 boys and girls at school, and 150 persons can be seated on the Sunday. There is a hot-air apparatus underneath the floor, and the warmth is diffused in passing through iron gratings running along the nave aisle. On the south side of the nave is erected the house of the schoolmaster, which communicates with the chapel by the porch. The entire work, including the school-chapel and master's house, has cost £3,000, or thereabouts. The York tradesmen employed were, — For stone and brickwork, Messrs. Bowman & Co.; joiners and carpenters, Messrs. Harrison; glazing, Mr. Yarker; staining, Mr. Pearson.

Books Received.

Fragments of Science for Unscientific People.
By JOHN TYNDALL, LL.D., F.R.S. London:
Longmans, Green, & Co. 1871.

THIS new work of Professor Tyndall's is a series of detached essays, lectures, and reviews, not quite new except in the form of a collected volume. It contains the papers on Dust and Disease, and various others, such as an essay on the Constitution of Nature, from the *Fortnightly Review*; Thoughts on Prayer and Natural Law, an extract from *Mountainering* in 1861; on Miracles, and Special Providences, a review from the *Fortnightly*; on Matter and Force, a lecture at Dundee in 1867; an address on the Scope and Limit of Scientific Materialism in 1868; one on the Scientific Use of the Imagination, delivered before the British Association at Liverpool; a "Rede" lecture on Radiation; a discourse on Radiant Heat; one on Chemical Rays and the Light of the Sky; one on Faraday; a lecture on Magnetism; and others, including some shorter articles on Slates, Miracles, Science, and Spirits, &c.

Mr. Tyndall's writings, while full of scientific interest, are often rhetorical and poetical; and the delusive "Spirits" of whom he speaks do not seem to have been far wrong, in one thing at least, — namely, in styling him "the poet of science," which they declared to be already his name in "the other world."

VARIORUM.

"THE Report of Works executed by the City Sewers Commission, during 1870, presented by Mr. W. Haywood, Engineer and Surveyor to the Commission," has been issued in a printed form. From this report it appears that the asphalted streets form a satisfactory improvement. [Mr. J. T. Bedford, a member of the Streets Committee, has just mentioned, at the City Sewers Court, that the asphalted paving in Cheapside has been subjected to a severe test, which it stood in a most satisfactory manner. A wagon conveying a large granite block, the weight of

which, including the vehicle, was 23 tons, passed over the asphalt without making any abrasion, or causing it the slightest injury.] The police are under the impression that fewer horses fall, and are certain that no more fall than upon granite. The secretary to the London General Omnibus Company, after taking the opinions of the drivers of the company, and considering the actual facts which had come under his observation, stated that no more horses fell in Cheapside and the Poultry than fell when there was granite pavement, and he was moreover of opinion that in very dry and cold weather the pavement would be less slippery than granite pavement. The superintendent of street cleansing, and the district inspector of pavements, were of opinion that upon the average fewer horses fell than upon the granite pavement. It has been decided to pave the carriage-way of Old and New Broad-street with Val-de-Travers compressed asphalt. The gas and water companies have since been relaying their pipes, and the paving work has only just been commenced. Various other street improvements have been executed during the year. The fronts of the houses, Nos. 87 to 91, and 93, Fenchurch-street, 71, Leadenhall-street, 35 to 40, Milton-street, and the angle of the house at the south-west corner of Wood-street and Gresham-street, were set back, and part of the site of the late hall of the Coopers' Company in Basinghall-street, was thrown into the public way. The covered way of Fleur-de-lis-court, Houndsditch, was widened from 3 ft. 4 in. to 9 ft., and was made open to the sky. The south-west corner of Union-street, Blackfriars, was rounded. Arrangements have been made for widening Basinghall-street, in front of the new Guildhall Library; the houses Nos. 69 and 71, Ludgate-hill and 78, Queen-street, and the property at the south-west corner of Swan-street, Minories, were purchased with a view to widening the respective thoroughfares. It having been resolved to take down one side of Reynoldscourt, Moor-lane, and to make that thoroughfare sufficiently wide for carriage traffic, notices were served and purchases made. Notices were served for acquiring properties Nos. 39, 40, 41, and 42, Poultry; Nos. 1 and 2, Old Jewry; and Nos. 79, 80, and 81, Queen-street. Negotiations were opened for widening the public ways on the northern and western sides of St. Paul's Cathedral, for setting back the front of the Church of Allhallows, Upper Thames-street, the front of the Corn Exchange in Mark-lane, and the houses at the southern end of the Old Bailey, next to Ludgate-hill. Arrangements were made for widening Upper Thames-street for a considerable length, near to its junction with Queen Victoria-street, and for widening Lower Thames-street, on its northern side next to Water-lane. Arrangements were made with the authorities for rectifying the lines of frontage of the new Post-office, now building on the western side of St. Martin's-ls-Grand, by which the front of that building will be parallel to the front of the present post-office, for altering the frontages of Bath-street at its southern end, so as to make it wide enough for two carriages, and opening its northern end. — "Our Meat Supply from Abroad. By T. J. Hutchinson, F.R.G.I., &c. Liverpool: Marples, Lord-street." This is a reprint of a paper read before the Liverpool Literary and Philosophical Society in January last. Its object is to advocate the use of bluishpate of lime, in preserving colonial or foreign meat for the British market, as a solution of the problem.

Miscellaneous.

Water abstracted from Definite Channels. — Though there is no remedy for the injury caused by sewers tapping underground springs, the Court of Chancery will interfere where it is shown that water is abstracted from definite channels flowing above ground. This was the decision of the Lord Chancellor, in the case of the Grand Junction Canal v. Shugar. The canal, it appeared, was supplied from a pond fed by springs, and by streams flowing into it. A local Board constructed a sewer with a branch running parallel to one of the streams and under the pond. The sewers tapped the springs so that the pond would no longer hold water, and affected the stream so that a great part of its water was absorbed. The Lord Chancellor held that the latter injury was a ground for the Court's interference by injunction.

A Monument to "Caledfryn." — Groeswen, near Caerphilly, Monmouthshire, was the scene of considerable excitement on Good Friday, consequent upon the unveiling of a monument erected to the memory of one of the most eminent Welsh bards, — "Caledfryn," or the Rev. Mr. Williams, for many years minister of the Welsh Independent Church at Groeswen. Mr. A. H. James, of Newport, was the sculptor employed. Upwards of 1661 were received, chiefly in small contributions, and the result has been a monument, the cost of which is represented by the above amount. The monument has been erected in the cemetery adjoining the chapel where "Caledfryn" laboured. The monument proper is constructed of Peterhead granite, polished, and it is of Grecian design. The base is formed of blocks of granite, measuring 5 ft. by 3 in. and 15 in. deep. On this stands a second block, which bears on one side the inscription: — "Caledfryn, Ganwyd Chwefror 6fed, 1801; Bu Farw, Mawrth 23ain, 1869." On this stands the surbase of polished granite, in which is inlaid a bronzed medallion of the bard. This is surmounted by a polished granite capital. The whole stands on a base of Radyr granite, worked, and measuring 8 ft. by 7 ft. It is surrounded by ornamental pillars and railings, executed by the Coalbrookdale Company from the design of Mr. James. The monument stands a little over 10 ft. high.

Miss Burdett Coutts's Memorial of Bishop Waldegrave. — A monumental brass, to the memory of the late Bishop Waldegrave, has been erected in St. Stephen's Church, Carlisle, by Miss Burdett Coutts, with an inscription, including an extract from the bishop's will. The memorial is of oblong form; at the ends are figure subjects symbolizing the resurrection and the victory of the redeemed; these are surmounted by lilies of the valley, arranged to form *fleurs-de-lis*, as suggestive of affection and purity. Below these figures are quatrefoils displaying the monogram of the bishop, with inter-lacements of trefoils, the colour of each arranged to form a cross. At the bottom, the border exhibits the emblems of the Evangelists SS. Matthew and John. The three compartments of the upper border are foliated; at their junctions are the emblems of the Evangelists SS. Mark and Luke, surmounted by tabernacle work. The crowning ornament of the memorial is the cross. A highly-polished grey fossil marble forms the ground or tablet upon which the brass is fixed. The brass has been designed and executed by Messrs. Hart, Son, Peard, & Co., of London, for Messrs. T. & J. Nelson, of Carlisle. The memorial is placed to the west of the principal entrance.

Working Men's Dwellings in Liverpool. A pamphlet on this subject by Dr. Trench, the Medical Officer of Health at Liverpool, and Mr. C. Beard, B.A., minister of Renshaw-street Church, has been published by Holden, of Church-street, Liverpool. The authors complain of the propensity of workmen and others to sublet even the smallest houses into single rooms, so as to make profit by them where there is little or no absolute occasion, either from want of means or want of dwellings. At the census of 1861, there were 65,781 inhabited houses for the accommodation of 443,938 persons, or an average of one house for every family of about six persons. As compared with other towns, therefore, the population per house, though not small, was little more than an average one. The houses, however, were smaller than in many cases. Since the census 15,223 additional houses have been built, and only 1,500 pulled down. At present the average of population per house is much the same as in 1861.

The Crown and the Thames Embankment. — A special meeting of the Executive Committee of the London and Westminster Working Men's Constitutional Association has been held at their Rooms, Victoria-street, Westminster, for the purpose of preparing and circulating petitions to the House of Commons, protesting against the enclosure of the grounds on the Thames Embankment, to which the Crown lays claim. A resolution was passed, praying the House to take such steps as will effectually prevent any part of the reclaimed land from being diverted from the purpose stated.

Trade-Unions Bill. — This Bill has been read a third time and passed in the House of Commons.

A Public Picture Gallery Fund for Birmingham.—A manufacturer of Birmingham, who wishes to be anonymous, desires to appropriate 3,000*l.* towards the maintenance of a public picture-gallery in Birmingham. He hopes that the fund thus commenced may form a nucleus of a much larger fund, which may be the means of providing a Free Public Picture Gallery for Birmingham, not unworthy of the town. The money will be invested in the name of an association, so soon as it shall be incorporated under the Companies Act; but he desires to leave to the unfettered and absolute discretion of the association the mode of prosecuting the object in view, namely, the promotion, diffusion, and development of a knowledge and love of the fine arts of painting, drawing, etching, engraving, and sculpture, in Birmingham, but not including art manufactures. It is to be hoped the inhabitants will show that they appreciate so valuable a gift by doing what they can to further promote the excellent objects in view.

Leadenhall Poultry Market.—A meeting of salesmen, inhabitants, and others, in and around Leadenhall Market, has been held in the market, to consider the scheme of the corporation to disestablish the present poultry-market, which has existed for 300 years, and to build a market on the site of the old meat-market. Mr. E. R. Rigby, a member of the Court of Common Council, presided, and the meeting was numerously attended. It was resolved unanimously,—

“That this meeting (publicly assembled in Leadenhall Market) is of opinion that the disestablishment of this ancient market would be most injurious to the interests of the public, who have been supplied by the tradesmen successively carrying on business there for upwards of 200 years, and is against the wishes of those who supply the market, as well as being calculated to destroy and divert the trade of the salesmen, and to injure the holders of property, and especially those carrying on business in the immediate locality.”

A deputation was appointed to wait on the Court of Common Council on the subject.

Economic Entomology.—The Royal Horticultural Society offer prizes for collections of economic entomology. They include a prize of ten pounds for the best collection of British insects injurious to any one plant, as the oak, pine, cabbage, or wheat (the choice of the plant to be left to the competitor). The insects to be shown as much as possible in their various stages of development—eggs, larva, chrysalis, and perfect insect; and a prize of 5*l.* for the best miscellaneous collection of any branch of British economic entomology, similarly illustrated. The collections are to be sent to the Assistant Secretary, Royal Horticultural Society, on or before the 1st of May, 1872.

The Great Well of Brooklyn.—This well is said to be the largest well in existence. It is situated on the edge of the lake on the southerly side of Vanderbilt Hill. It is 50 ft. in diameter, and is built of brick, with walls 2 ft. thick, laid in cement. It was sunk in the same manner as the caisson of the East River Bridge; its weight forcing it down in the earth to a distance of 70 ft. The engine that forces the water from this well is one of Worthington's duplex pumps, and is capable of forcing up a million gallons and a half in twenty-four hours. The reservoir is a work of considerable magnitude, and has been constructed at great cost. It is 75 ft. by 100 ft. and 12 ft. in depth, and has a capacity of 750,000 gallons. It is covered over with brick arches, built on brick piers, and levelled up to the surface.

Fall of a Roof at Blackburn.—The roof of a reed-maker's shop in Chapel-green, Blackburn, has fallen in. At the time, the proprietor and three of his workmen were all engaged working, when suddenly they heard the noise as of a smashing beam, and quick as a flash they were all embedded in the fallen structure, and their wonderful escape can only be accounted for in this way—that the joists, after falling, were planted obliquely against the adjoining walls, leaving an open space underneath. They extricated themselves from the debris. The immediate cause of the accident seems to have been that the cross-beam gave way. The roof appeared to have been in an unsafe state for some time.

Steam Saw-mills.—A want, long felt by the building trades in Penzance, is now met by Messrs. T. Coulson & Co., timber merchants, who have recently erected a saw-mill at Wherrytown, and will soon be prepared to supply wood of any scantle, at brief notice, so that many a hindrance to the progress of house-building will be removed.

Dwellings in Spitalfields.—The White-chapel Board of Works has had a discussion on the propriety of enforcing the provisions of the Artizans' and Labourers' Dwellings Act, in reference to some houses in Black Horse-court, Spitalfields. A report was laid before the Board by the medical officer, stating that the houses in question were unfit for human habitation, and the surveyor expressed his opinion that nothing short of demolition would meet the evils complained of. After some consideration the Board agreed to call upon the owner of the buildings to show cause why the houses should not be pulled down.

A Contracting Prince and a Princely Contractor.—Prince Napoleon (says a correspondent of the *Manchester Guardian*) has given 20,000*l.* for a house at Lancaster Gate, for which, with forethought, he contrived to save the choicest furniture, pictures, and objects of art that once glittered at Menden and the Palais Royal. The Prince is said to have sold his estate and chateau in Switzerland to Mr. Lucas, the contractor, for 70,000*l.*; and having tried all climates and zones, he seems to have made up his mind that about the safest place to settle in, as times go, is the north side of Hyde Park.

A College of Science for Yorkshire.—At the annual meeting of the Yorkshire Board of Education, held at Leeds, Lord F. Cavendish, M.P., advocated the necessity of establishing a college of science, to which both manufacturers and artisans could send their sons, to learn the laws which regulated the materials it would be their future business to deal with.

Railway Accommodation in White chapel.—Efforts are being made to get a railway-station placed, on the Blackwall line, in Leman-street, Whitechapel, where there is ground at present vacant, in a prominent position. The station would be midway between Fenchurch-street and Shadwell, and would, no doubt, be largely used by the public.

Destruction of Old Buildings.—A correspondent draws our attention to the proposed early destruction of an old house in Northampton to make room for the new railway station. The architectural society there, he says, have determined to have plans of it executed.

Opening of a Labourers' Institute at West Wickham.—This new hall has been opened to the public. It is 45 ft. long, 21 ft. wide, and 30 ft. high. The windows are Gothic; and it has an open roof, stained and varnished. The hall is to be used for classes, night-schools, lectures, music, Sunday evening service, &c.

Earlswood Asylum.—The dining-hall which has been enlarged to nearly double its former size to accommodate the increased number of inmates at their meals, and which serves for religious services, lectures, and entertainments, has been re-opened.

Artists' Benevolent Fund.—The anniversary festival of the Artists' Benevolent Fund will take place on this, Saturday evening, the 22nd inst. Captain the Hon. Francis Egerton, R.N., M.P., is the chair.

Royal Academy of Arts.—The private view will take place on Friday, the 28th inst.

TENDERS

For house, in Salmon's-lane, Caterham, Surrey, for Mr. T. Leoline. Mr. R. Martin, architect. Quantities supplied by Mr. F. Sparrow:—

Langmead & Way	£1,213 0 0
Turner & Sons	1,199 0 0
Smethurst	1,115 0 0
Jarrett	1,149 0 0
Ward	1,123 0 0
Bray	1,060 0 0

For public hall at Southend. Mr. Hayward, architect:—

Carmody (too late)	£2,949 0 0
Dover	2,690 0 0
Garon & Warr	2,409 0 0
Allen	2,390 0 0
Darke	2,300 0 0
Reepence	2,270 0 0
Watson	2,210 0 0
Saunders	2,150 0 0

* Provisionally accepted.

For villa residence, at Adlestone, Surrey, for Mr. Bone. Mr. Wonnacott, architect. Quantities supplied:—

Goldard	£1,539 0 0
Dover & Co.	1,449 0 0
Nightingale	1,446 0 0
Harrison & Son	1,370 0 0
Capps & Riso	1,317 0 0
Joy	1,287 0 0
Martin, Wall, & Co.	1,274 0 0
Collins	1,255 0 0
Lyle	1,240 0 0

For works at Highbury, for the British Land Company, Limited:—

Blackmore	£8,938 0 0
Pizzey	8,658 0 0
Capper	8,699 0 0
Crockett	8,600 0 0
Stiff	8,500 0 0
Cole	8,330 0 0
Wainwright & Wilson	8,930 0 0
Anderson & Dunmore	5,790 0 0
Brown	5,940 0 0
Jones	5,624 0 0
Bloomfield & Morris	5,509 0 0
Williamson	5,490 0 0
Hare	5,435 0 0
Messrs. Haynes	5,300 0 0
Wigmore	5,150 0 0
Riley	4,600 0 0
Pearson (accepted)	4,444 0 0

For repairs, &c., to house, at Herne-hill, for Mr. Taber. Mr. W. H. Powell, architect:—

Smith	£210 0 0
Cowan & Mannoch	172 17 6

For a pair of villa residences, to be built on the Casrau Estate, Newport, Mon., for Mr. J. Davies. Messrs. Lawrence & Goodman, architects. Quantities supplied:—

Hazel	£1,741 0 0
Whitaker	1,688 0 0
W. Jones	1,558 0 0
Linton	1,439 0 0
G. Jones	1,420 0 0
Richards	1,415 10 0
Chack (accepted)	1,400 0 0

For alterations, &c., to form shops, at Nos. 1 and 2, Bancewell-road, Newport, Mon., for Mr. Joseph Simmonds. Messrs. Lawrence & Goodman, architects. Quantities supplied:—

Linton	£193 0 0
Baker	183 0 0
Richards	180 0 0
Banfield	178 0 0
Biggs	175 0 0
Prosser	174 0 0
G. Jones	163 0 0
Whitaker	153 0 0
Miles & Son	137 0 0
Phillips (accepted)	128 0 0

For two cottages, Brunswick-road, Reading. Mr. W. F. Poulton, architect:—

Ball	£633 0 0
Shepherd	630 0 0
Searle	628 10 0
Mathews	618 0 0
Barnicot	617 0 0
Grover	650 0 0
White	627 5 6

For the construction of tanks, and other works, at the sewage pumping works of the West Ham Local Board of Health, adjoining the River Lea, Canning Town, Bow Creek:—

Jackson	£7,300 0 0
Rivett	8,275 0 0
Wigmore	5,950 0 0
Marshall	5,730 0 0
Harris (accepted)	5,597 0 0

For the construction of roads and drainage, on the Greenhill Estate, Harrow, for the United Land Company:—

Pearson	£3,575 0 0
Wigmore	3,149 10 0
Pizzey	2,877 0 0
Vickers & Crane (accepted) ..	2,449 0 0

For Basinstoke Waterworks. Messrs. Russ & Minns, engineers:—

Contract No. 1.—Pipes.	
Begg	£1,100 18 0
Head	1,398 15 0
Watts & Stevens	1,312 4 2
Spittle	1,270 12 9
Hodges & Co.	1,259 0 0
Hobbs	1,255 0 0
Guelgud	1,242 16 10
Wintmore & Co.	1,230 0 0
Firmstone & Co.	1,222 0 0
Cameron & Robertson	1,218 10 0
Clay, Cross, & Co.	1,200 0 0
Lindsay & Co.	1,193 0 0
Coburn & Co.	1,188 0 0
Bailey, Pegg, & Co.	1,178 7 0
Horsley & Co.	1,170 0 0
Tomlinson	1,163 0 0
Jordan	1,161 7 0
Marshall	1,150 0 0
Lawrie	1,149 7 0
Sibsey	1,090 17 3

Contract No. 2.—Pipe Laying.

Furness	£43 0 0
Sibsey	831 0 0
Beck & Co.	854 0 0
Crump	797 0 0
Baker & Son	764 10 5
Painter	718 0 0
Marshall	684 0 0
Bugbird	623 0 0
Tomlinson	610 0 0
Chandler	605 10 5
Stevens	580 10 0
Blaukeborough	574 15 0
Slade	534 0 0

Contract No. 3.—Reservoir.

Tomlinson	£54 0 0
Furness	441 0 0
Slade	375 0 0
Marshall	375 0 0
Jennings	373 0 0
Bugbird	365 0 0
Batten	365 0 0
Sibsey	358 0 0

For addition to Crown Field House, Botheredon, near Ashford, Kent. Messrs. Tolley & Dale, architects:—

Lee & Padgham	£7 0 0
Bridge & Bourne	775 0 0
Fowler (accepted)	734 0 0

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

J. JOBBINS, 3, WARWICK COURT, HOLBORN, LONDON, W

India-office, March 22nd, 1871.

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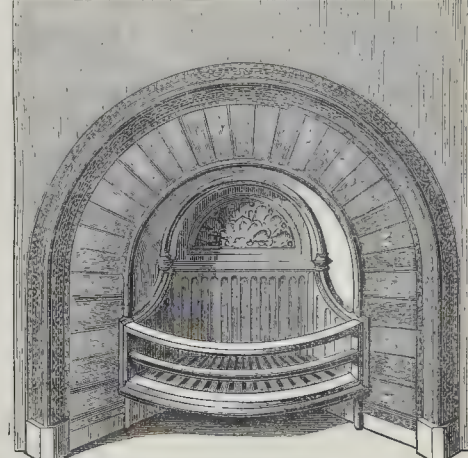
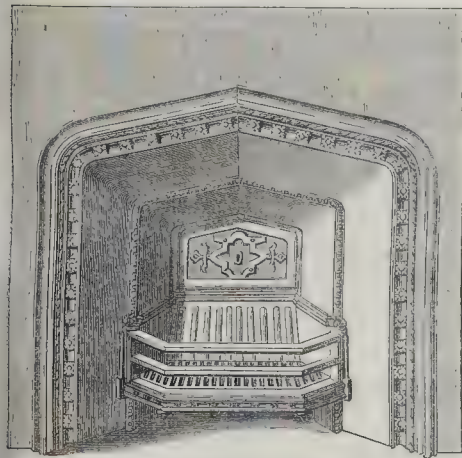
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The Builder.

VOL. XXIX.—No. 1473.

The Morgan Hospital, Dundee.



DUDEE has reason to thank the persistence of one or two of its citizens for the possession of what ought to be a very valuable educational institution, — the Morgan Hospital. The circumstances attending its establishment are curious, and involve considerations of some importance.

Mr. John Morgan, whose name it bears, died at Edinburgh on the 25th of August, 1850. On the death of his last surviving sister, on the 15th of January, 1848, certain writings were found in her repositories, executed by her brother, containing some personal bequests of small amount, and declaring it to be his wish that the bulk of his fortune should be employed to establish

in Dundee, the place of his nativity, an institution for the education of boys on the model of Heriot's Hospital in Edinburgh. Previously to the death of his sister, Mr. Morgan had fallen into a state of mental imbecility, and a *curator bonis* was appointed by the Court of Session to take the management of his affairs. The writings alluded to passed into the hands of the *curator*. Having learnt their import, the magistrates and town council of Dundee were naturally desirous of ascertaining their validity as testamentary bequests. It was known that Mr. Morgan had left a large fortune. Various parties came forward claiming to be "nearest of kin" to the deceased, and it soon became evident that their conflicting claims would not be settled without the intervention of judicial authority.

In the first instance, he had determined to be the founder of a family. His fortune was to accumulate till it reached the sum of one million sterling, and then it was to be invested in the purchase of lands in the counties of Forfar or the Lothians. The estates were to be strictly entailed. The heir in possession was to assume the name of John Morgan, and Mr. Morgan actually selected a gentleman of his acquaintance on whose descendants this golden shower was destined to alight. This will, however, was most carefully obliterated by Mr. Morgan, so much so that it is difficult to decipher its contents; and by a writing subjoined to it he specially annuls all its provisions. By this writing, dated the 10th of October, 1842, he declared his "wish to establish in the town of Dundee and shire of Forfar an hospital, strictly in size, the management of the interior of said Hospital in every way as Heriot's Hospital in Edinburgh is conducted." On reflection, he got to think that his fortune, which had been impaired by losses through the failure of his agents in London and Calcutta, would be inadequate to the building and support of an institution projected on so large a scale as Heriot's

Hospital, in Edinburgh; and by a subsequent writing, dated October 20th, 1842, he restricts the hospital to such a size as shall accommodate only "100 boys, in place of 180 boys." These two last writings, which are much altered and obliterated, formed the groundwork of litigation which subsisted for some years, and ended in their being declared, by a judgment of the House of Lords, to constitute a good and valid bequest of the fortune of John Morgan, or so much thereof as should be sufficient for the purpose of building and endowing an hospital for the education and maintenance of 100 boys in the town of Dundee. The litigation was long and disheartening, decisions for and against being alternately given. Meetings were held, money was subscribed, the case was carried on, and ultimately, as we have already said, the efforts of the town were successful. Mr. Morgan was upwards of eighty years of age when he altered his original writing, and struck out all that related to Heriot's Hospital. In doing this he also ran his pen through the two words, "an hospital," which referred to his intended establishment in Dundee, and not to Heriot's, as he evidently supposed. It was manifestly nothing more than a clerical error,—a slip of the pen. There are two well-established principles of law in the matter of testaments of personal property. The first is, that where a party leaves a number of documents all of a testamentary character, they must not be taken simply and separately, but must be all laid together; and, viewed as a whole, the light arising from one to be reflected upon the rest, and anything doubtful in one to be supplied by what is clear in the others; so that, from a consideration of the whole, the will or testamentary purpose of the party may be discovered and ascertained. The second principle is, that in testamentary writings,—at least, in holograph testaments,—the mind and intention of the testator is everything, the manner and form are nothing, if only the real intention appear. On the strength of these two principles the advisers of the town rested, and the result showed they were right in their expectations. After the decision had been obtained, an estimate was made of the sum necessary for the maintenance of the establishment when in full work, and for erection of the building, and the sum of 73,500*l.* was invested for those purposes.*

* The expenditure was thus estimated:—

1. Fee-duty per annum, being for three acres instead of two, as formerly proposed	£80 0 0
2. Head master	200 0 0
3. Second master, instead of 100 <i>l.</i> , formerly proposed	90 0 0
4. Third master, instead of £80 <i>l.</i> , formerly proposed	70 0 0
5. Occasional tuition	50 0 0
6. Matron, instead of 5 <i>l.</i> , formerly proposed	45 0 0
7. Physician	25 0 0
8. Treasurer and clerk	60 0 0
9. Auditor	10 10 0
10. Servants	94 0 0
11. Janitor and gardener	40 0 0
12. Housekeeping, instead of 840 <i>l.</i> , formerly proposed	801 0 0
13. Clothing, instead of 400 <i>l.</i> formerly proposed	363 15 0
14. Books and stationery, instead of 50 <i>l.</i> , formerly proposed	40 0 0
15. Fire and light	90 0 0
16. Repairs	40 0 0
17. Taxes	30 0 0
18. Fire insurance	14 8 8
19. Church seats	12 10 0
20. Extra expenses, such as duplicate of fee-duty, travelling charges of visitors and inspector, printing and advertising, sick-bed and funeral expenses of boys, retiring allowances for masters, and general incidents	112 0 0
	£2,287 3 0

Assuming that interest is to be at 3½ per cent., the capital sum required, in order to produce the above annual income of 2,287*l.* 3*s.* 6*d.* is

£84,775 14 3
Add to which the estimated cost of buildings and furniture
£13,503 0 0
And the additional cost in enclosing walls and laying out ground, occasioned by three acres being taken instead of two
150 0 0
13,653 0 0

Total sum required

£78,428 14 3

The difference between this and the sum invested was met by the circumstance that the full expenditure was not required for four years.

After the appointment of trustees and governors, measures were taken for the construction of the hospital. A site was acquired on the estate of Craigie, lying to the north-east of the town, and a design prepared by Messrs. Peddie & Kinnear, architects, Edinburgh, was approved of and adopted by the governors. The foundation-stone was laid, with Masonic honours, on the 30th of July, 1863. Unexpected causes of delay retarded the progress and completion of the work; but it went on gradually, forty boys being at first received, and is now completed. We have engraved a view of the building, and the plan of ground-floor.* The site is nearly triangular, and forms a sort of gusset between the Forfar road going north, and the old Abroath road breaking off to the north-east. The gateway is at the junction of the two roads, and the enclosure walls extend about 250 yards along each road, the divergent lines being united by a wall of about 150 yards, forming the top of the inverted triangle. The ground enclosed measures about 5 acres. It slopes upwards from the entrance-gate, and the hospital is built in the upper and broader portion of the grounds. The design presents a building quadrangular in form, 200 ft. in breadth, 120 ft. in depth, with an open court inside. The building may be called Flemish-Gothic in style, and is two stories in height, with a centre tower rising to the height of 120 ft., and projecting a few feet from the façade. In the ground-floor it contains the main doorway, which is formed in a richly-moulded archway, surmounted by a crocketed label. Over the doorway, in the second story, is a three-light window, headed with cinquefoil tracery, and opening into a projecting balcony. On reaching the height of the ridge of the building—the intervening space being filled in with a clock, the tower is corbelled out in the angles into circular turrets, each capped with a steep slated roof. Connecting the turrets are carved balconies, also corbelled out from the main walls of the tower. From this point the tower rises in a steep roof, formed in two stages, and exhibits in front a carved group of windows, surmounted by an ornamental gable. The tower terminates in double pinnacles, united by an ornamental crest.

On each side of the tower the design exhibits bay windows in the second story, surmounted by steep, crow-step gables. Extending on either side is a range of two-light windows in both stories, the upper being finished by gables flanked and terminated by pinnacles. At the angles of the front the building throws out slightly projecting wings, with a triple square-headed window in the lower story, and with two traceried windows in the upper story, separated by a projecting ornamental chimney-shaft, which terminates in a crow-step gable. The gables of both wings are flanked by buttresses, surmounted by shafts terminating in carved pinnacles. The roof is of high pitch, and is finished by an elaborate iron cresting. The groups of tall chimney-stacks, rising at intervals from the roof, form an effective and characteristic feature of the design. The east elevation is of the same general character as the front, and is broken in the centre by two projecting gables, to the north of which is a section of the building, containing the dining-hall on the ground-floor, and the chapel in the upper floor. The chapel is marked by pointed and traceried windows, and from the roof springs a bell-tower, rising 32 ft. above the ridge of the roof. In the west elevation the leading feature is the staircase tower, which rises to the height of 80 ft. To the north of this tower is the head-master's residence, which, in somewhat plainer style, preserves the general features of the building. The open court, which lights the building from the interior, is about 130 ft. by 50 ft. With regard to the internal arrangements of the build-

* See p. 327.

ing, we may state generally that, in entering by the main doorway, we find on the left the Board-room, the library, clerk's room, and matron's apartments; and on the right, the master's and matron's dining-rooms, and a series of large class-rooms, extending towards the dining-hall. In the upper floor are five dormitories, with an infirmary in the west wing, as also lavatories and bath-room.

According to the scheme for the erection and endowment of the hospital, the funds are vested in the following persons, viz.:—The Provost of Dundee; the sheriff of Forfarshire; one of the sheriff-substitutes of Forfarshire, to be named by the sheriff; the Dean of Guild of Dundee; and the Convener of the Nine Incorporated Trades of Dundee:—"All for the time being, as trustees for the establishment, endowment, and maintenance in all time coming of an hospital in Dundee, for the education, lodging, boarding, and clothing of 100 boys, the sons of tradesmen, mechanics, and persons of the working-class generally, whose parents stand in need of assistance to enable them to educate their families, or who are orphans in need of such assistance."

The governors who have the management of the hospital are twenty in number.

No boy is admitted into the hospital until he has attained the age of seven years, nor after he has attained the age of nine years; and no boy is permitted to continue in the hospital after he has attained the age of fourteen years complete. In order to the admission of any boy, it must be shown that either the father or mother of the boy is (or, if dead, was) an inhabitant of, and born and educated in, one or other of the towns of Dundee, Forfar, Arbroath, or Montrose; but the sons of persons, inhabitants of, and born and educated in, Dundee, have the preference.

There is this valuable stipulation, that every boy beyond the age of nine years shall attend for a certain number of hours during each week a class for instruction in one or other of the trades of a tailor, shoemaker, or carpenter, or such other branch of industrial employment as the Governors shall direct; and the governors are to appoint suitable instructors in every such trade or employment; and it is competent to the governors, on occasion of any boy leaving the hospital, to permit such boy, as a reward for good conduct, to receive the whole or any part of the profits of his work during the preceding year.

The scheme stipulates that the head-master shall receive an annual salary of not less than 200*l.*, besides the use of a free house attached to the hospital, with coals, gas, and water.

The hospital is to be inspected once at least in every year, by an educational inspector of known experience, character, and ability, who is to test the efficiency of the teaching and the progress of the boys.

It is to be hoped the time will not come when the masters, the matron, and the treasurer are more cared for than the scholars, and the testator's gift perverted to the maintenance of a few friends of the governors for the time being. Such things have been, and are.

INTERNATIONAL EXHIBITION.

THE hum of labour and the atmosphere of busy preparation are perceptible at South Kensington. So much remains, or rather remained at the commencement of the week, to be done, in order to be in any way prepared for the opening, that it is only by watching the progress from day to day that the visitor can be brought to believe such rapidity of transformation to be possible. But with all the active energy of hosts of workmen and workwomen, engaged in a joint partnership of handicraft, unusual in manual industry, there is neither confusion nor drive. Every one seems to know his or her duty, and quietly to carry it out. And the calm assurance of the officers of the Institution, fully practised as they are by this time in matters of punctuality and of preparation for the public, is, no doubt, not without good foundation.

The display of treasures that have accumulated, or been brought from their hiding-places, since our last brief account of a visit to these galleries, is such as to assure a most interesting exhibition. Nature has awakened from her long slumber within the carefully-guarded quadrangle, and the welcome April rains have made lawns and shrubs rejoice in tender and brilliant green. It seems almost as if the arcades of the Exhibition were sympathising with the growth of the plantations. Long lines of poles are

reared obliquely against the piers. Massive framework, that looks, from below, like the bulwarks of a ship, or the carpentry of shipwrights, but which, viewed from above, seems none too strong for a parapet, is being fixed and painted for the future support of creeping and twining plants. Great baskets of ivy and other climbing plants are being swung up into this hanging garden. Canning letters in *terra-cotta*, each letter borne, or inhabited, or assailed, by a sturdy little amorino, are arranged alphabetically on the grass or gravel, or are being set, one by one, in an inscription that will run like a frieze along the upper part of the arcade. The neglected gaps and unsightly holes in the brickwork are disappearing. A row of lions' faces,—rather blunt and woolly, but withal effective,—have just put in an appearance. The end of the week will see these long unfinished and neglected arcades gay, trim, and picturesque.

To the Ceramic Gallery large additions have been made, since our last account. Some Oriental China, of great beauty and variety, is among the latest additions. Our own manufacturers have come out nobly. We shall be glad of the opportunity for making a leisurely survey, with the aid of the catalogue; but already we can promise a high and most instructive treat for all lovers of pottery.

In the opposite gallery, allotted to machinery in motion, there is perhaps more room for doubt as to entire completion by the 1st proximo than in any other part of the Exhibition. We must speak with admiration of the manner in which the shafting is arranged. Tall, massive iron uprights are bolted to the floor, and carry a shaft, each section of which is driven by a small quasi-locomotive engine in a sort of shed or annex outside. The perfect steadiness and smoothness of the motion is such as to delight the mechanic, and to show that it is not civil engineering alone that is illustrated by the works of the Hall and galleries.

The upper gallery on the west side is full of English pictures, now all arranged on the walls; but it is not desirable to say more, before the day of the private view, than that the public will see many old favourites, and many paintings that deserve to become favourites; also that they will be able to see them, using the verb with emphasis; the form and lighting of the galleries being well adapted for their display.

In the corresponding Eastern Gallery, devoted to foreign works of art, which are in course of arrangement as we write, are some paintings that we trust will not be allowed to leave the country. And some Italian sculpture, unpacked only during our last visit, is far superior to both our experience and our expectations, rising high above that photographic and grovelling realism which characterises so much modern, and especially modern Italian, sculpture. The exquisite purity of the Carrara marble employed by Cavaliere Norchi and Signor Barzaglia, of Milan, is so superior to any material that our own sculptors are able to obtain, even when most liberal as to price, as to indicate that the latter are unacquainted with a simple and efficacious mode of removing the unseemly blue stain, which is a secret of the Italian artists.

It should be remarked, moreover, that the Italian sculpture which is now in course of arrangement around the great model of the Sanchi Topo, in the middle of the Eastern Gallery, is admirably, if not perfectly, lighted. There is nothing in which the curators and administrators of our public museums, halls, churches, and other situations adorned or disfigured by sculpture so sin against the conviction of the practical sculptors as in the question of illumination. Hardly a statue can be pointed out in London which is not so lighted as to appear at its very worst. Our priceless Roman marbles are condemned to cellars and corridors at the British Museum. A light that may show a picture to advantage is assumed to be proper for a statue. Thus around the northern staircase of the Eastern Gallery of the Exhibition are placed casts, models, and statues by English artists, which, unless actually worse than charity would hope to be the case, are cruelly used by the unsuitable light. The dying Clitio gets an absolute repulsiveness of aspect, in no way softened as we rise above and look down on her wrinkled shoulders. The common-place young woman who, by dint of a cock's feather in her hair, does duty for the Genius of America, might look more imposing if better lighted. As for the Fall of Satan, that statue gives us the new and undignified idea that the descent was only a fall

downstairs, as the position of the figure so plainly indicates.

Among the Italian sculptures, so far as they are visible as we write, admiration must be given to a very lovely group by F. Barzaglia, of Milan, representing the finding of Moses, or rather the presentation to her mistress by the "maid of the daughter of Pharaoh," of the ark which the royal lady saw among the flags, and the wonderful child that it contained. In this group are combined true poetic feeling, ethnological study, rich and flowing graces of the female form, and perfect mastery over marble. The sharp asp-like ornament on the brow of the maiden comes out like the piece of goldsmith's work which it represents. The grand sensuous Egyptian type is admirably maintained both in form and feature; the nose being, perhaps, a little too much constricted above the nostrils, and a trifle too broad at the bridge. The child is also a fine study, although it is an infant that might grow into the fiery and furious zealot represented by Michelangelo, rather than into a character of the unrivalled grandeur and legendary meekness of the great monotheistic legislator—the author of a law of mildness unparalleled at the early date of its promulgation, of which the "weightier matters" were "judgment, mercy, and faith."

Here, too, we have a charming "Capid on a Lion," by Cavaliere Norchi—an amorino, a richly-developed and graceful figure of a bather, conspicuous for the rare delicacy of the fingers; a lovely group of a woman and child fleeing from the destruction of Pompeii; and other statues to which we hope to return.

Some of the choicest possessions of the Museum are grouped around the great Indian gateway. Here is the silver statuette of Henry IV. of France as a boy. Here is the famous portrait of Richard III. on panel. Here are the Milton shield, a collection of armour, church plate, crosses, and other reproductions in electrotype; with a gigantic lantern, about the size of a Sedan chair.

Among the paintings we can only name a beautiful view of Venice; a Russian droskey, with a pair of richly-aparisoned horses, scudding over the snow; a very charming historical scene—"Queen Philippa of Hainault, Wife of King Edward III., visiting and relieving the Citizens of London." The rich robes of the crowned lady trail over the snow-covered road. Her face is very dignified and tender. There is a beautiful copy of the Madonna and Child from the famous group in the Dresden Gallery, of which a little known *replica* exists at Rouen; and a copy of a very early and curious *retable*, giving scenes from the Gospels, lately discovered in Norwich Cathedral. Here, too, is a fine "St. George overcoming the Dragon," taken from the palace of the kings of Hungary at Prague, and dated as early as 1378.

The lamented Regnault is represented here by a fine picture of General Prim on a noble Andalusian horse, which, as well as the accompanying powerful but repulsive painting of a decollation at Granada, has been exhibited in Bond-street. There is a dark-eyed Sappho of Italian parentage. There is an escape of Lot from Sodom, that is wonderfully weird and impressive. There is a striking group of prisoners by Alfred Stevens,—very illustrative of what was France. There is a sketch of Sir Edwin Landseer in his studio, at work on our old acquaintances the lions, which very fully confirms the criticism we offered at the time when those statues were just placed in Trafalgar-square. The painting, small as it is, has a life and dignity which the artist who could throw them upon canvas could not impress on a plastic material. Above all, the most original and admirable work in the gallery, so far as we can speak at present, is the charming *Godiva* of Professor Van Lierus.

From either gallery, a glass-roofed attic over the hemicycle of the conservatory, now filled with makers' and liners of frames, gives access to the Albert Hall. The large upper gallery of this building is allotted to the display of engravings of all nations, water-colour drawings, architectural drawings (at one time taken to the lower galleries, but found to be too numerous for that position), and photography from all quarters. The effect, at first, is far from good. In covering a wall with drawings and engravings in frames, it is destructive to architectural effect to treat them otherwise than as furniture, a mode of arrangement extremely unsuitable to the appropriate display of works of art. Again, with a great number of the exhibits we are

Among the engravings is a very striking one of an Egyptian woman and child, a well-known picture by Goodall, engraved by Stackpole. Mr. Cousins, R.A., exhibits a fine proof of the charming little lady performing a minuet, one of Millais's wonderful children. We only pretend to give, on the present occasion, a note here and there. It has been the wish of the Commissioners that their catalogue should not be anticipated. Within a few hours from the time that these lines are in the hands of our readers the private view of the picture gallery will take place. The public opening is fixed for Monday. We hope our notes will give additional pleasure to those of our readers who are able to attend on the 1st of May, and will convince all of them of the high character of the Exhibition that will be opened, on that day, by their Royal Highnesses the Prince of Wales and the Princess Christian.

THE ART-UNION OF LONDON ANNUAL
MEETING.

THE 35th annual general meeting of the Art-Union of London was held on Tuesday last, in the Theatre Royal, Adelphi; Lord Houghton in the chair. The attendance was large; and among those present were Professor Donaldson; Professor Westmacott, R.A.; Sir Walter Stirling, bart.; Mr. R. B. Butterworth; Mr. F. Bennoch; Mr. Z. Troughton; Mr. J. Martin; Mr. T. Grissell; and Mr. Loph Stocks, A.R.A.

Mr. Lewis Pocock, hon. secretary, read the report, as follows:—

REPORT.

In presenting their thirty-fifth Annual Report, the Council of the Art-Union of London have the satisfaction to state that the subscriptions for the year amount to 10,174. 7s.

The continued depression in all branches of trade and commerce, and the deplorable war on the continent of Europe, and its consequent baneful effect on the financial world, have, doubtless, notwithstanding the popularity of the plate of "Light and Darkness," prevented the subscriptions being equal to the amount of the few preceding years.

In consequence of the late period at which the above mentioned plate was completed, some delay has occurred in placing it in the hands of the subscribers; but all will be supplied at no distant date.

The Exhibition of Prizes of the past year took place, as usual, at the Gallery of the Institute of Painters in Water-colours, and the Council have the pleasure of announcing that there was no diminution of that improvement in the character of the works selected which they have had occasion to notice for the past few years.

The Council have to lament that death has deprived the Art-Union of a most earnest and distinguished Vice-President,—the late Dean of Canterbury,—who, although but recently elected to fill that office in the room of the late Dean of St. Paul's, had long been a member of the Society, and within but a few days of his death presided at one of the weekly meetings of the Council. Considering the high position of the Dean, and the fact that he was present at the last annual meeting will no doubt make the lively interest he felt in the proceedings of the day. It is now a matter of congratulation that the present Dean of Westminster—Dean Stanley—has consented to be nominated as a Vice-President. This Society can, therefore, boast of having consecutively on the list of its Vice-Presidents—Thomas Turlton, late Bishop of Exeter, and Dean Stanley.

The Council have likewise to regret the loss, by death, of an early and esteemed member of their body, Mr. Thomas Godfrey Sambrooke, who had been a subscriber from the first year of its existence: other vacancies have occurred by the retirement of John Henderson, Esq., and Mr. Alderman Wilson.

To fill two of these vacancies, Ralph N. Wornum, Esq. Keeper of the National Gallery, and Chas. J. Leaf, Esq. have been elected.

The following is a brief summary of the receipts and expenditure: a detailed account will, as usual, be printed in the report.

Amount of subscriptions	£10,171	7	0
Allocated for prizes	£5,040	0	0
For print of the year, almanac, report, &c., and reserve	2,681	2	10
		7,721	2
Agents, commission, and charges, advertisements, postage, &c.....	2,450	4	2
	£10,171	7	0

The continued depression of trade, both at home and in our colonies, has imposed on our representatives a larger amount of labour than usual in collecting the subscriptions; nevertheless, in some cases, the lists have exceeded the amount of last year. The Council feel great satisfaction in referring especially to the successful exertions of Mr. Robertson, of Constantinople; Mr. Jackson, of Barcelona; Mr. Rayner, of Bowen, Queensland; Mr. Hawkes and his assistants, in South Australia; and Messrs. Wilkie, Melbourne.

To one and all the thanks of the Society are due.
The accounts have been audited by three members of the Finance Committee, and two gentlemen from the body of subscribers, Mr. Cartwright and Mr. T. Mayhew, to whom the thanks of the Council are offered.

The Reserve Fund now amounts to 15,711*l.*, the greater portion of which is, at present, employed in the production of plates and other works for future years.

It may be useful to mention here, that the Council still have under consideration the desirability of establishing a permanent exhibition in connexion with the Society in a gallery of their own, the erection of which only depends upon their being able to procure a site in a suitable locality.

The great predilection which all classes of Englishmen manifest for whatever relates to the sea and coast scenery has induced the Council to select for the ensuing year a set of eight engravings, representing such subjects, from the works of David Cox, Copley Fielding, and Samuel Prout; and it is contemplated that these will prove extremely popular, not only from the nature of the subjects, but from the high reputation of the artists. The plates have been engraved in the first style, in the line manner, by Messrs. Brandard, C. Cousen, Prior, and Arthur Williams.

The warm thanks of the Society are due to Messrs. Quilter, Albert Levy, Pocock, Wiggall, and Timmins, who have kindly taken these valuable drawings from their walls or portfolios during the time required for the engraving.

The moderate size of the plates will enable the subscribers to avail themselves of an inexpensive frame to contain the whole series, or a pair of such frames each to contain half the number, varying from time to time the subjects exposed to view; and the Council have invited some framemakers of repute to submit specimen frames with this object. For those who may prefer it, the plates will be suitable for a portfolio of moderate size.

A peculiar degree of interest has been excited throughout the country by the marriage lately solemnised between Her Royal Highness the Princess Louise and the Marquis of Lorne. A charming portrait-bust of the Princess was modelled by Mrs. Thornycroft; and, by special permission of Her Majesty, the artist has made a very successful reduction of the bust for this Society. Its production in porcelain has been entrusted to Messrs. Coze and Land, and a number of copies will form part of the prize

The amount available for the purchase of works of art will be thus allotted :—

22	works at	.....	210	each.
20	33	.....	15	33
13	33	.....	2	33
12	33	.....	25	33
10	33	.....	3	33
10	33	.....	35	33
6	33	.....	4	33
4	33	.....	41	33
3	33	.....	5	33
2	33	.....	6	33
2	33	.....	75	33
2	33	.....	100	33
2	33	.....	160	33
1	work at	.....	200	33

There will also be distributed :—

10 Bronze Vases.
300 Chromolithographs of "Bellagio."
150 Chromolithographs, "Kite-flying."
100 Busts of the Princess Louise.
30 Silver Medals of T. B. Leslie, R.A.

Thus, with the parian busts given to all who have sub-

prized for ten years consecutively without gaining a prize, there will be 853 prizes, in addition to the won given to every member.

Amongst late events, connected more or less intimately with the line arts, we cannot omit to notice the opening, on the 29th of March, of the Hall of Arts and Sciences at South Kensington, which has been named after that great and good Prince to whom the progress of art in this country owes so large a measure of gratitude. This building almost equals in magnitude with the grand amphitheatres of ancient Italy; and it much more resembles them in plan

arrangement is different from any other structure of recent date—namely as the external walls follow the curve of the area within, thus avoiding much waste of space and awkward corners, which must exist where, as in most places of public entertainment, we have a horseshoe or oval interior placed within walls rectangular in plan. The present arrangement also greatly facilitates the means of ingress and exit, a most important point, too much neglected in our public buildings generally, but here amply provided for.

A special point in which the Kensington Amphitheatre differs from those of Italy, is the necessity imposed by the climate of roofing in the building. The manufacturing appliances of the present day have enabled the architect to effect this in a manner that would have been out of the question in ancient times, and a glass dome of vast size shuts in the arena. A troublesome echo, which marred the effect of the music, and was found to be produced by the dome, has been effectually corrected by a tent-like transparent roof, which, moreover, adds to the architectural effect of the interior.

In connexion with this building stand the permanent galleries erected for the annual International Exhibition the first of which is to be opened in a few days. The collection of works from the Continent must suffer considerably from the effects of the deplorable war, but still a respectable gathering will be displayed.

Your Council have taken care that the Society shall be well represented in several branches of art. The chief contribution to the whole group of the "Wood Nymph," a marble of which a premium of £100 was awarded to Mr. Birch in the Society in 1864, as the result of a competition, who fifteen life-size works of various degrees of merit were submitted, and exhibited, by permission of the authorities, the South Kensington Museum. A number of reduced copies, in Parian, of this work has been distributed, as highly appreciated by those to whom they were allotted. It is now proposed to make the marble group itself the chief prize in the distribution of the ensuing year.

selection from the reductions in bronze produced by the Society has also been sent in; and it may be remarked, in passing, that this Society is still almost the only source from which fine works in bronze after English artists are obtainable.

Within the past few months the Council commissioned M. Delpech to make a reduced copy of the beautiful Townley Vase in the British Museum. The work has been very successfully accomplished, and some copies in bronze will be included in the distribution to-day.

The Exhibition will also contain a completed series of the Medals produced for the Society,—to which one commemorative of the late C. R. Leslie, B.A., by Mr. A. B. Wyon, has been added since the last annual meeting,—and two very fine shell cameos, for which the Council gave a commission to Mr. Ronca.

We may note the fact, as connected with art-matters of the year, that the National Gallery has been fortunate in acquiring, at a very moderate price,—mainly through the instrumentality of Sir William Buxall, B.A., whose retention of his office of Director is a matter of congratulation to the public,—the remarkable collection of pictures formed by the Sir Robert Peel, which, we are informed, at a very satisfactory price, will be complete, and will be removed to the galleries in Trafalgar-square, to which they will form a most valuable and important addition; the more valuable because our National Gallery is comparatively weak in those schools in which the Peel Collection is very strong, namely, the French, and landscapes of the Dutch and the French schools. Many of the pictures in the collection are of the highest quality, and of great interest; their presence there will consequently be the more highly prized.

During the past year the art-world of England has lost one of its worthiest supports. On this very day, in 1870, died Daniel Maciase, R.A., deeply regretted by all who had the privilege of intimacy with him. With this Society Mr. Maciase's transactions were numerous, and involved large amounts; and a peculiar loss is felt in the absence of his superintending care in bringing to a conclusion some large and important works now in progress.

journal." "By his death we have lost one of our most original artists, and one who was as great in many respects as he was in his art," said Mr. Maclean. "The work of any of our school will bear comparison with his; take, for example, the noble series of outline drawings illustrating the Norman Conquest, engraved and published by the school. It is the work of a man of genius. A rich faculty of invention, combined with great power, makes almost every work that proceeded from his hand; and yet this genius of his was not confined to the field of art. He was a man of the highest intellect, and his work was done with the utmost attention to detail, even to pre-Raphaelism." Of the extreme care and accuracy of detail which Mr. Maclean brought to bear on every work of his, Mr. Maclean said: "I have seen a sketch of a memorial, purchased at the sale of his works, consisting of a portfolio, filled with a multitude of sketches of the minutest of every kind of military appliances, and of the minutest details of the armor of the soldiers, all drawn from the objects themselves, and prepared in reference to his noble wall-painting of Wellington and Blucher, in

Looking at the operations of the Society, continuous and methodical as they are, there can be no doubt—indeed it is undeniable—that it has sided immensely in spreading abroad a love of Art, and increasing the number of those who feel delight in its study, which, as our noble president lately remarked at a meeting held at the Cambridge School of Art, "adds to our appreciation of all we see around us."

The noble gift of the late Mr. Slade, and the steps now being taken to extend art-education in this country (carrying out the views so often urged by your Council), is now bearing good fruit.

The Slade Professor of Art at Cambridge tells us that the first and obvious reason man may, naturally and at once, give for art-cultivation, is the sense of delight it yields him. The sense of beauty is one of his first feelings of pleasure. To admire is to enjoy. To enjoy is, almost always, to long to imitate or create—firstly for himself and secondly in such wise that his fellows may share his delight.

A second reason why Fine Art should be studied is to be found in the spirit of gentleness and refinement which follow as a sequence of its cultivation.

We have seen that the tendency of the culture of the Fine Arts is to refine man. The ideal citizen constitutes the best subject. Gentle and peaceful existence is his business and necessity. He best appreciates disorder, tyranny, presumption,—he best holds an even and temperate hand, when power is entrusted to his care,—he best wields the sword of justice, whose tendency and cultivation lead him to desire to sheathe it. In short, the country is foremost in the race of nations to reach the goal of general happiness, the constituents of which stand with the greatest zeal, energy, and discretion those arts which refine without enfeebling mankind.

LEWIS POCKOCK, } Hon. Secs.

Lord Houghton, in moving the adoption of the report, said it was impossible now to attend the meeting of any number of Englishmen with the attention being drawn to the fearful state of matters in a neighbouring country, with which we have been in close and frequent intercourse, and without feeling a pang at the thought of the imminent danger now hanging over the fairest city of Europe, the very focus of refinement in arts and literature. This feeling naturally gave rise to a deep sense of gratitude for the fact that in this island we are allowed to enjoy the blessings of peace and prosperity; and he could not help recalling the instance of a little island in the Aegean Sea, named Delos, which was a refuge to all whom political motives drove from their own country in those days, and respecting which the Greek poet, Pindar, had written some lines, of which he had read this translation, —

"A sacred island set apart by Fate,
The sea its frontier, and the coast its gate,
Where every free man with safe foot may stand,
May God long guard the Column of that land."

England was at present like that happy island, and this aspiration was one which he was quite sure all would echo. His lordship went on

say that the past year would hereafter be looked upon as one of the most eventful years in history, and we had advantages with respect to the knowledge of these events. What would we not give for landscapes and drawings of the events of the civil wars of England by such artists as had executed the recent illustrations in the *Graphic* and the *Illustrated London News*? He hoped that foreign artists who had been compelled to live abroad by the terrible events which had taken place in their own country would ere long be enabled to return to a land which had done so much for art. He alluded to the purchase of Sir Robert Peel's gallery, which, he said, was one of great value; but not so well suited for a private gallery, as the pictures were too much of one class. He was very glad to find that Sir William Boxall had returned to the direction of the National Gallery, and he hoped that his health would be found to be perfectly re-established. His lordship congratulated the public on their being about to enjoy the opportunity at the forthcoming Exhibition of seeing Millais as a landscape-painter pure and simple, and he could tell them the picture was one to be charmed with. He concluded by formally moving the adoption of the report.

Mr. Godwin said that not having had any hand in the preparation of the report, — not having been present when it was approved by the Council, — he felt quite at liberty to second its adoption, which he did with great pleasure, and expressed his satisfaction at finding that the work of the society went forward as prosperously as ever. He believed that the forthcoming Exhibition at Kensington would be a great gain for art, and that both English and foreign artists would be amply represented; the chief difficulty, in fact, being, as he understood, to find room to hang the works sent in. He made some strong remarks on the disgrace it is to England to see our large and important towns, such as Liverpool and Manchester, without any galleries of pictures; while on the Continent even second and third rate towns were invariably possessed of galleries for the study and improvement of the masses. Even in London, in the Mansion House itself, though through the exertions of the late Mr. Bunning something had been done in the way of sculpture, there was not, he believed, one single picture.

Lord Houghton being compelled to attend on business in another place, the chair was taken by Professor Donaldson.

Sir Walter Stirling moved the thanks of the meeting to Messrs. Pocock and Antrobus, honorary secretaries, for their valuable services during the past year. Sir Walter drew an amusing picture of the contrast between two localities in Trafalgar-square, — the National Gallery of Pictures, where a collection of works of immense value existed for the delectation and instruction of all classes of society, and the neighbourhood of the column where there were frequent congregations of some whose avowed object was the subversion of all order and all rights of property. In connexion with the acquisition by the nation of Sir Robert Peel's pictures, Sir Walter remarked that sufficient value was not attached to the great encouragement afforded by King George IV. to the acquisition of works belonging to the school of art represented in the collection in question. He also made some remarks objecting to the sale of catalogues in the exhibition of the Royal Academy, advocating the plan of placing on each work a card with the name of the artist and subject of the painting.

Professor Westmacott seconded the resolution, and said that Mr. Godwin, though no longer hon. sec., also deserved their thanks still. He drew attention to the fact that all the services rendered to the society were gratuitous, and that every guinea subscribed was expended in promoting a love for art. He stated his concurrence in Sir W. Stirling's remarks as to the promotion by King George IV. of the acquisition of foreign works of merit, and stated that this was, in a great degree, due to the fact that at that time the court was frequented by a number of noblemen of great taste and artistic knowledge, such as Lord Farnborough, the Duke of Devonshire, &c.; while, unfortunately, at the present time, the nobility, with some few exceptions, were totally ignorant in matters of art, and quite indifferent about it, not as in the time above alluded to, going about to the studios of the artists, and interesting themselves in the progress of works of magnitude and importance. The Professor then made some remarks explaining how a careful and loving study of works

of art results, in time, in giving the power of properly appreciating them, — how a mere admiration of colour, or form, or detail at length results in enabling the observer to arrive at a reason why studying the excellencies of a picture or a statue in time educates up to the feeling of being able to give a reason for the faith in its qualities.

The hon. secretaries returned thanks. Mr. Pocock said, looking at the many years during which he had shared in the management of the Society, he began to think he ought to retire, and give place to some younger man; but this remark was received with a universal "No."

The drawing of prizes was then carried out.

320. — Stewart, H., Rensfield, Hendon.
1500. — Beavey, W. S., Douglas-street, Vincent-square;
James, F. L., Yokohama.
1000. — Busby, Mrs., 102, Oxford-street; Hodgson, R. J., 13, Frederick-street, Gray's Inn-road.
700. — Lawrence, Capt., Great St. Helen's; Nobes, J., Merton.

600. — Billings, H., Boston, United States; Gray, J., Stockton; Whitman, C. O., Wash.
500. — Blackburn, J., Kentish-town; Halse, R. C., Chesapeake; Hamilton, J., Belfast; McGregor, J., Jun., Hay.
400. — Brinton, W. J., Kidderminster; Deacon, J. J., St. Helen; Dymond, J., King's Cross; Elliot, J., Merton; Hillier, F. (per W. T. Fearis); McTurk, Dr., Bradford.

300. — Green, Mrs. H., Edgeware-road; Matthews, M., Bucklebury; Noon, Rev. J., Torquay; Pendergast, Longton; Reppin, W., New Bridge; Tait, J., King's Cross.

350. — Barragou, J. R., Lee; Browne, G., Bexley-heath; Freer, G. E., Dias; Grindley, R., Port Meadow; Gwynne, J. A., Denliquin; Meurer, Dr., Coblenz; Sealey, H., Gloster-terrace; Shalcross, R., Nelson, N.Z.; Smyth, R., Gains College, Cambridge; Warren, G. G., Market Drayton.

300. — Broadhurst, J., Fenton; Chorley, J. F., Moorgate; Grundon, W., Horbury; Hurst, J., Berrymead; Landerick, E. S., Tregulgar-road; M'Combs, —, Armagh; Miller, S. K., Denliquin; Powceby, S., Oxford-street; Spencer, J., Blackburn; Taylor, W. W., Norwood.
200. — Ash, G., Great Marlborough-street; Blakeman, T., Ely; Gellius, T. J., Richmond; Chorley, J. F., Moor-gate-street; Ferguson, W., Stock Exchange; Hayward, T. J., Newgate-street; Liddard, W., Inverness-terrace; McDonald, G., Farnham; Smiley, J., Newcastle-on-Tyne; Turnbull, T., Whitby; Tringham, J., Portland; Vase, D., Ayr.

200. — Bruton, A., Killarn; Bulmer, Capt., Ascot; Burt, E. L., Chelmsford; Dunn, T., York-gate; Morris, J., Cardiff; Morris, S., Geelong; Newdigate, Lieut.-Col. C., Granville-place; Reed, A. O., Woolwich; Rowe, Mrs. T., Victoria; Shirley, J., Hampstead-road; Vardy, Mrs. J., Southampton; Walters, Mrs. J., Regent; Waltham, J. W., Bow.

150. — Barrow, G. H., Adelaide; Chambers, W., Leeds; Fell, —, Groom's-hill; Feller, A., Hetcham; H.P.O.W. (per H. Crawford); Higley, W. S., L. and W. Bank; Howis, C., Brentford; Rutchings, J., Melbourne; Jackson, E., Torrington; Monkhouse, J., Brentwood; Overhead, W., Harrow; Peppin, G., Denliquin; Roulton, C. J., Finchley-road; Powell, W., Clifton; Saiz, G., Porto Rico; Stradwick, J. H., Bedford-street; Tindale, Capt., Blackheath-road; White, S. H., Hartford, U.S.; Woodward, N. W., Manchester; Wyon, A. B., Kilburn.

100. — Adeock, C. J., Port Elizabeth; Anderson, E., Morlaix; Cranfield, T., Dublin; Chubb, J. G., St. John, N.H.; Dorrell, —, Truro; E. M., East-cliff, Chelmsford; Friend, H. S., Islington; Gandy, G. A., Bishopsgate; Jackson, J. F., 67, Boro'; Jarvis, W. M., St. John; Keen, J., Cradley-heath; Lefroy, A. O., Grace-church-street; Leitch, J., Warrington; Naylor, H., Amwell-street; Officer, J., Victoria; Pilgrin, C. H., Merlewood; Reeve, Miss, Richmond; Rouniey, J. L., Lansdowne-place; Satterthwaite, J., Giverny; Seymour, W., Holloway; Vyse, H., Sunbury; Young, N. O., Christiansia.

A Bronze Vase. — Ethernott, Mrs., Brighton; Balls, W. T., Lewes-road; Carey, J., South Australia; Holbe, S., Mitley; Loder, F. W., South Audley-street; Bernard, W., Yarmouth; Ross, J., Dunfermline; Rowbottom, A., Sheffield; St. Barbe, Mrs. S., Lynton; Treacher, J., Clapham-road.

ON THE STRENGTH OF PORTLAND CEMENT.

At the Institution of Civil Engineers, on April 25th, Mr. Vignoles, F.R.S., president, in the chair, the paper read was on "Further Experiments on the Strength of Portland Cement," by Mr. John Grant, M. Inst. C.E.

In a previous paper the author had stated* that "further experiments were desirable, on the strength of and adhesion between bricks and cement under varying circumstances; on the limit to the increase of strength with age; on the relative strength of concrete made with various proportions of cement and ballast," &c. The experiments described in this paper were made with the view of throwing additional light upon these points, and might serve to show those interested in the subject the direction which their inquiries might advantageously take, and the large field yet open for their labours.

Before describing the new series of experiments, some of the points in the previous paper were reviewed.

The next step was to establish the conditions

* Vide Minutes of Proceedings Inst. C.E., Session 1865-6, vol. XXV., p. 68.

to be observed in the following new series of experiments:—

- On the strength of Portland cement tested by tensile strain at different periods, from one day to twelve months, mixed by hand and ground in a mortar-mill.
- On the adhesion between bricks cemented with Portland cement and lime mortars, tested by tensile strain at the end of twelve months.
- On the strength of Portland cement neat, and with different proportions of sand, tested at the end of twelve months, by compression in a hydraulic press. Size, 9 in. by 4½ in. by 3 in.
- On concretes of different proportions of Portland cement and lime, with gravel, sand, and other materials, tested at the end of twelve months by compression. Size, 12 in. by 12 in. by 12 in., and 6 in. by 6 in. by 6 in.

For these experiments 38 bushels of Portland cement were procured; the gross weight being 4,300 lbs. 11 oz., or 113·176 lbs. per bushel. When sifted through a sieve of 400 holes per square inch, this was reduced to 4,201 lb. 4 oz., or 110·56 lb. per "strided" bushel. About 36 lbs. were afterwards rubbed through the sieve; 34 lbs. would not pass, and there was a loss of 29 lbs. A certain quantity of cement was sifted, when it was found that the gain by sifting was about 14 per cent.

The following were the weights per bushel and per cubic foot of the materials used in the new series of experiments:—

Materials.	Weight of 1 Bushel.	Weight of 1 Cubic Foot.
Portland cement.....	110·56	68·376
Sand and ballast.....	123·49	78·490
Portland stone.....	98·00	78·580
Broken granite.....	116·00	90·625
" pottery.....	113·00	88·283
" slag.....	107·00	83·694
" flints.....	128·00	95·440
" glass.....	120·00	93·750

Table VI, Series A, gave the strength of the Portland cement used throughout these experiments at different periods from one day to twelve months; first, mixed by hand, and next, mixed in a mortar-mill for thirty minutes. In the first case the maximum strength seemed to have been attained at four months; in the second, at one month; the greatest strength of that mixed by hand was about double that mixed in a mortar-mill. The hand-mixed cement maintained its strength; the mill-mixed declined from its maximum at a month to the end of the experiments. This result was probably due partly to the process of crystallisation, or setting, having been interrupted by the continued agitation, and partly to the destruction by attrition of the angular form of the particles.

Table VII, Series B, on the tensile strain required to separate bricks cemented together with Portland cement and lime mortars, would require to be greatly extended before trustworthy deductions could be made from them. In the case of perforated bricks, the cement mortar seemed to act as dowels between the bricks, and the results were consequently high. The Suffolk and Fareham red bricks adhered well to the mortar.

Table VIII, Series C, on the strength of Portland cement bricks tested by crushing, was, so far as it went, very instructive. As a rule, strength increased with density. When the cement was in less proportions to the sand than 1 to 2, or 1 to 3, those dried in air bore a greater pressure than those kept for twelve months in water. This would lead to the inference, that when the quantity of cement was small, bricks or blocks of concrete should be kept some time out of water, to harden before being used. Contrasting the strength of these concrete bricks with different clay bricks, it was found that down to the proportion of 6 to 1 the former compared favourably. Thus, bricks made of neat cement bore a pressure equal to that of Staffordshire blue bricks or best Fareham red bricks. Bricks made in the proportions of from 2 to 1 to 6 to 1 of cement were equal to picked clay bricks of six varieties.

The D series showed the strength of concrete bricks made with Portland cement, mixed with various materials in different proportions, and crushed after being kept a year, half of them in air and half in water. The general deductions were, that those made with the largest proportion of cement were the strongest, the strength being nearly in proportion to the quantity of cement. Tables were given of the strength of 12 in. and 6 in. cubes of concrete made with

ballast, Portland stone, broken granite, pottery, slag, flints, and glass, mixed with Portland cement in the proportions of 6, 8, and 10 to 1, and compressed. Half were kept in water for twelve months. The most prominent result of these tables was that concrete made of broken stone or broken pottery, was much stronger than that made of gravel; due, no doubt, partly to the greater proportion of cement absorbed in the latter case in cementing the finer particles of sand, and partly to the want of angularity in the gravel. Compression and an increase in the proportion of cement alike increased strength. In making concrete bricks or blocks of moderate size, compression might be applied with advantage; but with large masses of concrete it would be difficult to do so without running the risk of interrupting the process of crystallisation or setting, which commenced immediately on the application of moisture. The cost of labour so applied would therefore be better employed in a larger admixture of cement.

The different modes of using Portland cement in the construction of sewers were described: in some cases only as a foundation or as a backing for brickwork; in others sewers, 4 ft. 6 in. by 3 ft., of concrete were lined with half-brickwork; and in other instances sewers were formed entirely of concrete, in the proportions of one of cement to six of sand. The cost of this concrete was less than half that of brickwork; but if rendered inside with cement, it was about the same as if lined with half-brick,—perhaps the cheapest form of sewer, combining strength with soundness. Sewers and culverts of almost any size might be made on this principle. Sewers made of concrete, and not rendered inside, though somewhat cheaper, had one practical disadvantage in busy thoroughfares, inasmuch as they required a long length of centering, on account of the slow setting of the concrete; and it was therefore necessary that about double the length of trench should be open at one time. The cost of a concrete sewer, 4 ft. by 2 ft. 8 in. was 10s. per lineal foot, exclusive of excavation. Under the same contract, a brick sewer, of the same size, 9 in. thick, cost 16s. 6d. Another concrete sewer, 7 ft. 1 in. in diameter, cost 16s., or, inclusive of earthwork, side-entrances, junctions, &c., about 23s. per lineal foot. This sewer was, in some respects, exceptional, inasmuch as it consisted of little more than an arch over a previously-existing invert. The lower half was, however, rendered with cement and sand, in equal proportions, 1 in. thick. Everything being taken into consideration, the most economical combination was $\frac{3}{4}$ in. of brickwork in cement, and the rest in concrete. Another sewer, 9 ft. by 9 ft., of concrete, with a lining of $\frac{3}{4}$ -inch brick in cement, was mentioned.

In the construction of the Albert, or Southern Thames Embankment, it was originally intended to form the wall of brickwork, with a granite facing; but after about a fourth part of the work had been executed, 14,335 cubic yards of Portland cement concrete, made in the proportions of 6 to 1, at 11s. per cubic yard, were substituted for an equal quantity of brickwork, at 30s. per cubic yard.

From the experience already gained in the use of Portland cement concrete, there would seem to be hardly any limit to the purposes to which it might be applied. It was gradually being brought into use in the construction of dwelling-houses in different parts of the country, and there was no doubt it would be still more extensively employed in the construction of docks, piers, breakwaters, and other massive engineering works.

Many experiments had been made in the manufacture of bricks of different proportions of Portland cement and sand, and these were equal in strength and appearance to most kinds of clay bricks. Where concrete could be used in a mass, it was cheaper than when used in the form of blocks, and still cheaper than in the form of bricks. In 1867, a number of arches were formed with "Bétons Agglomérés" by M. Coignet, under the steps leading from Westminster Bridge to the Albert Embankment; also about 40 ft. of sewer, 4 ft. by 2 ft. by 8 in., in the Camberwell-road. Similar arches and sewers were constructed of Portland cement concrete, and the general result was that the Portland cement concrete was both stronger and cheaper than the béton.

Tables were given of the strength of 589,271 bushels of Portland cement used during the last five years on various works south of the Thames, showing an average tensile strain at the end of

a week of 806 63 lb., equal to 358 5 lb. per square inch, being an improvement on that reported five years ago of 200 lb. on the breaking area of 2½ square inches, or 89 lb. per square inch. The quality had not only been maintained, but had continued to improve. The strength at the end of thirty days of 37,200 bushels of the same cement, as ascertained by 1,180 tests, averaged 1,024 lb., equal to 455 lb. per square inch, showing an average of 234 lb., or 30 per cent., over the cement tested at seven days, which broke at 790 lb. Wherever the nature of the work would admit of it, tests at the end of a month would be found more satisfactory than if made earlier, as heavy cements, though the strongest, eventually, were the slowest to set. The standard originally specified was 400 lb. on 2½ square inches, and this was soon afterwards raised to 500 lb., or 232 lb. per square inch. This had since been increased to 350 lb. per square inch, or 787 lb. on the breaking area at seven days. For the purpose of comparison the same sectional area at the breaking point (2½ square inches) had been retained. Further experience had confirmed the earlier conclusions, that the strength of Portland cement increased with its specific gravity, its more perfect pulverisation, and its thorough admixture with the minimum quantity of water in forming mortar. Heavy cement, weighing 123 lb. a bushel, like that referred to in Table XVIII., took about two years to attain its maximum strength under neat; but by the admixture of sand or gravel, cement, mortar, or concrete was reduced in strength, and set less rapidly than neat cement. Roman cement, though from its quick setting property very valuable for many purposes, deteriorated by exposure to the air before use, and was about double the cost of Portland cement, if measured by strength. In making cement concrete, it would from this seem desirable to spend no more time than was absolutely necessary to effect a thorough admixture of the cement with the sand and gravel.

SOCIETY OF PAINTERS IN WATER-COLOURS.

SIXTY-SEVENTH EXHIBITION.

CONTRARY to the usual rule, the "Society" of Painters has in the present year taken a decided step in advance of their brethren of the "Institute." It is true that some of the remarks which we made in our notice of the other exhibition may be not inapplicable to the case of the Society. Still, if works of the first-class of merit are rare, and that in consequence rather of the carelessness than of the want of skill of their designers, the ensemble of the 274 pictures now hung at 5, Pall-mall East, leaves an agreeable impression on the mind.

As an instance of the carelessness of which we complain, we can cite one of the most brilliant works, by one of the most noted artists in the Gallery. Carl Haag has given, in (104) "Danger in the Desert," a striking incident in the half-savage life of the Bedouin. A camel reclines on the sand, with a little scanty herbage in the foreground. Crouched behind the quiet ship of the desert is a woman, who bends in alarm over her child, while her husband, a tall stalwart figure, is preparing his rifle, and watching the headlong speed at which two horsemen, armed with lances, are hurrying towards them. The accidents of Eastern life are powerfully rendered. The contrast between the quiet repose of the camel, the heedlessness of the child, the terror of the woman, the proud self-reliance of the man, and the hurry of the distant foe, is admirable. The fierce sunbeams light up the head-dress of the defender, and the quaint pack-saddle of the camel. But where is the shadow? There is a sort of shade, which might be supposed to be cast by a cloud,—but for the character of the sky; or by a rock, except that in order to cast it the rock must be between the group and the spectator. But even then, the parts of the figures that are lighted up would cast a shadow somewhere. There is, however, none to be traced, and the strange omission is made more palpable by the fact that the distant horsemen throw very visible and effective shadows on the sand. Mr. Haag's other contribution (203), "An Egyptian Bahsi Bazouk," is marked by this artist's characteristic power of delineation.

The drawing which, out of the entire collection, lingers on our memory with the greatest charm, is one as to which our criticism is confined to the name. There is a confusion of

persons indicated in the title and line of illustration. The former is "St. Mary Magdalene," the quotation, "She sat at Jesus's feet, and heard His words." That the Mary of Bethany was the one called Magdalene is one of those errors which has had supporters, but no basis. The lovely, innocent girl drawn by Mr. Dobson (124) is neither a Jewess nor a *repentia*, any more than a saint of Romish or pseudo-Romish worship. The nimbus delineated over her head is not needed as an attestation of the purity and goodness of the mind, and yet it does not seem out of place. As a work of idealised portraiture, this head is of a very high order; but it would have been better named after St. Reine, the royal martyr of France, or one of those English captives, of whom St. Gregory said, "*Non Angli sed Angeli.*"

Entering the gallery, the eye is first attracted by a bright architectural view of Paris, from the Pont de la Concorde, an unintentional satire on the Paris of to-day, by Mr. Collingwood Smith (3). Close by hangs "Porte Guillaume, and Cathedral at Chartres," marked by the cool grey tints, and clear stippled touch, of Mr. J. Burgess. A little more red in the tiles would be an improvement to the colouring of this picture.

We think, as we expressed last year, that it is neither to the advantage of the exhibition nor of the public to display so many works by individual artists. Of Mr. Smith's drawings there are fifteen, and the same number by Mr. Callow; while Mr. Davidson, Mr. Gastineau, and Mr. Naftel nearly equal the count. Among those of Mr. Collingwood Smith we call particular attention to No. 99, "Finsington Spire, on the Dove," a romantic bit of Dovedale scenery. No. 102 "Trento, on the Adige," is another charming drawing, and "The Pharos," Genoa, is a characteristic peep, faithfully rendered.

The happily blended colour of the rich autumnal tints cast over the foliage that adorns "Bishopston Valley, South Wales" (17), and the bright gleam of the setting sun, show both appreciation and power to represent the beauties of our own scenery on the part of Mr. C. Branwhite. Mr. F. Taylor has turned out his cattle from the ferry-boat, in No. 18, with a vigorous touch. The creatures in the water are remarkably good. Our portfolio of English scenery is enriched by such drawings as (29) "The Last Wreaths of a Sea Fog at the Lizard," by Mr. S. P. Jackson; Mr. Branwhite's "Early Moonlight," with the stag shown in bold relief against the water; the well-selected peep at the ruins of Tintagel Castle, by G. A. Frapp; and the detached windmill on the Essex coast, by Mr. Branwhite (51). It is pleasant to pass from the reflected lights and tender green transparent shade of the beech trees in Mr. Davidson's "Early Spring," to the snow-dusted Scottish mountains that look down on Loch Awe and Loch Etchan. On the summits of the former, as drawn by Mr. Richardson (112), the snow lies unmelted, while it has sunk into the rifts and hollows of the latter, as represented (113) by Mr. Frapp. With these we compare the bright glow cast by "The Last Gleam of Sunset on the Glyders," lighting up the cloven scarp of the mountain-top with a ruddy tint like that of serpentine, or limestone very rich in iron ore. Scottish and Welsh scenery will compare, with good effect, with such Continental landscapes as Mr. Gastineau's "Lecco, on the Lago di Como" (79), where the aerial perspective in which the line of distant hill-tops dies away is admirably reproduced. Mr. Duncan's "Dutch Fishing Boats in a Gale" are running from a very truthful and angry sea (101). W. Evans, of Eton, displays an unusual appreciation of the vivid colouring of the Italian landscape in the intense blue of the sky in (85) "Bassano, from Poggia," and an evening view of "San Remo" (239). "Cochem, on the Moselle," a side-long view of sloping mountain ground (177), by Mr. Callow; "Deitz, on the River Lahn" (155), by Mr. Richardson; and the crater-like hollow of Cader Idris, by D. Cox, jun., will all repay attention.

Mr. Birket Foster gives nine very small drawings. They are, as usual, gems. No. 248, "Old Walton Bridge, on the Thames," brings to mind the *Liber Flavivirum*. No. 243 is a "River Scene, with Sheep," in which these animals seem almost to move on the canvas.

We wish Mr. Holman Hunt were more respectful to his own great reputation, to say nothing of the public. If he were to compare his rendering of marble, in No. 204, "The Interior of the Mosque of Omar," with the mode in

which Alma Tadema makes his columns gleam, we think he would put forth a little more of his dormant power. In 255, "The Pathless Waters," he has cut a steamboat in half, painfully, to show a told, though effective, representation of a lunar halo.

Mr. Gilbert always fills his canvas with colour, life, motion, and character. We wish that he would study ethnology. Great forces would be added to his designs if they were more true to national types. No. 19 is "A Scene from 'Gil Blas,'" in which the surprised deference of the hero, the eager assiduity of the dwarf, the solemn port of the landlord, and the easy beauty and well-drawn dress of the lady, form a very agreeable picture. We like "The Maid of Orleans" (66) less. Although her face is good, it is hardly that of the heroine; nor is her figure that of an armed maiden. There is nothing French in the faces. The fine figure of the Bishop may be recognised as suggested by a well-known Rubens. No. 110 is more like a representation of the play of Henry VIII. than of the scene counterfeited by the players. The features of Wolsey are faithfully taken from the portraits; the attitude of the King is exaggerated. In the "Arrest of a Traitor" (244), the dismay of the prisoner is very striking. Mr. Gilbert's pictures always tell.

We must revert to the masterly touch of Mr. Burgess, shown in his sober greys and browns, in the "Abbey of Jumieges," and the "Broken Bridge at Chartres" (49 and 50), and the "View at Dijon" (156). Mr. E. K. Johnson's "Midsummer Night" represents a group of graceful women seen by moonlight. The dim ghostly shimmer of the illumination is happily caught, but the flowers in the foreground have, we think, too much colour. Mr. Lundgren has given very life-like portraits of "Indian Natch Girls," in No. 90. A drawing from Mr. Pinwell will be eagerly looked for. In "Away from Town" (130), one can scarcely understand the reason why parts of a picture, each in itself so good, have such difficulty in combining into a whole. In Mr. A. B. Houghton's, "Hiawatha and Minnehaha" (138), not only the savages are red, but ground, rocks, hats, everything except the gamut and hungry dog—are a study in reds. We omit to particularise one or two imitations of mosaic work, and one or two which resemble studies of chopped hay, with many efforts and trials in varied and sometimes in original directions. There is much to please in the present exhibition, which seems to have been less impoverished than some contemporary gatherings by the claims of the International Exhibition at South Kensington.

THE GIBBS COLLECTION OF ANGLO-SAXON OBJECTS IN THE SOUTH KENSINGTON MUSEUM.

The Directors of the South Kensington Museum have done well in placing the arrangement of the Gibbs bequest of Anglo-Saxon relics under the care of Mr. C. Roach Smith, and the "Catalogue" now published is a proof of the wisdom of their choice.

Collections there are, more numerous, but few that yield in value to the Jewish or Saxon ornaments which have within the last twelve years been from time to time exhumed from the Faversham brick-fields, or during excavations made for the completion of the London, Chatham, and Dover Railway. East Kent was proved so particularly rich in relics of the arts and handicraft of our Teutonic forefathers, that the antiquities found in the district may be said to equal in number, and far surpass in beauty and elegance of workmanship, the objects of a similar character found throughout all the breadth of England besides; and although no single relic of the Faversham collection equals the great Kingston brooch,* set with garnets and turquoise, measuring 3½ in. in diameter, and weighing 6½ ounces, a large portion of it being of pure gold, yet the fibulae of the Gibbs Collection, consisting of some seventy or eighty specimens, comprise many beautiful ornaments, especially those which, in their gold braid or network, exhibit such wonderful artistic skill.

The elaborately executed ornaments for horse harness seem almost peculiar to the Faversham district, although some less finished specimens have elsewhere been found. The interments

whence these objects were taken seem to have been near, or intermingling with, a Roman cemetery, a not unusual occurrence; the burial-grounds of an older race of people offering obvious inducements for similar uses to the population which succeeded them. Indeed, the practice has not been confined to Pagan races; the churchyard of the nuns of the Holy Sepulchre, at Canterbury, was located over a thickly-occupied Roman cemetery, where the rites of cremation and urn burial had been practised, whilst beneath the deposit of earthen and glass vessels, and bronze relics, were found more than one rudely-formed urn, composed of sun-baked clay, which indicated that the still older inhabitants of British soil, probably Belgic or Celtic tribes, had also held their funeral observances on the same ground.

Amongst the Roman objects of the "Gibbs Collection," is a remarkable bronze vase, with highly-ornamented handle, described in the catalogue as "A Jug, bronze, No. 1295-70." We remember seeing this relic a day or two after Mr. Gibbs had obtained possession of it in 1859. It was found with several glass vessels and Samian paterae, and a mortuary urn or two. Possibly, two or more interments may have been included in the "find" for as Mr. C. R. Smith rightly observes, no systematic method was pursued either in opening the graves, or taking notes of their contents. Mr. Gibbs had, we believe, paid something like 11l. for these special articles, and he called our attention to the design on the worked handle of the "Jug," which he considered to represent Satan, Eve, and the Apple. Certainly a woman with an apple or similar fruit, is represented, and in spite of what Mr. C. R. Smith describes as the "mitred male figure," the said figure looks anything but clerical. We should attribute the design as the expression of some very ancient myth, and think the vase probably was of Etruscan origin. It is exceedingly curious.

The most perplexing question in connexion with the Faversham Anglo-Saxon Cemetery,—indeed, with most of the so-called Jewish interments in Kent,—is the dates. Mr. C. R. Smith has judiciously pronounced no decided opinion on this subject. The presence of Roman relics in the Saxon graves, such as coins, bulks, fragments of pottery, &c., prove merely that an immigrant people treading almost upon the heels of the departing, perhaps fugitive, Romans, had from their graves, or rather from the population remaining in the country they had abandoned, obtained the objects of Roman handicraft, remaining in abundance. Possibly, Roman art had a large share in stimulating the Teutonic workman.

The orientation of graves,—it was very apparent at Sarre, much less so at Stowting,—proves little, or rather is not conclusive of the Christian character of the funeral rites. With Roman coins, although very rarely, we find the Sceattas of the Anglo-Saxon kings; but the gold coins of the Lower Emperors—of Mercurius and Heraclius, as discovered in a Sarre grave—give a date, as far as that particular interment is concerned, from which we cannot recede.

With Mr. C. R. Smith, we are inclined to think that the earlier Anglo-Saxon interments in Kent were Pagan, but that subsequently the first Christian converts were buried after the manner of their heathen forefathers, and that until churches and religious houses had arisen, and had been for some time established, the ancient rites of interment were continued, and to such extent that of the hundreds of graves exhumed within even a comparatively small circumference, no distinctive differences were apparent. Possibly, as at Stowting, where few graves lay east and west, and little rudely-made black urns were found in many of the interments, we might note these circumstances as pointing to heathen practices.

Drinking-stoups as deposits in a grave might seem to be inconsistent relics for a Christian professor or convert; and yet the metal bowl at Sarre was found with the gold coins of two Christian emperors, and a Frankish Christian king.

The grave containing the coins above alluded to would bring down the date to the seventh century, at least. The difficulty seems to lie in the consideration that graves containing relics so similar,—indeed, in many cases almost identical,—could range over a period of more than two centuries. Supposing, in accordance with Mr. C. R. Smith's view, we take the fifth century as about the date of the earlier cemeteries?

An opinion is advanced that the fibulae of the

Gibbs and other Kentish collections might have been made by Canterbury artificers? There are circumstances, I think, which militate against this supposition; for although the soil at Canterbury is literally sown with coins and fragments of Roman relics, no Anglo-Saxon or Jewish fibulae have ever been found, except a few very insignificant objects, and these most rarely. Yet the fact of there being discovered in a Sarre grave a small metal crucible, containing a portion of molten bronze, admits the supposition that the Anglo-Saxon brooches and ornaments in metal were not entirely the workmanship of foreign artificers.

Mr. C. R. Smith's pamphlet is worthy of great praise, from the mass of information he has thrown together in so interesting a manner; and although his little work is styled a "Catalogue," it is an archaeological essay exhibiting the studied experiences of one of our most eminent antiquaries.

When we saw the collection itself, a few weeks since, crowded together in three small cases, it seemed in a deplorable state of confusion, and ought not so to have been exhibited at all,—at least, not until some order had presided over the apparent chaos. Some of the relics which we remembered when, in the keeping of Mr. Gibbs were preserved with a fatherly care, seem to have deteriorated or suffered injury from recent fractures or want of proper precautions. We trust their present arrangement will render them always accessible to the public. There seems a fatality attending the rich stores of antiquarian objects found in Kent. The Fansett, Rolfe, and Douglass collections are removed far away from the county in which they were found. The more precious articles of the Sarre graves, although deposited at Maidstone, are scarcely accessible at all, except through a ceremony of red-tapism and an ordeal of half a dozen keys. The "Roach Smith Collection" in the British Museum certainly wants a rearrangement, and the great fibula from Sarre, purchased by the county, with a few other objects, for 50l., still remains, after a lapse of several years, undescribed and unlabelled in the case in which it was originally deposited.

JOHN BRENT, F.S.A.

THE ORPHANS OF ARTISTS.

H.R.H. THE PRINCE OF WALES will preside at a dinner on the 6th of May, in aid of the fund which is being raised with a view to render material aid in the support and education of Artists' Orphans left unprotected for. The endeavour proceeds, our readers may remember, from the Artists' General Benevolent Institution, and we mentioned the gift of 1,000l. towards it by Sir William Titie. The Royal Academy has given 500l., and amongst the donors of 100l. each are Messrs. Ansell, Henry Bicknell, Elmore, Frith, Leaf, Leighton, A. J. Lewis, Lloyd Lloyd, Millais, G. Moore, John Murray, Reiss, Street, and G. F. Watts. Mr. P. C. Hardwick, the treasurer (Cavendish-square), who gives 250l., his late father having given a like sum, will receive subscriptions; and we cordially invite our readers to aid in the good work. It is intended to make use of existing schools and Orphan Asylums throughout the country, and thus to avoid the expense and responsibility of a special building, with its necessary staff.

THE ROYAL ACADEMY.

The Council of the Royal Academy of Arts have obligingly given an early day to art critics for a quiet examination of the 1,338 works of art forming their 103rd Exhibition; but as they at the same time intimated that it was desired no notices should appear till after the private view, this Friday, the 28th, we confine ourselves to a brief observation or two pending our next issue. The collection includes a large number of good pictures, but we doubt if it will be regarded, on better acquaintance, as quite up, as a whole, to what some of us can remember. In the first room, Mr. Millais's fine landscape, "Chill October;" Mrs. E. M. Ward's "Fortunes of Little Fritz;" Mr. E. Long's "Question of Propriety;" and Mr. Vicat Cole's delightful "Autumn Gold," will get most attention. The second room is distinguished by Mr. Calderon's "New Picture;" Mr. G. D. Leslie's graceful "Nausicaa and her Maids;" Mr. M. Stone's "Royal Nursery, 1538;" Mr. Hulme's landscape "On an English River;" and Mr. Wyndham's "Death of Buckingham." Room 3 has a large

* Found just a century since by the Rev. Bryan Fansett, at Kingston, in Kent, and now in the Liverpool Collection.

number of the plums. M. Gerome's "Cléopâtre apportée à César dans un Tapis;" Mr. Frith's gamblers, "The Salon d'Or, Homburg;" Mr. Calderon's "On her Way to the Throne;" Mr. Ward's "Anne Boleyn at the Queen's Stair, Tower;" Mr. Millais's "Moses," and Mr. Cope's picture showing "Mr. Guy conferring with Dr. Mead and the architect, Mr. Stear," upon the plan of his hospital. Here, too, are "The Book-worm" by Mr. Marks; "A Wee Bit Fractions" by Mr. T. Faed; Mr. Watte's Portrait of Mr. Millais; "May we come in" by Mr. Lehmann; "A Roman Emperor," by M. Tadema; and Mr. Leighton's "Hercules wrestling with Death for the Body of Alcesteis." We will not now go further. The architectural drawings are about sixty-five in number, and will be spoken of next week.

THE ILLIBERALISM OF LOCALISM AND LOCAL RULE.

THERE is not one spot in the British dominion where the universality of living genius finds a fuller recognition than in the City of London. Be he Frank or German, American or Australian, Celt, or Soot, there is a free *entrée* and an ample scope for the development of his theories or his talents; and if he possess the proper stamina for persevering labour, success will sooner or later be his reward. Long and arduous struggles against adverse circumstances, many are likely to endure; but if their hearts do not sicken and die within them from a succession of disappointments, the goal they have in view is not unlikely to be reached. Aspirants for practice and fame are, without doubt, numerous in every field,—more numerous than in any modern city. There are not only two for every opening and appointment available, but fifty times two; but appointments still increase as well as population, and a considerable quota of the latter die off, though not so fast as they are born. London is no longer a city, but a continent, or conglomerate of cities, and it may be compared to a great central focus, to which innumerable rays of light converge. In this huge cone of reflected thought many smaller rays are overshadowed or absorbed for lack of penetrating force. The greater the intellect the greater is the mechanical power; for true genius is a self-acting wedge that will open a passage for itself. Life in London is fast ceasing to have aught of localism about it, and it will be a happier time for humanity at large when every avenue to advancement will be publicly purged of the illiberalism that signalises local spirit.

The architect, engineer, *littérateur*, artist, and operative have now a fair field wherever honesty of thought and purpose regulates public rule; and where it does not, the transgressors are sure to stand confessed fit objects for just censure.

Appointments, of course, are still made by which candidates are pitchforked into office utterly unfit for their duties. Premiums are still awarded to competitors, not for merit, but by influence and favour. Disreputable and dishonest canvassing takes place now and again, by which useless men are elected over the heads of others with the largest experience and the highest of testimonials; but most of these evil practices are confined to minor local and vestry boards. A time is coming when they will be fewer and more rare. There are hundreds of professional men,—architects, surveyors, medical officers, clerks, and minor public officials,—who would not waste a sheet of paper in applying for an appointment to many of our local boards in the environs of London and in the country. Why?—Because their names and practices are notorious for local favoritism and jobbery. Any professional man who has lived between thirty and forty years, and has had aught to do with some of these bodies, knows from bitter experience what a rotten sham are many of their elections, what a specious pretext are their advertisements, what a juggle and make-believe is the open competition, varnished and enamelled with the false proviso, "No canvassing permitted."

We once devoted several months to the task of testing the reality of some of these appointments, and, with shame we confess it, we found, in the majority of them, a "foregone conclusion." While there was some little semblance of fair play shown in the election of superior officers, we found in the election to the minor offices a total absence of all fair dealing. In the matter of rate collectors, relieving officers, sanitary officers, &c., we found that the appointments were made or *managed* by private working and

intrigues, or by other well-known device, so that no amount of high-class testimonials as to former servitude, or intelligence, or experience, was allowed to have the least weight. Need we wonder, then, at the incapacity and scandal that often become painfully manifest to the public view. Where merit is ignored evil is sure to reign, in one way or another.

Taking a broad view of the matter, the principles of localism, if it possess any, cannot be healthy or sound. Love for one's town or parish does not imply hatred and exclusion to one's neighbour. If this principle were carried out, what would professional practice in London become? If localism regulated public, commercial, mercantile, and manufacturing practices in London, the true Cockney, and not the New Zealander, might soon stand alone in his glory on a broken arch of London Bridge. No, thank Heaven, exclusiveness is not the motto of this great city.

Irish and Scottish sculptors, painters, architects, engineers, artists, journalists, craftsmen, lawyers, and divines, may transfer their labours here, and work freely and openly for money or fame, and find recognition and honest assistance.

THE PEOPLE'S PARK, BELFAST.

THE town council of Belfast has purchased the demesne of Ormeau from the Marquis of Donegal. The demesne comprises 180 acres, and the corporation have obtained a lease for ever, at a yearly rent of 10*l.* per acre, or about 1,800*l.* It is intended to set apart 100 acres of the demesne for the purposes of a park, and the remainder of the ground will be let for building purposes.

The obtaining of this land for a people's park, was inaugurated by a demonstration of the trades and friendly societies, at which the mayor and corporation attended. The two M.P.s of the town, Mr. Thomas McClure and Mr. William Johnston, headed the procession, and the working men were congratulated on having obtained one of the finest parks in the United Kingdom. We believe it is also intended to secure ground for another park for the Shankill Falls and Cromlin-road districts, north and north-west of the town. People's parks go on increasing over the kingdom. There could not be a more wise provision and safeguard for the health of the future. They are the sanitary lungs of our over-crowded towns and cities.

THE MARKETS: LEADENHALL, BILLINGSGATE, AND COLUMBIA.

At the last meeting of the Court of Common Council, at Guildhall, the Lord Mayor presiding, Mr. Rigby presented a petition from salesmen, senders of poultry and game, poulterers, and others, carrying on business in Leadenhall Market, praying that the clause in the Bill now before Parliament to dismarket the present poultry-market at Leadenhall may be withdrawn from that Bill. The petition, without being read, was referred to the Markets Committee for consideration.

Mr. J. F. Bontems, chairman of the Markets Committee, brought up a report from them, recommending that Billingsgate Market should be extended to the western side of Darkhouse-lane, and that they should be authorised to present a Bill in Parliament containing powers to acquire the necessary property for that purpose, and raise the requisite funds to an extent not exceeding 150,000*l.* The estimated expense of 150,000*l.* would include the entire covering in of the market, the excavations necessary, and the purchase of the scheduled property. He added, it was expected that the extension of the market would treble the receipts of the Corporation there, and that the trade had not been in the least affected by the opening of Columbia Market. To this Mr. Turner proposed an amendment, to the effect that it would be impolitic for the Court to expend 150,000*l.* in enlarging the market until some better arrangement could be made for the street traffic, and that the report should be referred for reconsideration.

The motion for enlarging Billingsgate Market was carried by a majority of 23, and the Coal, Corn, and Finance Committee were authorised to consider the subject of raising the necessary ways and means.

The Lord Mayor stated, that while this dis-

cussion was pending, he had received a communication on the part of Miss Burdett Coutts, to the effect that she was desirous of having, through her representatives, a conference with the authorities of the Corporation in relation to the market she had erected in Bethnal-green, at a cost of about 250,000*l.*, and with the view possibly of handing it over to the Corporation. The communication was referred to the Markets Committee, for them to consider and report upon it. The Court then adjourned.

THE THAMES EMBANKMENT WORKS.

At the ordinary meeting of the Metropolitan Board of Works, on the motion "to receive communication from Messrs. Markwick & Thurgood as to a modification of the 112th clause of the specification of the Chelsea Embankment Works; and to take such action thereon as may be necessary," the chairman moved that the Board do resolve itself into a committee to take this communication into consideration, which was put and carried. Messrs. Fry & Neave, having put in the lowest tender, had obtained the contract for the works, but a week afterwards sent a letter declining to proceed, on account of the discovery of an error. The Board had then called upon Messrs. Markwick & Thurgood, who had sent in the next lowest tender, and their agent had agreed to take the contract on the terms formerly offered, and the Board then, by vote, passed the contract to them. But since then Messrs. Markwick and Thurgood appear to have taken an objection to one of the clauses in the specification, known to all when tenders were invited. It was formerly the practice of the Board to require sureties, but as that system led to a good deal of jobbing, sureties were done away with, and the contractor was required to do a certain amount of work before he received any payment whatever. This clause was objected to. On the public being readmitted after withdrawing, the clerk read the report of the committee of the whole Board, which stated that the terms of the 112th clause of the specification could not be departed from, and that further tenders should be invited for the works. The report was adopted.

The following communication was received from the vestry of St. Marylebone:—

"That this Board takes leave to express its strong protest against the conduct pursued by the Commissioners of the Woods and Forests with respect to the order issued by them to the Board of Works to build a brick wall around a portion of the Thames Embankment, which would deprive the ratepayers of London of the advantages of the great work which has been solely accomplished by a tax imposed on them. That this Board highly approve of the determination of the Board of Works not to proceed at present with the execution of the order of the Woods and Forests, and to await the event of the forthcoming motion of the honourable member for Westminster on the subject."

CHURCH IN CEYLON.

ALL Saints' Church, Point de Galle, was consecrated, on the 21st of February, by the Bishop of Colombo. The new church, which stands in a prominent position on the highest ground in the fort, was designed by Mr. James G. Smither. It is a cruciform structure, and consists of a nave with aisles, north and south transepts, chancel, apse, sacristy, and organ-chamber. At the intersection of the transepts with the nave there is a massive square tower, with angle pinnacles, crowned with a spire constructed of wood and covered with malleable zinc, prepared in England. Inside, the tower is vaulted with wooden ribs and boarded. The nave arches spring from columns of granite (each in a single block), which are to be polished. Slender wall shafts, on corbels, divide the walls into bays, and serve to support the roof trusses of the nave and transepts; but those of the chancel are borne by stone angels. A clear-story is carried round the church, lighted by lancet windows, those in the nave being triplet, and those in the transepts coupled, lights. A large rose-window fills the upper part of the nave and transept gables. The chancel is lighted by lofty lancets, and large triplets light the transepts below. Instead of windows there are doors in the aisles of the nave, which are made to slide in the walls. A narthex of considerable size occupies the west end. The entire length of the church is 120 ft., its width across the transepts nearly 80 ft., and the height from the floor of the nave to the ridge of the roof is over 50 ft. Two handsome memorial windows of stained glass, by Messrs. James Powell & Sons, of London, have been put up in the chancel, and

a third is promised. The subjects are the Crucifixion and the Last Supper in the centre window, and the Baptism and Ascension in the other. The windows of the church generally are glazed with cathedral glass, in geometrical patterns. A fine organ, by Messrs. Hill & Son, has been fixed in the organ-chamber. The font, altar and cloth, pulpit, and some other articles, are presents.

EXETER CATHEDRAL.

A LECTURE to the members and friends of the Exeter Literary Society has been delivered by the Archdeacon of Exeter in the Royal Public Rooms of that city, on the "History and Characteristics of Exeter Cathedral." The Bishop presided, and there was a very large attendance.

After some preliminary remarks, the lecturer referred to Bishop Warelwast, in the year 1112, with a plumb-line and trowel in his hand, about to lay the first stone of the first cathedral. And the great question about him and his Norman successors is, *how much* did they do? and what design had they in their heads in doing it? That they built the mighty transeptal towers, at once the glory and the riddle of our cathedral, is certain from the architecture. But why on earth they built them where they did is a problem to this day. There are only two other churches in the world that have towers in that position—the Cathedral of Le Mans, in France, and the Collegiate Church of Ottery, in Devon. Were they meant, originally, to form western towers to a fabric lying east of them, and only converted into transepts as an after-thought, or were they meant from the first to serve their present purpose? The former view is no doubt attractive. But after the fullest consideration I have no hesitation in joining with our best antiquaries in rejecting it. The fact that there are two other churches with similarly situated towers, presents a great difficulty, for the improbability is very great that three church builders should pass through the same change of purpose. And the facts on the other side are irresistible.

On concluding his historical survey, the lecturer spoke of other characteristics of the cathedral besides its transeptal towers; such as its bilateral symmetry; the unbroken vista of its vault; and its unusually uniform and apparently studied numerical treatment. This is seen in the height, length, and breadth of the nave and transept towers, each of which, as given by Mr. Hewitt, is 140 ft. Like the New Jerusalem in the Revelation, the length, and the breadth, and the height are equal. Very unusual, too, is it, if not unique, for the nave and choir to have, as here, the same number of bays, and that, too, the mystic, and in cathedrals uncommon, number of seven. And so nearly exactly in the centre is the great middle boss of the transept (bearing, it seems, the figure of the Black Prince) that if an axis were let down from it, and the whole cathedral turned round upon it, the great east and west windows would, as nearly as possible, take each other's place; as, of course, the north and south transepts would. Another and chief characteristic is the perfect unity of style in the interior as it exists, marked only by the introduction of the east window. It is, perhaps, the only cathedral in England in which you can take up a point of view (*viz.*, at the east end) from which you behold one style prevailing throughout, and that, too, the most perfect style, the Decorated. Salisbury is still more completely of one style, but that is Early English. The supreme and most glorious characteristic, however, of our cathedral is its architectural harmony, in which respect I doubt whether it can be matched in the world. The pillars and the vaulted roof exhibit to our gaze an immense and almost unexampled multiplication of regular and rhythmical intervals. Each of the thirty marble pillars is subdivided into sixteen minor, but still massive flutings: 480 in all, of which half, *i.e.*, 240, are visible at one time. But it is in the vaulted roof that the most astonishing effect of this kind is realised. The earlier roofs of Chichester and Hereford have simpler; and later ones, as of King's College Chapel, show what may be done by a rich and many pattern. But in the vault of Exeter the rhythmical repetition of parts reaches its sum. Each of the fifteen compartments exhibits twenty-four facets, so to speak, at a certain angle to each other. Bold girding ribs divide these facets from each other, and are themselves so moulded as to present each one fifteen different surfaces, with intervening hollows to the eye. There are therefore

nearly 60,000 surfaces in all, half of them visible at once, every one rhythmically placed, and affecting the eye with an agreeable impression of light and shade. It may give a further idea of the elaborate nature of the work, if I say that these surfaces and mouldings, each being, on an average, 12 yards in length, would, if drawn out in line, extend more than four miles. I shall conclude this lecture by insisting, on the authority of a great poet and profound lover of Gothic architecture, a comparison between our cathedral and the most perfect known instance of rhythmical architecture in nature,—the famed Fingal's Cave, in Staffa. The dimensions are nearly the same, our cathedral being 20 ft. longer, of the same breadth, but 30 ft. or 40 ft. lower. Were the cave ceiled with glass, so as to reflect the waters which roll below, the resemblance to our cathedral, with its fluted shafts and billowy roof, broken into thousands of rivulets and ripples, would be complete. Should the comparison be deemed fanciful, I would ask you to remember that, in the main, it is not mine, but Sir Walter Scott's.

We may conclude this notice of the archdeacon's lecture by here noticing that the dean and chapter have at length given orders for the commencement of the work of restoration at the cathedral. The work begins under the direction of Mr. Scott, who has prepared the plans. The works will extend over a year, but the cathedral will not be closed.

BRITISH ARCHAEOLOGICAL ASSOCIATION.

At the meeting held on Wednesday, the 26th instant, Mr. Thomas Wright, F.S.A., vice-president, in the chair, a tribute was paid to the memory of the late Mr. H. F. Holt, whose communications to the society were always full of valuable information, and whose agreeable manner and pleasing style of composition lent additional interest to the subjects of which he treated.

The Rev. S. M. Mayhew, F.S.A., exhibited an enormous collection of bronzes, from Butler's Wharf, Bermondsey,—so numerous as to lead to the conclusion that it was the site of a bronze factory. The chief articles were ecclesiastical, and some domestic; such as pins, wire, a gypsire mouth, reliquary, scourge, missal-clasp, steelyards, scale-beams, spurs, fish-hooks (or small harpoons), sail-needles, a gimlet, a morris-dancer's bell, keys, knife-handles,—some of which are gilt and engraved.

Mr. Watling exhibited drawings of Roman flat-tiles, with set patterns on them, found at St. Paul's, Suffolk.

Mr. J. S. Phené read a paper on the pottery found in tumuli in Scotland, chiefly on the site of Berigium, from which, and from Jedburgh, he exhibited examples.

Mr. J. Blashill produced a drawing and brief description of the Roman pavement just now discovered under No. 27, Mark-lane. He stated that it was 8 ft. beneath the surface, is of common red tesserae, and is very uneven on the surface. Several pieces of Samian and other pottery had been found, and sold to visitors. Other exhibitions having been made, it was announced that the Council had resolved to communicate with the French authorities, with a view to the preservation of the ancient walls of Dax, to which we drew attention in our last; whereupon it was moved by Mr. W. H. Black, F.S.A., and carried,—

"That the members of this association cordially approve of the steps taken by the Council to intercede with the public authorities in France on behalf of the ancient fortifications of the town of Dax, and earnestly hope that they may be spared from destruction, in accordance with the public voice of men of learning and science in this country and elsewhere."

BRISTOL CATHEDRAL.

THE annual meeting connected with the restoration of the nave of this cathedral has taken place.

The completion of the nave and aisles, together with the western towers (carrying the latter up to their full height), would require about 50,000. To build the nave and aisles and lower portions of the towers, with western entrance, the outlay would be about 40,000. Of this, subscriptions have been received and promised, amounting to 23,600; and, on the work already done, the sum of 18,400, has been spent. The nave will have a length of 117 ft., with a width of 80 ft.; and, when furnished with its north and south-

western towers, 130 ft. high, and west entrance, and brought into connexion with the original cloisters on the south side, the fabric will be handed to the future as a grand historical monument. At the service within the building, Dr. Fraser, Bishop of Manchester, preached from the text, "Worship the Lord in the beauty of holiness." The report was read by Mr. W. K. Wait, the hon. secretary, who referred to the future prospects of the church, especially with reference to cathedral institutions. There was great cause, he said, for hopefulness: the present gathering the great undertaking in which they were engaged, the kindly presidency and visit of their friend in the chair, were all matters hopeful and encouraging. The offertory for the restoration fund yielded 131*l.*, and subscriptions besides were handed in.

THE QUEEN'S HOSPITAL, BIRMINGHAM.

THE Birmingham Queen's Hospital Extension movement has advanced to a practical stage. The designs for the new buildings have been on view to the public in the Board-room of the Hospital. The plans exhibited have not yet been finally adopted by the Hospital Extension Committee, which consists of twenty-two members, equal numbers belonging to the Queen's Hospital Board and to the Working Men's Committee. Meanwhile, the fund is growing. The one thing needed now, says the local *Post*, is that all the factories and workshops should join the organisation. A similar movement has been started in Wolverhampton.

DEFECTIVE LADDERS AND SCAFFOLDS.

Sir,—The other day I had occasion to pass through one of the crowded thoroughfares of the City, and at a house undergoing repair there was a ladder (about 67 rounds), on which a man was standing painting the cornice. The dilapidated state of the ladder attracted my attention, so that I felt sure it was quite unfit for use.

We are all aware Government surveyors are appointed for the inspection of factories, which is a great boon for the people employed in the large manufacturing establishments. I think if we had surveyors to inspect ladders and scaffolding we should find numbers now in general use which are most unsafe for men to work upon; and at these times, while work is scarce, it is useless to expect men to think for themselves whether the scaffolding erected is safe or not, and they therefore are obliged to work in danger of losing their lives, or having their bones broken, whereby they are maimed for life.

I hope, Sir, you will be induced to use your powerful pen to urge on the Legislature the necessity of some protection (similar to that enjoyed by the factory operatives) for this much-neglected and valuable class of mechanics, *viz.*, bricklayers, painters, and labourers.

AN OBSERVER.

THE ACTION OF FROST UPON IRON.

A SUBJECT which we have repeatedly and very recently treated in these columns,—the action of intense frost upon the different kinds of iron and steel used in construction,—came up not long ago in the shape of some practical experiments made by members of the Literary and Scientific Society of Manchester. There can be no question about its gravity and importance, and we cannot afford to neglect it. The numerous and increasing class of fatal accidents which are caused by the fracture of a wheel or a spring on a railway-carriage during frosty weather seems to have originated the discussion among our Lancashire friends—for, after all, it has amounted to no more. But we need hardly explain to professional readers that railway accidents are not alone those which are due to the fracture of iron. By many thoughtful architects the present indiscriminate introduction of iron girders, tie-rods, and braces into buildings otherwise composed of brick or stone, may sooner or later tell on the stability of the various structures to which the composite materials have been applied. It is a singular fact, moreover, that while we have postulated our formulas on the numerous questions of deflexion, tension, and torsion of iron beams of different sections, with scientific precision,—given a certain quality of iron,—we have as yet no absolutely accurate test of quality which is the true basis of the equation.

And as to the influences of different temperatures, under given circumstances, upon different qualities of iron, we are destitute, or nearly so, of any sort of reliable data. Any common blacksmith or any fitter-up of iron railings knows, from early experience, quite well, that a bar either of malleable iron or cast iron,—particularly the latter,—may be fractured (that is to say, broken in two or more pieces, across an anvil, for instance) much more easily in frosty weather than in warm weather. But, according

to some higher scientific authorities, changes of temperature have no influence upon iron at all. Sir William Fairbairn, amongst others, holds the opinion that temperature has little or nothing to do with the strength of malleable iron,—an opinion which is based, in his case, on the results of a most elaborate series of experiments. Again, the common experience of railway companies undoubtedly goes to prove that the tires of wheels, the springs, the couplings, and even the chains, are more liable to fracture in winter than in summer; and it is a well-known fact to any average engineer that delicate machinery, when exposed to atmospheric variations, is more liable to break down in cold than in warm weather. In the teeth of this, however, Professor Joule tells us very plainly that the common belief of iron and steel getting into a brittle state at low temperatures was simply an idle pretence set up to excuse certain railway companies for neglect of their plant, in defiance of all that is known of the properties of metals! Our every-day experience shows that coroners and juries have greater difficulty in deciding this very point; for, of course, if it can be demonstrated that the fracture of a wheel-tire or a coupling, the origin of a frightful accident, involving loss of life and serious personal injury, and, by consequence, a heavy liability in damages, was entirely due to the action of frost, then the question of responsibility and compensation must be put out of court.

There ought, we have often thought, to be some limit set to these vague theories of temperature and atmospheric influences by which juries are misled. It is simply a question of degree. Can a coupling or a chain stand as much tension during a severe frost in January (let us say at 20° Fahrenheit), as it will during a hot sun in July (say 80° in the shade)? That is the question. Any common mechanic will at once answer in a moment, "Certainly not!" But then, if such high scientific men as Sir William Fairbairn, with all his knowledge and experience, reply to the question in a directly contrary manner, what is a poor jury to do? However, not to prolong the argument at present, we will proceed to describe the nature of the Lancashire experiments, premising only that advantage was taken of the intense frost which prevailed at the beginning of the year to subject the metal under various forms to the requisite tests.

Mr. William Brockbank, F.G.S., reported that he began his inquiry by having some bars of cast-iron of the best quality prepared, so as to ensure uniformity of size and strength. These bars he subjected singly, at various degrees of temperature, to a transverse strain, by supporting the ends and applying a weight in the centre. The results showed a gradual and considerable decrease of strength in the bars as their temperature was reduced below the freezing-point, while at the same time the elasticity of the metal showed a marked falling off. Mr. Brockbank tabulated the results of his observations in this instance, and a glance at the figures suffices to show that his conclusion was irresistible—namely, that the strength of cast-iron is very materially lessened by severe cold. While arranging for his experiments, he ascertained that in "the general opinion" of ironfounders, pig-iron fractures much more easily in frost than at ordinary temperatures, and that the breakages of castings are most frequent in cold weather. He also learned that in rolling-mills, and particularly where chilled rolls are employed, special care has to be used in frosty weather to warm the rolls before using them, and when in use to keep them protected from the cold air. A Middlesbrough firm had informed him that the cast-iron wheels of the chaldron wagons on the Stockton and Darlington Railway broke very frequently in frosty weather. Coming to wrought iron, he said he found that neither by tension nor by torsion could any true result be arrived at, as the metal almost immediately became heated under the strain. He next resolved to try the effect of sudden impact, and was successful in obtaining what he believed to be decisive results. A bar of round iron, 1½ in. diameter, and of the best quality, which was taken from an outside yard where it had lain for a week exposed to intense frost, was held over a smith's anvil, and struck with a 12 lb. hammer. At the first blow, a piece 4 in. long was broken clean off, leaving a sharp, crystalline fracture. The temperature of the air at the time of the experiment was 26°. The same bar was then put into the mouth of a furnace, and slightly warmed to drive the frost out of it. After being laid for some time on the floor

of the smithy in order that its temperature might become assimilated to that of the workshop, the bar was again placed on the anvil, and struck with the same hammer wielded by the same striker as before. Fourteen blows were now given without effect, beyond bending the bar about 2 in., and the surface of the iron showed no signs of fracture. Pieces of boiler-plate were similarly tested, and with practically the same results. It was observed that the pieces of plate broken in a frosted state by a single blow presented a sharp, crystalline fracture; while those pieces broken by a succession of blows, after being slightly warmed, showed a good fibrous structure. All these experiments, it will be seen, go to substantiate the conclusion Mr. Brockbank was led to even at the outset of his investigations.

Professor Joule, D.C.L., F.R.S., &c., in giving an account of his experiments, began by ridiculing the idea that the breaking of railway tires in winter was owing to the action of frost on the metal of which they were composed. The common-sense explanation of such accidents was that the ground being harder than usual during frosty weather, the metal brought into contact with it was more severely tried than in ordinary circumstances. That iron and steel became brittle at a low temperature was a mere pretence set up to excuse certain railway companies, in defiance of all that was known of the properties of metals, as well as of the experience of every-day life. One would expect, after such a preface, to find a record of experiments conducted on an extensive scale, and with the most exact appliances; and it is disappointing to learn that the Professor's researches on this important question did not get beyond the breaking of a dozen darning-needles, a few cast-iron garden nails, and some pieces of wire. He found that six needles broke, in a temperature of 55° F., under an average transverse strain of 58½ ounces; while, at a temperature of 12° F., six similar needles required an average strain of 59.5 lbs. ounces to break them. The test was applied by laying each needle on props 2½ in. apart, attaching a spring weighing-machine to the centre, and pulling until the needle broke—certainly a very clumsy and unscientific experiment. The garden nails were tested by being laid on props and having a hammer dropped upon them from a measured height. The collective result is stated to be that the blows required to break twenty worn nails broke only twenty-one cold ones. The only other experiment mentioned by the Professor was conducted in this way:—Wires of steel and iron were stretched upon a table, so that a portion of their length was immersed in a freezing mixture. On applying a breaking strain, it was found that the wires in every case broke outside the mixture, "showing that it was weaker at 50° F. than at about 12° F." It would not be difficult to show the worthlessness of this experiment. The merest novice in science knows enough of the heat-conducting properties of iron to enable him to see the impossibility of reducing a piece of wire to a temperature of 12° inside a vessel, while the temperature of the portion of the same wire immediately outside was 50°; and this leaves out of account altogether the heat generated in the wire immediately on the application of a strain. The "general conclusion" at which the Professor arrives is this, and he sets it down without any sort of qualification:—"Frost does not make either iron (cast or wrought) or steel brittle; and accidents arise from the neglect of railway companies to submit wheels, axles, and all other parts of their rolling-stock to a practical and sufficient test before using them."

Another series of experiments were reported by Mr. Peter Spence, F.C.S., &c., but these were extremely limited in range, and on such a puny scale, that they are scarcely entitled to rank higher than Professor Joule's need and nail tests. Mr. Spence confined his attention to breaking square bars of cast-iron half an inch in diameter. Six bars were tested at 60° Fahr., and six at zero, each bar being laid on props 9 in. apart, and having a scale suspended from its centre, into which weights were placed one after another until the bar gave way. It will be observed that this experiment bears a close resemblance to one of those made by Mr. Brockbank; but the results are the very opposite of those obtained by that gentleman. Mr. Spence stated that the average breaking weight of the six bars he tested at 60° was 4 cwt. 4 lb., while that of the six bars tested at zero was 4 cwt. 20 lb., showing an increase of strength from the reduction of temperature equal to 3.5 per cent.

We quite agree with a writer in the *Scotsman*, who gives an able *resumé* of the papers, that "it is scarcely creditable to this age, which, among other things, is remarkable for minute scientific investigations, that such diversity of opinion is possible regarding the properties of substances so extensively used in the arts as iron and steel. It appears to be the old story of what is everybody's business becoming nobody's business, and we cannot hope that the question at issue will be satisfactorily disposed of until investigation is undertaken by either the Government or one of our leading scientific societies."

Shall we also suggest that observations of a kindred nature should be extensively made by architects and builders?

THE CEMETERY OF STAGLIENO, NEAR GENOA.

At a recent meeting of the Glasgow Philosophical Society, Dr. Gairdner read a communication from Mr. Charles Heath Wilson on the Cemetery of Staglieno, near Genoa, its architecture and monuments. Mr. Wilson's communication, after some preliminary remarks on the carelessness and indecency which formerly characterised the method of interment used in Italy generally, proceeded to give an account of the Campo Santo at Staglieno. The design of the cemetery is by the city architect, Professor Rizzasoo. A large portion of the ground purchased, which extended to 60,000 square metres, was rocky hill-side, the lower level portion being bounded by the Bisagno torrent. The hill-side was terraced, and the material removed was used in levelling the lower portion. It was opened in 1851, and extended to 812 ft. in length and 681 ft. in width. The central level space is surrounded on the front next the torrent by magnificent arcaded porticos, about 18 ft. high internally, and 14 ft. 8 in. wide. Along these arcades are niches and piers for large and small monuments. The arcades are single along the front, double on the flanks, and quadruple along the rear, on the mountain-side. The whole ground is honeycombed with graves and vaults, and the walls of the arcades in many places contain shelves for bodies. The staircases on the hill-side are also made available as burial places. The architectural effect of the whole is magnificent. The cost of such a work must have been great, and about one-third remains to be finished; yet already 1,000,000 francs of clear profit have been made by the municipality. This would not have been the case under a more cheese-paring policy, as it is the very beauty of the cemetery that makes it so popular that all classes bury graves. The cemetery, when finished, will cost 5,000,000 francs; but when all the vaults are sold, a large profit will accrue to the municipality. The paper concluded by stating that, although only opened nineteen years ago, the cemetery contains four or five times as many monuments as St. Paul's, London, all erected by private munificence.

A discussion followed, at the conclusion of which Professor Gairdner said that the only remark he had to make was to strengthen the conclusion to which Mr. Wilson's paper seemed to point, that in large places, such as Glasgow, it was a clear duty for the municipality to remove this matter out of the domain of private enterprise, and deal with it in the large and liberal spirit which it demanded as a matter of public taste and aesthetics; and, what was of far greater consequence, as a matter of decency and public health. In Glasgow they had checked the worst abuses—the most offensive and abominable pit burials; they had shut up some of the intramural cemeteries; but the difficulty of going further arose from the fact that every single bit of ground shut up simply raised the price and increased the difficulty of interment for the poor. Among the 14,000 deaths occurring annually a large proportion were those of the poor in the centre of the town, and every difficulty put in the way was simply making it more impossible for the poor to bury their dead with anything like comfort and decency, and making burial break the back of the poor man. There was no way out of it except for the municipality to constitute themselves the administrators of the whole matter of burial. He held that the municipality should liberally assist in the removal of the dead. For the benefit of the public we removed our burial-grounds out of town, and therefore the public should pay to the individual poor man the difference of expense.



THE MORGAN HOSPITAL, DUNDEE, SCOTLAND.—MESSRS. PEDDIE & KINNEAR, ARCHITECTS.

SHAKESPEARE: A NATIONAL THEATRE.

At the last meeting of the Society for the Encouragement of the Fine Arts at their Rooms in Conduit-street, Dr. Doran, F.S.A., delivered an address under the heading "For and Against Shakespeare." Mr. Godwin presided; and the gallery was very fully attended, including Mr. Angiolo Solous, Mr. Walter Lacy, Dr. Hyde Clark, Mr. Henry Hill, F.S.A., Mr. Henry Slous, Dr. Heinemann, Mr. Walter Fawcett, Mr. Cave Thomas, Mr. Dillon Croker, and many others interested in literature and the stage. Dr. Doran reviewed and disposed of the objections taken by Dryden, and the injury done to Shakespeare's play by Cibber and others, and then with great eloquence set forth the genius of Shakespeare, the effect of his writings, and his claims on the gratitude of the world. It was a very remarkable discourse, delivered *extempore*, and elicited the loudest plaudits. Some of the points raised were afterwards discussed, especially with reference to the effect of Shakespeare's writings on the literature of Germany.

The Chairman, in his closing remarks, urged the want of a National Theatre not wholly controlled by the temporary predominant taste of the public, and showed the present unsatisfactory condition of things with regard to the education of actors. He called for the establishment of a theatre subsidized by the Government or by a public subscription, wherein plays of the highest character should be performed, and which should serve as a school for actors.

"FOR AND AGAINST SHAKESPEARE."

Sir,—Under this title, I read in the *Observer* of last Sunday, Dr. Doran, F.S.A., addressed a full meeting of the Society for the encouragement of the Fine Arts, on Thursday evening last, at their Rooms in Conduit-street, Mr. George Godwin, F.R.S., presiding, and the very brief notice of the proceedings is terminated by the information, that "the chairman, in his closing remarks, urged the want of a National Theatre, not wholly controlled by the predominant taste of the public." Feeling so intensely as I do on this subject, I hunted the papers over for a leading article, or some strong editorial endorsement of this important opinion; but neither in the *Observer*, nor any other journal that I have seen, has there been any, the faintest echo of a chord which should, I humbly think, have reverberated through the public press, which so constantly professes its admiration of the genius of Shakespeare, and so frequently indulges in too truthful lamentations over the decline of the English drama.

Upon this hint I speak. If that admiration be genuine, if that lamentation be sincere,—and it would be an offence to doubt it,—considering the intellect, education, and general ability enlisted in the service of the "fourth estate," I adjure it in the names of England and Shakespeare—names indisolubly connected, and almost equally sacred in the eyes of all who are proud of their country and its literature,—to exert its power and influence in the cause of that glorious drama which, though it can never be destroyed, is at present "a sealed book" to the rising generation. I was out of town, and not aware of the meeting: I am therefore ignorant of the precise words which may have been used by the chairman; but if not reported *verbatim*, their sense was, doubtless, to the same effect, viz., "the want of a National Theatre, not wholly controlled by the predominant taste of the public."

That is actually the want of a much larger portion of the public than I believe is generally suspected,—the want of thousands, I may say, in London alone, who rarely, if ever, enter a theatre, and of more thousands who do so to pass away an idle hour, to accompany a country cousin or a foreign visitor, or to gratify their children during the holidays. Let us grant that the predominant taste of the public is for "sensational drama" and burlesque,—and the truth of the axiom "that those who live to please must please to live,"—are those who have no taste for such entertainments to be shut out from the theatre altogether, because every stage in the metropolis is devoted to performances which they do not care to witness?

It would ill become me to express an opinion on the class of compositions which evidently possesses considerable attraction for the general public; and I unhesitatingly avow that I enjoy a really good sensational drama,

admirably acted, as I have often seen it, as much as any one. My natural inability to appreciate the merits of the prevailing style of burlesque does not induce me to propose that its admirers should be deprived of that which amuses them. All I, in common with that large portion of the play-going public I have mentioned, urgently desire, is the assured existence of a theatre in which the masterpieces of our unrivalled dramatic authors should be constantly and worthily represented, where—

"Thoughts that breathe, and words that burn,"

should be uttered by actors who can feel and express them to an audience "fit," however "few," without the fear that their salaries will not be forthcoming on the following Saturday, and that the manager, disheartened by the appearance of empty benches, will change the bill, discharge a company he has *jobbed* at a week's notice, and endeavour to outlive his competitors by pandering to the predominant taste of the public.

That the lessee of a theatre heavily rented, with a heap of other liabilities on his shoulders which he cannot shuffle off, in addition to the salaries, which must be duly paid every Saturday, should, in the presence of nightly loss, disembarass himself of such weekly pressure as he can, without actual dishonesty, escape, however distressing it may be to others, must be expected, while human nature is human nature; but at the present moment, when there are more theatres in London than ever before were known, and others in course of erection,—all privileged to perform any description of dramatic entertainment, and nearly all devoted to such as they consider in accordance with "the predominant taste" aforesaid,—is it not a just cause of complaint?—is it not, in fact, a national disgrace, that there should not be one in the vast metropolis, where those who can still enjoy the most sublime poetry, the most brilliant wit, and "the pure well of English undefiled," may resort for an evening's rational and intellectual amusement afforded by a creditable representation of the masterpieces of our unrivalled British dramatists?

Is it not a still greater opprobrium to us as a nation, possessing such art-treasures, and professing to be proud of them, that persons of high rank and men of large fortune can be found to support establishments the performances and performers at which it is not for me to criticize, and that not one English nobleman, not one English merchant prince, steps forward to lend a hand to raise the drama from the dust and oblivion into which it has gradually fallen, until it is actually unknown to the rising generation, who become naturally inoculated with the predominant taste of the public?

Hearken to the outcry for education!—compulsory education! Parliament is stormed. The existence of Government is threatened, so urgent is the demand, so voracious are its supporters. Acts are passed, boards are formed, schools are multiplied; but no senator, no minister, appears to have reflected that a theatre devoted to the highest order of dramatic composition, conducted as such a theatre should be, is one of the finest schools for the cultivation of manners and morals, for the diffusion of useful as well as entertaining knowledge, for the teaching of English, for attuning the year to eloquence and insensibly inculcating a taste for all that is grand in art and ennobling in nature, which happily might, so encouraged, become the predominant one of the British public.

I could talk "upon this theme until mine eyelids would no longer wag;" but length of argument would only weary without convincing those who cannot at once see the case in the same light that I do, and it would be superfluous as regards the numbers who do. A *subvention*, as in other countries, it is idle to hope for from any English Government; but from public spirit, roused by the public press, there is nothing that need be despaired of; and if the feeble voice of one who has ardently loved, and honestly endeavoured to promote what he considered the true interests of the stage to the extent of his humble ability for fifty years, should be fortunately listened to by those who have the power to effect the object so earnestly advocated by the chairman of last Thursday's meeting, and, as I learn from persons present, so enthusiastically responded to by his hearers, there may be yet a chance for the resurrection of our national drama, and the permanent existence in London of a truly English theatre.

J. R. PLANCHÉ.

LAMENT FOR THE RUIN OF THE
"WAKEHURST TREE," CALLED THE
"ADMIRAL'S FLAG."

This remarkable tree was broken on the night of December 21st, 1870, by a strong gale from the south coast. Many of our readers, sojourners or travellers in Sussex, will regret the loss of a curious landmark pointing out the fine Elizabethan house, Wakehurst.

Oh! Wakehurst woods are fair to see,
And Wakehurst woods are dear to me;
How often from my casement high
I've watched yon flag-tree waving high!

But late fierce winds from distant main
Have cleft our cherish'd tree in twain;
Oh, cruel winds from far-off seas!
Ye might have spared our "Wakehurst tree!"

Fair Tree! the country's pride; full high
Thy "Flag" was reared to'ward the sky:
A landmark true; but wind-torn now,
Low lies the Admiral's honoured bough!

Oh, noble Pine! we long shall mourn
Thy beauty marred, thy Flag-staff torn,
And long thy brother pines make moan
For thee, in wailing monotone.

Methinks I hear them sighing thus:

"The glory of our life is gone;
Our monarch's crown lies in the dust,
And we are left to weep alone."

Oh! weary wind, that would not spare
Our honoured tree, known near and far
Oh! ruthless blast, how could ye care
To rob us of our woodland star?

Back, dismal wind, to dreary shore,
Where we may hear thy voice no more;
None but soft breezes from summer seas
Come e'er again to Wakehurst trees."

P. OWEN.

ST. MICHAEL'S CHURCH, OTTERTON,
DEVON.

This church, the foundation stone of which was laid in March last year, was re-opened on the 29th of March, and at the same time the new burial ground was consecrated by the bishop of the diocese. Lady Rolfe's generosity has been the sole means of raising the fabric.

The church has been entirely rebuilt, with the exception of the main walls of the tower, which, being in good condition, were not touched. The body of the church was pulled down, as it was in a dilapidated and ruinous state. In the chancel were some interesting monuments of the Duke family, which have been preserved, and reinstated in the new edifice. The tower is in the same relative position to the new chancel as in the old church. A south-east angle turret as well as the new tracered windows in place of the old debased ones, have been added to the tower, the total height of which has been increased. The west end of the nave projects beyond that of the aisles, affording more space for the baptistery. The chancel arch is so designed as to cause no obstruction to the view. The walls of the church are built principally with the Berryhead limestone, which, being of a greyish blue tint, contrasts with the warm colour of the Ham Hill quoins and dressings. Internally the building is lined with ashlar stone from Beer. An encaustic tile pavement, supplied by Messrs. Maw's London agents, Messrs. W. B. Simpson & Sons, forms the floor in the sanctuary. The reredos, of Caen stone, embellished by Devonshire marble shafts and span, has a crocketed gablet in the centre over the altar-table, flanked by quatrefoil panels, containing the sculptured emblems of the Evangelists. Other sacred symbols, with inlaid mosaic, further decorate this portion of the design. The chancel seats are of wainscot, the seats in the nave and aisles of deal, the points formed by an open tracered arcade, with carved bosses and finials to the moulded bench-ends. The roof is in square panels, decorated with foliated paterae, the moulded wood cornice supported by a carved stone one. The nave roof is of hammer-beam construction. The nave is seated with open oak benches, with shaped solid ends. The aisles at the side have three-light windows. Externally, the covering of the roofs is tiling; the chancel has an ornamental tile ridge cresting. The tracery of the windows is varied. There is a carved cornice running level with and the full length of the chancel roof, which is also repeated inside. The columns and chancel

steps are of polished Plymouth marble. The columns of the arcades dividing the nave from the aisles have capitals of Caen stone carved. The treatment of the capitals is varied. Each alternate design is of an early and simple character, while the others have figures introduced into them. The corbels stopping the labels of the arcade are carved in natural and local types of foliage at the desire of Lady Rolle, including ferns, the oak, ivy, apple, hazel, &c.; whilst the corbels supporting the springers of the roof consist of life-sized heads, chiefly those of apostles, virgins, martyrs, and princes traditionally connected with the West of England. The chancel arch is supported by carved capitals resting upon polished marble columns, beneath which are sculptured angels of about half life-size, holding in their hands musical instruments and lilies. The cornices and capitals are all carved, and each alternate panel is diapered. Over the sanctuaries are sculptured angels in devotional attitudes, and the roof timbers of this part are of a richer design than those of the rest of the chancel. Although the contract has been pushed with despatch and rapidity, the works have been free from accident with one unfortunate exception. Mr. Herbert Burridge has carried out the entire works for his father. The vicar says, "he believes the workmen to be the most respectable set of men that ever built a church." The architect is Mr. Benjamin Ferrey, of London, and the contractor for the whole of the works, Mr. Burridge, of Exmouth. The sub-contractors are Messrs. Ormston, Chelsea, for the hot-water apparatus; and Messrs. J. & E. Goad, Phoenix Works, Stonehouse, for the marble. The wrought-iron work has been supplied by Messrs. Hart, Son, Peard, & Co.; the encaustic tiles by Messrs. Maw; and the clock-face by Messrs. E. Dent & Co. The wood carving is by Mr. Hurley, and the communion-table has been supplied by Messrs. Cox & Son, London. The stone carving and the sculpture are by Mr. Harry Hems, of Exeter. Mr. Hems did the stone carving at the Albert Museum, Exeter, in 1867, and since then we understand he has been engaged in adorning twenty-five churches. The organ has been renovated by Mr. Dicker. The total cost will be 8,000*l.*, or somewhat more.

This is the third church built by the same lady in the immediate vicinity of her residence within the last twenty years. The other two are Bilton Church, of which Mr. John Hayward was architect; and Wittycombe, designed by Mr. Ashworth. Both these were erected at a greater cost than has been that at Oterton. The clerk of works employed at the latter was Mr. Thomas Cloutman.

OLD TURRET STAIRS.

SIR,—Comments have been made in your pages on the dilapidated state of the staircases in our old towers,—that the steps are much worn. This, no doubt, is often the case, and all I wish to say upon the subject is this,—that the simplest and cheapest way to repair such wear and tear from hobbled shoes is to cover the stone steps with full 1-in. elm treads and risers. I know two staircases in Gloucestershire which were so treated more than 100 years ago, and though much used, they are still sound and good. It is well known that a wooden floor will last much longer than one of stone or bricks.

H. T. ELLACOMBE.

EXETER DIOCESAN ARCHITECTURAL SOCIETY.

The quarterly meeting of this society has been held at the College Hall; the Earl of Devon presiding. The hon. secretary (the Rev. J. L. Fulford) read the quarterly report. The report detailed the steps taken by the committee with respect to the contemplated cathedral restoration, especially with reference to the efforts made to induce the dean and chapter to reconsider their decision to retain, in its present condition, the screen between the choir and nave. In consequence of a letter from the dean, which appeared in the *Exeter Gazette*, in December last, complaining of an "offensive" expression in a report adopted at a meeting of the society, with respect to the action of the cathedral body, a correspondence ensued between the dean and the committee, which was embodied in the report. As to the screen, the chairman said while he should be exceedingly glad to see it pierced, he thought the proposal to consult another architect could not be entertained, unless it emanated from Mr. Scott himself.

Prebendary Barnes said Mr. Scott based the retention of the screen on the ground of its necessity to the stability of the fabric.

Mr. Fulford said it was not so stated in his report.

Canon Cook said Mr. Scott based the retention on the architectural features of the building. The question both of removing the screen and also of raising it was submitted to him. The chapter would undertake a greater responsibility in removing the screen than in retaining it. Nothing would be done in the contemplated restoration which would prevent the piercing of the screen at some future time.

STEAM FIRE ENGINES.

A LITTLE fight has been going on before the Fire Engine Committee of the Corporation of Preston. The question was the relative worth of the steam fire engines of Messrs. Shand & Mason, on the one hand, and of Messrs. Merryweather on the other, and this has at last been decided by the Corporation sub-committee, in favour of Messrs. Shand & Mason's. The sub-committee met at the Preston Town-hall on Monday, the 17th, and consisted of Councillor Benson, chairman; Aldermen John James Myres and Rawliffe, Councillors Hallmark & Hayhurst. The reports of six practical engineers had been printed, and the perusal of them seems to have convinced the sub-committee of the superiority of Messrs. Shand & Mason's machine; for after some discussion on the various points adverted to in them, it was decided by a majority of four to one that according to their judgment the test was strongly in favour of Messrs. Shand & Mason's; that their engine was superior to Messrs. Merryweather's; and that the Corporation be recommended to purchase one for the use of the borough. The chairman of the committee was at first inclined to the belief that Messrs. Merryweather's was less complicated; but an examination of the workings of the two machines, and a consideration of the reports of the engineers, induced him not merely to change his view, but to become a strong advocate of Messrs. Shand & Mason's. With the general public, too, prior to the trial a notion had been propagated that Messrs. Merryweather's was the best; but the practical tests on the bank of the canal appear to have demonstrated the superiority of the other engine.

THE ARCHITECTS' BENEVOLENT SOCIETY.

On the occasion of the last general meeting we advocated the claims of this association on the profession. Mr. Sydney Smirke, desiring to continue the appeal, says,—

"The Society has now been established twenty-one years, and it is very gratifying to reflect on the amount of good that it has been able to effect."

No one, however, except those who are actually engaged in administering the funds can be aware how sadly insufficient those funds are. The council has often to refuse relief altogether in distressing cases, and scarcely ever is it able to afford more than any temporary assistance. We earnestly, therefore, intreat favourable consideration of the peculiar claims of this Society.

None need fear that in helping them are encouraging improvidence. On the contrary, the care and experience of the society's council and officers fully secure us against all risk of any portion of the funds falling into unworthy hands. Those who have served on the council will bear testimony to the scrupulous and conscientious attention paid to the duty of inquiring into the real facts of each case. Pray, therefore, assist us. As architects, we invoke your sympathy; and as Christians, we, in all kindness, remind you of our common duty to our neighbour."

We cordially endorse Mr. Smirke's statement.

WELLINGTON MONUMENT, ST. PAUL'S.

We have received a communication in reply to Professor Donaldson's objection to the position of the monument, signed "Hugh Stannus," which states that the present position is fully approved of by the sculptor, Mr. Stevens. The writer continues:—

"In the commencement of the letter Mr. Donaldson states his opinion that there is no novelty of conception in Mr. Stevens' general design, but that 'it is a replica, with some slight variations, of the tombs to the Queens Mary and Elizabeth,' in the chapel at Westminster. With regard to this opinion, I would say, with great deference to the Professor's wide-spread reputation, that, having in my possession a tracing from Mr. Stevens' sketch of his design, and also some photographs taken from the model in his studio, and having again compared them during the last few days with the tombs at Westminster, I beg to affirm that there is no more similarity between Mr. Stevens' magnificent and well-proportioned work and these ill-designed crude Elizabethan abortions than there is between any of the refined Greek temples and their Egyptian prototypes; and I venture to think

that no one would say the Greek works were 'replicas' of the Egyptian. The monument itself, however, when done, will be the best survivor to the above opinion. The idea of covering a sarcophagus by an arched canopy supported on columns is not a novelty of the tombs in the Abbey, as it can be traced back through Medieval times to the Romans; and the architectural canopy in Mr. Stevens' work is not only a covering to the sarcophagus, but serves as a pedestal for the colossal symbolic groups of Truth, &c., and Valour, &c., which are the features of the sculpture."

PROCEEDINGS AGAINST A LOCAL BOARD.

For some time past the Littlehampton Local Board of Health have been at issue with Mr. Robert Bushby, a builder and contractor living there, with reference to an alleged deficiency of drainage accommodation for the district. Mr. Bushby appears to have made repeated representations to the Local Board on the subject, with the view of obtaining increased facilities for drainage to property belonging to him, of the rateable value of 2,500*l.* per annum, out of the 13,531*l.* rateable value of the whole town. It appears that in the latter end of last year a formal complaint was made by him to the Home Secretary, alleging several distinct cases of default on the part of the Local Board, and asking for an inquiry under the 48th clause of the Act. Thereupon an inquiry by one of the superintending inspectors (Mr. Arnold Taylor), was directed by the Home Secretary, and Mr. Taylor came down to Littlehampton in January last, for the purpose of holding such inquiry. This inquiry was duly advertised; but, notwithstanding this, in consequence of efforts made by certain members of the Local Board, the inquiry proved abortive, and no action was taken by the inspector. A fresh appointment was made by Mr. Taylor for an inquiry, which has just taken place, from which it appears to be admitted there was no neglect of the district, at which the inspector was much surprised, and expressed an opinion that it was impossible for the duties of the Local Board to be properly discharged without a correct plan showing the position, size, and situation of the district. The surveyor of the district admitted that during the time he had been in office very little attention had been given to the subject of main drainage, although an offer on the part of the Duke of Norfolk was repeatedly made to pay half the expense of carrying it out.

On behalf of the Local Board, it was stated that at this stage of the inquiry they declined to offer any evidence, as, in reality, the only witnesses they had to call were Mr. Hardwick, the clerk, and Mr. Snowin, the surveyor to the Board, and they had already been examined.

The inspector stated that he would duly weigh the evidence given before him, and that notice would be given to the parties interested when his report was ready.

The proceedings lasted about six hours.

LEEDS BRIDGE.

SIR,—Referring to a paragraph in your paper of the 22nd inst., in which you state that my design for the Leeds Bridge was awarded the first prize, not the second.

T. DYNE STREET.

ST. SAVIOUR'S, SOUTHWARK.

SIR,—Can you account for the curious restoration of the tower of the beautiful church of St. Saviour, Southwark? I pass it every day, and am at a loss to understand whether the churchwardens have not employed some neighbouring bricklayer or tinker, who is so carefully building up the windows on the south side, behind a huge black monstrosity that answers for a clock.

Q.

WORKMEN'S HOUSES IN THE NORTH.

SIR,—Of the suggestions published in yours of the 15th inst., those proposing houses for the agricultural working classes, and for the model village in Surrey, pleased me much. I want to say a few words with reference to the urgent necessity there is for the philanthropist to step in and stop the accursed system which is now the rage in all our large towns, of building cottages or workmen's houses, as they call them in the North, at the lowest possible cost. These places just stick together, and directly they are inhabited, plaster gives way, doors crack, pipes leak, &c., and if the inhabitants are tidy, they try to get things put right, generally in vain; but if they succeed, it is not until many weeks of discomfort have been endured.

Can any one even imagine the amount of moral and religious injury which this accursed practice of making large per-centages out of workmen's houses does? How can you expect a man to care for his home when it is a cracked, dirty, tumble-down place? And how can you expect a woman to keep her house clean when every time she sweeps some plaster breaks away?

Children are as clay, easily moulded and shaped as one likes; and men and women are but big children, and nearly as susceptible to what is passing around them, and to what the rough hand of time is squeezing them through. Let time's hand push them through speculating builders' houses, and they will arrive at the end of their journey, like these houses, all untidy and tumble-down,—all sham and all lies; but let some brave man step between the pestilence

and the people, and the plague will be stayed, and his reward be having stayed it. Though not a Radical, and no great friend of the "working man," I have lived long enough to know that real reform begins at the bottom; and therefore I cannot help thinking that the placing of our lower orders,—those people who are making millionaires of our Middlebrough men, and yet are allowed by them to live in worse quarters than their pigs,—in close contiguity and daily intercourse with that which is honest and good, if not beautiful, is the very best way to "spend money for the public good."

STOCKTON-ON-TES.

HORSES AND THE STREETS.

SIR,—A neighbour of mine has lost a valuable draught-horse through the farrier driving a nail too far into the hoof. I have had some conversation on the subject, and have learnt that it is no uncommon occurrence. Now, why not a rim shoe, with three or four screws at sides, they could be firmly, safely, and quickly fitted, without risk of injury to the horses.

Allow me to plead in behalf of the oppressed cabman and his horse that other resting-places be permitted, and devoted to one cab, at spots in localities where his services are often required, viz., at the corners of our large squares, near the railings, &c. It would be a convenience to the public; it would diminish that modern crime, crawling, police-court fines, and imprisonment of many a rough diamond. Then, here and there his jaded horse, like the dove from the ark, would find a resting-place.

Please say a sweeping word for a low mud-car, in order that passing pedestrians may not be soiled: a bent axle-tree would remedy the nuisance, and save the scavengers much labour.

R. T.

THE BARROWS ON THE YORKSHIRE WOLD.

THE closing lecture of the session in connexion with the Hull Literary and Philosophical Society has been delivered at the Royal Institution "by the Rev. Canon Greenwell, the subject being 'The Barrows on the Yorkshire Wolds.'" The Rev. H. W. Kemp, president, occupied the chair. The reverend lecturer remarked that barrows or mounds were to be found in nearly all parts of the earth. They were found in, perhaps, greater abundance in the southern parts of Asiatic Russia, and on the northern shores of the Black Sea than anywhere else. In Africa they were the most numerous on the shores of the Mediterranean. "There were not many of such remains to be found south of the Desert of Sahara. [It might have been added that they are much more Asiatic and European than African, and are sprinkled about all the way west from India to Ireland.] The mounds, of which he was to speak, and which existed on the Yorkshire Wolds, were of a time which might be called pre-historic. The works attributed to Homer contained accounts of interments similar to those in the barrows. The Yorkshire Wolds, where the barrows were found in such abundance, appeared to have been at one time a sort of island, being bounded by the sea and swampy land. It was, therefore, a desirable piece of territory, and was well populated. The barrows on the Yorkshire Wold were of two kinds, the long and the round ones. The former were the few in number and furnished the least information. They were nearly all placed east and west, the east end being wider than the west end. It was believed that the long barrows were the burial-places of the earliest people connected with the barrows. The round barrows were of a later period, as in them were found traces of metal. There were also secondary interments in the long barrows, of the same kind as those in the round mounds. Many bodies were found in some barrows burnt, but how the burning was effected was not known, there being no traces of charcoal, although the chalk and colite had been used so as to have been fixed in the stone. The mounds were encircled with stones in a Druidical manner. Pottery, urns, ornaments, weapons, and other implements, were found in them. The researches at the barrows showed that the people lived 1,000 years before Christ, when bronze was only used in small quantities, and when the use of iron was unknown. The traces of clothing, bones of domesticated animals, and other articles, showed that they were considerably advanced in civilisation.

CHURCH-BUILDING NEWS.

Linkenholt.—The chief stone of a new church has been laid here. Mr. W. White is the architect, and Messrs. Hillary, of Andover, are the builders engaged. The site has been given to the parish by Mr. T. Morton Colson, one of the landowners.

Middleton-One-Row (Durham).—A new church at Middleton-one-Row has been consecrated. The building, when completed, will cost about 1,800*l.*, and this sum has been raised within about 800*l.* The edifice is not quite completed, the spire not having yet been raised. The style adopted is the Early Decorated, and the dimensions are 73 ft. long by 25 ft. wide. The east end, towards the village, possesses a three-light window rising into the gable, which is surmounted by a foliated cross. At the south-east angle of the nave will be placed a tower and spire, square at the lower part, with the spire rising above from an octagonal lantern to the height of about 100 ft. The south side of the church has a porch in the westernmost bay; the other bays being occupied by two-light windows, between buttresses. The west end has two single-light windows, surmounted by a rose-window set in a lofty gable. On the north side the western bay is occupied by the vestry, and the others have two-light windows corresponding with those on the south side. On the north side of the chancel is a small organ-chamber. The whole of the walls are faced with stone from Waskerley, with dressings of ashlar. The chancel arch is moulded, with carved caps and marble shafts. The seats are low and open, with slanting backs, being formed of varnished pine, and affording accommodation for 220 persons. The most ornamental features of the interior are the reredos, the pulpit, and the baptismal font. The two latter are of Caen stone, carved, the pulpit being relieved with marble pillars. The windows are all filled with cathedral tinted glass, with coloured margins. The floors of the chancel and passage are paved with Mosaic tiles. The works have been carried out under the superintendence of Mr. J. P. Pritchett, architect; and the work has been executed by the following tradesmen:—Masonry, Mr. James Dodgson, Northallerton; slating, Messrs. Atkinson & Sons, Darlington; plastering, Mr. Ormerod, Darlington; joiners' work, Messrs. Gargett & Son, Darlington; painting, Mr. Dryden, Darlington; art metal-work, by Mr. Dovey, of Manchester; and the warming by Lewis's patent warm-air apparatus. The contracts, including the spire, amount to about 1,500*l.*; and the total expense, including warming, lighting, professional charges, furnishing, &c., will raise that sum to about 1,800*l.*

Walsall.—The new church of St. Michael and All Angels, Caldmore, Walsall, has been consecrated. The edifice is situated between Caldmore-lane and Bath-street, upon a plot of land given by Mr. T. Marlow, and containing about 1,280 square yards. The style is Early English, the materials used being freestone with Bath stone dressings; but, at present, the nave and chancel only are complete. The internal dimensions of the nave are 80 ft. long by 27 ft. wide, and of the chancel 35 ft. long by 22 ft. wide, both being proportionately lofty. The arches of the nave spring from stone columns, and the spaces are for the present filled up with brick-work, which can easily be removed when circumstances justify the addition of the aisles. The clearstory is pierced with five double windows on each side, each being divided with a pillar of black marble, and a circular window occupies the centre of the wall above the porch; while three stained-glass windows—respectively commemorating the Saviour's birth, crucifixion, and resurrection—find a place at the end of the chancel. The floor is laid with encaustic tiles, and the roof is of open woodwork, stained and varnished. The chancel is divided from the nave by a light iron railing, upon a stone basement. Upon the table stands a lofty brass cross, with a candlestick and two flower-vases, of the same metal, on either side, each candlestick containing a large wax candle, bearing a small shield with the monogram, "I.H.S.," thereon. Chairs, with plain wood frames and rush bottoms, are provided for 325 worshippers, and all the seats are free. The cost of the work so far carried out will be about 2,500*l.*, towards which the Lichfield Diocesan Church Extension Society contributes 350*l.*, and the Incorporated Church Building Society 100*l.* The architect is Mr. Veale, and the builder Mr. Lovatt, both of Wolverhampton.

Malvern.—The recently-erected Church of St.

James, West Malvern, has been consecrated by the Bishop of Worcester. The new church is built close beside the old one, which it is intended to supersede. It is built from the designs of Mr. Street, of London, architect, and is in the Early English style, with three-light windows. It consists of nave, north and south aisles, chancel, vestry, and organ-chamber, north porch, and tower on the south side. The pulpit is near the north entrance, and it and the chancel-screen are of stone, on small columns of Devonshire marble, and the super-altar being one large slab of the same material. The reredos is of Caen stone panel-work, the centre panel having a white cross set in a deep red marble, with supporting panels, ornamented with *fleur-de-lis*, the spaces on either side, between the altar and the north and south walls, being also filled up with twelve panels of ornamental tiles. The chancel is a special gift. There is a stained-glass window over the porch. The seats are open, and will accommodate nearly 500, whilst the old building had not space for half that number. The architect has assimilated the building on the outside to a good deal of the masonry to be found in this neighbourhood, inasmuch as it is built in irregular rustic fashion; the inside, however, is of faced stone, and the whole building is freely treated with Bath stone dressings. The church is laid throughout with tiles from the Lugwardine works. The ribs of the roof, rafters, and tie-rods are all of pine, and are unvarnished, and the church is provided with a heating apparatus, supplied by Messrs. Skinner, of Bristol. The tower contains only two bells at present, cast at Loughborough. The cost of erection of the entire building has been between 3,000*l.* and 4,000*l.* The contractor's work has been carried out by Mr. Smart, of Malvern Wells. It is intended to remove the old church, which it was found impossible to enlarge without going to as much expense as in building a new fabric.

Pattishall.—The parish church of Pattishall has been re-opened, after having undergone a partial restoration. The old building was in a disgraceful state, most inconvenient and unpossessing. Under Messrs. E. F. Law & Sons, of Nottingham, the architects, the more interesting features of the old church have been preserved. A new window has been erected at the west end of the north aisle, at the expense of Mr. George Osborn. It is an early lancet window, with two lights, and is of the same character as the one at the west end of the south aisle. It is glazed with Powell's quarries, and has a coloured border, being further beautified by a cross in the centre of one light, and the emblem of the Trinity, a triangle, in the other. In the head of the window is the *Agnus Dei*,—a lamb and a flag. The east window is entirely new: its style is early, and is in keeping with the earlier portions of the church. The old gallery has been removed. The stonework throughout the church, internally, has been scraped, cleaned, and restored. Nothing has been done to the roof, which remains simply with its smooth-plastered bricks. The chancel was not included in the original contract, but its restoration was decided upon subsequently. The seats in the body of the church are all of pitch-pine, with open-skeleton frames. The restoration, which commenced in October last, has been carried out, under the supervision of the architects, by Mr. Thomas Shinkshaft, of Ashton, builder. The cost of the restoration will be 500*l.* or 600*l.* The original contract was for 464*l.*; but as the work proceeded, it was extended.

Plumbland.—The new church here has been consecrated by the Bishop of Carlisle. The architecture is a mixture of Early English and Gothic, and the tower is square, relieved at the top with conical erections, each of which occupies one side of the square. The top of the tower extends very little above the roof. In the inside one or two prominent features of the old church have been preserved, the chancel arch, a specimen of old Norman, and a Gothic window in the transept being the most noticeable. The pillars are plain and thick, the arches wide and heavy. The pillars are of white stone, and the arches of alternate white and red. The church is well lighted, on the north and south sides being two-light lancet windows, while on the south side clearstory there are three-light lancet windows—dormer-shaped on the outside, those on the north side being quatrefoil. The east window is of stained glass. The church will seat nearly 400 people. The timber used in the nave and aisles is pitch pine, and with this also the roof is ceiled, but the chancel is furnished with oak.

White stone from the quarries at Tallentire has been used throughout. Mr. Henry Graves, Anpatia, was the contractor; and Messrs. Cory & Ferguson, of Carlisle, were the architects, the former gentleman superintending the erection of the church. It will be heated with hot water, the apparatus being supplied by Mr. D. Clarke, of Carlisle; and artificial light will be obtained from oil lamps.

Thixendale.—The Archbishop of York has consecrated the churches at Thixendale and Fimber, lately built by Sir Tatton Sykes, bart. These form two more additions to the many new churches built by the Sykes family in the East Riding, and they have been built, furnished, and endowed at the sole cost of Sir Tatton. In both cases the Early English style is adopted, the architect being Mr. G. Edmund Street, of London. Thixendale Church gives accommodation for 150. The new edifice consists of nave, with south aisle, north porch, and apsidal baptistry at west end, surmounted by a rose-window. This has been filled with stained glass, the representation being the baptism of Our Lord. The chancel has a south aisle, which serves as vestry, and is separated by an oak screen. In the vestry is a piscina. The chancel is separated from the nave by low stone screens, over which a fine chancel arch springs from corbels of oak and vine leaves and fruit. A panelled reredos occupies the east end, formed of Caen stone and Devonian marble. The reredos is surmounted by a three-light stained glass east window, by Esher. The subject is a representation of the Crucifixion. The chancel has two two-light windows in the north wall, and one two-light in the south wall. The vestry has an eastern two-light and a single-light south window. The nave has two three-light windows on the north, and there are four single-light windows in the south aisle, and one western two-light window. All these are filled with cathedral glass. The works have been undertaken by Messrs. Simpson & Malone, of Hull; the clerk of works being Mr. Robert Hayward, of London.

Abthorpe.—The parish church of Abthorpe has been re-opened for divine worship, after having been nearly wholly re-built. The old church was in a deplorably dilapidated state. The new church consists of a nave, north and south aisles, chancel with a south aisle and minister's vestry on the north side, north and south porches, and a tower and spire, so that considerable additions have been made to the original structure. The whole fabric has been re-built excepting a portion of the old arcade on the north side. The church, which is situated in the most conspicuous part of the village, is in the Early English style, and is built of local stone, with Bath dressings. Internally, the edifice has a high-pitched roof with open timbers. The porches have also high-pitched roofs with open timbers. The seats, which are out of the St. Petersburg deals and varnished, are open. The chancel, which has been rebuilt at the expense of the Ecclesiastical Commission, is inlaid with Minton's encaustic tiles. The tower and spire are quite new, their place having been previously occupied by a simple bell-turret. There is accommodation in the church for some 300 persons. The cost of the work will be about 2,200l. The work has been done from the designs of Mr. Ewan Christian, architect; the builder being Mr. Robert Walpole, of Stony Stratford. The ornamental ironwork of the church has been executed by Mr. T. Clarke, of Stony Stratford, under the supervision of the builder. The standards for the Communion-rail were by Skidmore, of Coventry.

Harleston.—The dedication stone of the new church has been laid. The plans were prepared by Mr. Phipson, architect. The new church will consist of a nave 68 ft. long by 20 ft. 6 in. wide, and 41 ft. high to the ridge of the roof. On each side are four Decorated arches opening into aisles of similar length and 10 ft. wide. These aisles are lighted by three-light windows, and the nave has a clearstory of trefoil and quatrefoil lights inclosed in squallateral arches. The chancel is 30 ft. long, and the same width as the nave, with an apsidal east end of five bays, with a single-light window in each bay. On the north and south sides of the chancel are the organ chamber and vestry, treated as transepts, with stone archways opening into the aisles, and chancel and circular windows in the gables. The principal entrance is at the west end—which is treated somewhat, but not exactly, like a Narthex—and over the doorway is a large four-light window. There is also a south entrance, and the first bay of the south aisle will form a

baptistry. The roofs are moulded, and open throughout, and of pitch pine covered with green slates. The benching, together with the doors and other woodwork, will be of wainscot oak, and the passages and chancel laid with Minton's tiles. The walls are of flint and stone, the west front towards the road being of squared flints laid in regular courses. The windows will be glazed with cathedral glass, with the exception of the east end, in which there will be probably stained glass. The church stands well up from the road, and will be reached by four steps. There is no tower nor spire, it being considered best to keep up the character of a chapel of ease, and not attempt to rival the mother church. There will be room for about 400 persons. The contract amounts to 3,150l., exclusive of pulpit, prayer-desk, lantern, font, stained glass, screens, enclosing walls, gates, &c., and has been taken by Mr. Grimwood, of Weybread, a builder who has restored many churches under Mr. Phipson's direction,—amongst others in this district, Starston, Weybread, Mendham, Fressingfield, and Fandenhall. The whole style of the church is Geometrical Decorated. Mr. Hazard entertained the whole of the workmen engaged on the building, amounting to about sixty in number, to a substantial dinner at the Magpie Hotel, after the stone was laid.

Liverpool.—The chief stone of a place of worship for a new body in connexion with the Church of England, known as the Free Church of England, has been laid in Stansfield-road, off Heyworth-street, Everton. The church is to be called the Emanuel Evangelical Free Church. The style of the new building is to be Early English, and the church is to accommodate 450 persons in the body and 150 in the gallery. There will be a schoolroom underneath, which will hold 350 children, also two vestries and class-rooms. The edifice will be constructed of red brick, and the front elevations will have white Stourton stone dressings. The cost is estimated at 1,600l., exclusive of the land, which is valued at 300l. The architect is Mr. Richard Owen, and the principal contractors are Messrs. Nicholson & Ayre.

DISSENTING CHURCH-BUILDING NEWS.

Droitwich.—A Baptist chapel has been opened here. It is of modern architecture, and calculated to afford accommodation for nearly 300 persons. The cost of the chapel amounts to 477l. Messrs. T. Guise & C. & H. Carter were the builders.

Market Harborough.—A new Wesleyan Chapel, with school-room and vestries, is about to be erected at Market Harborough, at a contemplated outlay of 1,200l. The architect is Mr. Charles Bell, of London.

Bristol.—The memorial-stone of a new Congregational chapel, which is to occupy the corner of Newton-street, Stapleton-road, has been laid. The new chapel will be in the Italian style, and is to be erected of blue Pennant stone, with freestone dressings. The principal front will be in Stapleton-road, and here will be the main entrance, consisting of an open arched porch, recessed in the main building. It will have three main arches of freestone, with shafts of polished Forest of Dean stone. The centre arch is to be subdivided, the small arches being supported on a slender shaft of the same stone. These shafts will have carved stone capitals. From this porch the chapel will be entered through inner lobbies, with swing doors. The staircases to the galleries will also branch off right and left from the porch. Over the porch will be a large triplet window, and above this (in the gable) a clock. The front part of the roof is to be surmounted by an ornamental ventilating turret. The side in Newton-street will be very plain in character, consisting of an arcade of six windows, with pilasters between. The roof is to be of one span, but supported by two rows of light iron columns, with arcades of wooden arches between them. These columns will also carry the side galleries. The greater part of the roof will be ceiled to the under side of the rafter, the centre part being ceiled flat to the collar-beams. All the main timbers of the roof will be visible, and stained. The whole of the seats on the ground floor and the gallery fronts are to be of pitch pine, varnished. There will be two vestries at the end of the chapel, behind the pulpit. The total accommodation on the ground floor and galleries is to be for 1,000. The architect is Mr. Hans F. Price, of Weston-

super-Mare; and the builder Mr. W. Gorvett, of Bristol. Contributions to the sum of 2,100l. have already been received or promised.

Akroydon (Halifax).—A new Wesleyan Methodist Chapel has been opened here. The chapel is calculated to accommodate 550 persons. The building is in plan a parallelogram, 54 ft. by 42 feet, and 30 ft. high, with a gallery on two sides and one end, and an organ and singers' gallery behind the pulpit, 19 ft. by 12 ft., access to which is gained by a separate staircase. On the chapel floor level, under the organ gallery, is the minister's vestry, with lavatory, &c. Accommodation has been provided for 306 adults on the ground-floor and 242 adults in the gallery, but a portion over the entrance has been set apart for school children. The school-room, 42 ft. by 41 ft., is placed on the basement floor, together with two class-rooms, each about 21 ft. by 13 ft., and kitchen 19 ft. by 11 ft. Advantage has been taken of the sloping nature of the site to secure abundance of light and ventilation. The principal entrance doors (which are both near the centre of the front) are approached by a wide flight of eight steps, and open into a vestibule, in which are situated two staircases leading to the gallery. The plainness of the wall is relieved in the interior by pilasters between each window. All the interior wood-work consists of yellow pine; the seats are open-ended, and all stained and varnished; the mouldings being a little darker than the rest of the panels. The hot-air system is adopted for warming the entire premises, but fireplaces have also been provided in the class-rooms and vestry. Messrs. Utley & Gray were the architects, under whose superintendence the various works were carried out by the following contractors, viz.:—Messrs. J. S. Carey & Co., masons; Smith & Erier, joiners; W. H. Wadsworth, slater and plasterer; J. Naylor, plumber and glazier; J. Berrey's trustees, ironfounders; Hirst & Son, for iron railing and gates; John Hinchcliffe, heating apparatus pipes; and W. Lee & Son, painters, at a total cost, including site and proportion of streets forming, of about 2,700l.

Oswestry.—The tender of Messrs. Morris & Chaplin, of this town, builders, amounting to 3,516l., for the erection of a new Congregational church, on the site of the old gaol, has been accepted. The church is to contain 600 sittings, and is to be erected in the Decorated style of Gothic architecture, from plans by Mr. W. H. Spaul, of this town, architect. The total length of the church is to be 75 ft. 3 in.; breadth, 47 ft.; height, 30 ft. 10 in.; and height of proposed spire, 115 ft.

Reading.—Augustine Congregational Church School has been opened for divine service in the rear of the site for the church, which is in Friar-street, near the late Assembly Rooms. It has a frontage of 50 ft. At present only the school-room is built, in the rear, at a cost of about 800l., exclusive of the site. The building is large and lofty, and until the church is built will be used for Divine worship. The room will accommodate about 500 persons. The architects are Messrs. W. & J. T. Brown, and the contractor Mr. Matthews, both of Reading. The church will be proceeded with as soon as funds will permit. The church will be 100 ft. in length, and will seat 700 persons. It will have an elevation in front to Friar-street, and there will be a tower and spire reaching to a height of 100 ft.

Ipswich.—The new church built for the congregation belonging to the English Presbyterian Church, which has been formed within the last three years or so in Ipswich, has been opened for divine worship. The site is that corner of Burlington estate which has a frontage on the wide space where the Norwich and London roads meet, on the Burlington-road and on Mill-street. Early last year Mr. F. Barnes was instructed to prepare plans, the result being the building now opened. The building is still unfinished; the tower, which will be surmounted by a spire of Bath stone, not being yet completed, and there being still some other work remaining undone. The style Mr. Barnes has adopted is the Decorated, and the material with which the walls are faced is Kentish ragstone, with Bath stone dressings. The church consists of a nave running nearly due east and west, with transepts at the western part, the west wall being thrown back so as to form a recess resembling an apse. The tower and spire are at the north-east corner, next the Barrack Corner. At the north-west corner of the tower is a turret, in which will be a staircase leading to the gallery it is proposed at some future time to erect at the east end of the building; and in the east wall

of the tower is a doorway, the gable of which is 0 ft. high, leading to the floor of the church. On the other side of the east end is a porch corresponding with that in the tower. In the eastern gable, the height of which from the round to the top of the pinnacle by which it is surmounted is 55 ft., is a five-light window, with tracery of geometrical character, below it being three single-light trefoil-headed openings, over the heads of these, as of those in other parts of the main building, there being alternate squares of black flint and Bath stone. The windows in the north and south walls are two-light, their height, which, in comparison with their breadth, would otherwise appear extreme, being relieved by transoms. In the aisle of each transept is a three-light window corresponding with those in the north and south walls, and at the west end light is obtained by three small three-light windows, the head of each light being a cinquefoil, in the upper part of the apse. Two doorways, corresponding to those in the east end, are provided in the western. The roof is slated, and surmounted with an ornamental ridge. The internal dimensions of the church are,—length from east to west, 73 ft.; width, 38 ft.; and width, including the transept, 55 ft. The height from floor to ceiling is 40 ft., the space between the ceiling and the apex of the roof being a ventilating chamber. With regard to the roof, Mr. Barnes has adopted the hammer-beam. The timber used in the church is stained fir, and the benches are of the same material, and will be stained. These benches are copied from those in the Croydon Wesleyan Church; the seats are wide and allowed, and the backs sloping. The plans proposed by Mr. Barnes include school-rooms and vestries on the part of the site fronting Burington-road. An east gallery is to be erected before the building is out of the contractor's hands. With this gallery there will be accommodation for 540 persons, and with side galleries the number of sittings will be raised to 750. A hot-air apparatus for warming the church will be provided. The windows are filled with cathedral glass, with a narrow border of clear glass. Mr. Henry Luff took the contract for the erection of the church for 2,897l. The cost of the building will come within the original estimate.

STAINED GLASS.

Pershore Abbey Church.—To the memory of the late Mrs. Scobell, wife of Lieut.-Colonel Scobell, of the Abbey, a stained-glass memorial window has been erected in this church. The window represents, in the centre, one of the acts of mercy of our Saviour. Above and below are angels bearing scrolls, with the word, "Alleluia," on each. Messrs. Clayton & Bell were the artists.

Linton School-Chapel (near York).—The centre window of the apse in this school-chapel, which has just been erected, at Linton-upon-Ouse, and will be shortly opened for divine service on Sundays, and as a school during the week, is filled in with stained glass, and represents the subject of "Christ disputing with the Doctors in the Temple." The glass is the work of Mr. J. W. Knowles, of York.

Kilworth Beauchamp Church, Leicestershire.—A memorial stained-glass window, in the Decorated style, has been placed in this church. It contains three openings, which are treated with the subject extending over them, of our Lord raising Lazarus to life, surmounted by foliated canopies of the passion-flower and ivy in the tracery, angels bearing scrolls, emblems, and musical instruments. A brass plate placed under the window explains the object of the memorial. The work was designed and executed by Messrs. Holland & Son, Warwick.

Church of St. Nicholas, Warwick.—The east window of this church has been filled with stained glass. The window, which consists of five principal openings and tracery, is arranged in the following manner:—The three centre compartments are filled with subjects illustrative of the part of the Apostle's Creed—"Was crucified, dead, and buried," and "The third day he rose again from the dead." The principal of these is the Resurrection. Below this are the subjects in medallions representative of the words—"He was crucified, dead, and buried." In the two outside openings are four subjects. The top ones, relative to the Resurrection, are, on the left hand, the raising of Lazarus; and, on the right hand, the raising to life of the daughter of Jairus. The lower subjects represent incidents after the Resurrection. Each subject is surmounted by a

foliated canopy. The tracery lights are also filled with Gothic ornaments, and with the emblems of the four evangelists. The work was designed and executed by Messrs. Holland & Son, of Warwick.

Boston Church.—The Fyde memorial window has been put up in the north-east corner of this church. It is the gift of Mr. G. D. Rowley, in memory of the late Mr. R. S. Fyde, who formerly resided in the borough. The work was done by Messrs. Hardman, of Birmingham. The upper figures in the canopies are Noah, Methusalem, Abraham, Isaac, and Jacob, each illustrative of Old Age. The bottom five main figures, which are almost life-size, represent Samuel, David, Simeon, St. John the Divine, and Zachariah, the father of John the Baptist. The canopy and tracery are after the fourteenth-century style, the same as the window.

Bolsover Church.—An east window has been placed in this church, to the memory of the late Mr. Joseph Armstrong, of the Lanes, Scarcliff, and Miss Sarah Charlesworth, of Hill-top, Bolsover, by members of their family, at a cost of nearly 200l. The window is divided into four compartments, which are filled by the following subjects:—"The Agony in the Garden," "The Crucifixion," "The Resurrection," and "The Ascension." Mr. Wallis, of Newcastle, executed the work.

Great Yarmouth Church.—A painted window has been placed on the north side of this church, by the sons of the late Mr. J. G. Fisher, in memory of members of their family. The apostles St. Peter and St. Andrew are the chief figures.

Books Received.

Iron and Heat: Beams, Pillars, and Iron Smelting. By JAMES ARMOUR, C.E. London: Lockwood & Co. 1871.

This volume is intended to exhibit, in simple form, the principles concerned in the construction of iron beams, pillars, and bridge girders, and the action of heat in the smelting-furnace; and as it is designed to benefit those who are more intimately acquainted with practical operations as workmen than with the principles on which practice is based, common arithmetic only is used in the treatment of the questions.

VARIORUM.

Mr. MURRAY announces the publication of "A Description, Historical and Artistic, of the National Memorial to his Royal Highness the Prince Consort," illustrated by engravings of the monument and its decorations; with details of sculptured groups, statues, architecture, mosaics, and metalwork.—"Gas: its high Price in the Metropolis; and the Way to reduce it." By C. G. Clemenshaw. Bell & Daldy." The author of this pamphlet thinks that the first measure necessary is the purchase of the gasworks by the local authorities, who should at once prepare plans for the future better supply of gas. The net price should be charged, and the surplus applied to complete a change of system. New works should be gradually constructed in suitable localities, and an entire new system of mains should be laid out, gradually to replace the present wasteful plan, which cannot be too severely condemned. The saving to the consumer he estimates at 400,000l. to 500,000l. per annum.

"Fourteenth Report of the Vestry of the Parish of Chelsea. 1869-70." This report has now been published in the usual form of a brief report, with voluminous appendices. The parish authorities are trying the steam-roller on their roads, and a resident builder is trying asphalt in the King's-road, without the sanction of the vestry, but has undertaken to remove his Val de Travers material, and substitute stone, if called upon to do so.—"A Sketch: Romance of Motion." By Alec Lee. Longmans & Co." Although the title of this very slight sketch is not what it ought to be, all such endeavours to think independently on the subject of the mode of motion of the planetary bodies in space ought to be encouraged, and not sneered at because they are not quite Newtonian. The sketch stipulates the action of two distinct forces,—a concentrative, or attractive, and a radiative, or repulsive,—and the existence of an ethereal resistive medium. There is added a special hypothesis as to the nature of nitrogen, or air proper,—that it is a combination of hydrogen, oxygen, and carbon, and not an "element," strictly speaking.

Miscellaneous.

Gall's Telegraphic Code.—To the invention of Mr. Gall, the agent of the New York Associated Press for the abbreviation of messages by telegraph, whereby a whole sentence can often be indicated by a word, we some time ago alluded. The singularity of this "code" is said to be the remarkable ease with which it can be transposed, so that if a thousand persons have the book, not one can tell what message the other sends. As thus:—Each page, we will say, contains 200 words, each representing its own sentence. Now, by moving the first column down one line, every first word has a different meaning. If moved two lines, it again has a fresh interpretation, and thus on *ad infinitum*; so that, independently of the inviolable secrecy of the Telegraph Company, there is the additional security of no one being able to make sense of the message, even though he has the code to refer to, unless he knows the arrangement made between the sender and recipient. Mr. Gall's code is now in use for the transmission of messages to the West Indies from the United States. By this code a message, the cost of which would have otherwise been 8l. 16s., costs only 3l. 5s. The Kingston papers make use of the new code on an extended scale, and lately arranged with Mr. Gall for the transmission of the Queen's Speech of 2,000 words at a cost of 105l.

A Wonderful American Water-wheel.—There is in the town of Meriden, Connecticut, says the *Scientific American*, a Lefell double turbine wheel, running under 240 ft. fall, and driving a manufactory. It uses only about one-half of a square inch of water, and runs at the marvellous speed of 3,000 revolutions per minute, or fifty revolutions per second, which is by far the most rapid rate of motion ever imparted to a water-wheel. This is also, beyond comparison, the greatest fall applied to the propulsion of a wheel in America. The wheel at Meriden is of the most diminutive size, scarcely exceeding in dimensions the old-fashioned "turnip" watches which our grandfathers used to carry in their capacious vest-pockets. The complete success of this wheel has attracted much attention, and affords further evidence of the wide range of adaptability of the Lefell turbine.

Good Screens in Cathedrals.—The annual meeting of the Worcester Diocesan Architectural Society was held last Saturday, Lord Beauchamp in the chair. The committee alluded in their report to the subject of the proper adaptation of cathedrals to the requirements of the present time, and expressed a hope that correct principles might be adopted in the arrangement of Worcester Cathedral, there being no impervious screen or other structural difficulty to interfere with the due and proper use of both nave and choir. Lord Beauchamp said he had often been much struck by the enormous absurdity of seeing the choir at our cathedrals walled off from the nave. It would be far more according to correct church arrangements that the choir should not be separated from the worshippers in the nave. It was quite contrary to the principles of the Church, whether before the Reformation or afterwards, to treat the laity as something so far apart from the clergy that they should be walled off, and not allowed, as it were, to worship with them.

Manchester Society of Architects.—This society, desirous of encouraging architectural pupils in the study of their profession, has recently offered premiums, of the value of 5l., to be competed for by articulated pupils in the offices of Manchester architects. The subjects of the drawings to be submitted were set forth in the circular inviting the competition; and in response, eleven sets were sent in, many of them being of considerable merit. The society has awarded the first premium, value 4l., to Mr. A. Mattinson, a pupil of Messrs. J. M. & H. Taylor, for his design for the side of a dining-room and a view of Cheadle Church; and the second, of 1l., to Mr. B. S. Dean, a pupil of Mr. J. Stevens, for a perspective view of a mansion.

Hazardous Employment.—A man has been engaged in repairing the stonework at the summit of the immense chimney belonging to Messrs. Hepburn's Tannery, Bermondsey,—a height of about 180 ft. The operation was commenced by flying a kite over the chimney, and the "Steeple Jack" then ascended by means of a rope secured mast-fashion.

Congleton Public Park.—This park is now advancing towards completion; it covers an area of about twenty-one acres, the north part of which is a wood of about eight acres in extent, with a number of winding walks through it, and provided with seats, from which commanding and picturesque views of the lower grounds and surrounding districts may be obtained. A rustic timber bridge is thrown across the ravine which crosses the western part of the wood. The principal feature in the park is the great terrace walk, upwards of a quarter of a mile in length, with a warm southerly aspect, of which the wood forms the background, and from which complete views may be obtained of the bowling-green, cricket, and recreation grounds. The walk will be furnished at convenient distances with rustic garden seats, and at suitable places two drinking-fountains will be erected. The river will be attractive for boating purposes. The road from the town to the park is 26 ft. wide, with ornamental iron entrance gates and continuous iron fencing. The river will be spanned by an iron bridge, on the truss girder principle, with ornamental iron parapets, pillars, and plank flooring, and will be supported at each end by stone abutments. This bridge will connect the road from the town with the terrace walk under the wood.

The Scott Monument, Edinburgh.—In the town council, on Tuesday last, it was mentioned that the treasurer's committee of the Corporation, after conferring with Mr. James Ballantine and the city architect, had agreed to recommend the fitting up of a chamber in the Scott Monument as a repository for relics of the poet. The recommendation was adopted, and the city superintendent instructed to have the work carried out. In accordance with a design, prepared by the city architect, it is proposed that the lower portion of the walls, to the height of 13 ft., shall be lined with carved oak panelling, surmounted with an ornamental cornice. An effort will be made to get the thirty unoccupied niches outside filled with appropriate statuary. Messrs. Brodie & Hutcheson, sculptors, have intimated their willingness to furnish the statues, modelled by their own hands, and out of the best freestone, at the rate of 50*l.* per figure. The Corporation have in their hands between 500*l.* and 600*l.*, being the surplus derived from the charge made for admission to the monument. Besides the fitting up of the relic chamber, a considerable additional sum will thus be required.

List of Lecturers.—For some time past the Working Men's Club and Institute Union has formed, at their office, a register of such lecturers as are willing to offer their services to workmen's institutions gratuitously, or on strictly economical terms; many of the smaller institutions not being able to engage the services of high-class professional lecturers. It has now been determined to extend these arrangements, and to register the names, addresses, and subjects treated, of any lecturers, metropolitan and provincial, paid or gratuitous, who may enter the same at the office of the above-named Society, 150, Strand, on receiving, in the case of professional lecturers, an annual subscription of five shillings; this amount being necessary to cover the expenses of printing, &c. This register will be open to the public seeking the services of lecturers; and from the fact that the offices of the Club and Institute Union are centrally situated, and are well known to the leaders of working-class and other popular movements, it is believed that the object in view will be effectually promoted.

Artists' Benevolent Fund.—The sixty-second annual dinner of this fund was given on Saturday evening last, at the Freemasons' Tavern, under the presidency of Captain the Hon. F. Egerton, R.N., M.P. The company numbered about eighty, and included Sir F. Grant (president of the Royal Academy), Mr. J. B. Philip, Mr. Cave Thomas, Mr. Vicat Cole, A.R.A., Mr. S. Cousins, A.R.A., Mr. Dimond, Mr. George Cruikshank, and other men of note. For the first time at these anniversaries ladies joined the gentlemen at dinner, and the experiment was so satisfactory in every way that it will doubtless be repeated. The subscriptions announced amounted to 571*l.* 14*s.* A selection of music was given during the evening.

Meeting of Builders.—A meeting of builders was held at the Elephant and Castle Tavern, on Monday last, in consequence of the builders on the Walworth estate considering themselves subject to very arbitrary measures.

Improvement in Coach-building.—Mr. Walter Brodie, plumber, of 60, South Clerk-street, Edinburgh, has invented and patented a new method of carriage-building, which, he tells us, is applicable to all the classes of traction vehicles, as well as carriages in the ordinary meaning of the term. He constructs the framework of the body entirely of light angle iron; and this framework is covered with sheets of *vulcanite*; that is, a material composed of india-rubber and sulphur, such as is now largely manufactured in Edinburgh and Manchester. The iron framework, springs, &c., are also vulcanised, to prevent corrosion. The process, should it be found to succeed, will no doubt supersede to a large extent our present expensive mode of constructing carriage panels and roofs; in fact, will do away with the necessity of painting and varnishing altogether, since *vulcanite*, the more it is rubbed and polished the finer the surface it presents. A great reduction of the original cost is expected, and what is probably of greater consequence, a saving in the outlay for repairs and redecoration.

The Brighton Aquarium.—The Toll-house (so long known as "Ratty's") and the gates at the entrance of the old road to the Chain Pier will soon be cleared away. A new toll-house is to be erected close to the flight of stone steps at the eastern extremity of the Chain Pier Esplanade. That portion of the work at the bottom of the steps will be an open courtyard, leading to the entrance-hall of the Aquarium. This hall will be paved with encaustic tiles, and roofed with groined arches. A corridor of 250 ft. in length, divided by columns of polished marble, and forming two promenades, will terminate in a conservatory. On each side of the corridor will be immense tanks, fronted with plate glass. It is proposed to construct fountains inside as well as outside the Aquarium, and the idea is also entertained of forming an aviary in the interior of the building.

Art in Farnham.—On Tuesday evening April 18th, Mr. Cave Thomas addressed a meeting convened at the Town Hall, Farnham, his subject being the very interesting one of "To what End should we study Art?" and the "Importance of Drawing and Music in Education;" the occasion being the early establishment in this thriving and enlightened little community of a school of art under the Science and Art Department. Colonel Lefevre took the chair, and after the address, explained, in a most able manner, the function of the Art Department. This prompt action and enthusiasm in favour of such a school is mainly due to the exertions of Miss Susan Luard, and the support of Colonel Luard, of the Cadars. We are glad to observe that University College has paid Mr. Cave Thomas the high compliment of electing him a Life Governor for his services in the cause of education and art.

Metropolis Water Bill.—On the order of the day for the second reading of this Bill, Mr. Bruce having intimated that it would not then be proceeded with, Mr. T. Collins protested against the delay. Mr. H. Lewis thought it should be proceeded with, or at once referred to a Select Committee. Mr. Bruce was quite willing that it should be referred to a Select Committee. Dr. Playfair was of opinion that a Bill of such importance, involving an expenditure of 3,000,000*l.*, should be amply discussed before it was submitted to a Committee. In reply to Mr. Crawford, Mr. Lefevre said it was true that some alterations had been made; but the securing an adequate supply of water was still aimed at, and though the compulsory power of purchase was given up, the permissive power was retained. The second reading was then postponed.

Death of a Kentish Archaeologist.—The Rev. Beale Poste, LL.B., has died at his residence, Bydew's-place, near Maidstone. He was born in 1793, of an old Kentish family. Mr. Poste was an early member of the Archaeological Association of Great Britain, and contributed several learned papers to their journal. On the establishment of the Kent Archaeological Society, he took an active part in its foundation, and regularly attended the meetings of the council. One of his last papers was contributed to that society's journal,—"Archæologia Cantiana,"—on the site of ancient Roman Maidstone. In 1847 Mr. Poste published a "History of the Church and College of All Saints, Maidstone," which was followed, in 1853, by "Britannic Researches; or, New Facts and Rectifications of Ancient British History."

Glastonbury.—Glastonbury has begun to boast of the acquisition of a fire-escape, hydrant, &c. She likes their appearance, is showing them to every one, and is longing for the opportunity of knocking sport out of them. If a fire should gratify her wishes, we fear the wayside ditches would have to be resorted to for the source of the supply; unless, indeed, the hydrant could be utilised to pour sewage upon the flames instead of water. When will the authorities of this once saintly but now slattern town take honest advice, and begin doing their work at the right end? A town without a water-supply or a system of sewerage is the very antipodes of civilisation. It may be that Glastonbury, like other Somerset towns, needs to be "woken up" to a consciousness of its position to see itself as others see it.

New Mural Monument in York Minster. A monument, in memory of Mr. Frederick Vyner, who was murdered by Greek brigands, twelve months ago, has been placed in the wall of the south aisle of the choir of York Minster. Upon a large polished brass panel, dispersed with an enamel border, is an Early English foliated cross. The panel has a cinquefoil head, and it is surmounted by a German Gothic canopy. On an oblong polished brass plate, below the panel, is the inscription. The canopy is supported by polished Devonshire marble shafts; and the caps, crockets, and finials are carved in the German Gothic style. The monument is protected by a fender of ornamental ironwork, of Medieval design. Mr. Earp, of London, has executed the sculpture; and the brasswork is by Messrs. Hart, Peard, & Co., also of London.

Accidents.—The gable-end of a cottage in Row 73, at Great Yarmouth, has fallen, during a violent gust of wind. No person was injured. This is the third casualty of a like description within a few weeks.—At Perth, the large, ornamental cast-iron vase upon the top of the chimney-stalk at the water reservoir at the north end of the South Inch, lately fell through the roof of the engine-house and storeroom. The motion of the engine was completely stopped, and it was otherwise damaged. An engineer, who was working beneath the engine, was severely cut in the head by splinters from the vase; but a fellow-workman escaped unhurt. On inspecting the fragments of the vase, it was found to be very much decayed. The vase was upwards of a ton in weight, and it will cost about 150*l.* to repair the damage.

Proposed Theatre in the City.—We hear that a company has been formed for the purpose of purchasing a site in the City suitable for the erection of a theatre. Several properties were submitted to the directors, and they have finally selected a freshhold block situated in Goswell-street, close by the Aldergate-street station. For this site, which covers an area of over 9,000 superficial feet, they have offered the sum of 15,000*l.*, and should this offer be accepted they will proceed at once with the erection of a theatre and restaurant, after the model of the Gaiety Theatre in the Strand. It is to be hoped the building will be isolated, and well provided with entrances.

Restoration of Christ Church Cathedral, Oxford.—The restoration of the cathedral has been considerably advanced. The south transept is now visible, and instead of being blocked up, as formerly, by the organ and vergers' rooms, one now looks upon the exterior wall the window in which is very fine, but is, unfortunately, spoilt by the present flat roof, which hides the upper part of the arch. An open perpendicular roof, it is stated, is to be substituted for the present flat one, and this will be a great improvement. The two rooms, formerly used as quarters for the vergers, beneath this window, have also been restored.

Fall of a Church Roof.—The roof of St. John's Church, Bacon, fell in with a load on Wednesday, the 19th inst. The east end of the church is a complete wreck, and the organ destroyed. The pulpit, reading-desk, and pews are broken to pieces, and the edifice is choked up with debris. The church, a plain stone building, was consecrated by the Bishop of Chester in 1788.

Carpet Tacks.—Double carpet-tacks, bent wire, are now used in New York. They are made of flattened steel, and are similar in shape to a common staple. A carpet fastened down by them can be more easily lifted, and with less risk of being torn, than if secured by ordinary tacks.

Surveyor to the Parish of St. Bride, Fleet-street.—At a meeting of the Parish of St. Bride, Fleet-street, last week, for the purpose of appointing a surveyor to the parish in the place of Mr. Arding, who has resigned his appointment, a vote of thanks was proposed by Mr. Deputy Walker, and seconded by Mr. Avant, to Mr. Arding for his judicious recommendations in relation to the property of the parish, which was unanimously agreed to. Mr. C. B. Arding was elected surveyor of the parish in the place of his father.

The Threatened Destruction of Caesar's Camp at Wimbledon.—This act of Vandalism seems to be still threatened. Can any of our correspondents tell us in what precise state the matter now stands? A circular, quoting from what has already been said on the subject, we observe, has been printed, with a few words deprecating the obliteration of the interesting old relic for the sake of a few pounds per annum of ground-rent for brick and mortar purposes.

The Ornamental Water in St. James's Park.—The Metropolitan Board of Works have not completed the drainage of the ornamental water in St. James's Park, with a view to cleanse its bed. As this is composed of concrete the process of cleansing is comparatively easy, and already the mud, which was some 5 in. or 6 in. deep, and was fearfully offensive, has been swept into heaps, and deodorised with chloride of lime.

Building Sites for Schools.—In answer to Mr. Simonds, in the House of Commons, Mr. Forster states that the parishes of Heddon Worth, Otterbourne, and Calden Common, in the county of Southampton, stand 2,000 down on the list of applications for school sites. He cannot, therefore, fix a date for reply.

Polytechnic Institution.—The Directors of this institution announce their willingness to exhibit, free of cost, approved models of inventions and improvements in machinery of all kinds. Steam-power will be applied to working models, and deposits will be described.

Society of Engineers.—At the next ordinary meeting of the Society, on Monday evening, the 1st of May, at the Westminster Palace Hotel, a paper read on "The Ventilation of Sewers," by Mr. Baldwin Latham, president of the Society, will be discussed.

The Royal Society.—The conversations on Saturday, the 22nd, was numerously attended, and included a number of very interesting exhibitions.

TENDERS

For infant school, Strood, Kent. Mr. Geo. Ruck, architect. Quantities supplied:—
 Flint & Dover £299 0 0
 Bookers 343 0 0
 Walls & Clements 930 0 0
 Gales 807 0 0
 West, B.R. 415 0 0
 Sollitt 814 0 0
 Clements (accepted) 790 0 0

For converting the White Hart, High-street, Harrow-on-the-Hill, into a shop (exclusive of bricks, which will be found by the owner), for Mr. William Winkley. Messrs. E. Habershon & Brock, architects:—
 Woodbridge £147 15 0
 Rendell (accepted) 115 0 0

For the erection of cottage residence, for Mr. J. Salter, at the Hermitage Brickfields, Woking, Surrey:—
 Slade £560 0 0
 Millard 482 5 0
 Faggater 451 18 0
 Whitburne 450 0 0
 Harris 414 0 0
 Martin & Wells (accepted) 350 0 0

For water-closets, baths, lavatory fittings, and other plumbing works, for Poplar and Stepney (Poor-law) Sick Asylum, Bromley, Middlesex. Messrs. Arthur & C. Hinton, architects:—
 Finch £1,500 0 0
 Jukes & Co. 1,485 0 0
 Mann (accepted) 1,485 0 0

For additions to Stoke Lodge, Stoke Hammond, Bucks. Mr. J. T. Lawrence, architect:—
 Edwards (accepted) £510 0 0
 Denchfield 295 15 0

For proposed additions to schools, Hornsey-road. Mr. Charles Higgins, architect. Quantities supplied by Mr. W. J. Worthington:—
 Leatherdale £1,717 0 0
 Goodman 1,625 0 0
 Jukes & Co. 1,350 0 0
 Capps & Rizzo 1,008 0 0
 Nisbett 1,680 0 0
 Ripps 1,558 0 0
 Crab & Vaughan (accepted) 1,537 0 0
 Heath 1,390 0 0

For alterations and additions to a house on the Heath-road, Leighton Buzzard. Mr. J. T. Lawrence, architect:—
 Adams £370 0 0
 Barker 287 0 0
 Andrews 278 0 0
 Edwards 275 0 0
 Miles 274 0 0
 Whiting (accepted) 240 0 0

For road and fence walls for Aged Pilgrims' Asylum, Hornsey Rise. Mr. F. Boreham, architect:—
 Hill & Sons (accepted) £258 0 0

For enlargement of Congregational Chapel, Richmond. Mr. W. Burnet, architect. Quantities supplied by Mr. Gordon Stanham:—
 Wilson & Co. (too late) £1,109 0 0
 Carless 1,087 0 0
 Bridgman & Nuttall 1,026 0 0
 Sweet & Son 1,120 0 0
 Palmer 898 0 0
 Adamson & Son 879 0 0
 Sims 840 0 0
 James (accepted) 799 0 0

For building family residence and stable, Shrewsbury-lane, Shooter's Hill, Kent, for Mr. James Chapman. Messrs. William Gosling & Son, architects:—
 Vickery £1,189 0 0
 Capps & Rizzo 1,160 0 0
 Machin 1,125 0 0
 Wevell 1,120 0 0
 Capps & Wall 1,110 0 0
 Watson, Brothers 1,089 0 0
 Jory 1,078 0 0
 Chaplin 1,051 0 0
 Harrison 1,045 0 0
 Watson 1,045 0 0

For sundry alterations at Messrs. Vickery's Distillery, Westminster. Messrs. Mayhew & Calder, architects:—
 Curtis £330 0 0
 Eaton & Chapman 330 0 0
 King & Son 327 0 0
 Turner & Sons 325 0 0

For erecting cottage, &c., at Muswell-hill. Mr. J. Coo, architect:—
 Turner £445 0 0
 Merritt & Ashby 405 0 0
 Eaton & Chapman 393 0 0
 Garrard 397 0 0
 King & Son 380 0 0
 Johnson 339 0 0

For erecting a new shop at Woodford, for Mr. George Hearn:—
 High (accepted) £255 0 0

For finishing two model dwellings in Finsbury. Mr. Knightley, architect:—
 High (accepted) £1,580 0 0
 Bates 1,230 0 0

For building a new concrete stable at Clapton for Dr. Wheeler:—
 High (accepted) £125 0 0

For alterations to three houses, &c., in Jubilee-street, Brighton. Mr. Tupper, architect:—
 J. & A. Stennig £387 0 0
 W. & T. Garrett 869 0 0
 Hall 799 0 0
 Lancaster 777 0 0
 Dean 770 0 0

For house and shops at Clarendon-road, Notting-hill, for Mr. W. H. Groppe, Mr. J. P. Bonington, architect. Quantities supplied by Mr. Henry Tovey:—
 Mann £915 0 0
 Lusham & Way 885 0 0
 Kelly, Broth. 867 0 0
 Preston & Fielding 845 0 0
 Milwater (accepted) 843 0 0

TO CORRESPONDENTS.

"How to Spend Money for the Public Good?"—Several communications on this subject are in type.
 F. R. C. E. R. E. F. G. R. S. A. Messrs. W. W. A. O. —
 Baron L. A. R. E. S. W. M. — W. G. W. R. — H. M. — H. L. —
 H. J. B. V. G. T. H. M. — M. B. B. J. G. R. F. C. J. B. R. T. —
 J. J. — W. H. — A. S. M. — W. D. D. — J. T. L. S. — W. G. — W. P. H. —
 W. R. C. — F. D. — H. T. R. — W. G. — Dr. F. J. D. M. — H. P. —
 J. D. P. — E. L. G. — R. T. O. — R. O. — A. H. R. — R. O. — G. O. —
 K. S. — G. C. T. J. H. — W. R. (to the extent to which a tenant is liable). — J. V. (thanks). — C. L. (beyond our province).
 We are compelled to decline pointing out books and giving addresses.
 All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.
 Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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ILLUSTRATED CATALOGUE of the INTERNATIONAL EXHIBITION, 1871.—The success that attended the publication of our Illustrated Catalogue of former International Exhibitions held in London, Paris, and Dublin, fully justify the Proprietors of the ART JOURNAL, in announcing their intention of re-issuing it in a form more than ever to be opened at South Kensington on May the 1st. It is proposed to issue with the Number of the Journal for that month Twelve Pages devoted to the Illustration of the most important and best of works of Art, Manufacture, both British and foreign, which will be contributed to the Exhibition, and to continue such publication monthly, to the end of the year. The cost of the Journal (price 2s. 6d. Monthly) will not, however, be thereby increased.
 The Catalogue will be printed on toned paper, and paper separately, so as to form a distinct Volume when completed. Every effort will be employed to render this Illustrated Report at least as attractive, interesting and suggestive as the Exhibition itself.
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The Builder.

VOL. XXIX.—No. 1474.

The International Exhibition.

EMARK-ably well adapted for the gathering and marshalling of a large body of persons are the corridors and the conservatory, which now connect the Royal Albert Hall with the International Exhibition buildings on each side of the Horticultural Gardens. With its wide flights



of steps, varied levels, terra-cotta arcing, and floral adornments, the aspect of the conservatory on Monday last, when H.R.H. the Prince of Wales, surrounded by a brilliant court, opened, in the name of the Queen, the first of the intended series of annual exhibitions, was beautiful in the extreme. The position of the staircases, too, was found very convenient for that part of the ceremony which included the fling past the Prince of the members of the various committees connected with the undertaking, as they proceeded up the staircase opposite to that by which they had descended, and re-formed in the corridor, ready to precede the Prince in his journey through the galleries. It has been objected that this fling past, or presentation, and the declaration of the opening of the Exhibition, should have taken place in the Albert Hall, so that a larger number of persons might have been present; but we are much disposed to think that the arrangement adopted was the better. To say nothing of the circumstances that a somewhat similar ceremony had been performed in the Hall only a few weeks previously, and that the necessary arrangements for the present meeting would have interfered with the musical display that was to follow,—had the great body of the visitors been gathered in the Hall, there they must have remained, and the procession must have passed through a series of nearly empty apartments, instead of through a lane of smiling, well-dressed people, very nearly three-quarters of a mile in extent. Everything went very smoothly and well, if we except a temporary block in the conservatory at the close of the walk round, and those who had the management of the ceremonial deserve praise.

In the address presented to the Prince, the Exhibition Commissioners of 1851 set forth the conclusions they have arrived at touching the exhibitions about to be held in this country, and to which they have endeavoured to give effect in the present undertaking. They propose,—

“To confine the Exhibition of each year to two or three industries only, but to admit every year works of fine art, scientific invention, and horticulture. To admit such objects only as might be selected as worthy of exhibition by a competent committee of selection. To group these objects by classes and not by nationalities. In the case of fine arts, certain slight modifications of the rule have, for this year only, been admitted. To save to exhibitors, so far as possible, the cost and trouble of exhibiting, by providing for them glass cases, stands, steam power, and other appliances for the proper exhibition of their objects; and also by employing agents who will answer inquiries respecting the objects and generally watch over the interests of the exhibitors.”

From the same source we learn that to the erection of the new galleries the commissioners have devoted the sum of 75,000*l.* out of the surplus left in their trust. They have devoted a further sum of 25,000*l.* in providing fittings, furniture, and cases for the Exhibition galleries, for certain necessary work in the adjacent buildings, to enable them to be used as a part of the Exhibition space, and to meet the preliminary expenses attending the undertaking. The total cost, therefore, of opening this the first of the series of exhibitions, including the permanent structures which will be available for the whole series, will be 100,000*l.* The catalogue of the Exhibition of the present year enumerates about 8,000 objects. We say heartily with Lord Houghton,—

“Be this a feast of hope! The flowers
Of Spring the waste of War repair,—
The quiet work of happier hours
Dispels the load of human care;
For Industry and Art are powers
That know no end and no despair.”

We are bound to mention that we doubt the desirability, not to say the possibility, of holding such an exhibition every year.

The ceremonies of the opening day were concluded, as our readers are aware, by a musical performance in the Albert Hall, wherein the musical art of Italy, France, Germany, and England was represented by compositions from the pens of Signor Pissuti, M. Gounod, Dr. Ferdinand Hiller, and Mr. Arthur Sullivan respectively. Signor Pissuti's “Chorale” represented the pure school of unaccompanied vocal part-writing which, within certain limits, was brought to perfection in Italy long before anything worth calling “instrumental” music had come into existence at all. The composition, sung very well on Monday by the chorus, might be accepted as a fair specimen of the school which it represented, in its simpler rather than its most elaborate forms: for such an occasion it was perhaps a little heavy in character. M. Gounod's cantata had melancholy reference, in its subject, to the present state of his own country, embodying the lament of the Israelites, “*Super flumina Babylonis*,” which did not prevent it receiving the hearty sympathy and applause of the audience. The last chorus is marked by considerable breadth and grandeur of effect, and was well calculated to bring out the resources of the large chorus and orchestra in so vast a concert-room. Then followed Dr. Hiller, with his “March,” representing the results of that high elaboration of orchestral effect which has been the noble contribution of the German nation to the art of music, and in which the fine and joyous melody forming what musicians would call the “second subject,” came out with beautiful effect; and was, to say truth, almost the first bit of music in the programme which enabled the listener fully to realise that the occasion was a festive one, or intended as such. Mr. Sullivan's cantata, “On Sea and Shore” (the words by Mr. Tom Taylor), was the longest and most elaborate of the compositions performed, and included a considerable variety in style and effect, especially as regards the orchestral accompaniments and interludes, wherein some of the more delicate and piquant effects of the modern orchestra were brought into play. There could scarcely be a more crucial test of the acoustic capabilities of the Hall than such a performance of a new piece of music, requiring in many parts great delicacy of treatment and of light and shade in its performance, and it must be said that the general result was perfectly satisfactory, and that the nuances of performance were as easily perceptible, in most cases, as in any ordinary-sized concert-room. It is noticeable that, from the upper part of the room the effect of the “percussion” instruments (drums and triangle in this case) was much greater, and their sound louder in proportion to the rest of the band than

we have heard it with smaller numbers in smaller concert-rooms; this class of sounds apparently possessing more travelling power than that of the violins. Large as the band and chorus were, the effect of the organ, though yet unfinished, was sufficient to dominate them completely. There will be at least no lack of power in this huge instrument, even beyond what the proportions of the Hall demand.

It may be doubtful whether it is the best policy on such occasions to have compositions made to order for performance. Poems, literary or musical, written for special occasions, somehow seldom represent their author's best inspirations; and after everything has been said in its favour, such a concert-room as the Albert Hall will probably be best used in giving grand performances of great standard works, already known and loved, rather than in introducing new works, which are always listened to in a more critical and less enthusiastic spirit. The applause on Monday afternoon was evidently more for the composers, who conducted in person, than from any great excitement produced by the music; and Rossini's “*Semiramide*” overture, which concluded the performance, evoked far greater enthusiasm on its own merits than any of the pieces written for the occasion. Here, again, the rapid violin phrases were heard with remarkable clearness, the only slight obscurity being in the rapid reiterated notes which form the commencement of the leading phrase of the *allegro*; these rather lost their sparkle, and had a tendency to blend and resolve into the effect of one long note. The piccolo-fute came out with a clearness and vividness quite amusing, when the size of the instrument was contrasted with that of the place. The solos in Mr. Sullivan's cantata were ably sung by Mme. Sherrington and Mr. Winn, the former of whom, in particular, was perfectly clear and audible in every note, and without any apparent unusual effort.

The Galleries.

To complete the general glance at the galleries of the Exhibition which we attempted last week, we must add a few lines as to the Western, or English, Fine Art Gallery, without prejudice to such more detailed account as may seem desirable hereafter.

The aspect of the English Gallery, mainly divided into two saloons or chambers adorned by oil paintings, one by water-colours, and one by cabinets, sculpture, objects of various descriptions of fine art, and treasures such as form the bulk of the contents of the adjoining Museum, is rather that of a Continental palace than of an ordinary exhibition. A double line of sculpture extends along the greater part of the range, and the admirable light, which we mentioned last week as giving such force to the works of Italian sculpture, is now shed, to their great advantage, on some products of the English school of which we have no reason to feel ashamed. The removal, moreover, of scaffolds and tarpaulins, has obviated some of the objections to the lighting of the staircase of which we before complained.

It may be questioned whether the tone of the pictures is not to some little extent interfered with by the brilliant white of the sculpture, at least in the case of those larger paintings which it is necessary to view from the opposite side of the gallery. Questionable, we say,—by no means feeling sure whether a certain subdued tone which seemed to characterise many old favourites is actually due to this cause; or rather to the effect of time, or to comparison with more brilliantly-executed works from Continental artists. Effects of this nature are matters for special study, and that repeated on days of varying brightness, and not for hasty dogmatism. Even at the cost, if such be the case, of some loss of power in the paintings, the general effect of the gallery cannot fail to evoke unusual admiration.

With regard, indeed, to some of the finest and best known productions of English art, which occupy conspicuous positions in the International Exhibition, no accident of juxtaposition or of illumination has in any way marred their beauty. Among the most striking of them, we rejoice to recognise Mr. Graham's famous "Spate in the Highlands," where the torrent rushes from the peaty moorlands, foaming in its fury, and heaven and earth are blended in the violence of the sudden storm. The lady bound to a tree, with a knight cutting the rope, whom Mr. Millais exhibited at the Royal Academy last year, has either learned to blush a "celestial rosy red" from meditating on her position, or has had a little touch from the artist's hands. Three children, also by Mr. Millais, will charm every one by their masterly delineation. The toil of the Hebrew slaves, in dragging along an enormous sphinx, which Mr. Poynter exhibited in Trafalgar-square, a year or two since, and which was so cleverly parodied in *Punch*, is also here. Mr. Nicol gives us his puzzled Schoolmaster, so evidently floored by the "antennes" of his scholar, that the very rod untwists itself beneath his hand; and a pedlar, who only looks audible voice to seduce us to the purchase of his wares. Mr. Faed's touching domestic scenes are on the walls; and there is this effective "Saek of a Nunery," by Mr. Poole.

Padre Francisco, with whom we made acquaintance in Mr. Wallis's gallery last year, painted by Mr. E. Long, continues to snore—it is certain that he snores, though we are not near enough to catch the sonorous vibration. There are two Early Italian scenes, by Mr. Alma Tadoma, in both of which we trace rather the later rough touch than the earlier photographic finish of this eminent artist. We can compare the terror of Haman, in Mr. Armitage's "Esther's Banquet," with the sated, jaded, sensual countenance of Herod, gazing upon the posture-making of Salome. The actual Eastern life of Es Salama, the noble Oriental chief, whose portrait Mr. Carl Hays gave us in the Exhibition of the Water Colour Society last year, somewhat puts the Romanised Jewish king out of countenance. There is a priest intent on a book, by Mr. W. Goodall, who, no doubt, holds converse, when the gallery is deserted and silent, with Padre Francisco. The demon fiddler, too, executes his *sonata* with the utmost glaze; and the picture has rather improved than otherwise by lapse of time. Mr. W. Linnell's "Aurora in Romagna," also, appears a much finer picture in its present position than it formerly did on the walls of the Academy. Both the intense hues of the sky, and the reflected lights on the faces and forms of the peasants, are rich with those effects that can only be caught in a few happy and fleeting moments of the short Italian twilight. With this Romagnese magic let the visitor compare the weird and impressive night-scene of the "Flight into Egypt," by C. Stuart, in Room No. 7. There is an original sketch, by Holman Hunt, of "The Child Jesus and his Mother in the Temple," which is remarkable for showing not only how the countenance of the Virgin has gained in dignity in the painting, as compared with the cartoon, but how the wonderful child has come into a poetic existence and dreamy life in the finished work, which had not even dawned on the artist's mind when he drew the sketch. Near this valuable record of the historic growth of a painter's creative power is to be seen the fine picture by Desanges of the Crown Prince of Italy, his lovely and dignified Princess, and the little Prince of Naples, whose birth was so wildly hailed by the impetuous Iazzaroni. This picture was mentioned by us some time ago when exhibited by Mr. Graves.

The poet of honour—speaking of the effect of a first visit—among the English pictures of the Exhibition is due to a Royal exhibitor, who has given no mean proof of selective taste in becoming the owner of the Madonna and Child by the late W. Dyce. It is hard to avoid something of enthusiasm in speaking of this beautiful picture. In conception, drawing, colour, and manipulation it is a piece of true Italian *renaissance*. Whether from intent, or from mishap in the choice of a vehicle (we much fear from the latter, in kept cases the picture ought habitually to be kept horizontal, and not hung on a wall) cracks appear in several places, which aid the deception. No judge would say it was a Raffaele, no judge would attribute it to Correggio; yet the name of no other artist would readily occur to the mind as that of the painter. The fall rich red of the tunic, the deep blue of the robe (though not the

attributed colours of the Virgin, which are cerulean blue and white), are laid on with a rich *impasto* such as we rarely find except in some carefully treasured gem by Perugino, or by Sandro Botticelli. The attitude and child-like grace of the Virgin evince long and loving study of Correggio. The power and divinity that slumber behind the shadowy eyes of the infant recall the child of the Sibine Madonna. Her Royal Highness the Princess Louise makes us feel what a loss the art—not of England only, but of the nineteenth century—sustained in the death of Mr. Dyce.

We must find room for two notes on the sculpture, in the hope of returning to the subject. The dignity and beauty of the bust of H.R.H. the Princess of Wales, by Vandenbosch, are such as to ennoble the coarse composition in which it is modelled. Such features should be rendered only in bronze, in silver, or in marble, and a reproduction of the present model in either or in each of these materials is much to be desired. Among the marbles we were unconsciously arrested by "On the Sea-shore," a little naked girl leaning against a rock, by Mr. Crittenden. Again and again we returned to this charming figure. The child is rather thin, but evidently modelled from English life. English, too, is the noble and cultured countenance,—Italian, or even Greek, the simple abandon of the pose. We regard this statue with the more interest from the fact that, exclusive of its intrinsic beauty, it points out a direction in which it is possible for the sculptor to succeed, in this country, in producing something worthy of the art. We allude to the treatment of the nude, a subject of the utmost difficulty in a climate where people are habitually and universally clothed, and where the desire of warmth is associated with certain conventional rules of decorum. To model from a living model in such a country is almost certain to entail failure. The more faithful the artist is to his model, the less true is he in the representation of the perfect unconsciousness which is an essential element of purity in dealing with the undraped human form. In seizing the natural graces of a child sporting on the sea-shore, when water is warm, and wind still, and sun not too fervent and blinding, Mr. Crittenden has evinced a judicious selection which has rendered success possible. In his charming portrait he has made it a fact.

Italian life, by an English artist, is given us by Mr. John Hutchinson. His youthful Dante is a very noble bust. There is something of the voluptuous character of the Decameron in the mouth of the poet of the "Divina Commedia," but the vision of genius is shadowed by the brow. A very life-like face, of the true ancient Roman type, still maintained by the women of the Trastevere, bears the name of "Pasquino," as well as we could read the label,—perhaps it is "Pasqualina;" but it is one of those countenances which, magical in their beauty in early youth, are predestined to become hags, if they reach the age of thirty. The fine Ganymede on the eagle is modern Italian,—non *constat* why it is in this gallery. With a glance at the beautiful Otoroon, by Bell, in whose tiny mouth we fail to trace even that eighth portion of African blood which is thought to impart to a race now, we suppose, about to become extinct, a peculiarly infantile grace and womanly charm, we must retrace our steps, remarking only, in the central compartment of the gallery, the very beautiful plateau, with epergne and candelabra, in blue-and-white Wedgwood, and the "Maske of Cupid on the Wall."

ARCHITECTURE IN THE INTERNATIONAL EXHIBITION.

A FATALITY seems to attend all efforts to get architecture properly represented at our Exhibitions. Whatever representations are made on the one hand, or promises on the other, there is always a lapse in one way or another; either the drawings are put where no one is likely to look at them, or the architects do not contribute adequately, or their contributions are not accepted; or all three stumbling-blocks to a proper representation of the art are combined. In the case of the International Exhibition, architecture has, to begin with, been sent up to the Albert Hall gallery away from the other fine-art work, and divided from the main body of the Exhibition by a series of stairs, which few persons who are not architects will ascend for the purpose of looking at the drawings; though curiosity to

get a fine view of the interior of the Hall may bring a good many up, who may, of course, by a gracious providence, be moved to look at the drawings also, in a sort of accidental manner. When the gallery is reached, the result is disappointing in a double way. In the first place, the exhibition of architecture is not "International," but National only, unless one or two drawings of churches by French architects (*two* is the precise number, we believe, of which one was in the Conduit-street Exhibition last year), and two designs for ceiling and wall decoration by a German architect (A. Schloß), can justify the title "international." Near the end of the architectural section of the catalogue there certainly is a small proportion of Austrian architects' names (Nos. 3,766 to 3,775), and one or two Italian and North German, but after vainly endeavouring to discover the whereabouts of these strangers, whose drawings are certainly not with the others in the gallery, we were obliged to give up the attempt, and conclude that these productions have been hidden out of sight by accident, or are not yet hung. Of drawings by English architects there are a considerable number, the principal of which, however, are mostly familiar already to those who have paid attention to recent architectural exhibitions, and there is among them nothing in the way of constructive architectural drawing, from which any student of the art could learn much. The opportunity which we had expected of comparing our own methods, both of design and getting up drawings, with those of Continental architects of various nations, is not existent in any way. If, on the other hand, any foreign architects find their way up to the picture-gallery to study the later developments of English architecture, they may probably be impressed (as the French critics were at the Paris Exposition) with our capacity for getting up pretty and effective views of buildings, but they will find scarcely any indication even of plan, much less of constructive design, to give any clue to the method or principle on which the more important designs have been worked up. Report, indeed, says that plans were sent in and turned back by the Executive Committee for this department; if so, the committee showed very little judgment as to the real object and value of an architectural exhibition. Some greater interest would have been given to the collection, even as it is, had the various designs been classified a little; if designs for ecclesiastical, domestic, and municipal buildings, for instance, had been respectively classed together for comparison, and sketches of existing buildings separated from those which are put forward as "designs." As it is, the whole thing is not at all satisfactory, and not of much use to any one.

Under the circumstances, and considering that a number of the principal designs exhibited are, as we observed, already pretty well known, there is not much in the collection to call for any special remarks or criticisms. Among the larger designs for public buildings, there is a greater proportion of "Classic" work, including some of the very best drawings, than we expected to see; though Gothic of one sort or another is the prevailing style in smaller buildings. Mr. E. M. Barry and Messrs. Banks & Barry are largely represented; chiefly by drawings of works already built, or known through representations in the *Builder*. Among these are the new National Gallery design, the Cannon-street Railway Hotel, the new front of Burlington House, which we recently engraved, and other well-known works. Certain drawings of the Houses of Parliament, prepared in 1843 for Sir Charles Barry, by Mr. W. H. Brakspear, and exhibited by him (3,620 and 3,665), are of some interest, as showing variations in the design, particularly of the clock-tower; one form of which is certainly more pleasing and artistic in outline and composition than that which has been carried out, though perhaps less directly expressive of its purpose as a clock-tower. The interior of the central hall at Crewe Hall, as rebuilt by Mr. E. Barry (3,726), is one of the best drawings in the gallery. Messrs. Mills & Murgatroyd's "Competition Design for Natural History Museum" (3,593), is a dignified Classic design, shown in a beautifully tinted sepia perspective drawing; Mr. Waterhouse's design for the same (3,616) is a somewhat heavy but powerful round-arched Gothic building, with square angle features crowned with slightly pointed dormers. Whether the design is to be carried out, or whether Mr. Waterhouse is to be entrusted with the

execution of the late Captain Fowke's scheme, does not yet appear. Among other representations of designs for large and important works may be named Mr. G. Scott's "Hall of Arts and Sciences" and Mr. Ferguson's design for the Albert Memorial; Mr. Wild's "East London Museum," designed under the superintendence of Lieut.-Col. Scott (3,706*); Mr. Sorby's design for St. Pancras Station (3,730); Mr. Waterhouse's Manchester Town-hall (3,743); and sundry unsuccessful competition drawings for the same, by Mr. J. O. Scott, Messrs. Speakman & Charlesworth, and others; Sir James Pennethorne's two designs for the University of London (shown, oddly enough, on totally different scales); Mr. Wyatt's "Quadrangle of the New Liverpool Exchange" (3,611); Mr. O. Barry's "Interior of Dulwich great Hall," and Mr. Massey's "Proposed Design for a Palace," crowning a grand set of terraces somewhere facing water,—where precisely is not of much consequence, as such a project is not very likely to be executed. The design requires more breadth and continuity of treatment to render it a success even on paper. Among small designs worth notice is the "Town Hall at Bromley" (3,580), a very original and picturesque Gothic design in brick, with an angle tower of unpretending but picturesque treatment, and a heavy horizontal brick cornice round the principal fronts, giving a look of unity and dignity to the whole without heaviness. Mr. Truett's Bank (3,736) for Messrs. Cunliffe, Brooks & Co., we recently engraved. Mr. Verity's design for the front of the "Criterion" (3,590) is a French Renaissance design, with a well-managed and dignified central entrance. The "Entrance Front of Castle Carr, Yorkshire" (3,592), by Messrs. Smith & Risley, is a fine water-colour of a grand and stern mass of building with a great entrance tower; it is a restoration, but there is nothing to indicate how much of it is Castle Carr, and how much is Smith & Risley. Messrs. Cune & Jowers exhibit very picturesque and expressive treatment of simple materials in their designs for Villas and Hotel, at Lancing, Sussex (3,678 and 3,724), executed in grey flint with brick angles. "Swan Downer's School," by Mr. G. S. Clarke (3,631), is another pleasant and picturesque design, as are Mr. St. Aubyn's "Greenhurst, Dorking, Surrey" (3,680), and Mr. Glover's "Parish Schools, Chesham, Bucks" (3,682). Mr. Robins's "New Tower and Spire for St. Stephen's Church, South Kensington" (3,690), is a pleasing specimen of modern Gothic. Mr. Sorby's "Villa near Bath" (3,702*) is a still better specimen of adapted Italian, and in fact as good an example of a modern villa, combining elegance and refinement with picturesque outline, as we have lately met with. Messrs. Young & Shaw's "Chapels and Lodge at Epsum Cemetery" (3,706), and Mr. R. Plunbe's "Schools in Wilkin-street, Kentish-town" (3,730), both deserve praise as specimens of quiet picturesque design, without pretence or straining after effect. Mr. Wyatt's "Mansion for Sir D. Conds Marjoribanks" (3,749), which we have recently engraved, may stand as an example of a town house (not, however, all that could be wished in point of style and detail); and Mr. H. Hall's "Wilts and Dorset Bank" (3,753), is another street architectural design worthy of commendation for the characteristic and expressive treatment of the ground-story forming the Bank: frequently designs for banks might be equally taken for club-houses, which should not be the case in a class of building the purpose and object of which are so marked and individual as a bank. One of the best of the smaller works in the gallery, both as to design and drawing, is the church at Tournay, by M. Carpentier (3,653), a brick church, with two west towers with square timber spires, and an octagon centre tower, with octagon spire of the same character. The drawing is a beautiful little specimen of purely architectural drawing and colouring, as clear and hard as possible. Mr. Currey's "Part of St. Thomas's Hospital" (3,606) is one of the best specimens of architectural colouring in the gallery. Unfortunately, this is just the kind of building the real merit of which can only be done justice to in relation to plan and arrangement: there is not much to attract in the architectural detail. Mr. Aitchison's "Cast-iron Staircase at 60 and 61, Mark-lane, E.C." (3,703*), is a small thing artistically carried out with thought and consideration, and therefore, though small, not to be passed over.

Architectural sketching, considered as distinct from design, is represented in some fine draw-

ings. We may mention Mr. Dobbin's "Court of Lions, Alhambra" (3,585); two or three of Mr. E. Sharpe's drawings of North German churches; Sir Digby Wyatt's frames of small pen-and-ink sketches made in Spain, equally interesting in subject, and as specimens of free and effective sketching on a small scale; and Mr. Brakspear's "Restoration of monumental Screen in Paignton Church, Devonshire," a remarkably fine water-colour drawing of rich and heavy stone carved work. Mr. Wyke Bayliss's large drawing of the interior of the Sainte Chapelle, is wonderfully elaborated, and rich in colour and tone, with very large use of body colour; unfortunately, in aiming at depth and richness of effect he has lost light, and his great rose-window does not show a vestige of indication of light through what we conclude is intended for stained glass. To represent on paper the depth and glow of a heavy stained window, without losing its transparency, is certainly a difficult problem; but it is better to lose some of the colour than all the light, as in the present case.

We have endeavoured rapidly to indicate what is and what is not to be seen in the architectural section of the International Exhibition; and quit the subject with a sincere regret that what might have been so fine an opportunity for the architects of various nations to learn from each other, both as to past practice and future suggestion, should have been, from whatever causes, almost entirely lost. Let us hope for a more complete exposition next time.

ARCHITECTURE AT THE ROYAL ACADEMY.

THE discontinuance this year of the exhibition in Conduit-street, which, for some little time past, had specially represented architecture, has not resulted in any noticeable increase either in the number or the interest of the drawings which find place in "Gallery No. IX." at Burlington House. We do not know, of course, what number of aspirants for architectural honours at the Academy may have suffered rejection at the hands of the committee; the result, at all events, is much the same as last year: a collection of drawings filling about half the room, almost exclusively perspective views of the picturesque order, with here and there a small explanatory plan attached; some exhibiting the very highest excellence in point of execution, all more or less commendable on that score (as it may be inferred that nothing absolutely badly drawn would be admitted); but certainly not constituting the kind of collection calculated either to afford the best sort of study for the architect, or to represent at all adequately the progress of the art of architecture during the past year. This is a disappointment, and one which we cannot be very easily resigned to. It was the argument of those architects who looked with indifference on the extinction of the Conduit-street Exhibition that it was far better for the architects that all they had to show should be concentrated in one room, the said room being one, too, into which the public were pretty sure to find their way to some extent, and where the architectural drawings would therefore have some reasonable chance of being seen by others than architects. The extinction referred to has taken place, and we have lost all which the Architectural Exhibition would have given us, without gaining anything at the Academy, where the show of drawings is, if anything, of less interest than last year. What there is to be noted therein we will endeavour to indicate; premising that we class separately those drawings which are only picturesque representations of previously existing buildings, and which of course stand on different ground from original architectural designs.

Among the latter, ecclesiastical architecture is represented by nothing very novel, indeed, but by some solid and satisfactory designs in a type of Gothic with which we are familiar. The "New English church about to be erected at St. Patras, Greece," by Mr. Vials (875), is shown in a coloured interior view; the style Gothic of the "transitional" character, with a boarded wagon-roof, in the form of a trefoil arch in section, with moulded tie-beams. Whether the design, either architecturally or practically, has any special adaptation to the climate it is to occupy, cannot well be judged from this drawing. Mr. Pearson's "Interior of St. Augustine's, Kilburn, in course of erection" (894), is a design of more originality and importance. The nave arcade is in two "orders" (to borrow

a classic term), the lower carrying a gallery, forming an integral part of the masonic design, the arcade above being carried up to the springing of the vaulting, which is of stone; coloured decoration is largely but not obtrusively employed on walls and roof. The plan of the ground-floor piers is worth notice as unusual and effective. "All Saints, West Bromwich, Staffordshire" (895), a pen etching of an interior, by Mr. S. Clarke, jun., is (besides general merit) worth remark for its very good and effective, though plain open roof, a piece of true "carpentry" design, worked out of straight timbers, and far more satisfactory and solid-looking than the fashionable wooden roofs of the present day, with their curved lines and iron tie-rods. Three interiors of various churches, by Mr. Brooks (887, 933, 934), have all much the same high merit of admirable etching in ink and solid architectural expression in the treatment of Early Geometric Gothic; the two first are so similar in general design as to appear almost like duplicates. The drawings are all hung too high to be as well seen as could be wished. A "Tower and Spire now being erected at St. Mary's, Rugby," by Messrs. Whelan & Heyes (918), shows true Gothic feeling, as well in the deep buttresses carried in stages the full height of the tower, as in the treatment of the spire, which, except one lucarne near the base on the cardinal faces, is carried up to the point in plain unbroken masonry; a simplicity of treatment far preferable to the kind of "bridecake" prettiness often obtained by an over-use of lucarnes and ornamental bands. A design, submitted in the much-discussed competition, for "Bexley Heath Church," by Mr. C. H. Cook (925), is a specimen of very pleasant free sketching in Indian ink, and a picturesque and somewhat original composition. The tower stands at a little distance from the church, connected with it by a covered arcade; the design of the tower pleasing, though a little weak and frittered in detail. Mr. Emerson's "Section through Choir of Allahabad Cathedral" (942) is noticeable as, we believe, the only geometrical drawing in the room; the general design of the cathedral we noticed last year, when a perspective view of it (now in the Albert Hall) was exhibited. Mr. Street's "South-east View of Christ Church Cathedral, Dublin" (944), showing the proposed new choir and spire, is an admirable pen-and-ink drawing, evincing even more than his usual resolve to seek effect rather from outline and grouping, and massive treatment of masonry, than from ornament, of which the design is almost absolutely bare. The expression of the design is durable and monumental enough, and, with plenty of character, but somewhat gloomy and forbidding withal. Whether, for the sake of "local colouring," it is worth while to adopt so ugly a form of finish to the tower, may be more than questioned. Mr. J. O. Scott's "Interior of Parish Church at Speldhurst," which is described as "now being rebuilt," furnishes no clue to the nature or extent of the "rebuilding," or whether it is to be taken as an original design or a restoration. Messrs. Ponton & Gough may be complimented on having produced in their "Interior of a Church now being erected near Bristol" (962), a solid and somewhat original but not very beautiful design. The nave arcade is carried by circular granite piers alternating with octagonal piers in courses of red, blue, and buff stone,—a suggestion evidently taken from the internal treatment of masonry in Mr. Street's new church at Clifton; but in neither case do we think the effect happy.

Domestic architecture is more largely represented as to quantity, but more poorly as to quality, than church architecture. There is the usual proportion of mansions of different style, castellated, Elizabethan, &c., of which, when their adopted style has been named, there is nothing more to say, good or bad. Among those which rise above the commonplace level, perhaps the best is, "Design for a Mansion to be erected near Warsaw, Poland" (951), by Messrs. A. Hartsborne & S. Clarke, jun. A small plan attached shows a very good arrangement of the various classes of apartments round a central covered court. In front of the entrance is a large open walled court, with wings of the building flanking part of the sides. It is from this court the view is taken, showing a plain, solid, yet sufficiently elegant, design in what may be termed Elizabethan, purified of some of its usual excrescences, and treated in a very refined manner. The two small cupolas over the entrance front are very picturesque, though simple in treatment. The material is apparently a warm-tinted light stone. The drawing is a

admirable specimen of the application of water-colour to architectural illustration. Mr. Seddon's "Portion of Victoria-terrace, Aberystwith" (880), shows no little character and originality of treatment; the material is mainly brick, red and black in the lower stories, buff and red in the upper story, relieved with stone dressings and grey granite shafts to the lower windows. The idea of employing a different coloured material in the upper portion is very suggestive; how it would look in the present case must depend a good deal on the nature and colours of the surrounding scenery; in a general way we have no liking for buff brick as an artistic building material. The treatment of the chimneys is novel and characteristic. In "North-east View of Preen Manor, Shropshire" (937), we have one of Mr. Norman Shaw's admirable etchings, in the picturesque style which he has made his own, and which, for an English country house, and under a summer sun, has a peculiarly happy expression of domestic quiet and homeliness, though belonging more to the past than the present. The awkward cutting off of one of the gables, over the entrance side, by the slope of the return roof, appears to us, however, rather clumsy than picturesque. Mr. Cockerell gives us, in "Down Hall, Harlow, Essex" (959), a design executed in concrete, "the architectural features of stone." What is an "architectural feature?" The phrase suggests a conception of the art of architectural design not altogether agreeable. "Lythe Hill, Haslemere" (932), a quiet Elizabethan design by the same hand, pleases us more. Messrs. Habershon & Pite's "Roydon Hall, Kent" (892), is a large red-brick gabled house, late Tudor, with red-tiled roofs: the mass of red is not agreeable, but the design is worth notice for a certain individuality of character, though somewhat heavy and monotonous. Among smaller things Mr. Butler's "Sketch for a Cottage Hospital" (881), to be erected as a memorial to the late Marquis of Westminster, is a very pleasing design. "House for John Foster, esq., Whitley" (886), by Mr. Nevill, is a picturesque sketch in ink rather in Mr. N. Shaw's style; and 884 shows a drawing of a new mansion by Mr. Edis, in his usual manner,—a manner which is very quiet and pleasing, but is open to the charge of being somewhat too flat in treatment not to tire us after a while. Mr. Norton has two large houses: 968, an Italian design, brick, with stone dressings; and 950, a castellated mansion; besides a church in the Geometric Gothic style (915). Other mansions there are, very well drawn and coloured, but calling for no special comment as architecture. We have more to say.

AS TO EXPRESSION IN ARCHITECTURE.

RECENTLY a claim was made by one of our correspondents in favour of the designs of an architectural firm whose productions had been criticised in these columns, on the ground that the said designs exhibited at least one important merit,—that of "expression," which should outweigh, it was urged, a good many lapses in refinement of style and design. Under certain restrictions, such a claim is one which may very reasonably be urged, and its validity would be admitted by those who can appreciate the value of what may be otherwise termed "life" and individuality in a building,—some quality which, though not easily definable, gives to a structure a separate interest of its own, distinct from that of others. The term "expression," however, as applied to architecture, is in itself somewhat vague, and is probably often used with no very common consent as to its real meaning. Without attempting to define precisely its constituents, and in what manner it is to be attained, it may be worth while to say a word as to the meaning of the term as applied to architecture, and the special merit of expression as distinguished from style.

We draw something in the way of analogy and illustration from the manner in which we habitually apply the same terms in reference to the human countenance. When we speak of a face as showing a certain "style" of beauty, we assert nothing as to its being "expressive" or otherwise. On the other hand, when we speak of a "very expressive countenance," every one knows that such a description does not necessarily imply the idea of what are called "handsome," that is, regular and symmetrical features, or even of what is usually termed beauty at all. Very plain faces may be recognised as very expressive, even on canvas, when they lose the

mobility that is one of the constituent elements belonging to human expression, and which has no counterpart in architecture. Placing this aside, can we recognise as all what it is that renders a face expressive to us, and which renders plain features often more interesting and even more pleasing than those which are perfectly symmetrical? We believe it may be said to consist in a certain similarity and harmony between the various features of the countenance, whereby, however deficient in mere formal symmetry, each assists the rest towards producing a total impression of a special character, an indication of a special bent of the owner's mind or feeling. The expression thus produced may be of any kind,—gay, grave, thoughtful, sensuous, and of many intermediate types which cannot be named,—but it will interest us so long as it is definite and strongly marked. Expressionless faces are those in which the features seem to contradict, or to have no relation to one another, and consequently make up no consistent whole, and convey no definite character; or they may be those in which every part is so well balanced and proportioned as to leave no room for any special indication of character. This is probably the cause why a perfectly handsome face so often appears comparatively expressionless, offering no indication of any leading propensity of the mind. Now, without pushing such a comparison too far, may it not be said that there is something of the same principle governing the expression of architectural design, considered as distinct from the style? A Classic and a Gothic building, no doubt, may be said to be radically different in expression, but this is using the word in a somewhat wider sense than we at present are giving to it. But we know, or at least feel, that there are in Classic, Gothic, or in whatever style we like to name, buildings which we recognise as having expression, and those which are without it; though they may each be sufficiently accurate representatives of the style, and each exhibit almost the same character of architectural features. The expression of the building will arise in the main from the relation of the parts to one another, the degree in which they are consistent with each other, and mutually assist in producing a definite and marked character.

And this quality of expression may be looked on, and aimed at, from two points of view, either for its own sake merely, as a means of heightening individuality and character in a design; or in relation to the purpose of the building, and as a means of expressing something of that purpose in its outward men. The first aim,—that of consistency and individuality of expression, for its own sake,—will have to be sought for in a general relation and similarity of character, both between the various portions of a structure regarded *en masse*, and between the various ornamental details, large and small. We are not, of course, going to offer receipts for obtaining architectural expression, or attempt to reduce to rules a quality so vague and indefinable; but we may illustrate our meaning by one or two general suggestions. Taking the main outline and composition of a building into consideration, we would see architectural designs so treated as to preserve throughout a generally consistent character of outline. If repose is the expression sought for, it should not be broken into by any lofty or aspiring feature which interferes with and disturbs the rest of the composition, or by any adjuncts of fanciful and broken-up outline. It was from an intuitive feeling for fitness of expression, we have no doubt, that, as in the progress of English Gothic, the high-pitched roof "went out," and the style assumed that depression of outline which characterises the roofs of the late period, that at the same time towers, rather than spires, came to be looked on as the appropriate principal feature; the low, heavy, though richly-ornamented upper stage of the tower carrying out the expression of the sub-structure; as the spire had done, in an equally appropriate manner, at an earlier period of the style. So, if an expression of picturesque gaiety and lightness be aimed at, let no heavy or disproportioned feature weigh down and interfere with it. In the smaller features of a building there is almost endless scope afforded for assisting, by a consistent treatment, the main character and expression which it is desired to impress on the structure. The material used, the spacing and arrangement of the windows, whether symmetrical or otherwise, the use of a deep and heavy or a light cornice, or of deep projecting eaves, the treatment of the

roofs, the character of the masonry, whether regular or irregular, and many other things not easily defined, may conspire to render a building palatial or rural, dignified or picturesque, in expression,—provided that the several parts are treated with consistency; otherwise the very means adopted with the idea of giving character may only ensure a jumble in which all real character is lost. Such a mistake, for instance, as in a large mansion, making some of the gables with a heavy stone coping, and others with a wooden barge-board, without any apparent motive, is an instance, which we have seen more than once in recent designs, of want of consistency resulting, not in individuality of expression, but in mere inconsistency and eccentricity. So, on a larger scale, is such a device as the use of timber and plaster ("post and pan") work interspersed, in a large building, with masonic construction, by way of gaining what is supposed to be originality at the expense of common sense and architectural propriety. These kind of contrivances, and others much worse, which are pretty sure to occur to our readers, constitute not expression, but oddity, or even caricature.

Another way in which, as we observed, the expression of a building is to be regarded, is in relation to the purpose for which it was designed. All "revivals" in architecture militate very much against the existence of truth and consistency of expression in such matters. Nor is it possible, as some enthusiastic persons have supposed, to make any building express its purpose with such a degree of certainty that any person ignorant of this could gather it from the external aspect of the building. The only method of doing this is by the employment of representative sculpture, which is not architecture, and though applied to architecture, does not come under the head of means of architectural expression, as we are at present understanding the term. But let it be known what the building is, and the harmony of its outward expression, with the purpose for which it is intended, is an important additional source of pleasure to the spectator who is able to appreciate it. And though we cannot, as we said, really tell the tale of a structure in its outward form and details, we can impart to it so much of character as to give no uncertain indication of the class of building to which it belongs; and we might at least avoid many of the incongruities of expression which frequently seem invented only to puzzle the spectator. A modern mansion or town-hall showing huge masses of wall and small slits for windows; a court of law marked principally by spires and towers; a set of offices for the carrying on of mercantile business of the most prosaic kind bedizened over with carved ornament enough to supply a cathedral; these are among many instances of incongruity, or rather absolute contradiction, between the purpose and the aspect of a building, which meet us frequently in streets and among competition drawings. An interesting field for expression is also open in the opportunity afforded (in designing houses for instance), of marking the leading distinctive characters of the internal apartments by a more or less refined and ornate character in the treatment of their external adjuncts, such as windows, doors, &c., and even by the application of mural ornament. This art of rendering the external design indicative of the nature of the building has been on the whole more happily attained, among revivalist architects, by those of the Classic than of the Gothic school; the latter having been generally, for reasons not difficult to understand, more under the dominion of precedent than the former. The Bank of England in a former generation, and the London University Buildings in the present, are both (the former more especially) successful instances of this relative expression in architecture; a praise which, of course, does not involve admiration of all the details of either building.

This latter art, however, of what we have termed relative expression, may be looked on as secondary to the art of expression *per se*, first touched upon, which really consists in putting life into a building and rendering it a real design and not a mere adaptation of style. We see many buildings and designs which, as architectural treatment of the features of a certain style, are irreproachable, but which have nothing to distinguish them from each other, except mere size and arrangement of windows and other features; nothing to show that the architect had an individual aim and feeling in his mind in working out his design. Buildings such as these, however pure in style, are only admired so

long as the peculiar style in which they are designed happens to be in vogue. Buildings which, like some of the Venetian palaces, and of the mansions of the Elizabethan and Queen Anne periods, in our own country, possess, though with a corrupt and decaying style and little refinement of detail, an individuality of character and expression which distinguishes them from each other and from contemporary buildings, are likely to excite interest and admiration (even while their style is critically condemned), which will never long be accorded to mere correct and insipid façades with no more expression than a mask.

HOW BEST TO SPEND MONEY FOR THE PUBLIC GOOD.*

We have made a further selection from the immense pile of communications on this subject that has reached us:—

Youths' Institutes.

In every such inquiry, we should never lose sight of the truth that "prevention is better than cure"; that however desirable it may be to mitigate existing misery, it is a thousand times more desirable to prevent its growth—to attack its causes.

What are the causes of the evils we are trying to grapple with? Our eyes must be constantly fixed on that question. First and foremost, ignorance in some shape or other, ignorance of the laws of health, of duty, of the means by which to gain bread, of the tools to be used, i.e. of reading, thinking, writing, figures, spades, chisels, and pencils,—ignorance of the best mode of applying labour, of economising it, of husbanding, investing, and spending the fruits of labour; ignorance in a thousand forms.

The overwhelming difficulties and miseries which baffle us, would disappear exactly in proportion as we could replace this ignorance by knowledge.

That is therefore the object to be arrived at, and how to accomplish it, and when. Obviously, as early in life as possible, while the mind and character are still pliable and impressible, and before the whole burden of life devolves upon the individual. Now, we have taken an immense step in this direction by the recent measure for the universal education of young children; but that is only half the battle; that will only half accomplish the work.

If we are to secure the full fruit of these educational measures, we must carry on the school instruction and training during that most important interval of youth which comes in between the age of leaving school and the age of reaching manhood. Nothing has been done to fill up that gap.

The state of things as regards the youth of this country is most serious. It need hardly be said that the kinds of knowledge which are essential to render the great majority of the population industrious, skilful, self-supporting, self-reliant, provident, healthful, and moral, cannot be all obtained by the age of twelve or fourteen, when the school is quitted.

At that most critical age, our youth become their own masters, in their leisure hours, only self-educated in any true sense of the word, but little restrained by the old-fashioned respect for elders and betters, pastors and masters, surrounded with a thousand temptations unknown to our fathers, adopting freely all the vices and follies of grown men. Under these influences, distractions, and temptations, not only does the moral character deteriorate instead of improve, but the intellect becomes feeble instead of stronger; and much that was learned at school is utterly forgotten. What is essential, is not only that the boy released from school should be sheltered from all this deterioration, but that he should be able to continue his education, to grow daily a better man, a better workman, a better citizen, become daily more fit to take upon himself, at manhood, the responsibilities of manhood, of father and husband.

We shall never be able to hold our own in the race with foreign industry if we thus waste the souls, bodies, and brains of our working population at the very time of life when the human being is most able to learn, and form his habits and character of life.

Therefore, I hold that every argument which holds good for the establishment of schools is good for the establishment of institutes for

youths, where, in their leisure hours, they may find harmless recreation; but, above all, the means of moral growth, and of mental and industrial education.

It is useless to expect a healthy, skilful, intelligent, and working population, if, from the age of thirteen to twenty, they have to pass through a discipline of music-halls, dancing-saloons, penny gaffs, of bagatelle and billiard playing, of drinking, smoking, and of low associations. I do not, of course, say that there are not numbers of men who escape from this contamination, but I do say that the evil is increasing; and that, putting aside the question of moral contamination, there is hardly any efficient agency for carrying on the education of the youths of the working class.

I believe, therefore, that nothing better could be done for England than the establishment in every parish of one or more youths' institutes, which should be so managed and conducted as to attract the youthful part of our working population, as well as to confer upon them, and through them upon the whole nation, the education that I have indicated. That it can be done, and that such institutions would be gladly attended by those for whom they are wanted, when wisely managed, is proved by the Institute at Islington. Let institutes of that description be as universal as the school, modifying their arrangements and management in matters of detail, according to the various circumstances of different localities, and I believe that no greater good could possibly be done.

As to the machinery for carrying out such an object, it could be provided by a small organisation of men selected for their practical experience in such work; and the leading principles should be (1) to stimulate aid and supplement local efforts, and (2) to require those benefited to contribute towards the maintenance of the proposed institutes.

HODGSON PRATT.

Home Colonisation.

This can be done by purchasing a portion of the common lands of England, and forming a colony, where men who have been reduced through want of employment could be sent to reclaim the land and renew their strength. On each ten or twenty acres of land could be built a small homestead. In the erection of these the skilled labour could be employed; and when the whole was reclaimed and made productive it should be let or sold, and more land purchased with the proceeds.

In connexion with this colony should be a city colony, for the reception of all men willing to work, but so reduced in circumstances that their appearance and strength prevent their obtaining work. These should be drafted to the country colony as required, and when their health was recruited, sent back. Donations might be invited from the general public, for loans to the wives and children, if any, to support them during the absence of the husbands; but in all cases the husband should be sent away to recruit his strength.

This is the outline of the scheme for really improving the country and the people, and it could be extended so as to embrace the rebuilding of the worst parts of large cities by judicious purchases and by working parties or pioneers from the country colony.

R. P.

Technical Schools.

I do not know whether or not you have closed your valuable paper, the *Builder*, from any more ideas on the best plan to "spend money for the public good;" if not, I should be glad to offer a suggestion, which I have no doubt would be appreciated highly by those whom it may concern, and prove a lasting benefit to mankind,—that is, the establishment of technical schools in country districts. I am a joiner by trade, living in a small country town. Several associates I have, and others in different branches of art, &c., who feel a very great loss of something of the kind. If, say, schools were established in six country towns, and an instructor appointed to the six, attending one each evening, to give instruction in mathematics, drawing, and also elementary education in connexion with pupil teachers, to those whose time in the day is fully occupied. School-rooms may be obtained, or in some cases erected at a moderate charge, and the amount of good thus effected would very materially, I am sure, tend to elevate the morals, and aid the scientific progress of the day.

W. O. HUXLEY.

The Courts and Alleys of London.

I have been hoping to find time to work out an idea which has occurred to me, with reference to the use of the Half Million; but I do not like to delay longer, so must send it you as a crude suggestion, in the hope that, if it is worth anything, you or some of your coadjutors may follow it up. No one knows better than yourself how large a number of courts and alleys there are in London which are not only unfit for human habitation, but which, from contracted site and other hindrances, can hardly be rendered fit for habitation even by rebuilding, unless adjoining property be purchased.

It appears to me that we want a body of improvement commissioners for London, with instructions to attend chiefly to sanitary requirements, and the interests of the poor, and with Parliamentary powers to take property as a valuation, under sufficient safeguards. A responsible body of practical men, appointed for this object only, would surely, in a few years, make a perceptible impression on the fever-haunts of London, especially if the sanitary laws were firmly enforced at the same time, so that landlords might not be tempted to let their houses deteriorate, in order to induce the commissioners to take them in hand. The difficulties to be overcome are, first, to get the compulsory powers given to commissioners; secondly, to supply them with funds; for I think you will agree with me, sir, that, however well the plan may be executed, it will involve a loss. The first step towards overcoming the former would probably be the appointment of a royal commission to consider not so much the evil as the remedies proposed. If no better remedy were suggested, public opinion would probably agree to the experiment I suggest. The second difficulty is the expense. The ratepayers are heavily taxed already; and it would be a novelty to allow a non-elected body to expend local funds. Might not the Half Million be so applied as to help us past this, and be made the means, not of building a few hundred tenements, but of rebuilding many thousands?

CHARLES B. P. BOSANQUET.

Land for the People.

If the owner of 500,000l. would retain it, and effect good and not evil with it, he must first turn it into the fee simple of English land; of what quality, where, and whether in one block or many is immaterial. With each year's produce he is to procure the fee simple of some other land, and convey this conditionally to the Sovereign or the State for ever, on these conditions:—1. That any part not to be built on may be leased to the highest bidder for any term not exceeding forty-nine years, but no longer; and if any part be left in one occupation above forty-nine years, it shall then revert (if not claimed by the Crown) to the heir of the original donor. 2. The Crown to be able to reserve trees, or make the lease forfeited if they are injured. 3. Sites of building, however, to be alienated for as long as the building on them shall stand and be habitable; but the day it may become non-habitable, whether by fire or any natural accident except earthquake, the ground to revert to the Crown; or (if it do not claim within a month) to the heirs of the original donor. Each year's produce of his original estate being devoted thus to diminish the amount of privately owned land, it would be always doing good and not evil; and reducing the chances of an approaching *Finis Angliæ* in iron and blood, such as our fathers and we have seen overtake Poland and France, and which awaits every nation that may persevere in usurping the Divine prerogative of owning land from generation to generation by few or many.

E. L. GARRETT.

Loans with Small Interest.

It appears to me that the best way of bestowing assistance is to help those who help themselves, and an almost infinite amount of good might be done by granting loans at the rate of 2½ or 3 per cent. in furtherance of schemes for any object that may tend to the improvement of soul, body, and mind,—as, for instance, churches, art and literary institutions, baths, hospitals, asylums, dwellings for the working classes, farm labourers, and clerks, and others with small incomes.

It is well known that many institutions are crippled by a heavy debt hanging over them, and others started, but not launched, because a certain sum cannot be made up; but if advances

* See pp. 220, 227, 297, ante.

could be made on such security that, although, perhaps, not sufficient to satisfy a private lender, is yet quite ample to prevent loss, and the loan made for a definite term, it would give the opportunity of the work being established, and a portion of the returns, whether derived from subscriptions or working, should be applied each year, until the whole was paid off.

This would be especially useful in promoting improved dwellings, as from experience it is found difficult to derive 5 per cent. on the outlay, and many who would be satisfied with this return have not the power of erecting or altering them without help, which cannot be obtained for less than 5 per cent., thereby leaving no margin. This arrangement would promote private enterprise, and be free from risk to the fund.

By this means the fund would be inexhaustible, and a considerable sum derived each year in the shape of interest, which could either go towards increasing the principal or given in grants to necessitous institutions, or in any other way the body of trustees might think best.

J. DOUGLASS MATTHEWS.

A Public Library for Working Classes.

I beg leave to suggest a free public library and reading-room for London, on a grand scale, for the working and middle classes, but particularly the former, and therefore open every evening.

In this matter London persists in lagging far behind Birmingham, Manchester, and Liverpool, where such institutions flourish.

Among matters of detail, in the newspaper and magazine room, the newspapers should be neatly arranged on shelves, so that any journal might be found without difficulty. It would also be a great convenience to have all the principal journals kept on file, being afterwards bound up and deposited in the library.

M. W. MILES.

Loans.

For many reasons (which I will not now enumerate), I would advise that the trustees should not give away, or invest on their own account, any portion of the money put into their hands, but should lend it at low interest on sufficient security for a definite term of years to the managers of different religious or charitable or useful undertakings. I think that in this way the trustees would be able to do a larger amount and a greater variety of good, with less risk and trouble to themselves, than by any other method that has been suggested in your columns.

W. A. GREENHILL.

Training Farms for City Arabs.

My plan is the formation of industrial (agricultural) training institutions for the poor "City Arabs" of London, and their sisters,—poor wretched creatures who are almost compelled to live by crime. I believe that a training of from one to three years, according to age, &c., would be sufficient to prepare them for life in our colonies, whither I would have them sent; for if employment were found for them in this country it could only be by displacing the sons and daughters of the industrious poor, too many of whom are now unable to obtain constant work.

The establishments for boys and girls might, if thought desirable, both be in the same village; each would require a school-room, a living-room, a dormitory, and an infirmary. The living-rooms should be lofty, well-lighted, cheerful places, with walls neatly papered, and decorated with well-selected prints. There should also be a small library, containing a well-assorted collection of illustrated and other books. Such a room, so furnished, and under the management of suitable officers (one of the women should be in constant attendance during the evenings, to exercise a matronly control), would be a home that could scarcely fail to have a very beneficial influence on its inmates.

For the boys, a farm would be required; the soil need not be very good, but should not be clay, neither should it be a light sand without there is clay near the surface. To provide the boys with constant work the land should not be all managed quite according to the usual course of husbandry, e.g., a portion would be summer fallowed every year, not for the usual purpose, but that there might always be some land on which the boys might be exercised in ploughing and harrowing; this they would do, not because it wanted doing, but for practice, just as when

in school they would fill page after page of copybook.

They should be taught how to use carpenters' and masons' tools, and also the method of burning lime and making bricks; a slight knowledge of such things being often of great value in countries where farmers have to construct their own dwellings from the rough materials.

Each boy might spend about four half-days in the school each week learning reading, writing, and arithmetic, and a little geography might be taught by means of easy and amusing lectures during the evenings.

As soon as a boy could manage a pair of horses, handle a spade with freedom, read a page in an ordinary book without difficulty, write a little, and understand the first four rules in arithmetic, I should consider him educated and ready to emigrate.

G.

Water for All.

I have read with much interest the extracts from the correspondence on the employment of the munificent gift of half a million for a benevolent purpose, and am tempted to offer one more suggestion,—the gift of Water,—pure, good, health-giving water. It is not only amongst the poor of London and many large towns that body and mind suffer for want of water, but in country villages.

The improvements in agriculture made by artificial manures have rendered the shallow wells supplying surface water in many cases almost poisonous. I know many industrious mothers who boil every drop of water before they give it to their children, who yet cannot prevent their suffering from worms and fever,—and this in a lovely country and healthy climate.

Water cannot be supplied without a great outlay. Half a million of money would not do all that is needed to give England pure water in all habitable places, but it would do much, and, by good management, might be an ever-increasing benefit.

My idea would be to form a society, whose duty it should be to supply wells, fountains, water-pipes, or aqueducts, where needed. Wherever the society worked, they would purchase more or less land; and, whilst reserving an open space for the fountain, well, or pump, which would be their own, for the benefit of the public, they might let their land on building leases or otherwise judiciously, and thus never exhaust their fund.

L. E. ROSS.

DU VAL'S HOUSE, HORNSEY-ROAD.

The interest attaching to local antiquities and their value and importance, as illustrating not merely the topography of the neighbourhood in which they are situated, but also as a means of confirmation of facts in general history, is now so universally recognised, that I need not apologise for directing your attention to the recent demolition of a building of considerable antiquity, which is intimately connected with the early history of the parish of Islington.

The house I allude to was situated on the east side of Hornsey-road, between Tollington-road and Seven Sisters-road, opposite Tyroise Villa. It was traditionally called Du Val's House, and was supposed by some to have been the residence of Claude Duval or Da Val, a noted highwayman, in the reign of Charles II., who was executed at Tyburn, January 21st, 1669. Its exact position, between a row of recently-built cottages, called Dillon-place, and a partly-formed street, called Killoch-street, at a distance of about 70 ft. from the main road. The house was chiefly built of timber, and was weather-boarded externally, but had been so frequently repaired that it had lost very nearly all its original features. It retained, however, at the time of its destruction, its ancient plain-tiled roof, with a picturesque gable to the southward; a staircase, with carved balusters; and a plaster cove round the eaves; which appear to have belonged to the house originally. The eaves and most of the internal woodwork were modern.

The identification of this house with the highwayman Duval appears to be a popular error. Hornsey-road was formerly called Hornsey-lane, or Duval's-lane, and is so described to this day in leases and legal documents. It would seem, however, that the word Duval was a corruption of Devil, for in a survey and plan of the manor of Highbury, made in the year 1611 (that is, fifty-eight years before Duval expired his misdeeds on the scaffold), by order of the Prince of

Wales, son of James I., the then Lord of the Manor, the house is called the Devil's House, in Devil's-lane, and is described as having been known in ancient writings by the name of the "Lower-place," . . . being an old house enclosed with "a mote and a little orchard within."

The mention of the mote in the above extract clearly identifies the house as having been the ancient manor-house of the manor of Highbury, or Tollington, as it was then called, which was removed to higher ground to the south-east, whence the manor was called Highbury. The mote appears to have been in existence until the commencement of the present century. Nelson, in his "History of Islington" (1811), referring to Duval's house, which was then used as a tavern and tea-garden, remarks:—"Between 30 and 40 years ago (about 1750-60) the surrounding mote, which was of considerable width and filled with water, was passed by means of a long wooden bridge." "The house," he adds, "has lately been fitted up in the modern taste, and the mote nearly filled with earth, and added to the garden which surrounds the dwelling."—*History of Islington*, p. 175.

The house in Hornsey-lane was known as the Devil's House as late as the year 1767, when we learn from a letter in the *Public Advertiser* of the 25th of May in that year, that "the landlord, by a peculiar turn of invention, had changed the Devil's House to the Summer House,—a name it is for the future to be distinguished by."

With regard, therefore, to the origin of the name, it is clear that the house was called the "Devil's House" before, and probably some time after, Duval's time, and that at the time that worthy flourished it was a house of public entertainment of some importance; and although it may have been the occasional resort of Duval, who appears to have favoured this locality, it could not have been his residence. It is not likely that illustrious hero had any permanent abode; and although his body is said to have lain in state at the Tangier Tavern, in St. Giles's, previously to its burial in the middle aisle of St. Paul's, Covent Garden, it is probable that he lived a precarious hole-and-corner life without any fixed abiding-place, and that his gallantries and successful forays were the inventions of later years.

The house was in all probability a tavern under the sign of "The Devil," which was a not uncommon sign in the sixteenth and seventeenth centuries, and the tavern gave the name to the lane by which it was approached.

In Wyld's new map of London, which is of recent date, a building is shown marked Duval's House, in the marshes opposite Woolwich, in a portion of the county of Kent, which is on the north side of the river, in the hundred of Little and Less Ness. In Ireland's "History of Kent," the house is called "Devil's House," and is so described in the map attached to the first volume of the history, but there is no allusion to the building in the body of the work. It is not shown in Hasted's map, nor is there any description of it in the text. It will be seen from this circumstance that the name Devil's House was not confined to the house in Hornsey-lane.

The original name of the famous Devil Tavern, in Fleet, Ben Jonson's favourite haunt, and where he established the Apollo Club, was "The Devil and St. Dunstan," probably from the tavern being situated in the parish of St. Dunstan, or from the neighbouring church dedicated to the saint. The name was in course of time abbreviated into "The Devil," but this abbreviation must have been made at a very early period, as allusions to the tavern under its shorter title are very common in the writings of the dramatists of the sixteenth and seventeenth centuries. One of the earliest is in 1563, in the play of "Jack Jugler." Rowley, in his "Match by Midnight" (1633), quoted by Larwood, in his "History of Signboards," makes one of his characters say: "As you come by Temple Bar make a step to the Devil."

In a letter dated 1624 in the Record Office the tavern in Fleet-street is called, "The Divin and St. Dunstan by Temple Barre."

"The Devil" was also the name of a celebrated tavern in Paris, near the Palais de Justice.

Another hypothesis is that the sign was originally "The Snail and Bacchanals," or St. Innocent, surrounded by Banns, an admirable ensign for a tavern or wine-shop, and that this became corrupted first into "The Devil and Bacchanals," then into "The Devil and Bag o' Nails," and finally into "The Devil." In Arabella-row Pimlico, was a public house called "The Bag o'

Nails," which is said to have been thus derived, "the Satyr having been painted with cloven feet, and painted black, it was by the common people called the Devil, while the Bacchanalians were transmuted into the Bag of Nails."—*Tavern Anecdotes*, 1815.

This latter derivation is plausible, but is not to be depended upon, the bag of nails was in all probability originally a woolpack, which was formerly a very popular sign when wool formed the staple of English commerce.

J. H.

QUANTITATIVE PHOTOGRAPHY.

GRADUATED STRIPS FOR PHOTOMETRICAL PURPOSES

PURELY photographic knowledge is at the present time, with only one trifling exception, wholly qualitative,—that is, it is exclusively confined to the kind of photographic reactions which certain substances under certain circumstances produce. How much of a given reaction will be obtained under given circumstances, or to what extent one material may be substituted for another to produce a similar result, are points upon which the most experienced have no knowledge whatever. The relative values of iron and pyro, as developing agents, no one can give in figures. The relative values of reduced temperature and acids, as restrainers of photographic action, no one can give in figures. The relative rapidity of wet versus dry processes, and of the hundreds of varieties into which collectively they are divided, no one can give in figures. The relative intensities, from a photographic point of view, of sunlight versus artificial light, of lime versus zirconia, of electrochromic magnesium, or of phosphoric or chlorochromic versus any or all, no one can give in figures. In short, with one trifling exception (and that of no practical photographic value), the quantitative reactions of photography are utterly unknown; and, as anything approximating to a complete or accurate knowledge of photographic phenomena must necessarily involve an acquaintance with their mathematical relations, the term science is at the present time quite inapplicable to our store of photographic knowledge.

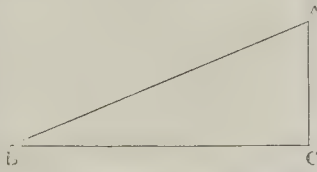
It is when the science has been fairly inaugurated that the greatest results of photography will be achieved. The writer's own quantitative experiments have made him acquainted with some astonishing facts, and placed him on the track of one or two processes which, when fully developed, will produce, with ease and certainty, results which have, so far, been only faintly foreshadowed; but more of this some other time. The inability of our average photographers,—men too often of very limited knowledge, and much too often of suicidally large personal acquisitiveness,—to perceive the value of quantitative photography is, for men dabbling in a scientific pursuit, certainly to be regretted. Some four or five years ago the writer commenced the labour of applying numerical values to facts of photographic interest; but, from the prodigiously laborious nature of the task, was obliged to pause in the work.

As opportunities present themselves, however, it is still his intention to give as far as possible an accurate numerical value to photographic reactions, and he hopes to meet with the co-operation of others in the effort to inaugurate the era of quantitative photography.

A correct knowledge of the actinic power of light, and of easy methods of determining it, obviously constitutes the first step in this direction. To the means of estimating the chemical power of light, therefore, he will first direct the reader's attention, and at some future time he proposes to give the actual value of some given artificial light produced under known and definite circumstances, and subsequently to compare it with diffused daylight, with direct sunlight, and with the principal sources of artificial light employed, or proposed to be employed, for photographic purposes. Of the succeeding points which should be investigated, it will be time enough to speak when the work here indicated has been successfully accomplished.

The methods at present in use for ascertaining the chemical power of light, are based, as every reader doubtless knows, upon the darkening effect produced by the actinic rays upon chloride and bromide of silver. The writer will briefly recapitulate the general outline of the method, so that, by refreshing his memory on this point, the reader may the more clearly see the advantage of that to which it is the object of this article to call attention. Firstly, then, paper, covered with a film of chloride or bromide of

silver, darkens by exposure to actinic rays; secondly, the longer the exposure the greater is the darkening effect; thirdly, the stronger the light the sooner is that effect produced; and fourthly, the effect produced by a light of whatever intensity will be produced in half the time by a light of twice the intensity, and in twice the time by a light of half the intensity. To ascertain the actinic intensity of a given light, as compared with another, with these facts before us, we have the choice of two methods open to us,—the one being to expose our papers until of a given tint, and note the times, inversely in proportion to which the intensities will be; the other being to expose our papers for a given time, and note the depth of colour obtained. The latter of these methods is infinitely more practicable than the former, it being vastly easier to expose for a given time than up to a given tint. This method, however, necessitates our having a graduated strip of photographic shades, the value of which shades must be known. Such strips are at present produced by the employment of an apparatus in which the oscillations of a pendulum move a sheet of dark material over the sensitive paper, thus producing on each progressive portion of the paper exposed a different tint of calculable value. This mode of making graduated strips, of course involves the possession of a pendulum apparatus, which many amongst photographers who are willing to experiment with more easily constructed instruments do not care to be at the trouble of making, or the expense of buying.



If the reader will refer to the above diagram, and suppose the letter A to indicate the position of a point of light, and the line B C that of a sheet of photographic paper, it will be obvious that after exposure of the latter to the former, the end C will be much more darkened than the end B, because then the effect of the light is so much greater. The apparatus needed to effect such a differential exposure is exceedingly simple, consisting merely of a box with a hole in the lid; nor are the calculations needed to ascertain the relative values of the shades produced difficult to make. Two causes contribute to lessen the effects of the light as we recede from the point C, viz., the distance of the exposed point from the source of light, and the obliquity of the surface upon which that light falls, in addition to which allowance must also be made for the volume of light permitted to pass at various angles through the hole in the box-lid used for the illumination of the sensitive strip.

The idea of using an apparatus of this description was suggested to the writer by Mr. Charles Wright, late of Owen's College, a gentleman who has given, as some of the readers of this journal will be aware, much practical attention to the subject now in hand. D. WINSTANLEY.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the annual general meeting of this Institute, held on Monday evening last, the report of the council for the past official year was read and adopted, subject to a few verbal amendments. Parts of the report have already appeared in our pages. The meeting having then proceeded to ballot for the council, hon. officers, and secretary for the ensuing year of office, the following gentlemen were re-elected:—As president, Mr. Thomas H. Wyatt; as vice-presidents, Messrs. E. Tanson and A. Waterhouse; as ordinary members of council, Messrs. A. W. Blomfield, M.A., W. Burgess, H. Carrey, C. Fowler, E. W. Godwin, J. H. Hakewill, Professor Kerr, R. L. Romieux, J. P. St. Aubyn, and J. Fowler. The following gentlemen were elected to fill up vacancies occasioned by retirement in rota or resignation:—As vice-president, Mr. Horace Jones; as ordinary members of council, Messrs. G. Aitchison, B.A., H. Dawson, E. J. Withers, W. M. Fawcett, M.A., and E. Sharpe, M.A.; as hon. secretary for foreign correspond-

ence, Mr. F. P. Cookerell; and as secretary, Mr. Charles L. Eastlake; as auditors, Mr. Harry Oliver and Mr. J. D. Mathews.

THE BIRMINGHAM COMPETITION.

We do not hear that a design for the Municipal Buildings has yet been definitely selected as the best. We understand that some little disarrangement has taken place. One or two of the designs selected as the best are found to be not in accordance with the instructions, in some points, and are not considered eligible. Moreover, one of the designs (a cross within a circle) that had been put aside by the referee, in the first place, as ineligible, because not accompanied with descriptive particulars, has since been specially reported on by him, leaving others to settle the question whether or not it is really "out of court."

LODGINGS FOR SINGLE MEN.

A PAPER "On the Economical Construction of Workmen's Dwellings, and especially in reference to improving the health and habits of the class," has been read by Dr. Stallard, at the Society of Arts; Lord Shaftesbury in the chair.

Dr. Stallard, in this paper, chiefly treated of the improvement of lodging-houses for single men. He proposed, he said, to commence at the very bottom of the scale, where indeed the chief difficulty is found. We have a maxim that the condition of the lowest independent labourer should be more eligible than that of the pauper, yet in respect to lodgings how far is this from fact. I am altogether dissatisfied, he continued, with the structure of existing lodging-houses; but I must not let it be supposed that I claim to raise the standard of cleanliness, decency, and comfort, at once and rapidly, to that of a work-house dormitory or a convict's cell. No one is more sensible than I am of the impossibility of doing so. Any action holding out a prospect of success must be prepared to meet the wants of thieves, sharpers, and gamblers, as well as industrious and honest men. This class forms the large majority of those with whom it is desirable to establish a relationship, and from whom chiefly our profits are at first, at all events, to come. We must seek to enter into a real competition with the low, dirty, filthy, ill-arranged, and ill-furnished den of thieves. We must be content to woo all classes with simple structural advantages. We must carefully exclude all appearance of a desire to reform people. It will not be difficult to give a little cleaner bed, or a more wholesome room than is to be found in ninety-nine out of a hundred lodging-houses. The thief appreciates a comfortable fire and good cooking apparatus, and he will avail himself of these advantages if you offer them as a simple matter of business. As regards his character and occupation, leave him to the police, as is done in the houses which he now frequents.

Be sure if the management becomes a public scandal the police will deal with it. Once get lodgers inside, and we may safely rely upon personal association for every possible reform. No regulations can exclude the good altogether, and no violence will prevent its influence. Personal association is the only leaven by which the standard of public opinion and public conduct can be raised, and a simple structural improvement is the fulcrum on which I propose to raise it. In the next place, I would observe that, in dealing with this question, we must carefully apply the usual principles of trade and competition. With respect to the erection of buildings, it is pretty generally recognised that they might be built by societies as successfully as by individuals; but it is equally certain that individuals can alone manage them. Societies cannot be managers; and if they employ a manager at a fixed salary, he either neglects his duty, or serves his relatives and friends, if he do not actually help himself. We must, therefore, let our buildings to responsible tenants on fair terms; and if, like house-builders, we have confidence in our scheme, we shall not only build with judgment, but we shall cheapen the property, until, as in a new neighbourhood, the demand is increased by the excellence of our supply.

Having thus laid down the general principles which ought to guide us in our future course, the reader proceeded to examine into the possibilities of profit, and the dangers which threaten to reduce the profit and convert it into loss. He then proceeded further to inquire whether it was within

the bounds of possibility, as he believed, to provide suitable buildings which should yield a profit of at least 5 or 6 per cent. to the capitalist.

He argued generally that 4d. per night, or 2s. per week, was within the reach of the poorest working man. This was the result of Mr. Archer's experience at Westminster, and he did not think it possible to find a poorer class.

As to the accommodation, he regarded three things as essential,—1st, a separate sleeping-apartment, which may be used as a dressing-room, workshop, or study; 2nd, a good kitchen, with an open fire; and, 3rd, a general sitting-room, for reading, conversation, and amusement. Of these by far the most important, he remarked, was the first. The principle of separate chambers had long been adopted in the best model lodging-houses; but they were all inferior to a convict's cell. He proposed that every chamber should be 8 ft. long, 4 ft. 6 in. wide, and with a ceiling 8 ft. above the floor, made of perforated zinc. Above this ceiling is a passage, which communicates externally with the open air by means of perforated bricks, and internally with the interior of the building. As the door of the chamber, he said, ought not to reach the floor, there will always be an abundant supply of fresh air without the possibility of draught. A somewhat similar arrangement has been adopted at the Woking Convict Prison, but it is there spoiled by a perpendicular diaphragm within the passage, as the grating at the top of the cell is too open to keep out draught.

In the discussion which followed, Lord Shaftesbury took part.

So far as he could judge, his lordship said, Dr. Stallard confined himself to lodging-houses for single men. The rent was, under his system, still to be 2s. per week, and that was a sum of money which could not be paid by a large proportion of the poor of London. Mr. Vigers had told them that the Peabody trustees wanted to get the poorest classes into their buildings, and that they would take any one who had a weekly wage not exceeding 11; but that was a large wage for a great proportion of the people. Then, there was another difficulty in respect of lodging-houses for single men, and that might be one reason why they so often had a great number of vacant beds, and that was distress in trade. Whenever that took place, the lettings fell off very much indeed. The workmen in London, too, and also in the agricultural districts, could not abide living by themselves; they infinitely preferred taking a lodging in a house where there was a family living, who would attend upon them and give them a little society in the evening when they came home. The difficulty was not so much in respect of the single men, however, as it was in respect of large families. If they were to go to families who could afford to give 6s. or 8s. per week the matter was perfectly clear; not only would they be able to construct houses on the Sir Sydney Waterlow principle, but smaller tenements in the suburbs, which might be availed of by means of the 1d. trains and other means, by which persons receiving 30s. or 2 guineas a week might be perfectly well accommodated. But there were great difficulties when they came to do anything in the interior of the metropolis; and in a great number of instances the houses must be built within the reach of the daily labour of the men, so that they would not have to rise early and get home late. It was a matter of great importance that they should not have to walk a mile or two to their places of work. There are many occupations in regard to which the men must be on the spot. He was sorry to say that Dr. Stallard passed over in a cursory way, and with somewhat of contempt, houses which he said had been made habitable by adaptation. Really and truly this was the only way in which they would be able to provide for the great mass of the population of London; and if they would only take the trouble to go to Tyndall's buildings, Charles-street, Drury-lane, and see the alteration that had been made by adaptation, and compare the state of these buildings with what they were before the society of which he was president took them, and also with the state of the courts and alleys around, they would find that, although they by no means approached to perfection, yet they gave decency and health, and compared favourably, in innumerable instances, with that which was dear to every Englishman,—and God grant that it might become dearer every hour,—the possession of home and domestic life. They could then, to a large degree, meet the difficulty he had pointed out by adaptation.

ART-TILE CHIMNEY-PIECE.

AMONGST various other specimens of Ceramic decorative work, by Messrs. W. B. Simpson & Sons, now in the International Exhibition, is the handsome chimney-piece of which we give a view. It is about 10 ft. in height, composed of what the makers call art-tiles, mounted in walnut, from designs by Mr. Walter Lonsdale, who lately obtained the Travelling Studentship of the Royal Academy. The particular kind of Ceramic decoration advocated by Messrs. Simpson, as applied to more elaborate works than this, unites the use of enamelled earthenware with the principle of mosaic work, on the system of the "opus sectile" of the Romans. The method of working has this in common with that by which a picture in stained glass is produced,—that in both the artist makes his cartoon, and so arranges his composition, that the whole surface of the picture may be cut up without allowing any of the lines in which the cuts are to be made to interfere with the leading forms or surfaces. Pieces of earthenware in the one case, and of glass in the other, are then cut out, or otherwise made to correspond with the various portions into which the original design or cartoon may have been subdivided. The earthenware is then prepared, and handed over, as glass is, to an artist to paint in various colours, until each piece is made to correspond exactly with its model in the cartoon; after which both are passed through the kiln, and fired, to make the colouring permanent.

The colours are capable of a high degree of brilliancy, and can be made glossy or dull at will, and in texture rough or smooth. After being painted and fired, the pieces are handed over to a mason, who fixes the several pieces against the surface to be decorated, and then points up his joints to correspond in all respects with those of the lead lines of the glass picture, excepting that many of the numerous subdivisions separating colour from colour, which are necessary for the transparent, may be omitted for the opaque picture. The method is likely to be largely employed.

CHURCH OF ST. SERVAIS, MAASTRICHT, HOLLAND.

WE have on a previous occasion given some account of the domestic architecture of Maastricht, and we then promised our readers that we would extend our observations to the ecclesiastical architecture of that ancient town: we now proceed to fulfil our promise.

The Cathedral (now parish church) of St. Servais is a noble building chiefly of Romanesque architecture: it consists of a long nave and aisles, with lateral chapels, deep transepts, and an apsidal choir. At the west end of the nave is a kind of narthex, which is divided into two stories, the lower opening into the nave by a large arch, underneath which is the organ; but the upper story forms a kind of hall at right angles to the axis of the nave, terminating in apses at either end. This singular hall or chapel is covered with three domical vaults, and is a most perfect and interesting example of Early Romanesque architecture. Over this building are three towers, two of which are ancient, but the centre one was erected during the last century, when all the other towers of the church were Italianised. Two other towers flank the great apse of the chancel, and these latter are being restored to their original form under the skillful superintendence of Mr. Cuypers.

The church is about 280 ft. long, including the narthex, and is lofty and imposing. Internally, the Romanesque nave has lost much of its original character from the addition of pointed vaulting of the Geometrical period, and side chapels of the same date; however, the graceful form of the vaulting and the fine Decorated windows of the side chapels certainly add to the beauty of the building. But by far the most interesting portion of the whole church is the superb porch, of which we give a view. It is situated near the west end of the south aisle of the nave, and is decidedly the finest example of Transitional First Pointed work in all Holland. Mr. Weale gives the date 1230 to this fine work, and the general character of the architecture would well carry out this idea. Externally this porch is very plain, and its gable has unfortunately suffered from modernisation. The outer doorway consists of two square-headed openings enclosed under a round arch, but all else is concealed under a wretched brick facing.

However, this portion of the church is to come shortly under the hands of Mr. Cuypers, and we have little doubt that when the present existing brickwork is removed, some very interesting discoveries may be made. Our view gives a good idea of the interior of this porch. It is difficult to ascertain what particular events and persons are represented by most of the sculpture, but the following are some of the principal incidents:—In the tympanum of the doorway, the Coronation of the Virgin Mary, the Heavenly Jerusalem, with its gates and towers, the Burial of our Lord, and the Death of the Virgin. On the jambs of the doorway are large statues of the following saints and prophets (beginning at the west):—1. St. John the Baptist; 2. David; 3. Solomon; 4. Abraham and Isaac. On the opposite side—5. St. Joseph bearing our Lord on his right arm, and a lily in his left. This is the only ancient example of this treatment which we remember to have seen, though we believe there is one at Chartres. 6. St. John the Baptist baptising our Lord; 7. St. John the Evangelist; 8. St. Servais holding his usual symbol, a mitre, with a key above it. The outer figures on either side, No. 1 and No. 8, are more modern—probably works of the fifteenth century, and we should be inclined to think that they do not occupy their original positions, as it does not seem likely that St. John the Baptist would have been twice represented in the same doorway, and the figure of St. Servais is considerably larger than the other figures. It is quite impossible to say what the small figures in the arch of the doorway are intended to represent, but it is very probable that they are a genealogy of our Lord. The twelve statues on the sides of the porch represent the twelve minor prophets. We should mention that all the shafts and pinnacles of this portion of the building are of black marble. As will be seen from our engraving, this porch is of large dimensions. Its actual measurements are as follow:—Length from north to south (including doorway), 39 ft.; width from east to west, 32 ft. 6 in.; depth and width of jambs of doorway, 11 ft. 6 in.; height about 40 ft. Owing to the church being built upon a hill, which slopes away very rapidly to the east, the ground is so high at the west end, that to enter the church there are two flights of steps, one down into the porch, and the second again down into the nave.

The side chapels, porch, and narthex are all raised several steps above the nave and aisles, and originally the choir was raised upon a crypt, which contained the shrine of St. Servais. This crypt was destroyed in the year 1811. We are glad to say the present dean of the church, Dr. Kitten, who is an enthusiastic lover of Gothic architecture, has determined to restore the ancient arrangement of this church, and again to raise up the choir upon a crypt which shall be visible from the nave of the church.

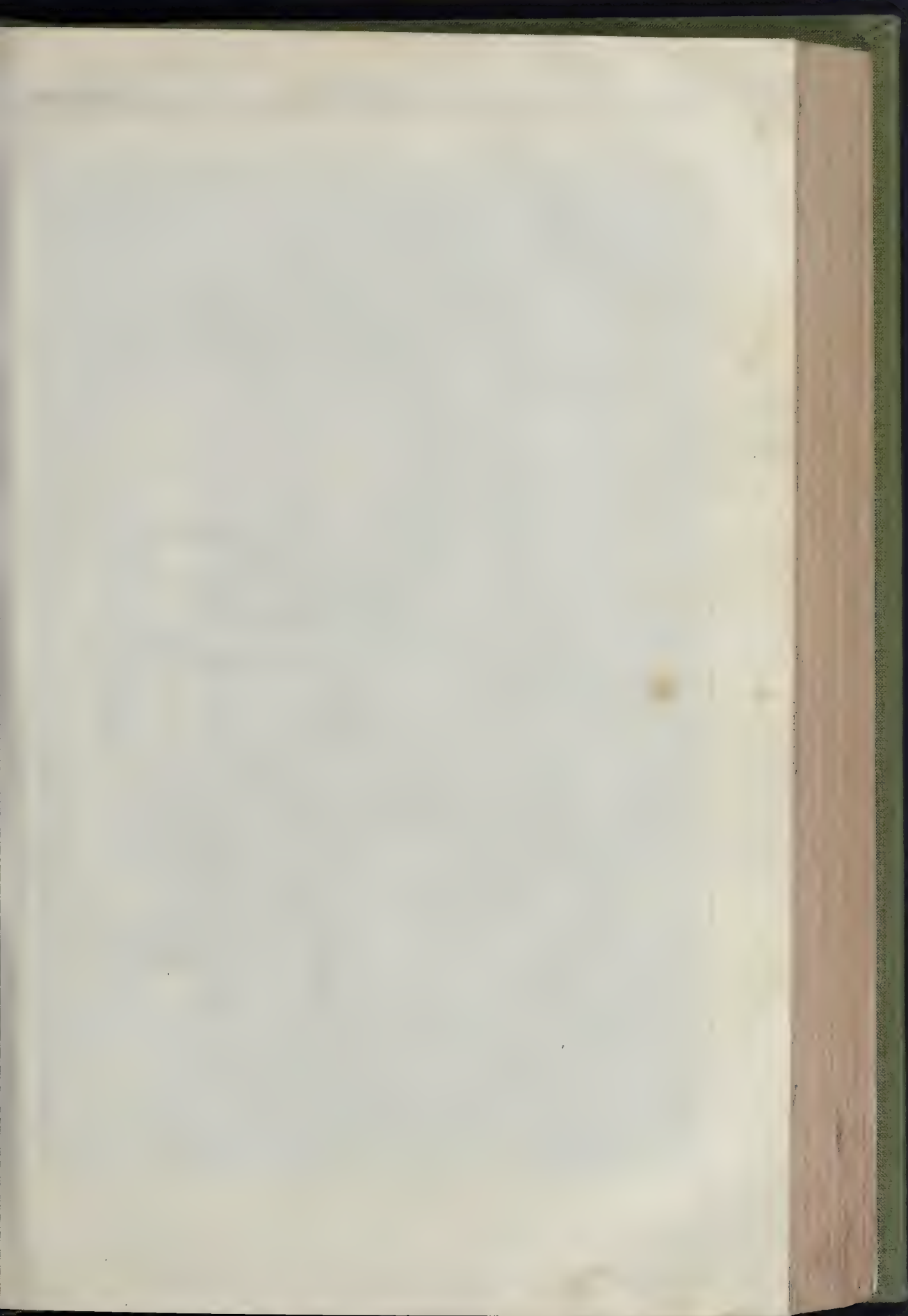
In the south transept is a singular Romanesque screen, which is said originally to have separated the narthex from the nave. It is now placed flat against the wall, so that only one side of it can be seen; but it is curious, and the centre portion, which evidently formed part of a reredos, is very interesting. The shrine of St. Servais is at present in one of the side chapels of the nave: it is a most sumptuous example of thirteenth-century metal work; it is nearly 6 ft. long, and large enough to contain a whole body.

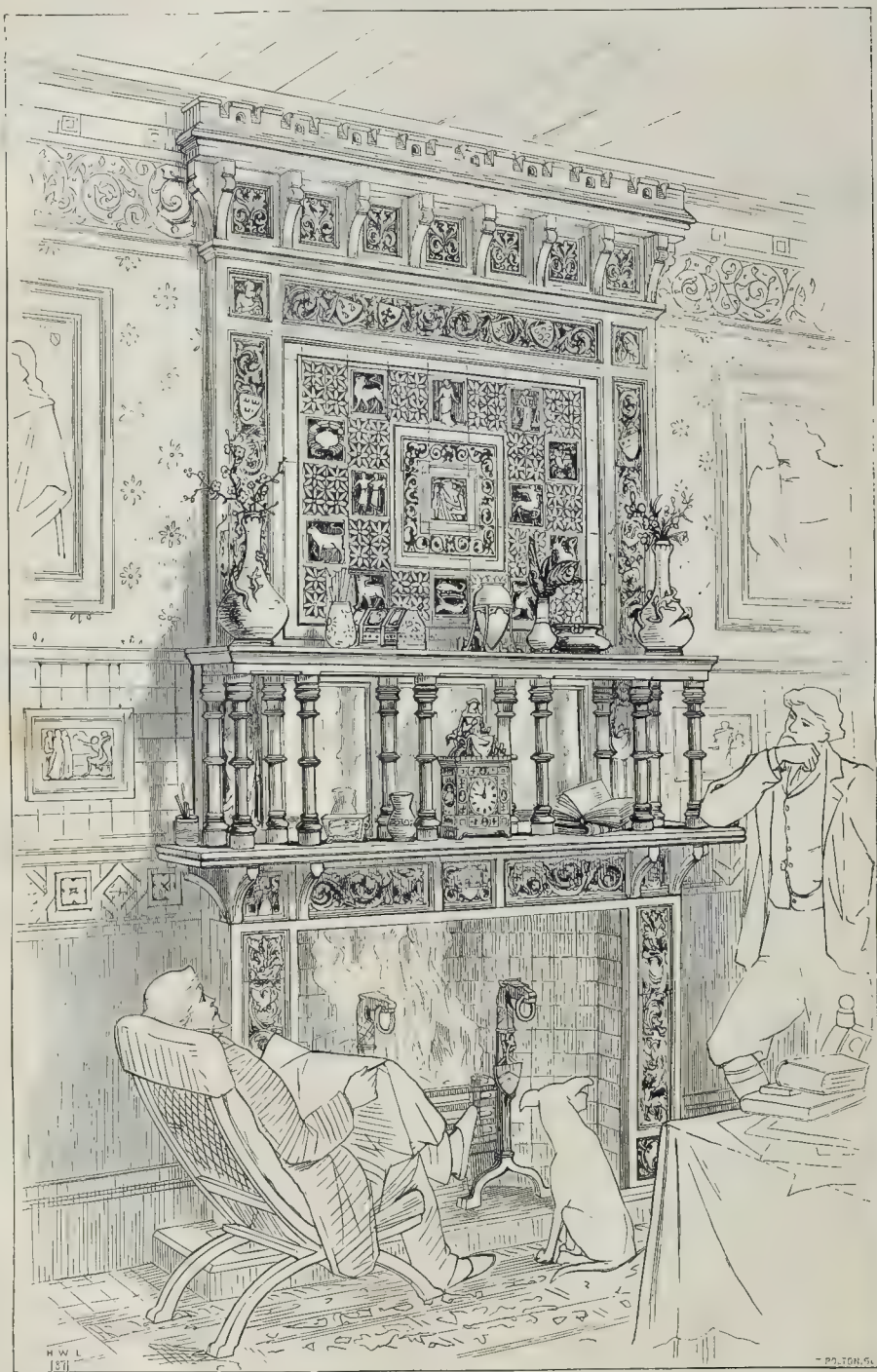
The nave and aisles of this church were badly decorated with colour about thirty years ago; but the decoration of the roof of the choir is excellent. It is from the designs of Mr. Cuypers, except the Madonna, which is ancient, and a beautiful example of fourteenth-century painting. There are fine cloisters and other ecclesiastical buildings attached to this church, some of which are undergoing a judicious restoration, and being freed from the disfigurements of the last two centuries.

In addition to the church of St. Servais, Maastricht contains several other fine churches. The old collegiate church of Notre Dams is a very interesting Romanesque building, with a singularly beautiful apse and a large crypt, supported upon columns of black marble, which divide it into four equal aisles.

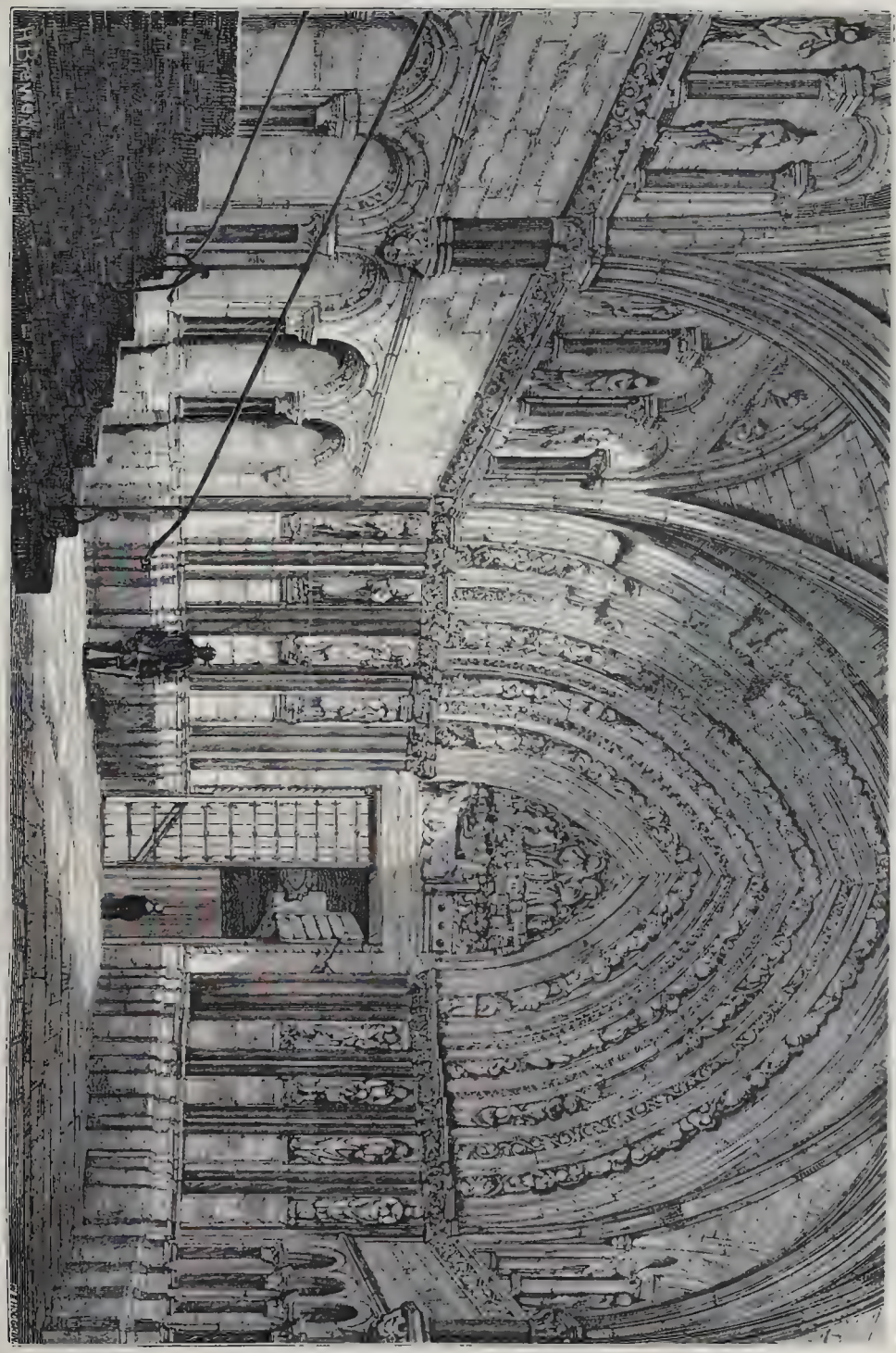
St. John the Baptist's (Calvinist church) has a noble tower, 230 ft. high, surmounted by an octagonal lantern, erected in 1450. The chancel of this church is much higher than the nave.

St. Matthew's is a fair example of a parish church of the fifteenth century, and the now desecrated Dominican church a valuable one of the previous century. The three modern churches in Maastricht we have described in our paper upon the "Revival of Gothic Architecture in Holland."





ART-TILE CHIMNEY-PIECE: INTERNATIONAL EXHIBITION.—By Messrs. W. B. Simpson & Sons.
Designed by Mr. H. Walter Lonsdale



CHURCH OF ST. SERVAIS, MAASTRICHT, HOLLAND.—PORCH, CIRCA 1250.

of the atmosphere with the carbon of the fuel. The product of this combustion is simply carbonic acid gas.

This carbonic acid gas abstracts heat from the fire, becomes expanded, and rushes into the chimney.

The carburetted hydrogen, which ought to have been burned in the furnace, is carried away by the force of the draught into the chimney before its carbon or hydrogen has had time to combine with the oxygen of the atmosphere, and this and other substances that ought to have been utilised impregnate the atmosphere with those black volumes of half-gaseous, half-solid matter which we call smoke.

Can this smoke be consumed, and thereby prevented from contaminating the air? My answer is that from a chemical point of view it can, from an economical point of view it should, and from a salutary point of view it must be.

The product of combustion being carbonic acid gas, and this gas consisting of six parts by weight of carbon in combination with sixteen parts by weight of oxygen, the former being the combustible, and the latter the supporter of combustion, and practically the only producers of the heat, fire, and flame generated in our furnaces, it follows as a matter of course that, if we can find the means to retain the carbonic acid for a sufficiently long time in the furnace for the absorption of one-half of its oxygen and the formation of carbonic oxide, we necessarily diminish the amount of carburetted hydrogen which would be evolved. Again, by the introduction of oxygen at a sufficiently high temperature to combine with the carbon and hydrogen, we should intensify the heat, save the fuel, which would be otherwise carried up the chimney by the action of the rarefied gases; the constituents of black smoke would thereby be utilised in the furnace; smoke would be altogether prevented, and the poisonous carbonic acid be given off in quantities so small as to be all but innocuous. Lastly, carbonic oxide being highly combustible, it would be preserved as a generator of heat, instead of being, as is ordinarily the case, unformed, in consequence of the carbonic acid not being subjected sufficiently long to the presence of carbon at such a temperature as to admit of one-half of its oxygen entering into combination and producing combustion.

That smoke should be consumed in the furnace is clear on the simple principle of commercial economy. It is an axiom of trade, "To buy in the cheapest and sell in the dearest market." Now, since the age of Exhibitions set in, the spirit of competition has risen to such a height that it has become absolutely incumbent on every manufacturer to reduce the cost of production to the true minimum. It is needless for him to say, "Coal is cheaper in England than on the Continent," if the continental manufacturer is able by economising his fuel to make it in effect cheaper than that which is used by the British manufacturer. This must be the case if the foreign manufacturer, by a better constructed furnace and the use of coal of a superior quality, is able in effect to obtain the precious though abundant mineral for less money than is paid for the same by the British manufacturer carrying on his business in the midst of the vast coal-fields that immediately surround him. And this must be the case if the combustion of fuel, carried on so ruinously in Great Britain, is so conducted on the Continent that the waste is reduced to its minimum. Let our manufacturers note what we are able to establish as a fact that an average of 25 per cent. of fuel is wasted by the present system, and that this amount is saved by a furnace so constructed as to consume its smoke, to say nothing at present of the more regular and constant supply of heat, and consequently of that which the heat is designed to secure, whether it be the generation of steam or the reduction of metals.

Again, look at our railways. The great cry is for economy of management. What can be more wasteful than the present locomotive furnace? The cold air is forced in according to the speed of the engine, and since it can enter under the fire-bars only, but a thin layer of incandescent fuel can be used. This has to be constantly renewed; and what with the manipulations of the fireman, and the tremendous rush of air through the thin layer of burning matter, thousands of tons of fuel are fired out of the chimney, and hedges, stacks, and not unfrequently merchandise are set on fire. Were my principle adopted, this enormous and dangerous waste would be avoided. I would insert in the fur-

nace an air-chamber made of refractory fire-clay, and perforated on its inner sides, and compel the cold air to traverse this chamber. During its passage it would become intensely heated, and passing in that state through the perforations into the furnace, would not only effect complete combustion and prevent smoke, but admit of the bed of fuel being so thick, that the air admitted beneath the bars could not possibly force the burning fuel up the chimney.

Then look at our vast marine, propelled by steam. Supposing the vessels, whether mercantile or warlike, required to keep up steam for a given number of days. If complete combustion could be secured it is not hazardous to say, in their case, that at least 50 per cent. of fuel might be saved. In the case of mercantile steamers that means that one half of the space now employed for coal could be used for freight, or that coaling stations would not be required, or that coaling stations could be largely supplied; and in the case of the royal navy, it means that a ship with her present accommodation for coal could maintain her way under steam for twice the time she can at present. But one step further: might not every sailing vessel, to the great saving of the owners and lighter risk to the underwriters have an auxiliary engine, and a sufficient supply of coal to serve for an emergency?

But I say that not only this consumption of smoke may be, not only that it should be, but that from a sanitary and legal point of view it must be.

The sciences of chemistry and physiology go hand in hand. Now, physiology says, and its arguments are drawn from experience, that smoke is injurious to both vegetable and animal life; and chemistry echoes the motto of the British constitution, that "There is no wrong without a remedy." For while physiology teaches us that smoke is injurious to health, chemistry tells us it is also hurtful to the pocket, is an unpardonable waste, and can and ought to be prevented.

Can the consumption of smoke be accomplished by a process that shall at once commend itself for simplicity, efficiency, and economy? My answer to this is in the affirmative. Various remedies have been proposed, and several have been attended with partial success. No doubt smoke can be prevented by the action of compressed air, no doubt it can be prevented by providing for the admission of an increased volume of cold air at each time of firing so as to diminish the draught, until such time as the fresh fuel has become incandescent. Both these plans are open to serious objection. I will mention two. One is, that they both depend for their efficiency upon the skill and attention of the fireman. The second that they prevent the constant supply of steam, inasmuch as they cool the surface of the boiler exposed to the fire at each time of firing, and as a consequence offer a premium to the fireman to neglect his apparatus in order to save himself from the complaints arising from a deficiency of steam.

There is but one efficient method for effecting the "consummation" so much "to be wished," viz. — 1. The removal of the smoke nuisance, by consuming the smoke before it can enter the stack. 2. The economizing of fuel, by securing its complete combustion. 3. The creation of a supply of steam that shall be constant or unvarying. That method is the one devised and patented by me. In every instance where it has been adopted *pur et simple* it has secured the three great objects just named.

In principle it consists simply in the introduction of intensely heated air above the bed of the furnace, and among and over the burning fuel. For it is only because the fuel when first supplied is heated to a certain extent by the underlying stratum in the furnace, and yet not sufficiently heated to undergo combustion, that we have carburetted hydrogen and carbonic acid produced, only to be carried by the great rush of air through the furnace into the stack as elements of waste and physical injury. If, as soon as the heat produced in the upper stratum of fuel by the underlying stratum of fuel in a state of combustion, we bring it into contact with the oxygen of the atmosphere in sufficient quantity and at a sufficiently high temperature, the carbon and hydrogen must combine with that oxygen, and the inevitable result must be combustion before it can reach the stack. My plan is so to construct the outer casing of the furnace as thoroughly to prevent the percolation of the external air. Within this external casing I build a chamber of the necessary dimensions,

The inner wall of this chamber is composed of perforated bricks, made of highly refractory fire-clay. The atmospheric air is admitted into the chamber, and traversing the sides of the furnace becomes intensely heated in its course, and is in that state admitted through the perforations on the inner side, among and over the fuel. No sooner does this heated air come into contact with the smoke arising from the heated but unburning fuel, than combustion ensues, smoke is prevented, the carbonic acid becomes decomposed, and the carbonic oxide formed and burnt, leaving no smoke, and but a comparatively small quantity of the deadly gases, to enter the stack.

I have confined myself in this essay to furnishing an outline of how smoke may be prevented and fuel economized in ordinary boiler furnaces; but the plan is applicable to domestic fire-places, as well as to brewing-pans, salt-pans, locomotives, marine engines, cupolas, and, in short, to every description of furnace where a steady and intense heat is required. It is no chimera, but has been subjected to the test of experiment, and is in operation in various towns, where it is completely successful and is giving full satisfaction.

THOMAS PRIDEAUX.

NEWSPAPER PRESS FUND.

We must congratulate the members of the fund on a step in the right direction. According to the original rules of the Society, relief could not be afforded to any but "members in want or distress, and the widows, parents, or other near relatives of the deceased members." In the infancy of the fund, it was necessary to limit the circle of aid. Further, a desire was entertained by its founders to encourage habits of providence, and to help those, specially, who helped themselves. It has been thought, however, that the time has now come for an extension of the purpose of the Society. For our own part, we should not be sorry to see the Newspaper Press Fund taking the same position in respect of all connected with the periodical press that the Royal Literary Fund holds in respect of the writers of books, and (possibly incorporated by royal charter) affording relief to all meritorious and qualified applicants, without restriction. We have little doubt that such a policy, so far from lessening the number of subscribers in the profession eligible for relief, would greatly enlarge it, while it would immensely strengthen the claims of the Society on the outside public.

At the general meeting held on the 29th ult., it was resolved to relax the rules so far as to place within the control of the committee a certain small proportion of the donations annually received, for the relief of worthy cases of distress not previously within the scope of the Society's operations. The annual dinner will take place on the 13th instant, and we shall be glad to find good evidence of public appreciation in the largeness of the amount subscribed. Lord Carnarvon will preside, and a number of well-known persons have notified their intention to be present.

KENSINGTON GARDENS.

In reply to questions put by Lord Elioche in the Commons,

Mr. Ayrton said he was afraid the noble lord had not thoroughly informed himself of what had taken place in the House last session upon this subject, or probably he would not have thought it necessary to have put his questions. Last year he (Mr. Ayrton) made a proposal to throw part of Hyde Park into Kensington Gardens, and the House voted money for the purpose of carrying out the proposal. The plans were, moreover, laid upon the table of the House. In consequence of that, the plans to carry out the design were practically considered in the Office of Works, and they were settled by his authority he alone being responsible for them. Circumstances had offered them only a choice of difficulties. If the House thought it desirable to discuss them, he would be ready to take part in the discussion. But the House had a great deal of important business to discharge, and could not spare time for such a debate. With regard to any plan, the noble lord was distinctly aware that orders had been already given by the House to lay it on the table. Plans were already in preparation, and would be laid before the House. As to the number of trees that had been cut

down, he would have no objection to grant a return upon the subject if it were moved for.

Lord Eloth begged to repeat a portion of his question.—Whether this divergence of the Broad-walk and the culture of the trees in the gardens were done according to any definite plan; and if so, what was the date of the plan, who was responsible for it, and by whom was it prepared and drawn?

Mr. Ayrton said the alteration was carried out according to the plan agreed to.

Lord Eloth.—Did that plan embrace the diverting of the broad gravel walk?

Mr. Ayrton said he had already stated the purpose of the deviation, and it was made by his authority. It was perfectly settled that a walk could be made from the Albert Memorial.

Lord Eloth.—When?

Mr. Ayrton.—The last plan was sanctioned in the beginning of December.

CONCRETE HOUSES, FOLKESTONE.

Sir.—The most interesting thing I have recently seen is a portion of a crescent in course of construction at Folkestone entirely of concrete,—all first-class houses; the two end ones, indeed, being mansions. From the paving of the kitchen up to the roof—five stories—all is concrete; the steps down to the area, the roof of coal-house, the dressings, and string courses. At the building I saw the builder of them, Mr. Richard Howland, who showed me everything about the houses. These must be, I should think, the largest erections in concrete going on. The materials are beach and sand, with large lumps of chalk pushed into the middle while the rest is wet. Where required, the surface is finished with a finer mixture while still moist.

C. H.

SHINGLE.

Sir.—The tower and steeple of the parish church at Alton being in a dilapidated state, we are just now considering the best way to restore it.

The steeple is at present covered with lead, and it requires to be stripped and re-leaded, or covered in some other way. Having just spent a large sum (say, 4,000*l.*) in restorations and additions to this church, we do not see our way to getting the amount necessary for re-leading; therefore are wishing for information respecting shingle. Our church is situated in rather a bleak situation.

We should like to know:—

1st. Under these circumstances would shingle be suitable?

2nd. How long might it be fairly expected to last?

3rd. What would be the cost as compared to lead?

4th. Is it necessary that the oak for shingle should have been cleaved out and seasoned for years? If so, where may it be obtained?

If any one who has had experience in this matter would kindly give us the benefit of it, he would much oblige

THE CHURCHWARDENS.

ERECTIONS BEYOND THE GENERAL LINE OF BUILDINGS.

Marlborough-street Police Court.—Mr. Tyrwhitt has given his judgment in the case of the Co-operative Supply Association, Albert-terrace, Knightsbridge, whose architect, Mr. Dudley, was summoned (as already mentioned in the *Builder*), for erecting a covered way over the forecourt of the premises in Albert-terrace, by the authorities of St. George's, Hanover-square.

Mr. Tyrwhitt said the summons called on the defendant to answer a complaint under the Metropolitan Management Act for unlawfully proceeding to erect an iron and glass covered way in front of No. 19, Albert-terrace, without the consent of the Metropolitan Board of Works, such intended erection being beyond the general line of buildings. The main question turned on sec. 75 of 25 & 26 Vict. c. 112, whether the fabric was a building, structure, or erection, prohibited by that statute. The fabric in question projected 22 ft. beyond the general line of buildings towards the street. It covered the greater part of the original forecourt. It had an arched roof of iron and glass, supported by four iron columns and by girders or plates. The columns were inserted in sockets bolted in the arches, the girders are either screwed or inserted into the front wall of the house. In one or other of these ways the fabric derived support from the house wall. The sides were open, and the whole might be removed in a few hours. The Section 75 must be read by the text of the Act, and, adopting that text, it was plain that the Legislature intended to prevent any deviation or projection from the general line of building, and had most comprehensive powers to enforce that intention. It was

properly urged that by the general rule of construction (which he believed dated from the Archbishop of Canterbury's case, in "Oake's Reports") the latter words, "structure or erection," must be confined to matters *ex-tem-pore* with "building," which preceded them. But this could not extend to prevent them from having each of them a meaning of its own, distinct from, and, as it would seem, more extensive than "building," or it would be mere repetition. In his judgment, this fabric was a structure akin to "building," if, indeed, it did not amount to it, having a roof and being a covered way fixed to the ground and house adjoining. No definition of building had been given by the Act or attempted by the courts; but its effect must be given to each word, subject to exclusion of matters not akin to "building." As to the facility of removal, it did not affect the question. The decisions of the courts on this section.—*St. George's Vestry v. Sparrow*, and *Simpson v. Smith*, in the Common Pleas,—did not appear to apply to this case, except in showing that every question of this kind must stand on its own circumstances as one of fact, and also of degree, for the magistrate to decide. That last ingredient would probably dispose of the question of dwarf boundary walls, conservatories over shop-fronts, or porticoes or porches. The architect had by mistake been summoned; the company was the party to proceed against. He must dismiss the summons on that ground; but he had thought it best to express his opinion on the main point, in case the subject of this structure should be renewed before him.

Mr. Edward Lewis, solicitor to the Supply Association, said this decision would be considered final. After an opinion so strongly expressed, the company would remove the structure.

LOCAL BOARDS AND THEIR OFFICERS.

Sir.—Will some of your practical and legal readers inform me the law and the courts' decisions (referring me to cases), upon the terms of engagements between Local Boards and their officers? And how the somewhat ambiguous section in the Public Health Act of 1848 has been construed in which reference is made that their officers shall be engaged during pleasure? What is understood by "during pleasure"? It is well known in the case of town surveyors, "the engagement shall be subject to three months' notice on either side;" to use the phrase employed in instructions to competing candidates, would it be correct to call this "during pleasure"? Or would the local authority (as I am gravely informed is the case by those learned in the law) be entitled to dismiss an officer instantaneously, although the agreement (not under seal, but entered on the minutes) is that the engagement shall be subject to three months' notice on either side? and what are the decisions on this question?

Does the law permit corporations to make agreements with their officers for stated periods, and, on sudden dismissal, to take shelter under the general Act, which sanctions them to make engagements "during pleasure," which they are pleased to construe into "instantaneous" when it suits them? N. C.

CASES UNDER BUILDING ACT.

Dangerous Structures.—At Marlborough-street, the occupier of the King's Head public-house, No. 35, Crown-street, Soho, was summoned before Mr. Knox, under the Dangerous Structures clauses, for neglecting to comply with a notice received from the Metropolitan Board of Works to take down certain premises dangerous to the public.

Mr. Henry Napier appeared to support the summonses. Mr. Kendall, district surveyor of St. Anne's, Soho, said an order had been obtained in January, but nothing had been done, and the danger was increasing. The premises might fall at any moment.

Mr. A. Alcom also stated that although something had been done, the premises were a tower at the top before the defendant. For the defence, Mr. Richard Richardson said a Bill had passed through Parliament for a railway to come beneath the premises, and he had adopted every practicable means to keep the premises safe without going to the expense. He considered there was not the slightest danger of the house falling, and he quite disagreed with the other surveyors.

Mr. W. White, builder, Regent's Park, had been employed to make the premises safe, and had made them safe accordingly.

Mr. Knox said there was a conflict of testimony between the public officers and witnesses interested for the defendant. Two independent witnesses had declared that danger might arise at any moment. He should, therefore, make an order for the occupier to pull down the premises within a fortnight.

"CONTRACTS: PRIME-COST PRICES."

The question asked in the *Builder* of April 22, can only be properly answered in "A Builder's" special case by somebody who has looked into all the circumstances, into the clauses of conditions, other similar instances in the specification, &c.

With reference, however, to this matter of "prime cost" generally, a word or two may be said. Prime, or first cost, should always be understood as the sum actually paid out of pocket for any goods, and the phrase should not be used when any modification of this sense is intended. In order to guard against misapprehension, architects often introduce in their specifications some such explanatory clauses as the following:—

"The prime-cost (P.C.) prices provided in this specification are to be understood as the actual amounts payable by the contractor to the manufacturers, and the contractor is to include for his profit thereon, and also for packing, carriage, risk, fixing, and all other charges. The architect is to be at liberty to select the goods for which a prime-cost price is provided from the stock of any manufacturer, and the contractor is then to order and obtain the same from such manufacturer. The whole or any part of these works

to be performed by the contractor on his being specially directed to carry out the same; otherwise the value of the work omitted is to be deducted from the amount, &c."

And at the beginning of the clauses in "paperhanger"—

"The whole of the papers to be of patterns approved by the architect, or he is to be at liberty, &c. (as above). The prices named are to be understood as being the current nominal prices of the paperhanging manufacturers."

If such clauses are not in the specification under which "A Builder" is working, they may by "custom" supply the interpretation he asks for. The system of naming prices in the specifications is a very useful one, tending to define a class of charges that may be differently estimated by different contractors. It is true that a contractor who thoroughly understands his trade, and desires to practise it fairly, will rarely have much difficulty in determining the quality of the "good 6-in. mortise lock," or even of the "proper fastening" that occasionally presents itself; but a definite 10*s.* or 4*s.*, as the case might be, would often keep the hurried and careless from any chance of blundering.

Some manufacturers, in the circulars supplied to architects and the general public, maintain an undesirable reticence as to their terms of business. "Terms—[the amount left blank], per cent., to the trade only," does not convey a sufficiently definite idea to the writer of a specification who wishes to insert P.C. prices. Why not fill up the blanks in type, and even for important articles put boldly two columns:—

The Trade.	Retail.
<i>£. s. d.</i>	<i>£. s. d.</i>

A decision and straightforwardness of this kind would be appreciated by architects and their employers. It would be worth while, at any cost, to uniformly dispel the mysterious haze that sometimes hangs over these business arrangements. The want of liberality often felt, and sometimes manifested, which affords builders at times just cause of complaint, is much of it due to the supposed existence of secret bye-paths, along which disproportionately large profits glide to those who hold themselves ready to receive them. More directness would not disclose any special trade secret, and would not do any harm by bringing home constantly to the mind of everybody (including the contractor himself), the nature of the services rendered by him to the individual and to the public, for which all would wish that he should always be rewarded in the current manner.

AN ARCHITECT.

THE IRON HURDLES IN THE PARKS.

Sir.—There have been several complaints lately of the way in which the grass in the parks is cut up into shreds. Certainly in no civilised country but this is such a selfish disregard shown, even by respectable people, for the good appearance of the public property. The gritty walks may have something to do with it; but a better protection might be afforded if the hurdles were made differently, and more care shown in the placing of them. At present they are quite suitable for the exclusion of cattle; but the advantage that is taken of their ladder-like construction might have been used by Mr. Darwin as another illustration of our descent. The intermediate bars should be perpendicular, and not horizontal, and they might then be made lighter than at present, while the hurdles, as a whole, would be stronger. Only those who could vault over them would then be able to disregard them. A. P.

COAST DEFENCES FOR IRELAND.

The Commander-in-Chief of the Forces in Ireland, Lord Sandhurst, was last week in Belfast on a tour of inspection, and afterwards, accompanied by Col. Warrand, of the 4th Royal Engineers, proceeded to Carrickfergus. Belfast Lough was examined for the purpose of discovering a suitable place for the erection of a fort or battery. The bay of Belfast is entirely unprotected. The only building on the County Antrim coast near hand, bearing resemblance to a fortification, is old Carrickfergus Castle, hoar with antiquity, and interesting alone to antiquaries and tourists who visit the Giant's Causeway in the summer time. Belfast Lough has had no coast defence, save of a temporary nature, within the present, nor indeed at the close of the last century, and the danger was often

pointed out by home as well as foreign enemies. It is now decided that there shall be a fort or battery for this important point. Londonderry was also visited, and the garrison of that city, and the forts on the north coast, were inspected with a view to additions and future efficiency in case of danger.

CHURCH-BUILDING NEWS.

Bristol.—The Green Bank Cemetery, intended for the parish of St. Philip and Jacob (Whitcomb), has been consecrated by the bishop of the diocese, in the presence of a very large number of persons. The cemetery is situated at the junction of St. George's and Stapleton parishes, and is surrounded on two sides by watercourses (one of which divides the parishes), and on one side by the Midland Railway, and on the other by the road from Ridgway or Keyate to Whitehall. The approach from Bristol is by Stapleton-road and through Lower Easton, passing St. Mark's Church. The land purchased by the burial board is nearly twenty acres in extent, eleven of which are at present set apart for burials. It is on a hill, the top of which is about 45 ft. above the brooks. Advantage has been taken of this circumstance to form roads and paths to wind round the hill, the curved lines of which have a very pleasing effect, especially as seen from the Midland line. In most cemeteries considerable difficulty exists in identifying the locality of any grave without application to the officials. A novel plan will therefore be adopted here. Each walk or road will be known as an avenue, and will have tablets to denote it, and the trees or shrubs at the sides will also act as guides. The avenues are named after them, viz.:—Oak Tree-avenue, Laurestinus-avenue, Arbutus-avenue, Cypress-avenue, Laurel-avenue, and Cedar-avenue, so that it being ascertained which avenue the grave is near, identification will be easy. The ground has been planted by Mr. John Nelson, of St. Michael's-hill, under the supervision of Mr. Parker. The trees and shrubs are nearly 4,000 in number, and have been selected to suit the peculiarity of the soil. The chapels are placed near the summit of the hill, the land declining from them in every direction. The soil of the cemetery is a dry compact sand, which absorbs water rapidly. The ground is inclosed on three sides by stone walls, and on the fourth by an iron fence. The buildings consist of a double chapel, one for Episcopalians and the other for Nonconformists. They are connected by corridors, in the centre of which is a campanile or bell-tower, 90 ft. high. The chapels form a prominent feature, and may be seen from Kingsdown, Montpellier, Brandon-hill, and other lofty localities. The chapels are similar, except that the Episcopalians have a communion rail and table. The chapels are each divided into three compartments. The centre is a square, 22 ft. every way, fitted with four sets of benches and lecterns. At the ends of this square, and divided by pointed double arches and Mansfield stone columns, are apses or chevets, circular inside and octagonal out, fitted with circular benches and central octagon book-rests, the extreme length of chapel and chevets being 50 ft. The fittings are of pitch pine. Warning apparatus is provided for the chapels, and ventilation has been considered. The roofs are of arched rib construction, supported upon blue slate shafts, with carved foliated caps and corbels. All the woodwork is varnished except the roof boarding, which is painted a deep blue. The approach to the chapels is by porches, with stone benches at the sides. The floors of the chapels, porches, and corridors are laid with encaustic and other tiles, supplied by the Poole Pottery Company. Attached to the chapels are ministers' vestries, fitted with fireplaces, with access from the corridors. The corridors have four Pennant shafts, with foliated capitals, and eight arches. The bell-tower is in three stages, the lower of four arches, two of which are connected with and form part of the corridors. One is filled in with a group of sculpture; the subject "Christ the Comforter," after Ary Scheffer. The upper stages of the tower consist of a bell floor, octagon louvre lantern, and spire terminated with a metal cross, a ball of about 2 cwt. being fixed inside. The external walls of the building are of blue Pennant stone, with dressings of Box ground freestone, the chevets having five-pointed gables, and in each is a two-light window with rose tracery, the head filled with coloured cathedral glass. The roofs are

covered with alternate layers of purple Bangor and Whitland Abbey green slates, and the chapels are surmounted with ventilating turrets, covered with dressed leadwork. The chevets and corridor roofs are ridged with wrought metal-work, coloured and gilded. The mortuary (so-called) is a room fitted for the reception of infested or other bodies, and for post-mortem examinations. This structure consists of a room, 18 ft. by 12 ft., covered with a steep roof, having a lantern light at the top, while in the centre of the floor is a stack, 7 ft. by 3 ft., and about 3 ft. high, and it is fitted on the top with a trough for post-mortem examinations. There are three other stacks, about 18 in. high, for the reception of coffins. The stacks have receptacles and air-ways, so arranged that disinfectants will pass between the operator and the body, in whatever position he may be. The stacks are constructed of smooth slate slabs; the floor and walls are lined with the same material; and all the connections are of brass. Water will be also provided. Attached to the mortuary are a tool-house, &c., and special provision is made that the water from the mortuary shall be disinfected and absorbed, and not pass into the ordinary water channels. The lodge consists of a residence for the superintendent, with a watch-tower, board-room, &c. There are two entrances to the cemetery, one to the Episcopalian and the other to the Nonconformist portion, and one gate does the duty of two by being hung upon a central column, and although the gate weighs upwards of two tons, it is so poised that a child may open and shut it with comparative ease. The cost of this cemetery, including the land and other expenses, will be below 12,000l. The contractor who has executed the works is Mr. William Brook, of Temple Meads, and he has carried them out under the direction of Mr. Henry Masters, architect, Bristol.

Southport.—The new Church of St. Andrew is about to be erected on a site in Eastbank-street. It consists of nave, with north and south aisles, north and south transepts, chancel, organ-chamber, north porch, a north-east tower and spire in the angle of transept and chancel, and a vestry. The style is Geometrical Decorated. Accommodation is provided for nearly 1,000, without galleries, at a cost of 4,500l. Messrs. T. D. Barry & Sons are the architects.

Birkdale, near Southport.—A new church, to be called St. Peter's, is to be erected here on a site adjoining the Liverpool-road. It will consist of nave, north and south aisles, north and south transepts, chancel, vestry, and a tower porch at the south-west, in second bay. It will seat 650 persons. The cost will be 2,500l. The architects are Messrs. T. D. Barry & Sons. The style is Geometric Decorated.

Clunbury (Salop).—A new church for the township of Clunton, in the parish of Clunbury, county of Salop, and diocese of Hereford, has been opened for divine service. It has been built from the designs, and under the supervision, of Mr. Thomas Nicholson, of Hereford, the diocesan architect. In style it is Early Decorated, and it is built with native stone, externally and internally, relieved with freestone dressings, the interior work being fair hewn and neatly set. The roofs are framed with open timber work, boarded on the upper side, and finished with ornamental cornices. The entrance doorway is protected by a timber porch, and the western gable is surmounted by a bell-cote. The floors are laid with plain tiles in the body of the church, and in the sanctuary, with ornamental encaustics. The sanctuary contains a carved credence, constructed in the north wall, also a sedilia and piscina in the south wall. The roofs are covered with Broseley tiles, and the gables are terminated with metal crosses.

Kirby-under-Dale.—To our account already given of this edifice, as reopened for divine service, we may add that the pulpit is of oak, placed upon a stone base. It is hexagonal, and was presented by Mrs. Baresford Peirse. The three panels and the cornice were designed by Mr. G. A. Rogers, of London, and were carved by Miss Baresford Peirse in waistcoat oak. The centre panel bears the Christian monogram in the centre, surrounded by a German Gothic design, and surmounted by the symbol of the heavenly crown, the earthly symbol, the crown of thorns, being at the base, with the scourges at each side. The right-hand panel consists of grapes, vine-leaves, and wheat, as symbols of the sacramental elements. The left-hand panel is composed of passion-flowers, with the triple lily springing from the centre. The cornice is a

continuous wreath of oak-leaves and acorns. The fret-work is mounted upon backboards, coloured a dull Indian red, which gives prominence and effect.

VARIORUM.

"ANNUAL of Scientific Discovery; or, Year-Book of Facts in Science and Art, for 1871. Edited by John Trowbridge, S.B., of Harvard College, aided by W. R. Nichols and C. R. Cross. Boston: Gould & Lincoln. London: Trubner." This American Year-Book of Facts, as we have had repeated occasion to say, is a valuable annual. It contains a fair account of the chief points in progress, in all countries, during the year, and is preceded by notes of the editor on the same subject.—"A New Manual of Book-keeping for Wholesale and Retail Traders. By Philip Crellin, Accountant. London: Bell & Daldy." The chief aim of this work is to present traders with a method of book-keeping involving little or no additional labour to that required in single entry, yet by which the advantages of double entry are believed to be secured. The book is considered to be suited both to the unpractised learner and to the practised trader.—"The Journal of the Royal Historical and Archaeological Association of Ireland. Vol. I. Fourth Series. January, 1871. No. 5." This number of the proceedings of the Kilkenny Archaeological Society, once so called, contains much information on the subject of ancient Irish documents, and an account of a Crannog at Ballydough, county of Fermanagh.—"Wetake from Cassell's 'Illustrated Travels,' for May, a paragraph on the stone towns of Central Syria:—"Seen from a distance, the stone cities or even villages of Central Syria are sufficiently striking to arrest the attention of the most careless observer. Owing to the houses being crowded closely together, and often surmounting towers, every hamlet has the air of a fortress. The illusion is heightened by the lofty black walls, which, thrown out in strong relief against the bright green of the surrounding plain, glitter in the pure upland air like those of some enchanted castle of Eastern legend. On nearer approach, so few signs of decay become visible, that it is hard to believe that that every house has its inhabitants, and that they will soon be both seen and heard passing to and fro along the streets. In the immediate vicinity of the buildings large reservoirs, originally formed with much skill and labour, are frequently found. Outside the town lies also the cemetery. The tombs, square towers, built of regularly-laid blocks, and averaging 30 ft. to 40 ft. in height, stand at short distances apart. They vary extremely in external decoration, some being ornamented with pilasters, while others are perfectly plain. Internally they are more uniform, one side,—generally that opposite the door,—being fitted with shelves for the reception of sarcophagi. These family tombs frequently contain Greek inscriptions."—The "Household Guide" gives some plain directions how to paper a room, which may be useful in quarters where the services of a paper-hanger are not to be obtained:—"Several lengths of paper should be laid one on another upon the floor or bench, allowing the fair edges to project over, so that the paste may not touch the figured surface. The back should then be smartly brushed over with paste, covering every part, but taking especial care not to soak the paper. The more quickly and dexterously this operation can be performed, the better will be the result, and no time should be lost in at once placing the wet paper upon the wall. The more common papers have less power of resisting water than those of good quality, and speedily become so rotten and weak that they will not support their own weight, while at the same time they expand so much that it is often difficult to match the patterns; in fact, some of the very common and cheap papers can only be hung when they are half dry, and one person should paste the back while the other is engaged in placing the previously pasted piece upon the wall. As it is difficult to manage a very long length of wet paper, the best plan is to fold it loosely back into about half its original length; and when the upper part is fixed to the wall, unfold the lower portion, and place that in its turn. The proper place to commence hanging is the left-hand corner of the room, working round to the right. Of course, great care must be taken to fix the first length perfectly upright, as, if this be not done, the whole of the paper will, in following it, be out of the perpendicular, and a most unpleasant effect will

produced. When the first length has been properly placed, the exact lines of the ceiling and skirting-board should be marked with the back of the scissors, and the paper gently drawn away from the wall, out off to the line, and smoothed. All air-blisters and wrinkles should be pressed out, and the whole smoothed down with a soft, long-haired brush. While the paper is wet, a very little will cause it to smear; and it is consequently of the first importance not to touch its surface more than is absolutely necessary. The first length being properly placed, the others may be fixed in the same manner, until the whole of the longer lengths are in position; when the smaller portions, such as those over the windows and doors, may be filled in with the remnants before mentioned.—*The Art Journal* for May says:—"A good deal has been done lately in the way of arranging the art-treasures of Florence. Statues by Donatello, John of Bologna, Verrocchio, and others, have been removed from the crowded corridor of the Uffizi to the Bargello, where they may now be seen, along with some splendid examples by Luca della Robbia and other Tuscans. In 1865, at the time of the Dante fête, the Bargello, which had been used as a prison, was appropriated for the reception of everything which could in any way illustrate the life and times of the poet. The result was a most splendid loan collection, embracing both the intellectual and domestic life of the period; harmonising well with Giotto's fresco of Dante on the walls. This interesting collection was soon dispersed, and has been replaced by a Mediæval museum, containing splendid specimens of majolica, bronzes, ancient armour, and such like, to which loan contributions are added, on the same principle as in our South Kensington Museum."—In *Fraser* of this month an article headed "The Working Man's Political Question" may be read with advantage.—The veteran, Mr. John Kimbs, has commenced his "Autobiography" in *the Leisure Hour*. It can scarcely fail to be very interesting.—In the current number of *the People's Magazine* instructions are given, with diagrams, for modelling stained-glass windows, with aid of Bristol board, gelatine, and transparent colours.—A very full and comprehensive account of "Wood-working Machinery," with illustrations, is being given in succeeding numbers of the *Journal of the Franklin Institute* (Philadelphia). The improvement of late observable in the conduct of this journal is remarkable.—A print has reached us of the fine despatch steamer *Espresso*, 2,000 tons register, built by Messrs. Wigham Richardson & Co., of Newcastle-on-Tyne, for the Genova and Rio de la Plata Lavarello Passenger Steam-ship Company. The length of the *Espresso* is 300 ft., and breadth 16 ft.

Miscellaneous.

St. Alban's Abbey Church.—A meeting has been held to consider the present condition of St. Alban's Abbey, at which Lord Erskine took the chair. A report from Mr. G. Scott was read, stating, among other particulars, that the central tower of the abbey was in great danger, and that many other parts of the fabric required immediate attention. It was proposed and carried unanimously—1. That the reparation of the abbey be undertaken, as far as possible, in accordance with Mr. Scott's report; 2. That a subscription-list be opened, subscriptions to be spread over five years, if so desired; 3. Those present were formed into a committee, with power to add to their number. Lord Erskine consented to act as treasurer. It is estimated by Mr. Scott that the sum of £2,650L. required for the reparation of the abbey, exclusive of all internal fittings, restorations of floors, tombs, &c., of which 26,048L. are considered by him to be absolutely "necessary work." This does not include architect's commission and other contingencies. It is proposed to hold a public meeting in London early in the ensuing summer.

End of the Postage-stamp Circulating Medium.—An order has been issued by the Postmaster-General, that after the 30th of June next, the permission which has been hitherto granted to officers of the Post-office to purchase postage stamps from the public will be withdrawn, and such purchases thenceforward forbidden. We must ask advertisers and others who do not desire to send us small sums to employ post-office orders.

The Improvement of the Harbour of Great Yarmouth.—Important works have been completed and are in progress at the entrance to Yarmouth harbour, under the direction of the present Port and Haven Commissioners. They are of an extensive description. Within the memory of the present generation the north pier was extended seawards about 180 ft., which had the effect of considerably deepening the water on the bar; and in 1867 the works were carried out 152 ft. further, the consequence being that at low water there is always now a minimum depth of 9 ft.; and at high water of from 14 ft. to 15 ft., amply sufficient for ships of respectable tonnage. The haven is said to have gained immensely in the estimation of all nautical men. The construction of the breakwater at the South Ham also has proved salutary. "The Brush" at one of the most important points of the navigation is an angular intrusion of brushwood into the river, which has formed for ages a great obstruction; and the rapid decay of the work of late years, involving its absolute removal and reconstruction or entire removal, has, under the advice of the engineer, Mr. J. Cabitt, O.E., backed by the deputy-engineer, Mr. W. Teasdale, O.E., induced the Port and Haven Commissioners to adopt the latter alternative. Superintended by Mr. Teasdale, relays of men are daily engaged in effecting this long-standing disfigurement to the harbour. Piles of enormous dimensions and iron landies have been laid down, in order to prevent the quay from slipping outwards; while thousands of old piles, which for centuries have stood in the foundations, have been uprooted. The consequent expense will be something considerable, and before the new works are finished several thousands of pounds will have been spent.

What is a House?—In the Court of Common Pleas, the case of Thompson v. Ward has been heard before Lord Chief Justice Bovill, and Justices Willes, Keating, and Brett, sitting in Banco. The court gave judgment in this case, which was argued last Michaelmas term, and a representative case of importance. The delay has been occasioned by a difference of opinion among the members of the court, the issue being the interpretation of the Reform Act. The premises are in Old Elvet, Durham. Mr. Justice Brett said that in this case George Herbert appeared on the list of claimants for the city of Durham, in respect of a "house" occupied by him, at a yearly rent of 41. 10s. It appeared that he occupied only one room in a house of nine rooms, occupied by six tenants—three tenants having two rooms each, and three tenants one room each. The house was originally built for, and occupied by, one family, and now the passage, staircase, and conveniences in the yard were used in common by the tenants. There was an outer door which was never closed, and was without lock or bolt, but having two staples through which a bolt might be shot. The owner did not reside upon the premises. It was held by the revising barrister that the claimant was not an occupier of a dwelling-house within the statute; and the question was, whether the premises claimed for constituted a "dwelling-house" within the meaning of the Reform Act of 1867. The revising barrister's decision was affirmed, that it was not a house within the meaning of the Act.

Organs in Places of Worship.—The growing desire for organs in places of worship of almost every denomination appears to have no limit. By a firm in Hull (Forster & Andrews), no less than eight organs, as particularised below, have been completed in churches and chapels, from March 25th to April 25th, one month in this year. It is thought that so many have never been erected by one firm in so short a period before, as the smallest instrument referred to has two sets of keys and pedal organ. Taney Church, near Dublin; Independent Chapel, Bacup; St. Andrew's Church, Kelso; Bishopstoke Church, near Stockton; Llandugwy Church, South Wales; Caythorpe Church, Lincolnshire; Spittlegate Church, Grantham; Oldcotes Catholic Chapel, near Tuxford.

Sideboard and Shelves.—Messrs. Jackson & Graham have just now completed a very handsome side-table with shelves above, from the design of Mr. John Gibbs, of Oxford. It is mainly of oak, with small columns, supporting the shelves, of ebony. It includes some good flat metal work and "jewels" in panels, and is altogether an excellent piece of work. Mr. Gibbs is very successful in his designs for matters of this kind.

Town-hall and Free Library for Bilton. The local town commissioners have adopted, as they were recommended by the finance committee, the plans which had been prepared by Mr. Bidlake for a new town-hall and library and reading-room. It had been at first intended to invite a competition of architects, and give premiums for the best and second-best plans; but this was abandoned, and Mr. Bidlake was consulted. On a building of red brick, he purposes to put architectural pilasters and other architectural ornaments in stone. The principal elevation fronts Lichfield-street, whence is the chief entrance. On the right is the library and a large reading-room; on the left, a board-room, behind which is a committee-room. The clerk's, surveyor's, rate-collectors', and an extra office are entered from Lichfield-street. Over the library are two class-rooms, while the upper part of the town-hall portion of the building is almost entirely occupied by an assembly-room, fitted up with platform and orchestra. There are rooms for the hall-keeper, and the necessary conveniences. The entire cost will be about 5,000L.; and notice was given of a formal motion, to be adopted at the next meeting, which would allow of the immediate commencement of the works. In the meantime the plans were to be forwarded to the Home Secretary for his consideration and approval.

The proposed Public Library and Museum for Brighton.—A report is to be laid before the Town Council of Brighton by their Pavilion Committee, on the plans submitted to it by the Borough Surveyor (Mr. Lockwood) for the appropriation of that part of the Pavilion known as the Eastern Court for a Public Library and Museum. Mr. Lockwood proposes to construct on the ground floor an entrance-hall (from Church-street), two library and committee rooms, and a central gallery, of 115 ft. by 30 ft., to be used as a public reading-room or for art collections, or a picture gallery, with, on the east side of this gallery, a subscription reading-room and library, a reference library, and a lavatory; and on the west side, three rooms, suitable either for library or museum purposes. On the upper floor there will be seven more rooms, including a lecture and museum-room, with cross galleries. Its area on the ground floor will be 10,500 superficial feet. The estimated expense is about 6,000L. The committee recommend that the plan be approved by the council, and that the town clerk be instructed to take the necessary steps to obtain the consent of the vestry to the proposed alteration of the building.

The Reredos of Lynton Church.—Chancellor Phillpotts, sitting as judge of the Diocesan Consistorial Court at Exeter, has heard a petition promoted by Mr. Riddell, one of the churchwardens of Lynton, for the removal of a figure of the Saviour on the cross, with the Virgin on one side and St. John on the other, on the reredos of Lynton Church. The points in dispute were whether the reredos had been authorised by the faculty, and whether the figures were illegal as being images. The judge held that the reredos was not authorised by the faculty, and that the figures were illegal. A plain cross was legal; a crucifix was not; and the addition of figures to the crucifix to form it into a group did not make it legal. The removal of the figures was ordered. The judge also decided that the ten commandments should be put up in their place. This portion of the order was afterwards, however, with the consent of the counsel on both sides, withdrawn. Notice of appeal has been given.

The Thames Embankment.—The Kensington vestry, on the motion of Mr. Freeman, has decided to petition Parliament against the proposed enclosure of a portion of the Thames Embankment by the Crown. Mr. Freeman moved that the petition be forwarded to the borough members, and said if all the facts of the case were known, the conduct of those who represented the Crown in this matter would cause surprise. They got an exemption from the Lands Clauses Consolidation Act, and obtained arbitrary powers. The ratepayers had to purchase the foreshore of the Thames for 30,000L., and now the Crown proposed to build a wall, and enclose this land, thus shutting the public out from the land which they had purchased.

Conversations.—The Council of the Pharmaceutical Society have issued invitations for a *conversazione*, on the 17th inst., at the South Kensington Museum. The Society of Arts will hold their *conversazione* at the same place, on the 1st of June.

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VOL. XXIX.—No. 1475.

Further Evidence on Sanitary Matters.

SINCE we made some remarks upon the second volume of the Report of the Sanitary Commission we have received the third volume, consisting of minutes of evidence, upon which, in conjunction with the first volume issued, the Report of the Commission has been founded, and we find the remarks we made to be fully borne out by this latest issue of evidence.

The balance of testimony in favour of direct legislation in all things that are well ascertained to be beneficial to the proper sanitary government of the country is heavily on the side of obligatory as against permissive legislation and supplementary bye-laws.

We shall pass over the merely medical evidence and regard that chiefly which relates more to structural works (but we shall still have to say some little about nuisances and the prevention of disease), and to what we may call the territorial question,—the division of the country into districts for local government by municipal councils, improvement commissioners, and local boards of health, any one, two, or all of which kinds of district may, and in some cases do, exist in one parish without their boundaries or any of them being coterminous with those of the parish in which they are situated, and out of which they have been carved from time to time for single and separate local purposes, without any regard to the parish as a whole; and thus leaving outlying districts which at present are under no local government at the boards of guardians of the unions in which they are situated.

In his New Rating and Local Government Bill, Mr. Goschen proposes to constitute the parish the unit of area, instead of the union, as proposed by the Sanitary Commission, and he apparently proposes to cut the knot formed by the overlapping of county boundaries by parish areas, by giving to that county in which the parish church stands the whole of the parish for sanitary purposes; at least, we suppose it would result in this from the following description:—

Where a sanitary district is situated in more parishes than one, such district shall be deemed to be wholly in the county which contains a larger portion in area of such district than any other county." But if there are any of these parishes in which the parish church is not situated in that county which contains the largest portion of the area of it, then there will be a difficulty, and the wording should be altered to that we have indicated.

The new Bill, although, in local circumstances, it differs essentially from the propositions of the Royal Sanitary Commission, maintains the same idea in the constitution of a central authority as they have; and, after reading the evidence given before this latter body upon the chief point of establishing sanitary legislation on an obligatory basis instead of a permissive one, and the consolidation of the numerous sanitary Acts, and their application by local authorities, it is hardly possible to arrive at any other conclusion than that the local government of the country is most

wretchedly conducted. Mr. Tom Taylor, secretary of the Local Government Act Office, says, in answer to the question whether he would recommend the board of guardians of a union or the vestry of a parish to be the local authority, that he has found very great difficulty in making up his mind upon the subject. "I have watched," he says, "the working of both systems; I have watched the working of boards of guardians when they were the local authority; I have also watched the working of the parochial system, where the vestries were the local authority, and I have been painfully sensible of the deficiencies of both."

Mr. Simon, the medical officer of the Privy Council, is in favour of the guardians, and the other witnesses are about equally divided in their opinion as to whether the one or the other should be the local authority; but none of them seem to have a favourable opinion of either. Those who prefer the guardians seem to do so because "sanitary neglect is one of the fruitful causes of pauperism; and the same body that is to superintend the relief of the poor might very properly be superintending the causes which go a great way to make that relief necessary" (T. Taylor, Q. 8,680); while those who prefer the vestry are hardly able to give any good reason for the preference.

Mr. Taylor thinks that borough boundaries ought to be extended from time to time, so that the growing population outside should be brought within the rating powers of the town council, instead of, as now, receiving all the benefits of the proximity of the borough, without contributing to its necessities.

Dr. Druitt, formerly medical officer of the parish of St. George, Hanover-square, in answer to a question, whether he thinks the existing sanitary Acts of Parliament sufficient, says that they are not so; for he assumes that the object of his office was to check disease; and in order to do that, one wants the exercise of power tolerably quickly; but if he had a case, say, of a disputed nuisance, he and his inspector of nuisances would have to bring the case before the local authority, and they could not be got together in less than twenty-four hours, or perhaps forty-eight hours; and the officers would relate the facts, and there would be persons interested to confirm or rebut those facts before the local authority; and then, after sifting the evidence, they would come at last to a conclusion that the case should be dealt with, and it would be taken before the magistrates. Then their difficulties would begin. If the local authority had the power to deal with the case at once, much mischief might be stopped; but they only have power to send the case before the magistrates; and then an endless series of difficulties begins, and very much time is wasted; whereas, if a small committee of intelligent members of the board could be selected out of the large number, and entrusted with the power of carrying out the nuisance law summarily, it would be a very good thing.

As to overcrowding, this witness says the chief results that ensue are, that "there is a general lowering of health, a degradation, as it were, of the whole system and character," but he doubts whether it can be prevented, because it arises in the first place from poverty, and the desire of warmth; and in the next place from utter ignorance or recklessness, overcrowding being a compound of these two causes—the moral status of the population and their means. The want of drainage follows necessarily on overcrowding. "Where many human beings are put together on an inadequate space of land, they never can get out of the odour of their own breath and of their own excretions."

On being asked what powers he would like the local authority to have that they have not now, Dr. Druitt says, "I should like the local authority to be constituted carefully. The local

authority, for instance, let us say the vestry of a parish, consists of 100 persons, and if any matter, especially a matter of detail, comes to be discussed by a large number of persons, there is never any chance of an agreement. The bane of such bodies is that they are divided into parties, and that the leader of a party (it is a bad imitation of the House of Commons) will not consent to the sweeping of a crossing, if the leader of the other party wishes it, and so forth. It is perfectly ridiculous. Mr. So and So's party is known to object to a measure, not because of the merits or demerits of the measure, but because the opposite party has proposed it. I always found that although a large body was utterly unmanageable, yet if you had a small committee of, say, four or five gentlemen, you could always get their most particular and intelligent attention to the matter before them, and that they would act with the utmost discretion and conscientiousness; and I only wish for them a power of doing what can only now be done with delay and dilatoriness; the same power which is now exercised by the magistrates in petty sessions whom they appeal to, that is to say, they should do what the magistrates now do on their evidence."

On examining Dr. William Budd, of Bristol, the commissioners at once ask him whether he has turned his attention a good deal to the prevention of disease, and he says that he has, and that, drawing his data from the mortality of London, he believes that the deaths from recognised infectious diseases amount to rather more than one-fifth of the whole; and as to the proportion between diseases which are preventable and diseases of other kinds, he believes that the diseases which cause the greatest mortality in mankind are nearly all of them self-propagating diseases; and, being self-propagating, that they may be prevented. He further says that he estimates that for every actual death by a preventable disease ten persons are made ill by it.

Dr. Augustine Batt, medical officer of the Witney Union, on being asked whether the inactivity of the guardians is owing to their own indifference or from a fear of the body who elect them, says that in the case of the local Board that fear operates, but in the case of the guardians, they, being large ratepayers, take care of their own pockets, and simply decline to tax themselves for any improvement, however great.

We had intended to say something of the evidence of the chairman of the Sanitary Committee of the Lincoln Union, but it is so comprehensive of the case of an undrained town, that we cannot now do justice to it; and the same may be said of the evidence of Mr. Alexander Brogden, M.P. for the borough of Wodnesbury, and of that of Dr. Heslop, of Birmingham; and we will conclude with a few notes from the evidence of Mr. John Liddle, the medical officer of health for the Whitechapel district, who says, "One of the main points to which I wish to draw the attention of the Commission is the necessity for a new Building Act, containing clauses to prevent houses unfit for habitation from being built, by which means we could gradually deal with the evils which now exist. Those evils have been left to us as a legacy from our forefathers; but we want to prevent the extension of the evils;" and he thinks such an Act ought to be applied, not only to towns, but all over the country, and that "provision should be made to insure that every house constructed for human habitation should be of a healthy character, wherever situated." We can add but little to the importance of these remarks by further comment. What we most desire is that the people of this country should individually consider for themselves whether the present state of things is satisfactory, and if it is not found to be so, on due consideration, that each one should put his shoulder to the wheel to help this wagon-load of difficulties out of the way.

THE STAINED GLASS DESIGNS AT THE INTERNATIONAL EXHIBITION.

The specimens of stained glass designs scattered about the Exhibition rooms, at Kensington, mainly in the staircases and the Meyrick Gallery, are not very numerous, but exhibit a great variety of styles, and illustrate the most opposite possible principles in the treatment of this class of art work. Commencing with the Meyrick Gallery, where only are to be found a number of windows placed in immediate juxtaposition, we find towards the western extremity of the gallery the work of Messrs. Mayer & Co., of Munich;* three or four designs, comprising "Hamlet and the Gravedigger," "The Woman of Samaria," "The Adoration of the Magi," &c. These windows, like many others of Munich origin, may be regarded, speaking broadly, as illustrations of what stained glass ought not to be. Not that they are by any means without merit as compositions; but they are exactly the style of composition least suitable for stained glass work; are, in short, large life-size figure subjects, with landscape backgrounds. It may be worth while just to reiterate here (though a majority of our readers require no such reminder, we trust), why stained glass ought not to be treated, and cannot with any satisfactory result be treated, in this pictorial manner. An ordinary picture is palpably an illusory representation, to be looked into; a glass window is as palpably a transparent plane to be looked through, or to let light through; the argument is the same whichever way it be regarded. It will only bear decoration as a single plane, the flatter in treatment the better. A landscape extended in perspective, as a means through which to let light into a room, is a contradiction, however well it might be done. But it cannot be well done, for the materials used will not lend themselves to the effect of aerial perspective, and the whole thing thus treated becomes as unlike anything in nature as a landscape executed in worsted work. Nor can the human face and features be satisfactorily represented in this naturalistic way on glass. The smaller details of facial expression cannot be adequately represented, and the result is only a bad and wooden-looking painting. The face of the grave-digger in "The Hamlet" window is one of the most expressive we have seen in stained glass, yet even this would be passed by as a very ordinary head in an oil painting. Moreover, a main object of staining windows is to procure a glow and warmth of colour effect, by direct transmission of sunlight through coloured planes, such as cannot be obtained in the same degree of brilliancy and richness by any effect of reflected light from an opaque surface. Now, the tertiary and neutral hues which must necessarily be employed, over considerable surfaces, in any attempt at a realistic representation of natural scenery or of architecture, &c., have the effect of stopping out a great portion of light by the interposition of dingy colours, not sufficiently like reality to be illusive; and yet affording none of the pleasure to the eye which it would derive from rich artificial colour. This is notably illustrated again in Vander Poorten's two large windows in the Pottery Gallery, "King Edward Healing the Beggar" (2,394) and "The Torture of St. Julie" (2,395). In the latter, where the scene is laid in a kind of open-air pagan court of justice, with the judge or governor enthroned to enforce the torture or recantation of the poor prisoner, a very large portion, perhaps nearly one-third of the whole surface of the glass, is covered with a dirty dingy brown to represent the stone pavement and the architecture in the rear. In the former picture this is avoided to some extent by a party-coloured pavement, buff and blue, and here, too, the colour design is the best, and shows a well-considered gradation of tints blending up to the brightest colour or "high light" on the principal figure. Unsatisfactory as these are, as windows, they are refined in comparison with one exhibited in the same locality, by W. von Swertakoff, representing two fantastic figures supporting a shield with the Bavarian arms. We doubt whether any (strictly Parliamentary) terms could be found to charac-

* At the time of our examining these designs, scarcely any of them were numbered, and the names of subject and artist, if attached, were in some cases too far up to be legible; in assigning the authorship of the various designs, we have therefore necessarily had to trust to the description of subject and position in the catalogue. We believe we have managed thus to "put the saddle on the right horse," in all cases; if there is any mistake, the reason will be obvious.

terise this production, whether regarded as colour or design. It is, at least, a satisfaction to be able to feel assured that no English firm would have the hardihood to exhibit anything like this. To conclude what we have to say as to foreign stained glass, we may mention Vander Poorten's other windows in the Meyrick Gallery (2,396, 2,397), the latter number consisting of "Specimens of Renaissance Style in Three Panels." These consist of architectural alcove designs, mostly in a by no means agreeable yellow tone, and containing figures, and a head in medallion in the centre light, which is the best of the three, and the diaper ground of which, in blue and a very low green, is really the only pleasant bit of colour in the whole.

The best of the foreign windows is that of H. Dobbelaen (2,375), in the north-east staircase, "The Education of the Virgin," a somewhat unusual design. The Virgin and her instructress are enthroned together in the centre portion of the window, bending devoutly over a texted scroll; beneath their seat arise dark green stems and crimson flowers, with one white lily standing out with brilliant effect in the midst; above the throne is a diaper work of twisted red and green stems and white lilies. Unless the window is to be placed at a great distance from the eye, this diaper is rather too large and coarse in scale, and we could have wished the flower growths in the lower portion a little more conventionalised, but in the main this is a rich and decidedly not commonplace design, in conception and colour alike.

A window by Messrs. Lavers & Barrand on the south-east staircase, a three-light, of scriptural subjects, the crucifixion in the centre, shows considerable richness, and effective but not violent contrast of colour, in the side lights especially, showing blue and green draperies on a deep crimson diaper ground; the architectural canopy work at the top is like much other work of the kind, commonplace and wanting in refinement; and this constant imitation, in stained glass, of architectural features and pinnacles, rests on no artistic principle that we are aware of, and might surely be replaced by something less hackneyed and more specially adapted for glass design.

The question whether strong and rich colour, or brighter and more transparent tints, should be employed in stained glass design, will probably always be regarded as what is generally called a matter of taste, on which no very fixed principle can be established. It is sufficient to point out that while rich and strong colour may be preferred when the glass itself is the main interest or source of effect, a lower and more subdued tone and greater transparency are far more favourable in assisting architectural effect, when the glass is regarded only as an adjunct to this. Strong colours in windows rob the architectural detail of light, and reduce the apparent size of an interior by destroying aerial perspective. In regard to this question a figure-subject window in the Meyrick Gallery, contributed by Messrs. Heaton, Butler, & Bayne (no number), is worth notice. It consists of subjects from Tennyson's "Idylls,"—Enid, Elaine, and Guinevere,—shown in low light colour, the figures designed and drawn with more genuine artistic ability than we often see in stained glass, and with no affectation of stiffness or archaism. The group of Lancelot and Guinevere is particularly good in this respect. The tone of the colour, unfortunately, is not quite pleasing, except, perhaps, in the panel representing the arrival of the barge with the corpse of Elaine. There is too large a proportion of yellowish tint and of a kind of non-descript grey-blue, resulting from the attempt to give the effect of steel armour in the figures of the knights, an effect which cannot be well given in glass. A defect inherent in the employment of large figures in light glass in this way, is the strong prominence assumed by the lead lines, one of the many difficulties in regard to figure representation in glass which lead more and more to the conclusion that the real field for the stained-glass designer is to be found in purely ornamental, rather than pictorial, design. Very pleasing windows, for domestic art, are those by T. G. Jackson (2,390, exhibited by J. Powell & Sons), entitled "The Seasons," but consisting mainly of geometrical diaper of flowers in circles, a very small pictorial design in the centre of each. Near this are three small panels by Messrs. Morris, Marshall, & Co. (2,383), containing figures from Chaucer's "Legend of Good Women," and one of Chaucer himself, reclining on the ground (as he describes himself doing) to

see the daisies open. These are not commonplace things, and contain some beautiful bits of colour; and yet how is such art to be defended, which represents a doll's house and palings, and heterogeneous weeds, for a background, and in the foreground figures looking, for the most part, as if they had walked out of an illuminated missal of the most Medieval type? The design is conventional where it should be naturalistic and naturalistic where it should be conventional. The figures are such as Chaucer himself, with his intense "animalism" of feeling, would have been the very last to admire. Over these is a window, as to the authorship of which we cannot be certain, but which deserves perhaps higher praise than any other in the gallery. The subject, "They brought young Children unto Him," is illustrated by a female figure leading a child and carrying another,—drapery very light, and covered with a delicate small diaper, and a background of conventionalised green foliage. We refer with pleasure to this window as an example of very refined and artistic treatment of stained-glass design. No. 2,387, by H. Hughes (Ward & Hughes), illustrating "Revelations xii. 5, 14," is a fine, powerful design as to the principal figure and general composition, but not very refined in colour, and the "red dragon" is really a terrible affair, enough to frighten any one, as to colour alone. 2,382, by the same hand, "Angels and Mary at the Tomb," is more harmonious and pleasing; and "Industry," another of this artist's figure-windows, is pleasing as a figure design; but, regarding it in a chromatic light, shows too sudden a transition from the strong colours (mostly primary) of the draperies, to the dead neutral tints of the background. Messrs. Holland & Son's "Scenes from the History of Joseph" (Meyrick Gallery, no number) attempts too much, with its crowded figures on different planes; the colour design is too scattered and destitute of motif; we counted five different shades of blue in this heterogeneous combination. In every outline composition, the necessity of a principal figure, and of a reference to it by the other figures, is recognised; why not the same in regard to the colour design of a window? In many cases the colours seem to be placed by accident, and the eye knows not where to rest. The three windows by W. B. Scott (for the Keranic Gallery, South Kensington Museum), scarcely come under the head of "stained" glass, being in fact transparent etchings merely, without interest. Mr. Hughes's window of "Scriptural Subjects" (in the Pottery Gallery, 2,388), is perhaps the best in colour which he exhibits, as to harmony of colour-design, though open to the charge of being over-strong and deep in tone, even admitting the desirability of strong colour; and we have again to regret here the employment of coarse and commonplace imitative Gothic architectural detail, which seems to be regarded as the orthodox way of filling up the head of a pointed window. We shall not be accused of having no sympathy with Gothic windows, and therefore notice (not without a sigh) certain Renaissance windows by English artists, up and down the staircases. The most ambitious is that of Mr. C. A. Gibbs (2,376, S.E. staircase), which is simply a large picture in a classic frame of pilasters and festoons; as a mere pictorial design, by no means without value, but totally unfitted for glass treatment; and as to the prevailing tone of colour, we can only sigh again. No. 2,391 (S.E. staircase), is described as a "Renaissance window, carried out by Messrs. Powell, of Whitefriars;" we wish them better employment. The artist of this window, Mr. F. W. Moody, is author of another, "painted in grisaille" (2,392, S.W. tower staircase), in arabesques and medallions of emblematical figures, on white glass ground; there is really a great deal of labour in it, but it is labour bestowed on a design which appears to us destitute of all artistic recommendation whatever, except perhaps some rather elegant arabesque scroll-work. The colour, again, is very bad; and we can see no reason for encouraging a style of execution on glass which can never be depended on for permanence. We believe all colour painted on glass, instead of being incorporated with the metal,* must come off sooner or later, and in the meantime obscures the light by its opacity, the dead effect of which is totally different from that of stained glass; it is a hybrid, neither painting nor transparency. No. 2,399, "Maries at the Sepulchre," by F. Westlake, is a large design, with Renaissance border, the figures very good, except the white angel with the red wings,

who appears to be tumbling backwards in the rear of the composition; but the colouring is very strong and harsh, and the border really painful in design. Inharmonious and gaudy colour seems common to all modern Renaissance stained glass. A window, which, though not exactly Renaissance in style, cannot be classed as Gothic, is sent by Messrs. Cox & Son (2373, N. W. staircase), a design in oblong panels containing a very pretty delicate diaper, and centre medallions, with birds and flower sprigs; the background to the two figures in the centre and top of the windows is disagreeable, but otherwise the general effect is not displeasing, and is at least not open to the charge of vulgarity in design. The same firm exhibit a good Gothic window (2372, N. W. staircase), the subject apparently a "Christus Consolator," rich and harmonious in colour for the most part; the colours and tones of the draperies are so arranged and modified as to assist and emphasise the peculiar expression and feeling of the different figures in a manner not easy to describe, but which is very evident on studying the design, and is well and thoughtfully carried out. Referring to our remark above, as to the Renaissance windows, there is not the slightest reason, of course, why a window should not be designed in the type of decorative treatment usually recognised as "Renaissance," with as harmonious an effect of colour as in the Gothic style. We notice the fact that it is not generally found to be so, without attempting to account for it, save, perhaps, on the ground that stained glass really was a medieval invention, and therefore there has been a school of precedent and study for it in this style, which has not existed for designers in the classic school. Where these latter commonly fail in their extraordinary preference for heated and staring colours—pinks, yellows, and "loud" buffs. The impression left on a review of the stained-glass designs in the Exhibition is that the designs of our own artists, whatever their faults, evince in the main better knowledge and feeling for the art than is shown in the continental specimens. But the general want in all modern schools of glass-staining seems to us to be, a better critical perception of the nature of treatment required by the material. There is a great deal of talent, as to draughtsmanship, and considerable feeling for rich effect of colour, in many English designs; but it is design and colour applied too often in a wrong way, and on wrong principles. There is too much of mere habit and practice about it; too little evidence of an intellectual comprehension of the object and limits of this beautiful branch of art—an art which, within its own sphere, possesses effects not to be obtained in any other manner, and not easily to be surpassed, as a source of architectural decoration; but which always fails, more or less, when it leaves its own peculiar sphere to invade that of pictorial art.

ARCHITECTURE IN THE ROYAL ACADEMY.*

AMONG miscellaneous designs not included in the two classes of architecture (ecclesiastical and domestic) which we touched upon last week, one of the most prominent is Mr. J. Gibson's Town-hall and Law-courts for Todmorden, showing the proposed site of the statue by Foley of the late John Fielden, M.P. The building is a large oblong block, in Roman Classic style, semicircular on plan at one end, and consisting of a high rusticated basement and a single order, carried all round, in columns on the circular portion, and in square pilasters on the sides. The statue stands on a low pedestal, opposite the centre of the circular end. On a smaller scale, the treatment is something like that of St. George's Hall, Liverpool, and makes simple and dignified building; but the architrave and frieze appear to us somewhat too shallow for the columnar order, and the large acroteria ornaments in the frieze increase this defect, by diminishing the scale of this portion. Nos. 952, 953, and 954 show Mr. H. Jones's design, already illustrated in our pages, for the New Library and Museum at the Guildhall, in an exterior and two interior views. The difficulties of lighting would appear to have been considerable, and the museum depends largely on borrowed light through the floor of the library above. The museum, with its octagon piers which carry the main supports of the library-roof above, is solid and satisfactory in appear-

ance. The competition for the Corn Exchange in Mark-lane is represented in two or three elaborate drawings,—among others, the very finely coloured interior view by Mr. G. G. Scott, jun. (940), showing a florid and over-ornamented, but very clever classical design, of considerable novelty of detail: the whole is reduced to some degree of unity and consistency by the heavy deep wainscot near the floor, and the dark red of the wall immediately over it; but even this would scarcely have sufficed to balance the great exuberance of ornament, which renders the upper portion of the design almost perplexing to the eye. If Mr. Scott would curb his pencil a little, and not over-do the thing, he would be more likely another time to win the suffrages of competition committees as well as of his brother architects; in the present case versatility and originality have been allowed to run into something like extravagance. The second premium design in the same competition, by Messrs. Hesketh & Watson (939 and 947), shows an exterior Renaissance design of considerable elegance, especially in the treatment of the ornamental panels, with sculpture, over the doorways. The interior, with a glass roof, is a very clever treatment of iron construction, the roof being formed by curved box wrought-iron principals, apparently elliptic in outline, the feet brought down on to what may be called "hammer beams" of the same construction, projected horizontally into the building at the cornice-level, and supported beneath by similar struts from the floor, continuing, nearly, the line of the spring of the principals. The thrust of the roof is thus visibly brought down to the floor, giving a very satisfactory expression of stability to the whole. As to architectural beauty, that is another question; at any rate, this is not to be assisted by the addition of cast and gilt mermade, and such gauds: the plain iron construction would have been better than that. Mr. D. Brandon's perspective view of the "Principal Front of the Marlborough Club-house, in Pall-mall" (955), forms a somewhat picturesque Elizabethan design of considerable originality in the treatment of the projecting oriel. The whole would have borne a little more ornament, perhaps, and looks somewhat cold; but the too sparing use of decoration is a rare failing in modern designs of this class, and one which "leans to virtue's side." The second premium design for the "Criterion" restaurant, by Mr. Spiers (958), is a pleasing if not particularly original "front" in the French Renaissance style. The pier on the first floor comes somewhat awkwardly over the centre of the large ground-floor window; a light column would have been better. The author, with good powers of draughtsmanship, does not seem as yet to have struck out a style or manner of his own in design. The interior of the hall is shown in No. 920. Mr. Lonsdale shows a view of a design for a National Mausoleum (893), and Mr. Florence one of a theatre (913) (will no one have the kindness to design a theatre without "festoons?"): the elevations of both these are in the Albert Hall; they are creditable in composition and more than creditable in drawing; but their authors have yet to find a style; a quest of which it may be said, "Few there be that find it." Mr. Waterhouse exhibits a drawing of the clock-tower of the Manchester Town-hall and one of part of Eaton Hall, Cheshire,—an addition to the old work; but the drawing conveys no information as to the extent of the new. We have frequently to make this comment, particularly as to drawings exhibiting restorations, and would recommend that all such drawings should give, either in the main drawing or in a key sketch, a clear statement, by distinctive colouring or in any other convenient manner, of the nature and extent of the new work. The want of some such distinction sometimes occasions misapprehension as to the merits and meaning of the architect's design.

Decorative design is not largely represented. No. 877 is a small drawing of a stained-glass window by Mr. A. O'Connor, for St. Mary's, Ripham, Norfolk; the upper portion (tracery) filled mainly with a strong crimson colour, the three lights below showing a crucifixion subject, with a landscape background, and castle, &c., opening out in perspective, and appearing to recede behind the upper portion of the window,—a method of treating stained glass against which we reiterate our protest, considering such a design as *ipso facto* out of court, whatever its other merits. The largest ornamental contribution is Mr. Seddon's "Design for Decorations

and Furniture of Christ College Chapel, Brecon, recently restored" (927-8-9). The longitudinal section of the chancel shows a design consisting mainly, in the upper portion, of a series of wall-paintings, angels and seraphs, and Scriptural characters, in panels, and of ornamental diaper below. The general effect of colour is pleasant and harmonious; but we should suggest the reconsideration of the background to the figures, consisting alternately of blue, surrounded by a band of low green, and the reverse arrangement of the same tints: the effect would be to attract a little too much attention to the ground, and thus confuse the eye; we would rather see either a single tint, or at least a similar arrangement in each panel. The wall diaper just over the stalls, in the lower part of the walls, is very pleasant in tone. The west wall of the church is covered with a "gloria," a representation of the Saviour in a "vesica," surrounded by angelic heads with gilded aureoles, and a row of angels below, apparently (and allowably) adapted from Blake's drawing of the "Morning Stars" in the illustrations to the "Book of Job." It would not be fair, or possible, to judge of the figures in the design from these small sketches; we have only to regret that they are apparently to be executed in the hard stiff archaic style which is so often considered a kind of *sine qua non* in ecclesiastical art; against the revival of which we feel bound to protest, as a mere concession to the antiquarian and ecclesiastical prejudices of the day. Granting, as we do, that a certain amount of conventionalism is desirable in the treatment of figures in wall-painting, it is surely possible to attain this without sacrifice of the power of drawing and freedom of style and manner which belong to the best modern art-work. That it is possible, indeed, has been amply shown by Mr. A. Moore, many of whose pictures exhibit all the qualities which should characterise mural decoration, combined with a mastery of drawing which renders him, at least as to manner, a better model for the architectural decorator than Fra Angelico. The same architect exhibits also a perspective drawing (964) showing furniture and decoration of the chancel of Groomston Church, Monmouthshire, recently rebuilt. Two designs for wall decoration (in fresco?), by D. Langée (899, 911) show historical subjects well drawn and composed, without the slightest archaism of style, but rather heated and uncomfortable in colour, particularly in 899, where the predominance of red both in the pictorial and decorative portion is not agreeable. Mr. Talbot exhibits a design for internal decoration, "Interior of Hall" (817), in his usual style; a very good water-colour drawing, showing furniture and other accessories combined to produce a pleasing and artistic effect. One design for metal there is, for "Gates from Thames Embankment to Temple Gardens, in memory of the late Colonel Brewster," by J. Newton (976), which is hung too high to be properly studied, but appears not only to be a satisfactory design in itself, but to exhibit in style and treatment some novelty and originality of detail.

Among drawings merely illustrative are several very fine ones; indeed, the Exhibition, as usual, is stronger in this respect than in original designs. We may instance as a splendid specimen Mr. Brewer's "Shrine of St. Cymbert, at Augsburg" (906), a very difficult subject in regard to drawing alone, and in which the colouring is most successful in the precise indication of colour and texture of material. A certain hardness and deficiency of breadth and effect are the natural result, probably, of the postponement of every other consideration to that of the adequate rendering of architectural detail. The "Rood Screen in Munster Cathedral, Westphalia," by E. George (907), is an instance of an architectural drawing, almost equally good in its way, in which general effect has been aimed at rather than very accurate or precise rendering of detail. The "Interior of York Minster" (898), by J. S. Downy, is a careful but not an effective drawing; Mr. T. Allom's "Kelso Abbey" (900), on the other hand, is very effective, but not quite successful in tone and texture, for a representation of old masonry. The "Temple of Mars Ultor, Rome" (910), by E. Carrington, is a capital specimen of clear, precise handling and texture, especially in the ancient bridge which crosses the roadway. "The Jesuit Church, Venice" (905), by W. Henry, is a fine specimen of architectural painting in oil: the effect of light and the details and reflections of the marble are given with a transparency and aerial effect not always seen in architectural oil-paintings.

* See p. 339, ante.

"The Bank Parlour," a drawing presented to the governor of the Bank of England on his retirement from office in April of this year, by J. D. Wingfield (904), is a very good specimen of realistic representation of a furnished interior, which is probably all that was aimed at: artistic effect there is none. Two or three small water-colour sketches by H. L. Florence, are very neat finished bits of architectural sketching, but their author should aim at more freedom of style and attention to effect; the only one which is effective as a composition is the "Archway at Verona" (931), which is the best, though the least finished, of the three exhibited. A specimen of what we mean may be found in the slight but charming little sketch of Mr. J. D. Grace, "Temple at Gertasse, Nubia" (883). Two or three small sketches by A. W. Hands are interesting, particularly the "Upper Part of Doorway, Palazzo Dandolo, Venice" (972),—a curious feature. In regard to the art of architectural drawing and sketching, there is a good deal in this year's Exhibition that may be studied with pleasure and advantage.*

A PLEA FOR ST. ALBAN'S ABBEY.

THE preservation of the Abbey Church of St. Alban, to the condition of which venerable edifice we called the attention of our readers some two months since, is a matter of such national importance that we desire to give any aid in our power to the appeal now made for public support. A recent visit, made expressly for the purpose of forming an opinion on the hope or fear that there is reason to entertain as to the permanent stability of the structure, has strongly impressed the mind, as must be the case with every observant visitor, with the urgent need that there is for aiding the efforts of the rector and local supporters of the church, and for providing the architect with the funds that are absolutely requisite for arresting the progress of dilapidation.

It certainly can be only necessary for the actual state of the case to be distinctly known to insure the supply of funds. Are the public aware that the question is that of the preservation or the demolition of one of the most remarkable churches in this country? Later in date, by some ten years, than the Norman Abbey of Westminster, St. Alban's retains so much of the grave and severe outline of the work of Abbot Paul as to give us a far more correct idea of the original minster founded by the Confessor than we can gain from the study of that building itself as it now stands. In many respects the Church of St. Alban is entitled to a primæ place in this country. Its commemoration of the death of the proto-martyr of England, however overlaid by monkish comment, has a material weight not to be over-looked. Built into the galleries of the rectangular Norman work are baluster pillars, which, we have no doubt, are of the seventh century, the work of King Offa, the original founder of the church, or its restorer, on the site selected by Constantine. But the material of which the bulk of this imposing pile is chiefly reared carries us back beyond Anglo-Saxon times. Nor is this only from the fact that the hard, durable Roman bricks, which show no signs of decay, once formed the walls and houses of a Roman town, before they were borrowed for a Norman church. The excellence of the mortar, in a district where no local reason for peculiar tenacity can be given, holds to Roman tradition. The difficulty of detaching a brick from one of the spiral staircases of the abbey is as great as that which resists the pincerner of a specimen from the ancient city wall of Verulam. The Roman mode of making mortar, used to the present day in Italy, seems to have been retained by the workmen of Abbot Paul. It is thus probably the case that there is no building in the country which presents us with structural features at once of such hoary antiquity, and such well-defined subsequent periods. The attribution of the several additions, repairs, and restorations to the various abbots, and the preservation of some record of the dates of these dignified ecclesiastics, make the abbey a sort of architectural museum. Roman, in site and in material; Anglo-Saxon, in well-preserved baluster columns, and other features; Norman in its main structure; Early English in its

western portal, and in the last four bays of the nave; Decorated, with a tracery of higher perfection than Mr. Scott can quote elsewhere, in its lady chapel, and with arches of bold and massive grandeur, adorned with delicately carved corbels, shield, and foliage, in the five bays of the nave built by Abbot Hugh between 1308 and 1326; with the western end filled with a Perpendicular window of eighteen lights, the work of Abbot Wheathampstead, whose death ended the second abbey, in 1462: the church bears the impress of the entire series of phases through which architecture passed in this country up to the sixteenth century. Special examples of ancient art are to be found in unusual perfection within this vast area. Of the magnificent roof-loft only fragments are preserved. The grille, through which the public were allowed to gaze at the magnificence of the chapel and shrine of the martyr, is one of unusual form. The watching chamber, with cupboard below, and a roost for the monks above, is a rare specimen of old oak carving and cabinet work. Paintings, of an antiquity only limited by that of the masonry on which they have been drawn, have recently been detected beneath the whitewash of the Norman piers. At the close of the long series of abbots, the architect who reared the exquisite chantry-tomb of Abbot Thomas Ramsey (the thirty-seventh of the forty) appears to have dealt with the solid masonry of the choir and transept as though it had been actual rock. The pilasters of the great piers that bear the entire weight of the tower piers have been rudely hewn and pared away, and the northern wall of the choir, which served as an abutment to the north-east pier, has been excavated in order to make room for a miniature copy of Henry VII.'s Chapel. The delicate stonework of this rare work of art is now opening at every joint. The original structure has avenged itself on the reckless innovator. Whatever determined the commencement of the movement which Mr. Scott has arrested only just in time, the weakening of the piers and abutment of the tower has been the main cause of instability.

The tower, as it now stands, shored and propped, has had its downfall arrested. But much must be done before the church can be restored to the public. Even more serious than the displacement of the tower itself, now that this has been stayed by acid underpinning and the abutting work of brickwork in cement, is that of the north face of the north transept, which visibly declines from the perpendicular, and is shored from the ground. It is impossible to disconnect this movement of the north wall from the subsidence of the tower, although the distance intervening is 118 ft. It is a highly-interesting remark, as showing how the introduction of an unnatural mode of dealing with stone vaulting (however magical the effect) vitiates the structural science of a builder, that the introduction of the elaborate workmanship of the chantry-tomb made the fall of the tower (without fresh support) only a question of time. 26,000*l.* are required for the work, absolutely necessary for stability. We trust that neglect on the part of the public will not be such as to involve actual danger, discreditable scandal, and irreparable loss.

FOLKESTONE AND ITS NEIGHBOURHOOD.

"WYE, near Ashford, Kent." Such was the address which, in my younger and more ignorant days, I had to put outside a hebdomadal newspaper, and send it down to an unknown old gentleman in this to me unknown part of the world. Latterly it has occurred to me, I might as well put the same address on myself and my impedimenta (as the Italians so wisely phrase "luggage"), and go down and make the acquaintance of the unknown land; though the old gentleman must still remain "unknown," he having years ago removed to a yet more unknown land, whither it is not, I suppose, desirable for me to follow him just now, since "I have my work to finish," as poor Miss Proctor so pathetically wrote. Talking the matter over, it appeared that another of our party likewise wished to make the journey; though with him the motive spring was a reminiscence of boyish holidays passed under an uncle's roof at Wye. So one said to the other, "Let's go down to Folkestone, and run over to 'Wye, near Ashford, Kent';" and the answer came, in Boompie fashion, "Let's!"

Accordingly, we met at Redhill Station—or, "d-Hill," in railway-porters' parlance—and two hours and a half took us to Folkestone. The first noticeable object was at Marden, where the fine old church, close to the railway station, has been made an object of, with a witness. The large low tower has been capped with a wooden abomination, such as one sees occasionally at a brewery; a square wooden room with large louvres, and a very flat-pointed roof. This is painted white, the church itself being coated with apparently a dark-coloured rough-cast. The windows are very pretty, and the whole outline of the church is good; it looks old, but intervening objects prevented us from distinguishing much of its various features.

At Smeeth, Murray's Guide says, the church has a fine Norman chancel arch, of which we make a note for future guidance. At Scot's Hall, here, lived Sir Thomas Scott, the leader of the Kentish forces at the time of the Armada, and who, by the help of the bosons, sent 4,000 men to Dover the day after receiving the Council's letters. The original mansion has, however, entirely disappeared.

The next railway station is called "Westenhanger and Lythe." At the former place are the ruins of the fortified manor of Westenhanger, formerly defended by nine towers, alternately square and round. Of the three still remaining, the central one is called Fair Rosamond's Bower, from a tradition that she lived here previously to her removal to Woodstock.

On the left of the rail lies Saltwood Castle, a very picturesque ruin, now used as a farmhouse. The inner gatehouse, flanked by two circular towers, is said to be the work of Archbishop Courtenay, time of Richard II. At Saltwood Castle the four knights assembled, December 28th, 1170, to plan the murder of Thomas à Becket; and here was their first resting-place afterwards. In the distance is seen Saltwood Church, an imposing edifice, with a large, handsome tower.

Just beyond Shorncliffe and Sandgate Station, the long interminable lines of low wooden huts of the camp come into view, perched high above the railway; and then Folkestone, with its comfortable *table-d'hôte* dinner,—not abundant, but sufficient—we strolled out in the dark on to the beach, to create for ourselves a sensation out of the solitary grand restless sea, the wide-spreading deserted shingle, the fresh night wind, and the cloud-wrack of the stormy sky; and then we put poetry and sentiment away, and went prosaically home to tea and sleep.

Next morning, we started off early for "Wye, near Ashford," first by rail, and then on from Ashford by carriage and horses. At the station nothing was, evidently, so little expected as a passenger. By dint of much perseverance, the ticket-giver was found, and the necessary little card-board documents were obtained; but then no one knew anything about the train, and when our official put us into a carriage, another took no notice. Finally, we did crawl off, and took no longer than thirty-five minutes to go from Folkestone Harbour to Folkestone Junction. This unrapid motion had one great advantage: it gave us plenty of time to look about; and one of the curiosities that attracted our attention was the singular construction of some brick corrugated garden-walls, which were waved in and out in most serpent-like fashion. We understood that the object of this was to gain strength, the brickwork being particularly thin. How queer it must be to have such an in-and-out garden wall! Rather pretty, though, I well covered with climbers; and how invaluable in a sunny exposed situation, the little patches of shade and shelter must be, for delicate plants and fragile flowers. Ashford was reached at 11.20, and while the carriage was being prepared, we walked about. The situation of the town, with the everlastingly hills closing up the vias at the end of every street, reminded us, on a very small scale, of Turin. Our first attention was given to the church, of course. Inside we found very lofty arches under the tower which stands at the cross, and here they are of fine proportions; but in the nave they look uselessly tall, and the long spindly columns are mean and ugly. The church was rebuilt or restored, in the reign of Edward IV., by Sir John Fogge, of Repton, whose tomb is in the chancel, but bereft of its brasses. The church also contains some elaborate highly-coloured monuments (date, sixteenth century) of the Smythe of Westenhanger; and on the wall has recently been placed a simple but good brass—merely a

* Mr. Butler wishes us to correct the wording of the catalogue, which led us to describe it as "Sketch for Cottage Hospital intended to be erected at the Westminster Memorial." It is simply one of the designs submitted in competition.

inscription, very well done,—to the memory of the last of the name, that Viscount Strangford, whose monument, in Kensal-green Cemetery, always attracts attention from the beauty of its elegant bas-relief, of two draped figures floating upwards: the ascending soul and its guardian angel.

Outside the church, as we were standing looking up at it through the tender green of a young lime-tree, which just sufficiently screened us from the warm spring sunshine, mid-day struck out from the huge black-faced clock on the tower, dated 1783, and the musical chimes rang out merrily, "Oh! dear, what can the matter be?" The effect was so weird and old-worldish.

The quiet close, now occupied by equally quiet, half-asleep-looking dwellings and small shops, in a dormer-window of one of which some bird-lover had stretched wire-netting across, and behind it were many little pantries disporting themselves; then the tall lime-trees beyond, gently waving in the light breeze; and the blue sky over all. At the entrance of the stone-paved alley which leads to the church stands a quaint old gabled house, its front covered with varied designs in executed stucco, and without any apparent design, coloured *ad libitum*, brick-dust red and brown.

Leaving Ashford, the environs look all well cared for, and the handsome roads, fresh green fields, fine trees, and smooth banks covered with grass and wild flowers, give a traveller the notion that he must be passing through some private park rather than along a public highway. On the right, a well-to-do miller had called into his service wind, water, and steam; then, on the left, a handsome residence, with most quietly cut yew-tree hedges. On inquiring of the driver "Whose place is that?" the answer was as quiet as the yew-tree hedges—"Mr. Culler's, sir; the widow now lies dead."

At Kempe's Corner turnpike-gate, the lady all-keeper came with two sweeping courtesies, and a "sixpence, if you please, sir," of irreproachable accent and intonation; the road turned off to the right, facing a range of hills, the facsimile of "our part of Sussex," and at half-past twelve Wye was reached, sun-lighted downs on the left, a bridge over the river in front, and the miller's house, with the lock, on the right. Wye is only a small country town; at least it reminds one very much of the entrance to Salisbury on a small scale, and without the water-channel: such as it was, at least, twenty years ago.

Wye Church has been woefully rebuilt, and bears the date of its disgrace carefully cut upon —as if the style alone were not sufficient to tell the sad tale!—1706. Its first rebuilding was by Archbishop Kempe, who was born at Ollantigh not far off, time of Henry VI. The central tower fell in 1685, and destroyed great part of the building, but not the nave, which is perpendicular, and Kempe's work. The tower boasts a peal of eight bells, all, or nearly, if not quite all, re-cast 1774. "Our big bell, she's nearly twenty-four hundred," said the old sexton. Philip Parsons Cubate, of Wye, and John Ement and Richard "somebody, seem to have re-cast this, the eighth. The others, so far as they could creep in among the timbers to see, were re-cast by Paok & Chapman, of London. The third is cracked, and has been so "over thirty years;" this one bears the inscription,—

"Such wondrous power to Music's given,
It elevates the soul to Heaven."

Another, the fourth, has,—

"Music is medicine to the mind;"

and the fifth,—

"Ye people all who hear me ring,
Be faithful to your God and King."

The oak frame on which the bells are suspended was, roughly cut upon it, "John Brovmelled this frame, 1709."

Wye was one of the royal manors granted by William the Conqueror to Battle Abbey. Its manor-house, of which no trace now remains, received the visits of many sovereigns. A college was founded by Archbishop Kempe, 1447; when he rebuilt the church he made it collegiate, and endowed it. It afterwards passed through various hands, till Sir George Wheeler, in 1724, gave it by will as a residence for the master of a grammar-school, and for the use of Lady Anna Thornhill's charity; which latter was dissolved 1708, and amply endowed, to provide education for the poorest children. Mr. Holmes, present schoolmaster, was extremely kind in showing us over the college, the most noticeable

feature of which is "the grand staircase," but which, unfortunately, stands cramped up in a corner. The balusters are carved, and on each of the angle newels, six in all, stands a tolerably large statue of carved wood, painted like life. On the walls opposite, similar figures are painted, thus forming pairs to them, as it were; and over a door is the date 1622. In a window, in an apartment to the right on entering, are a few small remains of coloured glass; an encaustic bearing two daggers crossed, and a tall yellow column on each side, with some other devices. The entrance-garden, with its trim grass-plots, red gravel path, and freely-growing old sweet-scented flowers, was very calm and suggestive.

Leaving Wye, we were presently advised to climb up a height on the right, which we did, but saw nothing more than could be seen when driving along the road, namely, the rich valley, the winding river, Ashton Church-tower in the distance, and the ever-beautiful, ever-present downs. Perhaps we did not climb high enough, but time was an object; so when we had reached the first elevation and its clump of trees, only to see another and another rising up beyond, we thought "discretion is the better part of valour," and our discretion counselled us to descend. Then on we drove to Ollantigh, which is, we were told, "a show-house." A handsome park, studded with fine trees, brought us to the carefully-screened-off dressed ground; this latter, crowded with a whole army of white marble, I presume, statues and busts, interspersed with some bronzes.

And here I wish to make a remark, which may possibly be considered dire heresy; but as the idea struck me very forcibly, I must state it, leaving the question to wiser heads than mine to determine. It seems to me very questionable taste, to place life-size, sparingly-attired statues out-of-doors, in a variable climate like that of England, exposed to all the vicissitudes of wind and weather. They look wretchedly uncomfortable for three-fourths of the year, and, at their best, never delude us into the belief that we are enjoying the amenities of an Italian garden. Planted as they are in long rows down each side of the carriage-drive at Ollantigh, and scattered amongst the shrubs, the only impression made on my mind was, that I was gazing on a London suburban cemetery. Busts and terminal figures are better, and if placed sparsely among the foliage, often harmonise well; but I cannot help thinking life-size statues of dancing-girls, and similar effete creations, a mistake, detracting from the grandeur of a noble demesne, instead of adding thereto. It seems to have been the ambition of the owners of Ollantigh to collect a copy of all statues extant. In the short time we had for observation, we espied, among others, a Bailie's "Eve" in bronze; a medium-size copy, also bronze, of Kie's "Amazon"; and a diminished "Mercury," from the July Column, including the turned-up face of Aëolus, Boreas, or some other wind, with the bronze breeze issuing from its open mouth and puffed-out cheeks, on which Mercury is supposed to be blown upwards and started on his journey. This obviously materialistic representation of a metaphysical idea would, I suppose, have been scouted long since, if it had not been produced in France, where "they manage those things so much better than we do;" but poor France! we will not say an unkind word to her now! In front of the portico at Ollantigh, stands on a pedestal a gigantic equestrian bronze statue, of which the most prominent portions, as seen from the house, are the luxuriant flourished-up tail of the horse, and the huge chimney-pot hat held in the right hand of the rider.

We were unable to gain admission to the house, because we had, unfortunately, come on the wrong day. We represented that being strangers in the neighbourhood, and having come many miles, we hoped the rule might be relaxed in our favour; but all to no purpose; the owner of the house was absent, and his sister, or daughter, whichever she was, would not be mollified. Of course we drove away disappointed, and somewhat annoyed; it has been our good fortune to experience so much courtesy at the residences of the highest in the land, that we were unprepared for this rebuff. Such a rule is no doubt necessary, and in the case of visitors from the locality who can come any other day, it is quite right it should be enforced; but with strangers from a distance who may never again be within many miles, it is a pity to miss the chance of doing a kindly, graceful act. We only hope Mr. and Miss — may some day find them-

selves in our neighbourhood, and may request to see our place, and then, with what punctilious courtesy will we have them show everything!

Driving away, we passed near to a handsome piece of water, with an island, and a suspension-bridge across; but, here again, the genius of incongruity had marred the beauties of nature. Each of the three piers of the bridge was capped by one large white Italian vase, all three alike, and all three doing nothing, apparently, but stand there ready to catch the rain that seemed about to fall from the leaden-coloured cloud above. Surely some better termination might be invented for the somewhat unsightly long, flat piers of a modern suspension-bridge, than replicas of ancient vases?

Then, on we drove to Godmersham Church; but still another disappointment awaited us. The church-door was locked, and we were unable to obtain the key. Our effort to do so from the house adjoining the churchyard, and which we supposed to belong to the clergyman, was met with such a decided rebuff from a surly four-footed creature (and from an equally surly two-footed ditto), that we thought it wiser to refrain: so were forced to content ourselves with nothing, on the outside of the church the very early lancet east end; the Norman west door, the head of which is filled in with diapered stones, apparently inserted there for preservation; the Norman clearstory windows, with the peculiar plain flat mouldings; and the large tower, on the north side, with loop-hole-like openings and larger windows. We could see some nicely-carved trefoiled screen-work within; and a very good modern carved-wood porch has, not long ago, been placed on the south side, with a corresponding lych-gate at the entrance of the burial-ground, covering a small bridge over a tiny stream.

Boughton Church came next on our list,— "Boughton Aluph," as it should be written. It is large and has a central tower. The windows are some Decorated and some Perpendicular; but they have been so fearfully neglected, built-up, and messed in every way, that we could feel small interest. Inside, the arches are very lofty, with the same spindly columns and ugly capitals, out from a circular moulding into an eight-pointed scooped-out abomination,—a fashion that prevailed at one time in this part of Kent. The floor, of red brick, descends one step to the chancel. . . . This ended our explorations, and we returned, hungry and tired, to Folkestone, but thinking we had done a good day's work.

On Sunday morning, spite of wind and rain, we mounted the steep incline and stairway to the old church on the cliff. This has recently been thoroughly restored, and High-Churchly decorated. Mr. Woodward is the vicar. We were placed, in a pew close to the very fine organ and most perfect choir, under the central tower, one of the huge piers of which screened the altar from our view, and this was quite as well for our peace of mind, as we have no "Roman" tendencies. By this last sentence, the ceremonial observed can easily be imagined. Close to us, one young idiot belonging to the choir deliberately crossed himself at some sentence of the Creed; and a female, who came in after the morning service, to attend the Communion, made a reverence to the altar, crossed herself, and knelt down to pray. "What are we coming to?" said one of our party; nevertheless, we cannot but appreciate most thoroughly the perfect singing and exquisite music the "movement" has introduced into our churches. May I still say "Anglican churches?" Possibly; but no longer "Protestant!" The youthful organist was evidently an enthusiast in his art, and seemed to pet and converse with his instrument as if it were his familiar friend. He luxuriated among its multitudinous stops, using a different one, and thus varying the tone, for the response after each commandment; and he laid his head close to the keys, as if to catch their most delicate breathings. Possibly, too, he was proud of his choir: well he might be, for it was just about perfect,—sweet, full, rich, deep, and most exact as to time. Nor must the youthful preacher be passed over in silence. From the text, "In my Father's house are many mansions," he gave us a sensible and practical, though not a very eloquent, discourse, to the effect that those only who live the best lives on earth can hope to inherit the best mansions in heaven; and that it is those alone who do the will of God here who can be fitted to dwell with Him hereafter.

Service over, we went out to find the sun brightly shining; so we walked along the promenade on the cliff, the Lees, to the extremity

of its houses, and were amazed to see the numerous palace-like abodes springing up everywhere; and again in the afternoon, when we drove out to Sandgate and Hythe, the wealth and prosperity, as evidenced by the house-building, perfectly astonished us. Sandgate is two miles from Folkestone, and unless some unforeseen check should arise, it will very soon be joined on to it, as Hove is to Brighton. But there is no comparison between the attractions of the two localities, Brighton and Folkestone. The former is superior in but one point, its nearness to London; and that, after all, is but a doubtful advantage, for this very nearness it is that vulgarises it. Folkestone can boast a more picturesque town; a busy harbour, full of life and animation; steam-packets starting and returning, whose arrival and departure afford continuous excitement to its youth; it possesses a magnificent sea, covered with shipping; a fine stretch of gently-sloping, and therefore safe, beach for bathers, free from all sediment or seaweed; a beautiful surrounding country, large trees and green grass growing close to the sea-shore; and the most magnificent downs for walks, rides, and drives, where objects of interest for the archaeologist are sown broadcast, as it were: Roman camps, ancient and modern British earthworks, and Medieval churches. The grand, rolling, swelling downs, rising one above another, are alone enough to turn any lover of nature perfectly crazy with delight; and then there is the fine broad expanse of shipping-covered sea, everywhere closing in the picture.

Such were our meditations as we drove along the shore to Sandgate, which lies embosomed in a hollow of the downs, and rises gradually house above house, interspersed with trees and gardens, up the green slope, which is crowned by the camp of Shorncliffe, at the summit. At Hythe we came upon the military canal, constructed in 1805, for the conveyance of troops, at the same time that the martello towers along the coast—very numerous about Folkestone and its neighbourhood—were erected.

A long yellow barrack looks down upon it from a short distance, green grass clothes its banks, and tall trees wave above all. Hythe Church is known to have special objects of interest, but on Sunday afternoon we did not care to climb up to the high ground where it stands perched above the town. It has an Early English triple chancel, the main portion raised eight steps above the nave, and the altar still three steps more above the chancel, producing an imposing effect from the west end. Round the chancel runs an arcade formed of Bethesda marble, which greatly resembles that from Peterworth, being full of minute shells. Bethesda lies two miles from Flockley, a station on the South-Eastern Railway. Its quarries are but little worked now, though the marble was extensively used formerly, as seen in Canterbury and Rochester Cathedral.

Returning, we drove up on to the downs and through Shorncliffe Camp. Those persons who have seen Aldershot will understand exactly the sort of place it is, for Shorncliffe bears a strong family resemblance to its younger brother. On a circular grass-plot, outside a row of huts, we were somewhat startled to come upon a fine stag, tethered by a rope attached to a collar round his neck. This pretty creature is the pet of the 3rd Buffs, and probably—like the goat so well known during the Crimean war—he also accompanies the regiment on all its marches. The encampment was formed in 1806. Sir John Moore trained many of the old Peninsular regiments here.

Cheriton, with an inviting-looking old church, had to be passed, on our left, unvisited. The downs all along the way are grand in the extreme. They rise in a series of abrupt conical hills, of which Sugar-loaf Hill, or Cassar's Camp, with its treble line of earthworks, are the largest and most remarkable. Gazing along the whole range, one cannot fail to be struck with the idea, "What a wondrous site these downs would be for the annual volunteer review." Imagine a supposed invasion from seaward, half Britain gullied on the heights ready to repel the audacious foreigner. Then, a landing effected at various points along the beach; and then the grand swoop downwards of England's gallant sons, like an eagle from its eyrie, and their wild rush and ringing about, as they drive the invaders back into the sea.

By no means satisfied with our imperfect view

of Folkestone Church yesterday, we climbed up to it again this morning. Its doors stand always open, and service appears to be almost always going on; but we fortunately arrived opportunely, and had nearly half an hour for our survey. The appearance of the east end is very rich. Three lancet windows, filled with coloured glass; and above them, similarly filled, a large opening, which was originally a rose-window, but is now elongated internally, into the vesica form; a carved alabaster or parti-coloured marble reredos, the wall on each side concealed by gorgeous drapery; a rich needlework altar-frontal, of gold thread and silks; pots of flowering plants; needlework carpets, and kneeling squares; two lofty brass and coloured gaseliers; every inch of wall and ceiling covered with decoration: these items may well suffice to form an imposing whole. On the south wall of the chancel an elegant illuminated brass cross, some 12 in. or 14 in. long, marks the spot where the consecration-cross is said to have been discovered. On the north wall, a niche with a sharply-pointed head is, I presume, the credence-table; and here stood a highly-ornamented book and stand, the book open, and an elaborate "marker" laid across it. On both north and south walls is a deep recess or closet, about 3 ft. square, divided by a stone partition down the centre, but without doors or (so far as I could see) any trace of hinges,—ambries, I suppose, but so large!

The altar-rail is raised two steps from the floor of the chancel; and outside this, built against the north wall, stands a very beautiful tomb, or Easter sepulchre, as we thought. The figure of a mailed warrior now reposes there, but evidently without any title to its position save possession. The lower portion has been richly carved, with small figures in compartments, and bearing, we imagined, emblems of the Passion. One, who is weeping, carries a thing like a scourge, for instance; and at the back of the arch, a very ornamental but much-defaced bracket was, most likely, intended to hold a lamp. The front of the arch is formed by a band of delicate pierced tracery, of trefoils, the upper leaf pointed, the two lower circular, which has a very beautiful lace-like effect. The few remaining of the handsome crockets, which once ran up each side of the gable, show careful work, joined to bold, flowing outline; but fine filial and delicate cusplings have all vanished. On the opposite side of the chancel, a modest brass commemorates Joan, mother of the celebrated Dr. William Harvey. He was born at Folkestone, April 1, 1578; and she died in 1605. A handsome seventeenth-century monument in the south aisle—formerly a chapel belonging to the Herdson family—in memory of John Herdson, bears two kneeling knights in armour, each in an arched recess. Over the tower arch is an elaborate painting representing Christ enthroned, with a fawn's saint kneeling right and left before him.—Saint Mary and Eanswythe we presumed, they being the patron saints of the church. Saint Eanswythe was daughter of Eadbald, king of Kent, who about 630 built a nunnery at Folkestone by request of his daughter, who became its first abbess. The nunnery was destroyed by Danish pirates, and in 1095 a Norman priory arose on its site; in 1138 the encroachments of the sea obliged the monks to be removed, and a hundred years later both priory and church had been swept away by the waves. A church on the cliff, where the present one stands, and, like it, dedicated to Saints Mary and Eanswythe, appears from ancient writers to have been coeval with the Norman priory.

In the painting over the tower arch, of which I was speaking, the emblems of the four evangelists are represented issuing from the throne, the angel and eagle above, the winged lion and the bull below; these the artist has painted a dull red, which has a most singular appearance, making them look much more like fiends being chased from the presence of the Lord, than representations of anything good and holy.

A very handsome effect is produced in the centre of the church by the broad mouldings surrounding the lofty tower arches, and which, running down to the ground between the columns, give the massive piers the appearance of huge pillars carved out of stone. On one of these mouldings, the ubiquitous hour-glass mark—but much flattened, looking at a distance more like the N mark—displays itself.

This church investigation over, we paid our pennies and walked on the pier till it was time to get into the train for Tunbridge. We flattered ourselves we should have a pleasant ramble about

Tunbridge Castle, but found, to our no small chagrin, that visitors are no longer admitted. A tradesman in the town informed us the ruin and grounds had been recently purchased by a widow lady named Leigh, who had fitted up the mansion attached, and had come to reside there. The next best thing for us to do was to take a boat and float about on the Medway, here quite a baby river; but a dirty baby though, sadly in want of cleansing of its mud and clearing of its bushes, which hang over and frequently touch the oar on both sides at once. The youth who rowed told us a different story about the castle. He said it was taken by a French lady, whose name was something like Senior; that she came down a fortnight or three weeks previously; that she is a friend of the French Emperor, and he is expected down to visit her at the end of this month. If this latter account be true, it will afford a grand piece of excitement to quiet little Tunbridge.

We found "excitement" at such a low ebb that we took the next train on to Tunbridge Wells. Here, all is life, busy life; building, marketing, driving, walking, gossiping, and so forth. Hiring a little open vehicle, we drove across the common,—so nicely laid out with trim walks and drives, and convenient seats for the weary,—on to Southborough. Again, evidence of wealth and vitality everywhere perfectly astounded us. Looking back from any height, handsome houses, detached or in groups, are visible on all sides, stretching for miles and miles away; most of them, as seen by the numerous and fine trees interspersed, being surrounded by spacious pleasure-grounds. Where can all the people come from able to live in such mansions, and whence, above all, comes the wealth to support all this luxury? Such were our meditations as we turned our faces homewards. Surely the secret lies in the magic word, "PEACE!"

R. F. H.

SEWERAGE WORKS, FRANKFORT-ON-THE-MAINE.

FROM a report recently presented to the Frankfort authorities by Messrs. W. Lindley and J. Gordon, the chief engineers of these works, it appears that out of a total sum of 108,833*l.* granted for the works since their commencement in 1866 the sum of 89,644*l.* has been expended in the construction of 97,789 lineal feet (about nineteen miles) of sewers, the average cost of the works executed up to the date of the report being thus 18*s.* 4*d.* per lineal foot. The balance of the sums granted is now being expended in the completion of various districts; and in the report from which these particulars are extracted it is proposed to commence the drainage of four fresh districts, for which 50,499 lineal feet of sewers, at an estimated cost of 55,000*l.* will be required. It is expected that these works will be pushed forward this summer, after their partial stoppage by the war.

New waterworks are also in progress of construction at Frankfort, which town will, on the completion of the two undertakings, hold a high rank as regards sanitary improvement.

ROYAL ARCHITECTURAL MUSEUM.

THE report of the council about to be issued says,—"The latest, but by no means the least of its transactions the council records at starting, as one vitally affecting the future welfare of the Institution, and as calling for a prominent expression of gratitude for the very hearty co-operation which the council received on this occasion,—that through the generous aid of its friends of the Museum the council is now enabled to announce the all-important fact that the Institution is free from the mortgage debt with which it was encumbered.

It is due to the generosity of Sir William Tite, M.P., and to the readiness with which others followed his example, that the annual resources of the Museum can now be devoted to the promotion of its intentions, instead being crippled by an annual charge for repaying the debt on its building, and for the interest thereon. At the date of the last report the debt was 1,000*l.* Donations, including 25*l.* from the Goldsmiths' Company, enabled the council to pay off 100*l.*, leaving 900*l.* to be raised within the four years over which the mortgage debt was extended. Then came the offer of 160*l.* from Sir William Tite, on condition that the remaining 750*l.* should be subscribed for within a month. Not only was the condition complied with, but the council believes that there will

a surplus to enable it to provide articles of furniture, fittings, &c., for the use of students, in which the Museum has hitherto been sadly deficient. The list of donations will be found printed after the names of the annual subscribers.

By an arrangement with the committee of the Architectural Art Classes, established in the Museum Buildings, the Upper Gallery has been raised round, and access to it obtained by the erection of a permanent staircase from the floor beneath, thus rendering the whole of the Museum accessible to visitors, and providing increased space for specimens arriving from time to time. Among these are about 1,100 casts from Arians Cathedral and other places, lent by the Science and Art Department, South Kensington; Classic casts from the Royal Academy, in exchange for duplicate specimens of Gothic work in the Museum; &c.

CALIFORNIAN ARCHITECTS.

We have received accounts of a remarkable instance of disinterested and kindly feeling amongst architects, from San Francisco, California Alta. The San Franciscan and other architects having competed for the designs of the proposed New City Hall and Courts of Law there (lately illustrated in our pages), and the first premium having been gained by Messrs. Fuller & Laver, of New York, the San Franciscan architects, many of them competitors, congratulated Mr. Laver, who was then at San Francisco, on the success of his firm, and called on him in a body before his temporary departure for the East, when he was heartily welcomed as a new fellow-citizen, and the most cordial feelings were reciprocated. There are no less than forty-seven architects, and a great many art-workmen, in San Francisco.

THE ARTISTS' ORPHAN FUND.

The dinner in aid of this new fund, to which we invited our readers, took place on Saturday evening last, at the Freemasons' Tavern. H.R.H. the Prince of Wales presided, and about 350 gentlemen sat down, a great proportion of them being well known and eminent. Sir William Pitt and others had given large sums, so that, as the Prince announced, in the course of an excellent address, the committee saw their way to about 7,000*l.* of the 10,000*l.* for which they went in. Such, however, was the earnestness with which Mr. P. C. Hardwick (the treasurer), Mr. Millais (the honorary secretary), and the stewards, had worked, that at the close of the dinner the total was announced to have reached the magnificent sum of 12,308*l.*

The Duke of Wellington threw a bomb-shell, which "flattered" some of the guests, when, in the course of his speech, he said they were met to aid the orphans of those "who had been frowned on by Fortune and the Royal Academy." But Sir Francis Grant was equal to the occasion. He had been commanded, he said, by the Council to add to their first subscription 1,000*l.*, making 1,500*l.* in all; "and this, your Royal Highness," continued the president, "is the way in which the Academy 'frowns' on its poorer brethren."

The Hon. A. Kinnsaid and Mr. Doran brought a memorable evening to a merry end in proposing and replying for "the Ladies;" and every one went away saying he had had a good dinner.

THE FOUNTAIN COMPETITION: BOARD OF WORKS.

At a meeting of the Metropolitan Board of Works held on the 5th inst., the Board considered a report from the Parks, Commons, and Open Spaces Committee, stating, with reference to the designs sent in for a fountain on the Victoria Embankment, that the committee had selected six of them, bearing the following mottoes, viz.,—"Aquarius," "Combination," "Natura," "Siren," "Undine," and "Well-considered," as being the most suitable and meritorious, and recommending that the first and second premiums be awarded to the authors of the designs "Aquarius" and "Combination" respectively. It was stated that the first design selected was by Mr. Waldeck, and the second by Mr. Mackenzie, the landscape gardener to the Board. Mr. Healey moved, and Mr. Furniss seconded, an amendment that the second prize be awarded to the design signed "Natura," instead of to that

signed "Combination." This amendment was negatived, the original motion agreed to, and the subject was referred to the Parks Committee for consideration and report.

The selected design is one of those we pointed out as best deserving of consideration.* We cannot say the same for No. 2, in which the basin is borne, after a very old and worn-out type, on the upraised tails of three dolphins. The design is in other respects of a very indifferent character, greatly inferior to some we named.

TENDERS FOR THE CHELSEA EMBANKMENT.

At the meeting of the Board of Works last week, tenders were received for the Chelsea Embankment and Northern Low-level Sewer works from Chelsea Hospital to Battersea Bridge. Our readers know that two firms to whom the contract had been previously awarded had declined to carry it out. The first who obtained the contract, presenting the lowest tender, a week afterwards discovered a mistake in calculation of something like 10,000*l.*, and thus declined to carry it out for the sum agreed upon. The next lowest tender was then accepted; but here, again, as we have before stated, another difficulty interposed, as the contractors objected to do a certain amount of work without receiving payment, in place of finding security for the due performance of the work, and that being considered essentially necessary, from the experience which had been gained, the Board had no alternative but to advertise for fresh tenders. There were about seventeen of them, the highest being 177,860*l.*, and the lowest 110,900*l.* After a long discussion, on the public being admitted, it was announced that the Board had accepted the tender of Mr. William Webster, for 133,950*l.*, as that gentleman had done the most important works ever executed for the Board, including the Southern Main Drainage, the Southern Thames Embankment, and the formation of the new street to the Mansion House, and the sewer under the Northern Thames Embankment.

CONFERENCE OF ARCHITECTS FOR 1871.

We are pleased to learn that the arrangements are rapidly becoming perfected, and that there is every hope of a successful meeting. The sectional secretaries on whom the duty devolves of collecting papers to be read have made considerable progress, and we would point out to any of our readers who may be willing to take part in the proceedings of the several sections that they should immediately send their communications to the respective secretaries of the sections, or to the secretary of the Institute, Mr. C. L. Eastlake, 9, Conduit-street, Regent-street.

OUR WASTE LAND.

In the course of a paper recently read by Mr. Francis Fuller, at the Social Science Association, "On the Undeveloped Agricultural Resources of the Soil of the United Kingdom, and the Necessity of Increasing Production and Employment," the reader said, my position is, that whilst, for their own benefit, as well as for that of the labouring classes, it is advisable for landowners and farmers to adopt a more fruitful and remunerative system of husbandry, it is intolerable that, whilst the people want food and work, millions of acres of really valuable land, which could furnish both in abundance, are lying waste. "But," I may be asked, "where are these acres?" I answer, "All around us, in every part of the country." The total area of England, Scotland, Ireland, Wales, and the Channel Islands is 77,513,585 acres, of which 45,652,545 are returned in 1869 as "cultivated" and 31,861,040 as "uncultivated." Writing off from the latter the 11,000,000 and odd acres as unfit for profitable cultivation, and 10,000,000 as only fit for plantations, &c., there remain 10,000,000 acres which, it is represented by the Industrial Employment Association, and acknowledged by many who are well conversant with agricultural capabilities and values, are as eligible for profitable farming operations as a large quantity of the land now under tillage. A great deal of the waste is undoubtedly good land, a great deal of it average, and admitting that some of

it is inferior and below the average, can any sensible person doubt, after the profitable results already obtained from "poor and inferior land," by applying plenty of labour, plenty of manure, and thorough ploughing, that this could be cultivated profitably? To deny it would be to ignore the evidence of standing facts.

Grant even, for the sake of concession, that after deducting from the total waste more than two-thirds, or 21,861,000 acres as irreclaimable, the whole of the remaining 10,000,000 acres are not of the average standard, but rather below it (which plainly would be conceding much more than the facts demand),—grant all this, and there is still the fact that in the signal examples of successful farming which I have quoted, the soil dealt with was "poor and inferior," yet the produce obtained was about three times the average of all the land throughout the United Kingdom. Can demonstration be more satisfactory?

Now, the proposition of those who contend that this waste land should be reclaimed is, that by vigorous cultivation, which always means the abundant application of labour, these 10,000,000 acres could be made to produce food of the annual value of from 10*l.* to 20*l.* But, putting it at the lowest, say 10*l.*, what would be the result? After the proof which has been furnished that very poor land can be cultivated with profit to produce 12*l.* or more, no one claiming to be called a farmer can be satisfied much longer with the miserable United Kingdom average of from 3*l.* 15*s.* to 4*l.* per acre. Assuming, therefore, the 10,000,000 acres of so called waste land to yield a produce of the value of 10*l.* per acre, here is an increase in the national wealth produce of 100,000,000*l.* annually, whilst the means by which it is to be obtained would give employment strictly and literally to millions of all ages and both sexes, and impart prosperity to every branch of industry. Here, upon our unclaimed lands alone, we have the power of growing, not only the vast amount of food for which we now pay foreigners, and which in some years closely approaches 50,000,000*l.*, but 50,000,000*l.* worth additional, so direly needed to fill up the vast deficit which now exists, and which, it is but too certain, causes not only want, but crime; not only suffering, but disease; and is undermining the health and lives of our people.

WINCHESTER GUILDHALL BUILDINGS.

The report of the Town-hall committee has been adopted. It states that they have received the working drawings of the proposed Guildhall and buildings, and also specifications. The architects, in preparing the working drawings, had made a few alterations. In bringing forward the building and widening Abbey Passage at the entrance, the frontage has been reduced, and consequently the offices in the front block slightly lessened in size. The two large rooms at the east and west ends, however, are of the same area as originally proposed. The alterations in the large hall consist of four more windows being inserted where it was originally intended to have merely blanks. This has also led to the necessity of a separate staircase to the balcony. The upper part of the west side of the building has been made to correspond with the east side, windows being inserted, and the cornice, &c., continued round. The roof over the centre part of the building has been altered and improved. The committee proposed inviting tenders for the erection of the buildings. The estimated cost is 11,000*l.*

WINCHESTER GUILDHALL COMPETITION.

Sir,—As the time is drawing near for obtaining the estimates for the proposed Guildhall for the city of Winchester, perhaps you will permit a few lines to be addressed to you on the subject.

There can be no doubt that the Committee of Selection have been desirous of acting fairly. A report of a meeting, at which the successful competitors were present, leads one to believe that the estimate shall exceed the stipulated amount, the present selected design will be thrown on one side, and another selection made, in accordance with the terms of the conditions. It is quite possible that the estimate may be within the amount named, but it will be the duty of the committee, both to themselves and to the rest of the competitors, to see that they get really and substantially the same building as shown in the competitive design, as it may be so cut and pared down as to be no longer like that which influenced the committee to select it.

These remarks are prompted by the opinions of your reviewer, that the cost of that design would of itself be sufficient to exclude it from selection; and it is now for the committee to use their best judgment in bringing the competition to a termination satisfactory to all concerned.

A CORRESPONDENT.

* See p. 249, ante.

A SKETCH OF EARLY LONDON.

The primitive aspect of the site on which the City of London stands was notable for its beauty. It consisted of a range of hills covered with verdure, gently rising from the north bank of the Thames, divided by two luxuriantly wooded vales, through which swift translucent streams, known afterwards as the Wallbrook and the Fleet, descended to the river. From the commanding summits of the hills the Thames was seen at low water ebbing and flowing, clear and transparent at their feet, while it appeared at high water spread out into a lake, covering the level tract of low ground now occupied by the densely-populated districts of Rotherhithe, Southwark, and Lambeth. Immediately to the north of the City a great morass or fen, the site of Moorfields and Finsbury, extended eastward to Bishopsgate, westward to Smithfield, and northward towards Islington; whilst the country stretching away to the river Lea on the one hand, to the river Brent on the other, and to the picturesque northern heights of Hornsey, Highgate, and Hampstead, was covered by a dense forest, which was afterwards known as the Forest of Middlesex. It abounded with game, deer, wolves, wild boars, and wild hares; and that portion of it which extended from Islington to the heathy uplands of Hampstead, and thence to Highgate and Enfield, was for centuries a famous hunting-ground. Perennial brooks, fed by a thousand crystal streamlets flowing off nothing but verdure, wandered through the forest, by massy oaks, emerald glades, and fern-clad knolls, down to the river; for during the existence of the forest the rainfall was greater, and consequently much more water passed down the brooks than after it was removed. Caen and Bishop's woods, Hampstead, and the wood on the eastern slope of Highgate, are remnants of this ancient forest. In primitive times Celtic tracks traversed it from Ludgate through Fleet-street and the Strand, from Newgate through Holborn and Oxford-street; from Cripplegate through Highbury and Highgate, and from Aldgate through Bow and Stratford. It was, however, gradually cut down for supplying the City with timber for house building, and fuel for cooking and warming; and the ground as it was cleared was converted into parks, gardens, meadows, and cornfields.

Long before the Romans invaded Britain, a Celtic community of fishers, hunters, and traders occupied the acclivity sloping up from the Thames at the little port of Billingsgate. The habitations spread eastward towards the Tower, westward towards Dowgate, and northward towards Fenchurch and Lombard streets, down which a clear stream, called the Langbourne, ran westward from Aldgate into the Wallbrook, near the Mansion House. The town thus situated was the nucleus of the present giant metropolis. It was named *Llyn-dum*—that is, the hill-town on the lake, as it appeared at high water meeting on the slope of an eminence jutting out into an estuary or lake. To realise this, it must be understood that the wide expanse lying between the Kent and Surrey hills on the south and the Essex and Middlesex hills on the north, was then, as most of it is now, below the level of the highest tides. At high water, therefore, it was submerged, and assumed the character of a lake, while at low water it presented a series of mudbanks and swamps, with the river-channel winding through them to the sea. As river-beds running through estuaries are, before they are embanked, usually shallow, and obstructed by shoals of sand and shingle cast up by the sea, or deposited by the river-current meeting the tide, so it is probable that before the tidal channel of the Thames was embanked, it also was shallow, full of sandbanks, and fordable at low water of spring tides at one or more places below as well as above London. But by throwing up embankments at the sides, which was done by the Romans (who employed their legions in executing useful engineering works as well as in fighting battles), not only was the expanse referred to won from inundation, but the energy and scour of the falling tide and river-flow were so much increased, that in course of time they raised and swept away the shoals, deepened the tidal channel, reduced its slope, lowered the low-water line, permitted the adjacent low grounds previously covered by the tides to be drained and laid dry, increased the range and duration of the tides, and enabled the largest vessels to be carried far into the interior of the country independently of the wind. The embankments, which extend from the sea to

some miles above London, hold the river in a trough, high water therein being several feet above the level of the land on either side; so that were they to be broken through to admit the tides, thousands of acres of verdant marshes and fertile cornfields, and numerous populous towns and villages would be inundated and destroyed. Nearly the whole space occupied by Deptford, Rotherhithe, Bermondsey, Southwark, Lambeth, and Battersea, north of a line drawn from the river-bank at Greenwich to the river-bank at Wandsworth, equal to about ten square miles, and the entire area of Westminster and Pimlico, south of a line drawn from Charing-cross to the river-bank at Chelsea, except Thorney Island, whereon Westminster Abbey stands, were, before the river was embanked, flooded by the tides. Some parts of the former space are from 6 ft. to 8 ft. below high-water level; but the latter area has been raised from time to time, especially during the last quarter of a century, so that little of it, except the basement floors of the houses, is now under the highest tides.

In the eighth year of the reign of Claudius, A.D. 49, the Roman general, Ostorius Scapula, who was then pro-prefect in Britain, took possession of London. At that time it was celebrated for commerce, and much frequented by traders from Germany and Gaul. Under the Romans it soon became a flourishing and populous city; and, as was their wont wherever they settled, they left nothing undone to develop its resources, to render it healthy, and to improve its appearance. Thus they made hard durable roads from it to their various ports and stations; they raised the banks, already mentioned, at the sides of the river-channel and its tributaries, where the tides overflowed the adjoining marshes; they prepared parts of the adjacent country for tillage by cutting down the forests that covered it; and they deepened the bed and piled the banks of the Wallbrook from the Thames to the great morass north of the City, for the purpose of thoroughly draining it. This is attested by Roman remains found along the ancient bed of the brook, from near the Mansion House to London-wall, at 25 ft. to 30 ft. below the present surface. Besides, it is not likely that a people so well versed in the art of drainage as the Romans were, would suffer a large unhealthy swamp to exist so near to their magnificent dwellings, when it could be laid dry by simply deepening the brook winding through it. Moreover, they must have drained the southern portion of it beforehand down to the bottom of the City wall, to enable them to build this wall from the foundation upwards, in the substantial and workmanlike manner in which it was afterwards found.

After the Romans left the country, in A.D. 420, the large marsh district north of the City wall again became a swamp. This was caused partly by the choking of the Wallbrook and its tributary drains from neglect, but chiefly by the Great Ditch, which was made 200 ft. wide, outside the wall, nearly from the Tower to Smithfield, raising the drainage level of the country beyond, and filling the subsoil thereof full of water. The Romans, previously to building the wall, excavated a deep trench for it along the southern border of the marsh from Newgate to Aldgate, and thence to the Tower. This trench they drained from Cripplegate into the sewer which now runs down Hosier-lane into the Fleet; from Cripplegate to Aldgate into the Wallbrook, which intersected it near Moorgate; and from Aldgate into the Irongate sewer, which still falls into the Thames east of the Tower; and when they built the wall they left a dry ditch outside, which they planted with thorns; but in 1190-93, during the mayoralty of Henry Fitz-Eylwin, this ditch was widened, and formed into a wet ditch, by placing a dam across the Wallbrook inside the wall, and stopping up the drainage outlets at the ends. A portion of the stone culvert which received the overflow from the dam is now in existence under London-wall, in the line of the old Wallbrook. Long after the ditch was made, Stow says "it contained great store of good fish of divers sorts;" but in time it became the common receptacle for the street-sweepings and nightsoil of the city, which often made it an intolerable nuisance. The ditch is shown in the map of London made by Ralph Aggas in 1560.

The mischief resulting to the inhabitants of the surrounding district in after times by the evil influence of this ditch no pen can describe. By whom it was made, whether by Fitz-Eylwin, the mayor, or by Bishop Longchamp, the chancellor,

there is no evidence. Doubtless it was the work of the latter, who at this time pulled down part of the City wall from the Tower towards the Minories, enlarged the Tower, and isolated it by a huge moat connected with the river. Some years ago the bottom of the moat was filled with rubbish above the level of the tide; but what use the gulph is to the Tower at the present time it is hard to tell. As some set-off for the injuries caused by Fitz-Eylwin's or Longchamp's precious ditch, the space occupied by the moat and Tower-hill, from the Thames at Irongate-stairs on the east, to the Thames at Tower-stairs on the west, should be levelled, planted with trees, and thrown open to the public for recreation and health. The Great Ditch was allowed to exist for nearly 400 years before it was entirely filled up, and another century was permitted to elapse before steps were taken to improve the drainage of the morass beyond it. The site of the ditch is now occupied by Fore-street Cripplegate, Finsbury-circus, New Broad-street, Houndsditch, and the Minories.

Early in the fourteenth century the arts of brickmaking and bricklaying were introduced into England from Flanders; but it was not until the reign of Henry VI. that building with brick became general in clay districts. It was in part of the great swamp near Finsbury-square that bricks were first made for house building in the City, for repairing the Roman wall round it, and for arching over the Wallbrook through it; and it was partly into the holes left by excavating the clay for these bricks, and partly over the surface, that the sweepings from the streets, and the nightsoil from the cesspools, were deposited for many generations. It was also to Finsbury Field, north of Finsbury-square, that more than 1,000 cartloads of human bones were brought in 1549 from the charnel-house of Old St. Paul's; and in Bunhill Fields, north-west of Finsbury-square, that thousands of people who died of the Great Plague in 1665 were buried. It was, moreover, in the parishes on the western and eastern borders of the swamp, namely, in Clerkenwell, Cripplegate, Bishopsgate, Shoreditch, Aldgate, and Whitechapel, that the plague raged with more violence than at any other place within or without the City, and lingered long after it had abated elsewhere. In 1606, 3 James I., when the natural water-courses falling into the Thames in and near London, were placed for the first time under the jurisdiction of Commissions of Sewers, the City Commission arched over the streams and cleaned the ditches passing through the swamp. Owing, however, to the shallowness of the outfalls, the drains were laid only just below the surface; and, in consequence, the accumulations of liquid filth, which everywhere abounded, were let alone. From this time until long after the Great Fire, this district continued to be the common lay-stall for the rubbish, street refuse, and nightsoil of the City, as it had been for centuries before. It was therefore a pestilent slough, the effluvia constantly rising from which was wafted into the city and the suburbs, adding its poison to that continually emanating from the filth in the streets and houses themselves. Hence it is no wonder that diseases were never absent from the people, and that fearful plagues periodically broke out among them.

The Wallbrook was originally a large stream of sweet water. It rose in the forest about Ball's Pond, between Islington and Hoxton, passed through the great morass before referred to, and entered the City through the wall (whence its name), about 60 yards east from the centre of Moorgate-street. It flowed thence, clear as crystal, in a beautiful vale, winding in a south-westerly direction through the midst of the City, into the Thames at Dowgate. It was mostly on the grassy and woody slopes of this vale that the Roman military and civil chiefs built their luxurious villas and stately public buildings. For wherever excavations have been made within it down to the natural earth, which is from 5 ft. deep on the ridges to 30 ft. deep in the hollow below the existing surface, the foundation-walls, hypocausts, and tessellated pavements of these structures have been met with; and fragments of marble statues that adorned the halls and gardens, of plates and goblets from which the Romans ate and drank, and rings and bracelets that belonged to their wives and daughters, have been discovered among the earth and debris. From the eminences on either side the eye must have dwelt with delight on the charming prospect presented by the elegant buildings, gardens and statues, patches of foliage, and emerald lawns; by the clear and

sparkling brook, bordered by drooping trees, winding down to the river; and by the river itself, like a sheet of silver at high water, fringed with verdure in the far distance. But no indication of the vale is now to be seen except at Cannon-street, where the surface still dips into it eastward from St. Paul's Cathedral, and westward from King William-street. Elsewhere it has been filled up nearly level with the high ground at the sides which ran from St. Paul's Cathedral towards Cripplegate on the west, and from Laurence Pountney-hill towards Bishopsgate on the east.* The outfall of the brook was a tidal creek which the Romans formed into an open dock for their galleys, with landing-places at the sides, and the channel thence to Lothbury they made navigable for boats to pass to and from their villas and the river. From the dock a ferry crossed the Thames to Stoney-street, Southwark, whence a paved causeway, carried above high-water level, was continued through the marshes by High-street, Kent-street, and Old Kent-road, to Deptford and Blackheath, and thence to Rieborough, Dover, and Pevensey.

In the reign of Nero, A.D. 61, while the Roman general Suetonius Paulinus and his army were engaged in the Isle of Anglesey, reducing the Druids to subjection, Queen Boadicea, with the Iceni and Trinobantes, who occupied the south-eastern part of Britain, revolted against the Roman power, plundered and burned London, Verulam, and other Roman stations, and put 70,000 of the inhabitants, who were chiefly Romans, to the sword. Suetonius, on hearing of this, returned with all possible speed, and, with an army of only 10,000 men, gave battle to 200,000 Britons, commanded by Boadicea, whom he defeated, and killed 80,000. The battle was fought on the hill side north-east of King's-cross. Suetonius, or his successor Cerealis, rebuilt London, and colonised it again with people from Italy and places attached to the Roman empire. As the City had hitherto been open and exposed to assault, probably Agricola, who succeeded Cerealis in A.D. 78, enclosed it with a wall to protect it from invasion. But in time the area within this wall was found to be too small for the population, whereupon about the age of Constantine, the city was extended, and again 'encompassed with a wall of massive construction. The wall, as before observed, had a dry ditch set thick with thorns on its east and north sides, while the Fleet-brook and the Thames served as ditches on its west and south sides. It was defended by many strong towers and bastions, and had four gates (afterwards increased to seven), flanked by towers. These gates were placed on the ancient ways, leading from the city into the country. The wall was 26 ft. high, 9 ft. 6 in. wide at the base, and had an embattled parapet, 4 ft. high, and 2 ft. thick outside at top. It was built of Kentish rag stone, with two courses of large thick tiles, laid every 2 ft. apart, for bonding the rubble work together, from the ground to the parapet. The face stones and tiles were bedded in well-tempered mortar, containing pooded brick, which gave it a red colour, and increased its setting property, and the interior stones, tiles, and rubble were laid in hot liquid mortar, boiled in caldrons. This accounts for its extraordinary hardness and vitreous character. The wall extended along the bank of the Thames, near the line of Lower and Upper Thames streets, from the Tower to a fort guarding the entrance to the Fleet brook at Blackfriars, with an opening to the Thames at the port of Billingsgate, where vessels received and discharged their cargoes, and another at Dowgate, where the ferry already mentioned crossed the river to Southwark.

The Fleet brook originated in springs issuing from a richly-wooded vale dividing Hampstead-hill from that of Highgate. It wandered thence through the forest, where Kentish, Camden, and Panora Towns are now situated, to Battlebridge, so called from the battle before alluded to fought near this place in A.D. 61, between Suetonius and Boadicea, but now named King's-cross, from a hideous cement statue of William IV.

set up in 1834, where the cross-roads meet, but afterwards removed. From thence the brook flowed in a valley of luxuriant verdure, bounded by Spa Fields, Colbath Fields, Clerkenwell, and Ludgate-hill on the left bank, and by Chad's Wells, Bagnidge Wells, Mount Pleasant, Saffron-hill, and Holborn-hill on the right bank, to the Thames at Blackfriars. Three bridges spanned the brook along this part, one in the line of way leading from Portpool-lane to Turnmill-street, and thence to Smithfield; another called Holborn Bridge, in the line of the ancient Celtic track, and subsequent Roman Way, leading from Holborn-hill to the postern of Newgate; and the other, named Fleet Bridge, in the line of Fleet-street and Ludgate-hill. Between Battle Bridge and Holborn Bridge the brook received many streams, and the overflow of several wells, which together increased its volume so much that from them it acquired the name of the River of Wells. It was also called Turnmill Brook, from some mills which it turned near Turnmill-street. These mills, which belonged to the Nunnery of St. Mary and the Priory of St. John, located on the adjacent heights of Clerkenwell, must have existed from a very remote date, as in 1154 Fitz Stephen speaks of their clacking sound as being very pleasing to the ear. Before the City extended beyond the great wall that inclosed it, this valley, with its wooded heights and verdant slopes, its silvery streams and crystal springs, and its clear sparkling brook tripping over the glistening pebbles, presented a scene of sweet natural beauty such as existed at no other spot in the vicinity of London. Here it was that the youths, maidens, and citizens used to flock on summer evenings to enjoy its sweet influences, and that the parish clerks, schoolmen, and scholars, used to assemble on saints' days to perform sacred plays. Lower down the valley, without the wall north of Ludgate, the declivity was occupied by a Roman amphitheatre, and on this site was subsequently erected the Fleet Prison. Before the forest which covered the area drained by the Fleet was cut down, the outflow of water therefrom was so large and rapid that it kept the tidal-channel of the brook of "such breadth and depth that ten or twelve ships at once were wont to come up to the Bridge of Fleete, and some of them to Oldbourne Bridge."† Thence to Battle Bridge, by the same course, it was navigable for small boats. It was in King John's reign that coal began to be used for fuel in the City in place of wood and charcoal; and it was on the eastern bank of the brook, near Seacoal-lane, that the first vessels bringing coal from the Tyne, and boats with rushes for strewn the floors, and reeds for thatching the roofs of the houses, discharged their cargoes.

But in course of time dwellings were erected on the heights and slopes of the valley, and offensive trades, such as tanners, cattle-slaughterers, horse-boilers, tripe-dressers, gut-spinners, and sausage-skin makers, were established on its banks. From thenceforth the beauty of the valley gradually disappeared; and by allowing the solid and liquid refuse arising from these trades to pass into the brook, and the slopes and waste water from the houses to fall into the streams communicating with it, its purity was destroyed, and its channel down to the Thames became choked with the filthy deposit, the stench from which was almost unbearable. Efforts were frequently made, by removing the mills erected over it, by bringing the water from the Hampstead Ponds along its channel to the City for household purposes, by prohibiting the trades from casting offal into it, and by appointing rakers specially to keep the channel clear, to bring it back to its ancient state, but without success. Indeed, by laxity of attention on the part of those whose duty it was to prevent or find a remedy for the evil, and on the continued increase of dwellings on its drainage area, and of insalubrious trades on its banks, whence additional quantities of solid and liquid refuse were thrown into it, it became more polluted and noisome every day. Thus from a clear translucent stream, that watered the meadows, gladdened the villages, charmed the valley, and ornamented the City, through which it passed, it became a foul and filthy ditch. The history of this stream is just that of every stream throughout the country where sewage from dwelling-houses and factories is permitted to flow into it. This may be a ready and easy method of disposing of the sewage, but it is not sanitary drainage; in truth, during the

last twenty years the health of towns has been purchased by polluting the natural streams of the country.*

In 1606 the City Corporation endeavoured to utilise and improve the tidal channel of the Fleet from the Thames to Holborn Bridge, by building walls and making wharfs at the sides, and by placing floodgates across it to flush away the deposits. But this also failed, both commercially and sanatorially, as, indeed, everything in the latter respect was bound to fail so long as foul drainage, ordure, and offal were permitted to be discharged into it. Directly after the Great Fire the channel from Holborn Bridge to Fleet Bridge was covered in by two culverts, placed side by side, each being 14 ft. high by 6 ft. wide, and Farringdon-street was formed, and Fleet Market was established, over it. Subsequently, when Blackfriars Bridge was built, the remaining part from Fleet Bridge to the Thames was arched over by a culvert, 13 ft. 6 in. high by 12 ft. wide, and Bridge-street was made leading to the bridge. In Farringdon-street by Ludgate-hill the ancient bed of the brook is 26 ft. below the present surface of the street.

The natural streams passing through the City could have been preserved from pollution at this period by laying drains along their banks for receiving nothing but the liquid refuse from the houses and factories, with settling pits within or attached to the factory premises for preventing heavy matters and offal from entering the drains. A main drain could also have been laid down by the river-side for receiving the sewage from these drains, and using it for agricultural purposes along its course. As the town increased on higher levels northward, similar drains could have been laid in or near the brooks for receiving the refuse drainage only from the houses, with catch-drains carried across the valley lines, and disposing of it as above. Connexions could also have been made from the brooks and river for occasional flushes to pass from the former through the latter. By these means the natural streams and the river would have been maintained in a comparatively pure state, and agricultural produce increased.

The Thames is the most important commercial river in the world. It gushes forth as a spring in Tewsbury mead, near the Cotswold hills, in Gloucestershire, gathers volume and strength by each contributing stream as it glides onward through the valley, and falls into the sea at the Nore. The direct distance from its source to the Nore is 110 miles; but its actual course is 215. At London its width is from 700 ft. to 900 ft., at Woolwich it is over a quarter of a mile, at Gravesend half a mile, and at the Nore six miles. The tide flows up the channel nearly one-third of its length to Teddington Weir, which is sixty-three miles above the Nore, and eighteen miles above London Bridge, to which point it is navigable for large ships. At Teddington Weir high water is two hours later, and high and low water marks are respectively $1\frac{1}{2}$ ft. and $16\frac{1}{2}$ ft. higher than at London Bridge. As the flood-tide advances up the channel it rolls back the ebb currents; so that the body of water in the channel at high water is salt for about twenty-five miles above the Nore, brackish for the next ten miles, and fresh from thence upwards. But owing to the tidal oscillation between Teddington and the Nore the river water that passes Teddington during any day works to seaward only one mile each tide; that is, it does not arrive at the Nore, until thirty days after. According to Norden, who wrote nearly three centuries ago, the mean tides did not flow higher up the channel than Richmond. He says, "the River of Thames ebboth and floweth as farre as Richmond, sometimes farther, sometimes not so farre, neere sixtie miles from the maine sea."‡ As the tides now flow up to Teddington, which is three miles above Richmond, it is evident that the river-bed from London upwards is deeper now than it was three hundred years ago. The river-bed would be deeper still, and the low-water line lower, were the obstructions formed by the piers of Battersea and Putney Bridges to be removed.

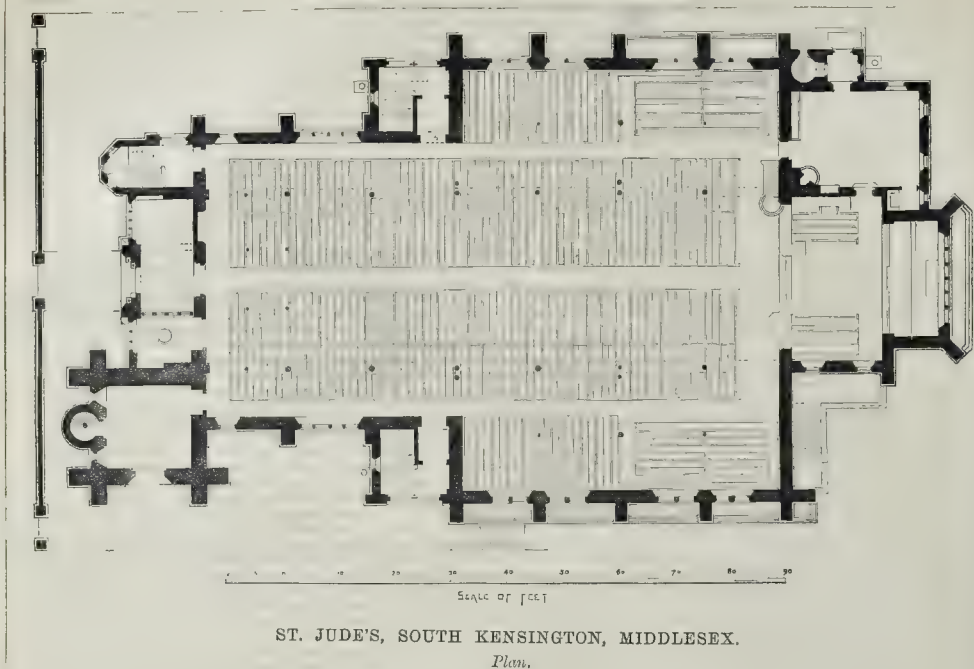
Before the soil drainage of London and adjacent towns was permitted to pass into the Thames the stream was so pure and sweet that it teemed with salmon, barbel, trout, bream, and other fish, the catching of which gave employ-

* Probably only few persons who now occupy the City, are aware that its present surface is from 5 ft. to 30 ft. above the natural surface, which eighteen centuries ago was occupied by the Romans. The rubbish accumulated each time the City was destroyed by fire; the debris deposited along the beds of the brooks, with their subsequent arching over, and lying up to the level of the adjoining high ground, and the raising of the lower parts of the streets and lanes, as also of the ground floors of the houses abutting thereon, have tended to elevate the City above the original surface, which was every where much more uneven and undulating than the existing surface.

† Act 31, Edward I., 1307.

* The recommendation of the General Board of Health, namely, "that it is far less injurious to the public health to have the refuse of towns in water in the next river than underneath or amidst dwellings," may have conducted to this.

‡ Norden's Middlesex, 1683, p. 10.



ment to a large waterside population, and supplied the people with a cheap and wholesome article of food.* The foul condition of the river in modern times, the destruction of the fish, and of the trade of fishing therein, and the thick deposit of silty mud along its shores, are caused by the sewage from houses and factories entering the same drains that receive and discharge the rainfall or surface drainage. Twenty years ago, when the main drainage of London was determined upon, it was proposed to restore the river and the natural streams to their original purity by separating the sewage drainage from the surface drainage. This, however, unfortunately for the metropolis, and for the towns and country below it, was ignored, and the opportunity of remedying this great evil was lost. In ancient times the middle and lower classes consumed much more fish than meat. This was owing not merely to the plentifulness and cheapness of the fish, but to the rigidity with which the fasts of the Romish Church were observed. Thus Friday-street, Cheapside, acquired its name from being a great market for fish on Fridays. In the reign of Elizabeth two thousand wherries and other boats, and three thousand men were engaged on the river between London and Westminster,—some in fishing, some in carrying people up and down and across the river, and some in conveying merchandise to and from the vessels and the shores. From the earliest down to recent times the Thames was the great highway or channel of communication to and from the sea and the interior of the country, and from one end of London and Westminster to the other, and the royal road to and from the palaces of Westminster, Whitehall, the Tower, and Greenwich. Each City company had its retinue of barges and wherries, and each palatial residence on the

* "What shall I speak of the fat and sweet salmon daily taken in this stream, and that in such plenty as no river in Europe is able to exceed it? But what store of barbel, trout, chub, perch, smelt, bream, roach, dace, gudgeon, flounder, shrimp, &c., are commonly to be had therein. I refer me to them that know by experience better than I, by reason of their daily trade of fishing in the same. . . . The water itself is very clear, and in comparison near unto that of the sea, which is most subtle and pure of all other, as great rivers are most excellent in comparison of small brooks." *Holinshed's Chronicles.*

river bank between Thames-street and Westminster, its water-gate and boats.* On high days and holidays the river, with its host of boats filled with merry people, and its processions of gaily-dressed barges, was a sight well worth beholding. The picture-heading to the *Illustrated London News* gives a fair idea of what it was a quarter of a century ago.

London is the first large tract of high ground met with from the sea rising directly from the north bank of the Thames, and communicating directly with the country to the east, west, and north. Hence the Romans selected it for their chief station, and made straight, durable roads from it over hills and rivers and through woods and marshes to their landing-stations on the south coast, and to their stations or cities in various parts of the country. From a stone standard, which they set up in the Forum on the left bank of the Wallbrook, they reckoned distances along these roads, as is done to this day from the General Post Office. Part of this stone is preserved near where it was set up, in the front wall of the church opposite Cannon-street railway-station. It has been a moot question whether the Romans built a bridge across the Thames at London. That they did so in the line of High-street Southwark, and Fish-street-hill, for the more easy passage to and fro of their legions, and of their vehicles containing provisions, war implements, and building materials, is almost certain. For it is not probable that a people who embanked river-channels running through vast estuaries, who raised strong earth and stone walls across the island, who built walled cities in different parts of the country, and who connected these cities with each other by permanent roads, would be content to cross the Thames to and from their chief city by a mere ferry-boat. The bridge was probably built of oak timber, which could then be obtained in great abundance from the adjacent forest. That a timber bridge existed here in

1008 is certain, because in that year a dreadful battle was fought around and upon its south end, between the Saxons and Danes, when the latter were defeated, and the bridge was nearly destroyed. Doubtless this bridge had often been repaired and rebuilt by the Saxons during the 600 years that had passed away since the Romans left the island. Directly after the battle the bridge was restored. Subsequently, however, it suffered great injuries, particularly in 1091, by a storm, and again, in 1136, by a fire, which also consumed a large portion of the City. Forty years after this, in 1176, a stone bridge was begun on its site, which was finished and opened for traffic in 1209. To enable this bridge to be built it has been supposed that the Thames was diverted by a canal extending from Rotherhithe to Battersea, the remains of which were said to have been traced before the marshes were built upon. This would have required the canal to be embanked to prevent the tides from inundating the marshes, and a cofferdam to be made above and below the bridge to keep the tides from flooding the works. The canal referred to was doubtless the large natural watercourse which drained the southern portion of the marshes and the range of hills to the south. By entering this watercourse at Rotherhithe, and coming out at Battersea, Canute the Dane, in 1016, passed London with his fleet of ships. This bridge, which had nineteen arches and eighteen massive piers, obstructed the ebb-currents so much that low-water level was 4 ft. higher above it than below it. To shoot the bridge, therefore, in a wherry, at low-water, was considered a dangerous feat, and many persons were drowned by attempting it. The bridge, also, by raising the river-bed and the low-water line above it, raised the drainage level of the low flat districts of Westminster and Pimlico, and of Lambeth and Battersea, so much as to keep those districts always in a very wet state, especially after heavy rains. While, therefore, the bridge remained, they could never be thoroughly drained; but when it was removed, which was done directly after the opening of the present bridge, in 1831, the low-water line was again lowered several feet, which enabled them to be drained to a proportionately lower level. They are now, in consequence, nearly covered with houses.

JOHN PHILLIPS.

Slow's "London."



ST. JUDE'S, SOUTH KENSINGTON.—MESSRS. GEORGE & HENRY GODWIN, ARCHITECTS.

ST. JUDE'S CHURCH, SOUTH KENSINGTON.

INSTRUCTIONS on the part of the original promoters of St. Jude's, South Kensington, that the church should accommodate 1,600 persons; be instructed with iron columns, so that no obstruction might be produced; and that the expenditure should be comparatively small, regulated in design, and led to the plan and internal aspect which we now illustrate. We have already published a view of the exterior of this building, and some descriptive particulars, to which we must refer such of our readers as desire to know more about it.* We will briefly recapitulate that the church is 131 ft. long internally, exclusive of west porch; 49 ft. 3 in. wide, including aisles of nave, and 76 ft. 3 in. in aspect; the height of the iron columns carrying the brick arches is 20 ft.; and the height of the interior to the underside of boarding under the ridge of main roof, is 54 ft. 6 in. The difference in the ground levels, led to the formation of a large lecture-hall below the east end of the building; and the floor of the church is mostly a brick arches and iron girders. The chancel, or apse, turned in brick, has a span of 26 ft. Messrs. George & Henry Godwin were the architects, and Messrs. Myers & Sons erected the building; the amount of the contract being 11,300*l*. exclusive of the tower, pulpit, and font. The seats are of deal varnished, with the exception of those in the chancel, which are of oak. The organ chamber, large and lofty, is over the vestry, and the organ is played from the chancel.

The Rev. R. W. Forrest, the incumbent, has ready a very large congregation; and it may be worth note, as furnishing data in an important inquiry, that the reader and preacher in be well heard in every part of the church. The architects claim no special credit in this respect, but are content to rejoice in the result. They did their best to bring it about, but they now well the uncertainty which prevails, and that it is nearly impossible to predicate with exactness as to the acoustic qualities of a building. Mr. William Jackson has recently commenced a number of good houses on the land near to the church.

PATENTS AND PATENTEES, RETROSPECTIVE AND PROSPECTIVE.

QUEER patentees to bless their happy stars in being placed under the tutelary guardianship of the Lord Chancellor and his two lieutenants, the Attorney and Solicitor General? His lordship is well known to be the keeper of the Queen's conscience, one of the first peers of the realm, has the honour of a mace and the dignity of a purse adorned with rich embroidery of bullion lace, a symbol of the all-devouring maw that swallows up the shower of fees that fall into its golden jaws; and for all this state and dignity what is its return? A lamp of figured wax, slung to piece of hieroglyphic parchment.

This mystic talisman is supposed to give protection to those who rack their busy brains, and so frequently empty their pockets, to purchase his hopeful but illusory charm. It has royal honours and sovereign virtues. It is entitled, Her Majesty's Royal Letters Patent, to which might be added the word "lottery," in imitation of the seductive "limited" which we so frequently tagged on to the tail of speculative companies. It is well that mechanics who are inclined to improve their minds and exercise their faculty of invention should know to what honourable company they have to appeal for protection for the products of their teeming brains and busy hands. All this information can be had for a few pence. It is cheap and useful, and can be found in many almanacs. They will be in honourable company, and laborious inventors ought to be proud to see what great minorities of the law they support by their restless industry. It must be satisfactory to know that patents are profitable to some one, if not always to inventors. Here is the title, to begin with: "Great Seal Patent Office and Office of the Commissioners of Patents for Inventions." These commissioners are "the Lord Chancellor and the Master of the Rolls." It might be expected, their workshop abuts on anancery lane.

Then, look at this very pretty statement, noted in all its virgin purity:—"The total count of fees payable to the law officers in 1870-71 is 15,973*l*," out of which our excellent

friends, the Attorney and Solicitor General for England claim 8,400*l*.; then comes the Lord Advocate, but he is a moderate-minded man, and only claims 850*l*.; the Attorney-General for Ireland gets 1,200*l*.; and the Solicitor-General, 800*l*. All these pretty pickings are received from fees; so, you see, the patent trade is profitable to some one.

There is also the "Patent Division," with a series of happy first-class clerks, who, let us hope, are all first-class men. Then there is the "Specification Division," with another series of first-class clerks,—a library clerk to look after the books; a financial clerk, with a sharp eye to the fees; and a "translator," no doubt well furnished with a fine collection of technical dictionaries: all, of course, with the usual allowance of assistants and happy juniors.

Then there is the "Patent Office Museum," at Brompton, which has a real, visible, tangible, and useful existence, and seems, to our poor comprehension, to be the only real thing in this multifarious catalogue. Last, but not least, there is also the superintendent of the Museum, Mr. Bennett Woodcroft, F.R.S., to whose exertions and unceasing industry the mechanics of England will readily and cheerfully admit their many obligations. He has had a hard up-hill fight; he has fought it well and continuously; and let us hope he may live to see the "crowning mercy," in the shape of a spacious museum, suitable to our wants, worthy at once of the mechanics of England and of the nation. When this happy day comes, then Mr. F. P. Smith, the worthy curator, may have "ample space and verge enough" to make a full display of his many articles, from the old moth-eaten germ of the first crude machine to the spick-and-span new implement, in its full development of perfection.

Much may be learned from books, but much more from seeing the rise and progress of any piece of mechanism, from the first rude and feeble attempt, through the gradually improving and expanding series, step by step, bit by bit, till the perfect machine and the first raw germ stand side by side, in well-ordered sequence of historical arrangement.

What is done in picture galleries to illustrate the history of art,—providing specimens of all masters and countries, first sketches, models, and then the perfect picture,—is equally required for mechanical museums. It is pleasant to study a picture by any great master, and see its growth, through the first sketches,—to see the many changes introduced by the artist, the well-studied bits and scraps of detail,—till all are finally united in the complete picture. What these scraps of sketches are to the artist, so are the bits and scraps of models and drawings to the mechanic; they deserve to be preserved as well in one case as in the other, and for the same reason,—they show that perfection can only be obtained at the cost of time and labour without stint.

We are trying to establish schools of design broadcast over the land, and there seems to be a great, loud outcry for technical education, but that education what it may, whether in the line of art or of science,—for, somehow, these two functions of the human mind seem to be considered as essentially separate and distinct. But, why so? It seems to be taken for granted that there is necessarily a great gulph between them, that they are separated by a terrible *Pons asinorum*, that to get from one to another you must walk the plank and topple headlong into a sea of mystery and confusion. What is the difference between a school of design and a technical school,—are they not, more properly, man and wife, like George Stephenson's wheel and rail?

Have we not just inaugurated a great hall dedicated to art and science,—a future temple of Hymen where these twain are to be made one, and helpmates to each other,—a consummation most devoutly to be wished? Look to the mosaic frieze, or whatever it may be called, of this new hall: it is filled with realistic pictures of the functions and attributes of art and science,—a long mural ribbon of technical operations in full work. Here we have the swart mechanic, with his wheels, hammers, and levers; the artist with statures, pictures, and ceramic works; the chemist with his alembic; and the astronomer looking out for other worlds, all emblematic of the wonders to be seen within the show,—a true sign-board of the institution.

It would appear that there is a broad distinction drawn between art and science in regard to the granting of patents, and this may be one reason

why in other respects they are supposed to be dissimilar in their relative functions.

Patents relate to what are often called practical matters, which are often condensed into the summary word "invention," which covers a large ground. They are often granted for a mere improvement in detail, as well as for a great and novel principle, or the application of a novel principle to some old machine that has lived its day, and is dying out for want of new blood,—a little alteration to give it new vitality: the word "invention" covers all these and many similar cases.

Artists do not take out patents, yet they are inventors in the true sense of the word. Hogarth could not take out a patent for his inimitable "March to Finchley," yet it is full of invention; nor could the "Light of the World" be patented, though the electric and Drummond light have been, in more forms than one. The invention of the artist, as well as that of the author, requires protection no less than the invention of the mechanic; they all produce property more or less valuable; and it is an axiom in law that property must be protected, this being one of the principal ends of government: to the latter are granted patents, to the former copyright, and thus in some degree a property in mental produce is acquired, if the title is really good.

The artist produces a picture: he sells the picture if he can; but he does not always sell the privilege of engraving to his kind patron who buys the picture,—this is a right often kept to himself by the artist, though no doubt it is true that many artists when they dispose of a picture dispose of all their rights.

The author has his copyright, and, as one daily sees on the title-page, "all rights reserved." These are different schemes for the same object;—to protect property in brain-work, the property so produced being original, and therefore an invention.

An author has to deal only with his publisher; an artist has to deal with his patron, if such a word is now permissible, and the engraver. These bargains may be a very simple agreement, easily committed to writing; not so with the mechanical inventor. He has a long string of preliminary processes to go through. He has almost to beg permission to take out a patent; he may be opposed, and his application may by chance be altogether rejected: he has to submit, as it were to the purgatory of Standing Orders. The law officers of the Crown are supposed to investigate the merits of his invention before such a formidable document as Royal Letters Patent can be granted to the hopeful applicant, and we may be sure that every step is attended with expense in the shape of fees, because he is not supposed to be invested with a profitable monopoly—in prospect certainly?

A patent is often a perilous thing, charged with all the plagues of Egypt to its unhappy owner. He has claimed too much, or he has not disclaimed sufficiently; consequently, he may have unwittingly infringed the patent of some other person, of whose existence—patent as well as patentee—he has not the slightest knowledge. As most inventors are sanguine beings, they often fall into this miserable error, nor will the best professional advice at all times enable them to steer clear of this difficulty.

Still, the inventor must be protected; for, if there is any utility in his invention, his property will be stolen from him with impunity; his principle, whatever it may be, will be at once seized upon and applied to daily use by people of whom he has never heard; so that, without something in the form of a patent, protection, or privilege, he cannot defend his property, although it is as much his property as an acre of land would be if he had bought the freehold.

Before and up to the time of James Watt, the growing depth of the mines had outrun the power of the "fire-engines" then in use to keep them clear from flooding, and had got beyond their power of lifting,—a deadlock was approaching. Watt hit upon his great invention,—the separate condenser,—that was all, but it was the very soul of the engine, every engine owner in the country could readily add a distinct condenser to his wheezy engine; reap all the advantage of the improvement, pocket all the benefit,—no small one,—and leave Watt without a single penny to reward his ingenuity, or the means of recovering a single iota from those who impudently appropriated his improvements.

What benefit could Watt have received for his simple, but nevertheless splendid invention,—none whatever,—without the protection of the law, in the shape of a patent,—no matter in

* Vol. for 1870 (xxviii.), pp. 646, 647, and 1042.

what form,—so long as it secured his rights? Had Watt's patents not been granted, what condition would our mines have been in now? And what would have become of the splendid industry they created.

We have puzzled at various times through the dry and dusty papers which have been read before the assembled wisdom of learned societies on this much-vexed subject. We have heard lectures on patents and patent laws, and listened eagerly to all sorts and kinds of projected improvements, and we generally left as wise as when we entered. Little or nothing seems to come of all these palavers and speeches: they die a prompt and natural death; and Parliamentary recommendations share the same disastrous fate; and jurors' reports from great exhibitions are no exception to the general rule.

Inventors themselves disagree: some advocate the total abrogation of all patents and patent laws,—they stand up for free-trade in inventions; others fight manfully in their defence, and appear pretty unanimous in the wish to cheapen, and make them more easily accessible to the working classes.

Who can decide when doctors disagree? This fierce conflict of opinion,—a healthy sign in itself,—is a tolerably strong proof that some change is required, a remedy for admitted evils; but no inventor has yet invented the happy medium that shall satisfy all parties, or at least the majority, for it is hopeless to attempt to satisfy all.

There has been a short debate in Parliament this session which only proves the almost hopeless diversity of existing opinions, even among men who are deeply interested, not only in patent laws, but in patents. However, a few interesting facts may be culled from this brief discussion, not so much by way of argument, by one side or the other, as for illustration of the operation of cause and effect in producing this strange diversity of opinion. Mr. Samuelson, who appears to be no great friend of patents, stated that Mr. Roberts, the well-known inventor of the self-acting mangle, incurred an expenditure of 90,000*l.* before the machine could be brought to perfection, or before there was any return for the money. This is very likely to have been the case; but no allusion appears to have been made by Mr. Samuelson as to the origin of the invention,—well known,—its success, and the inestimable advantages it has conferred on the trade. Such a machine, when we consider the effects it has produced, cannot be dear for the preliminary outlay. It has answered its purpose well. The question more properly is, what advantage has it created since it was brought into operation?—let alone the moral part of the matter, which is an element of no small magnitude, when quarrels and strikes are taken into consideration.

He also stated that before Bessemer could bring his process to perfection for the manufacture of steel, upwards of seven years had elapsed, with an expenditure of 100,000*l.* This again is very likely, both as to the expenditure of time and money; but this being so, is it an argument against patents?—is it not rather to the contrary effect? Is it a great inventor to lose the benefit of his labour and expenditure of capital, when he has so immensely added to the productive wealth of the country? Are we to grudge the reward? The remuneration in this case has been, no doubt, unprecedentedly great; but it must be borne in mind that no one loses by this. The inventor has developed a new method of creating wealth, and from this wealth so created he expects and exacts a profitable percentage, in the shape of royalty for the use of his invention. In creating this benefit for himself, he has created a greater benefit for his country, the amount and extent of which at present can neither be foreseen nor calculated. That it will lead to great changes in engineering works can be seen and appreciated by any one at all conversant with the profession; but to what extent is beyond our grasp of mind. That steel will ultimately supersede iron in many extensive engineering works, cannot be doubted. It has long since commenced its march in rails, ships, and bridges, simply or combined with iron; and what will stop its onward flow? Will it not, more or less, creep into every structure where iron is now alone employed?

Mr. Macfie appears equally hostile to everything in the shape, make, or form of patents, and looks back with evident regret to the happy year of grace 1700, when there were only two patents granted in England—a sluggish state truly. In 1750 such had been the sleepy state

of the mechanical arts in England, that in that year there were granted only seven patents. After the lapse of another fifty years to 1800, only ninety-six were granted. In the year 1855 these pestilential patents had increased to no less than 255—a long stride. Then comes a grand making-up, for last year of blessed memory, there were no less than 2,491, and this increase was proportionably large for Scotland and Ireland. This proof of mental and mechanical activity the honourable member appears to deplore—perhaps as a sad sign of the awful depravity of the times, or a growing fondness for law and litigation.

He also states that the reports of the International Juries, published in 1862, were unfavourable to the patent system. The honourable member must be mistaken, because in a report now lying before me are these words:—"However susceptible of amendment the patent law may be, civilised industry could suffer no severe blow, nor manufacturing progress any more disastrous retardation, than would result from its abolition." He also states that Mr. Cobden was decidedly opposed to patents, for in the same year he wrote,—"I have growing doubts with regard to the value of the system whether as regards the interest of the public or the inventor." Lord Derby has expressed an opinion to the same effect, and what is more remarkable still, so, it seems, has the redoubtable Count Bismarck. In Prussia there were only 103 patents, while in England during the same time the number was 2,500. We need not be surprised at this paucity of patents among the Prussians, for we know that any one of them can evolve anything from the sublime depths of his moral consciousness—from Krupp's gun to the last new sausage. We must break off here, however, till next week. J. L.

ART LECTURES, CAMBRIDGE.

THE Slade Professor of Fine Art in this University, Sir Digby Wyatt, commenced his course of lectures for the present term, last week, at the Fitzwilliam Museum. The subject of the first discourse was "Engraving." Sir Digby explained the various processes in engraving, dwelling more particularly upon the turn it took in the fifteenth century, consequent upon the introduction of printing, as it was at this period that the idea arose of transferring prints from plates. The Italians claimed to be foremost in this, but the claim was disputed by the Germans, who, although unable to substantiate their claim, certainly excelled at that period in the mechanical methods of printing. He thought that we in England had not distinguished ourselves so much as could have been desired in this branch of art until more recent times. The prospects of engraving at the present time were somewhat overcast from the introduction of photography, but its quality was sustained; and he believed engraving would hold its own as a branch of art as long as art itself existed. The lecture was illustrated by diagrams.

On Thursday, the subject of the lecture was "Woodcutting." Previously to proceeding to the historical portion of the lecture, he described how a woodcut was made and how it was printed. The great difficulty of the cutter was, at the outset, to preserve a perfectly clean outline, as the fabric of the wood had a tendency to divert the tool. The workman, therefore, with a very fine tool, followed round the contour of the figure he was to cut, and thus saved himself from cutting into the figure. Although the draughtsman was the chief mover in the matter, it was essential that the woodcutter should be dexterous and gifted with considerable perception, in order to give expression to the artist's representation. In former days, the cutting was done on pear-tree blocks, but now-a-days we used box-wood. One of the disadvantages of the latter was that, being so close-grained, unless something was put on the block,—in the shape of paint,—the unpractised wood draughtsman would find that his pencil slipped. Next followed a description of printing from woodblocks, and the process of what is termed "overlaying" in the press. The first known use of woodcutting he believed was for making playing-cards, and the lecturer said that one of its most interesting aspects, in an historical point of view, was its connexion with the printer's art; nor did he think we paid quite sufficient attention to it in its connexion with the art of oil painting. The early mode of

printing was from the pear-tree block, which contained both illustration and letterpress (specimens produced). The next stage was to engrave the illustration and letterpress separately; and the next advance was to make type movable. The lecturer then proceeded to treat of the introduction of playing-cards from the East; of the use of the stencil in Chinese and Japan prints; of the pre-eminence of Germany in printing and wood-engraving; and of the earliest known woodcut, which was dated 1423. Having spoken of the ebb and flow of this art in Germany, Italy, France, and England, the lecturer dilated upon Albert Dürer, and other early artists.

SCIENCE AND ART.

Leeds.—At the annual meeting of the Yorkshire Board of Education in Leeds, Lord F. Cavendish, M.P., advocated the necessity of establishing a College of Science in Yorkshire, such as that successfully proposed at Newcastle, on the ground that the sons of artisans and manufacturers should learn the laws which regulate the materials with which they would have to deal.

Lewes.—The students of the Lewes School of Science and Art have had an examination at the County-hall. Twenty-four students were examined in free-hand, nineteen in model drawing, ten in practical geometry, and six in perspective science. Examinations in building construction, physical geography, magnetism, and electricity were to be held on the 6th, 9th, and 12th of May. Mr. Fisher's appointment as head master of the School of Art in Brighton, will not interfere with the continuance of his duties at the Lewes School.

Bristol.—The annual meeting of the Bristol Academy for the Promotion of the Fine Arts has been held in the gallery of the institution, Queen's-road; Mr. P. W. S. Miles, president of the academy, in the chair. The report of the committee, in chronicling last year's operations, stated that:—"The result of the Graphic night and following morning left a small profit in aid of the general funds of the academy. The exhibition was well attended throughout, and sales of pictures to the amount of 1,129*l.* were effected. The life school has been regularly attended, several new students have been admitted, and it is hoped that its usefulness has been duly appreciated." The accounts showed a total income from all sources of 324*l.* 7*s.* 5*d.*, and, after meeting the expenditure, about 19*l.* remained in hand. The report was adopted.

London.—At the usual monthly meeting of the Livery Committee of the City, it was reported that the Turners' Company had resolved to give the freedom of the company and the silver medal as a reward for the best specimen of turnery, and that the competing works were to be sent to the Mansion House, it being understood that the Lord Mayor would give away the prize. It was also reported that measures were in progress at the East End of London for promoting technical education; and Mr. F. W. Campin was directed to inquire of Sir Antonie Brady, who was understood to be connected with the matter, as to the nature of those measures, in order that the committee could judge how it might affect its own action in the promotion of technical education by the City companies.

THE WOOD-CARVERS' SOCIETY.

Sir.—The committee of the Society of Wood Carvers beg your kind permission to bring their claims of their old and valued society more prominently before the public.

Having for nearly half a century enjoyed a honourable and prosperous career; and with its valuable library, drawings, casts, &c., been the means of diffusing amongst its members some opportunities for self-improvement and culture as could not have been obtained until the formation of similar collections by the Government Schools of Art in connexion with South Kensington, we are sorry to say that (owing to the formation of another society of a similar name, but having other advantages) it is now in its old age nearly deserted, and badly want of funds.

Knowing that it has many friends and honourable members that have reaped the benefit of the various advantages that it offers, who need only be reminded of its present difficulties, the committee hope that the kind insertion of this letter in your widely circulated and invaluable journal may be the means of arousing them to a know-

ledge of the duty they owe, and the opportunity they have, of helping in the hour of need this still valuable society.

Signed on behalf of the Committee,
W. SANDILANDS, Secretary.

ART EDUCATION FOR AMERICA.

We hear that upon the nomination of the Science and Art Department, Mr. Walter Smith, head-master of the Leeds School of Art and Science, who has for twelve years been actively engaged in the promotion of art education in the county of York, has received an invitation from America to go and give practical advice in the establishment and organisation of a system of art education, including schools for the training of teachers, schools of art, &c. These new agencies for technical education are to be moulded upon a combination of the English and French systems, and it has been Mr. Smith's long experience in the one and intimate acquaintance with the other which have led to his selection for so important a work. The consent of the local committee here having been warmly accorded, Mr. Smith has started for America, and will be away about a couple of months.

THE TAUNTON EMERGENCY.

TYPHOID FEVER prevails at present in certain parts of Taunton from causes which we have more than once pointed to. The River Tone contains several feet deep of sewage matter; and in regard to certain obstructions, the Bristol and Exeter Railway Company have made some slight concessions. The pollution of the river, and the remedy, lie with the Board of Health. Twice already have the authorities been threatened that unless the river were purified and kept free from a heavy outfall of impurities, legal action would be taken against them. They gave a deaf ear to these remonstrances, and continued still to pollute the Tone. Once more the solicitor of Captain Beadon has written to the Board of Health to apprise them that if a satisfactory scheme be not adopted within the next three weeks to abate and remove the nuisance, a prosecution will take place.

As usual, the Board of Health refer this matter to the "Emergency Committee," and it is not unlikely to rest there, until some more of the inhabitants sicken and die. It cannot be too plainly and too often stated, that the bed of the Tone is above the level of a great part of the town; that the river as it exists at present is an untretched cesspool for a considerable length above and below the town,—that the river requires dredging and deepening, and the sewers need reconstruction. The streets are kept fairly clean, and in summer weather their watering is attended to. The greatest evil is below the surface, and the sewerage of the town and the state of the river are so thoroughly bad that foul smells can be detected at once in hot weather.

The Board must move in earnest, if they would avoid a collision.

THE COST OF THE NEW SLAUGHTER-HOUSES AT MANCHESTER.

In the city council, on the reading of the minutes of the markets committee, which contained a record of the acceptance of a contract by Messrs. Bates for the erection of the new slaughter-houses in Water-street, Mr. Muirhead called attention to the excess of the contractors' estimate for the construction of this building over the estimate submitted by the architect when the plans were sent in for competition. Mr. Darbishire's estimate was 17,000*l.*, but it now appeared that the building could not be completed for less than 30,000*l.* Mr. Darbishire's plans had been accepted by the markets committee chiefly on account of their comparative cheapness. Mr. Stewart and Mr. Alderman Murray also complained that Mr. Darbishire's estimates for the erection of the lodges at the Alexandra Park, which were placed at 1,600*l.*, had been exceeded by 400*l.* It was moved by Mr. Auderton that the minutes be referred back to the committee, on the ground that they did not state the amount of Messrs. Bates's estimate. Mr. Ashton said he had received a letter from Mr. Darbishire, in which he partly explained the excess. He had originally estimated the cost at 16,000*l.*, but a reference to the report accompanying the plans showed that this did not in-

clude the cost of boundary walls, paving, or surface drainage. He also found that though the machinery was shown in the drawings, the cost was not included in the estimates—inasmuch as it was impossible to do more than guess at the value of this portion of the work until a definite engineering plan had been decided upon. A considerable extra cost would also be incurred in consequence of the improvements which the committee had wisely decided to make upon the original plan. He calculated that, setting aside these different items, the excess of the contractor's estimate over the original approximate estimate would not be more than 2,683*l.*, which he regretted, but did not think was excessive, considering the peculiar difficulties of the building, the construction of which was almost new to the profession. Re-marking upon this letter, Mr. Ashton said he was surprised to find that Mr. Darbishire put down an item of 2,000*l.* for "foundations and drains" as one of the causes of excess. He was at a loss to know how Mr. Darbishire proposed to build the slaughter-houses without foundations, and he could not conceive why he had left out the cost in framing his original estimate. He must say the markets committee were not at all pleased with the position in which Mr. Darbishire had placed them, and he agreed with the other speakers that the low estimate which he had submitted along with his plans had greatly prejudiced the chances of the other competing architects. Mr. Auderton's amendment was rejected, and the minutes were adopted.

ARABIC NUMERALS.

SIR,—With reference to your wish to be informed of early dates in Arabic Numerals, allow me to say,—The wells at Christchurch, like the town, are of olden days: one, belonging to a private house, was, on cleaning, found to be lined with cut blocks of chalk instead of stone, as the public wells in the town are. The well is 18 ft. in depth, and near the top, incised, were the Arabic numerals, 1024.

. In the absence of the clearest proof, we should be forced to regard this statement as erroneous. The figures were probably misread. A Medieval 4, 2, with the tails worn away, has been taken for 0 before now.

THE PATENT LAWS.

At a meeting of the London Association of Foremen Engineers and Draughtsmen, held at the City Terminus Hotel, Cannon-street, on Saturday evening; Mr. Joseph Newton (Royal Mint), president of the Association, in the chair, a paper "On the Patent Laws," was read by Mr. W. Lloyd Wise. After discussion, the following resolutions were carried:—

1. "That the recognition of property in inventions contributes most materially to the wealth of the community, and that the abolition of such property would be most injurious to the industrial progress of the nation."
2. "That the Committee of the London Association of Foremen Engineers and Draughtsmen are hereby requested to consider the desirability of appointing a deputation, to wait upon the chairman of the House of Commons Committee, to submit the foregoing resolution, and to give evidence thereon if necessary."

A printed form of memorial is in circulation to be forwarded by individuals or firms to Her Majesty's Commissioners of Patents and Inventions requesting the curtailment of delay in the issue of the printed specifications of patents and indices.

BREAKING UP THE PAVEMENT.

Southwark.—In the early part of January Mr. Jacobs, iron merchant and dealer in steam-boilers and machinery on the east side of Newington-causeway, was summoned to Southwark Police Court, before Mr. Benson, by the Vestry of St. Mary, Newington, under the Highway Act, 5 & 6 William IV., cap. 50, sec. 72, for unlawfully damaging the pavement in front of his premises adjoining the London, Chatham, and Dover railway-bridge. It was adjourned several times, owing to the magistrate's illness, but having now returned to his duties, he gave his decision.

It appeared that the defendant had for many years carried on business as a brass and iron merchant on the west side of the causeway, but having entered into a large way of dealing in second-hand steam-boilers and other heavy machinery, he moved from the London, Chatham, and Dover Railway Company six arches opposite, at a yearly rental of 250*l.*, and erected gates on each side. He had an entry at Tiverton-street in the rear, but the locality was too narrow to admit heavy and large machinery. The

consequence was that he was compelled to receive large boilers and machinery in front, and to prevent obstructions he had a trolly on which the goods were conveyed across the pavement. Mr. Jacobs applied to the vestry before he took his goods across, and offered to pay for a substantial crossing, but they refused, and as the pavement was broken the vestry repaired it, and took the present proceedings for damaging and destroying the pavement.

Mr. Metcalfe contended that the defendant had a right of entry to his premises, and the vestry had no case against him.

Mr. Besley cited several cases in opposition, explaining that the causeway had been dedicated to the public over twenty years, and no person had a right to disturb it. In fact, such a course of proceeding as that pursued by Mr. Jacobs would be the ruin of many shopkeepers along that part of Newington-causeway.

Mr. Benson was of opinion that defendant had a right of entry to his premises, therefore he dismissed the summons; but, at the request of Mr. Besley, he granted a case for the Court of Queen's Bench.

The question is one of considerable importance.

PREPOSTEROUS TENDERS.

SIR,—The following is a list of tenders delivered for the erection of a villa residence in St. Paul's-road, Canonbury, for Mr. T. Rowland Hill. Quantities were supplied by Messrs. Finch Hill & Paraire, architects:—

Dodds	£1,711 12 0
Blackburn	1,310 0 0
High	1,400 0 0
Heath, junr	1,188 0 0
Dorset, Dorell, & Co.	1,182 10 10
Nightingale	1,172 0 0
Grover	1,168 0 0
Niblett & Son	1,134 0 0
Groom	1,017 0 0
Goodman	1,013 0 0
Newton	1,002 15 0
Moore & Grainger	998 0 0
Capps & Rife	992 0 0
Ingram	986 0 0
Cooke	971 0 0
Blackmore	959 0 0
Cooke & Green	761 0 0

Will you endeavour to throw some light on the affair? A BUILDER.

HORSES AND THEIR SHOES.

SIR,—Your correspondent, "E. T.," after detailing the loss of a "valuable draught-horse," through the farther driving a nail too far into the hoof, proceeds to suggest "a rim shoe, with three or four screws at sides," and asserts "they could be firmly, safely, and quickly fitted without risk of injury to the horse."

It is evident "E. T." writes in ignorance of the anatomy and physiology of the horse's foot. Horses are commonly lamed by nails, we admit, and not a few are lost annually; but how does this occur? The answer is plain, and the truths are irrefragable. Pressure upon sensitive structures in the interior of the hoof, by the inevitable use of nails, will arise in the most careful work, executed by the most painstaking farrier. It must be accepted as truth that the hoof of the horse is not a solid body, but a most beautifully-arranged horny box, fitted to the outside of structures, second in degree of sensation only to the brain itself. It is, therefore, in the walls of this case that the hold for nails can be obtained, the thickness of which is not more than $\frac{1}{4}$ in. in the stoutest foot, where lameness is as likely to arise from pressure of a nail $\frac{1}{32}$ nd of an inch in thickness, as in many others. How, then, would "E. T." adapt a rim shoe with screws? If a flat thin nail on occasions inconvenience, how will he accommodate in the same structures a substance double that size?

"E. T." may be assured that the subject has engaged the minds of enlightened men for years, and up to the present nothing has been found to supersede in any degree the use of nails and the present form of shoe. I also desire to assure him that much of the inconvenience and mortality arising from shoeing, as at present pursued, is due to removable causes. To be thoroughly understood, more than an enumeration is necessary, which your valuable space may not probably admit. I shall be glad to give the particulars if required, but at present confine myself to the order in which they occur. 1. Apathy in horse matters generally among proprietors, and the delegation of too much power to ignorant grooms, horse-keepers, and coachmen. 2. The system of contract, which favours rapid execution of work, without regard to its correct and substantial character. 3. A false system of paring and rasping the hoofs. 4. Bribery among farriers and grooms to obtain the shoeing; and 5. Predominating and equivalent ignorance among farriers, as among grooms, on a subject which, fraught with so much interest to a commercial community, occasions greater inconvenience and more extensive losses than many proprietors are cognisant of.

GEORGE ARMSTRONG, M.R.C.V.S.

HOW BEST TO SPEND MONEY FOR THE PUBLIC GOOD.

SIR,—One of the advisers of your benevolent millionaire, —I must call him,—the third on p. 238 (being the only one who, for some inscrutable reason, appears with neither name nor initials), "totally differs from" all who would spend money on aught but the teaching of "true religious principles." This rather forcibly recalls Mrs. Glasse's receipt for hare pie. Otherwise he would strike me as the most logical and noteworthy of all whom you have admitted to a hearing, had he only stated *what* principles they are to be. Now, as what is "true" in these matters, we may presume, is at least ascertainable,—namely, I do not see to what practical intents it might not as well be false as true,—it would seem that he cannot apply the whole 500,000*l.* to teaching, some having first to be devoted to *ascertaining* what to teach. The only reason I did not claim the 500,000*l.* for this was because I do not know the whole would be absorbed thereby, and the philanthropist does not want it split up among different objects.

Now, I cannot offer another half-million, nor even with certainty the part thereof that this might require, and will therefore take a leaf out of another philanthropic invitation just published, which, from its close connexion, I rather marvel you have not reprinted among these replies,—that which does Mr. Ruskin's May pamphlet. He tells us he is not rich as men now count wealth,—I am not as they ever did,—and so he will but devote a tenth of all income from Christmas day next, to buy land for the treatment he describes, and offers us certified accounts that he does so, and others' contributions are invited; the object having unlimited capacity of absorption, like mine of p. 641. But as the capacity of this present one I believe to be very limited, I will merely promise to devote a tithe if necessary, when, and from the time that nine others, however rich or poor, may make the same promise; namely, to give any amount not demonstrably exceeding a tenth of each one's income, to this purpose, the ascertaining publicly of matters of fact touching any taught religion, the precedence being given to things on earliest record. Thus, if facts respecting Mormonism, for instance, are proposed for ascertainment, no objection is to be made but this, that what your correspondent calls "the different Protestant Evangelical Societies" have precedent claim. And so behind theirs are those of the Church of Rome; and behind this, of the New Testament, and behind that, of the Old; to say nothing of Koran, and Talmud, &c., which I only omit as unlikely to have votaries reading or replying to this appeal. Otherwise they are all equally welcome. By "public ascertaining" I observe, I mean that our facts must be stated and stated under the hand and seal of the locally most authoritative and responsible official persons in Church or State.

On Mr. Ruskin's moral ground, there is to be "no liberty," and "no equality," but above all, "no intended and unearned—for creatures upon it." Now, similarly, in the disposal of the tithe, what I insist to have excluded is all rhetoric, all controversy, all pious opinions (or impious either), and to have no unexamined or unascertained and unpaid-for statements. We want simply what a purchaser does in looking into the title of an estate,—facts, first-hand facts, or as near first-hand as can be got. To the first nine persons who may make me this promise, addressing me as under, I will make some tentative proposal of matters for inquiry.

EDWARD L. GARBETT,
7, Mornington-road, London, N.W.

THE CENSUS AND THE WEEKLY REPORTS.

THE revelations made by the Census as to the population of Birmingham, says the local *Journal*, have a serious bearing on the weekly reports of the death-rate of the borough. The Registrar-General, estimating the population to have risen to 378,574, tells us, for example, that in the week ending 29th April last the mortality was at the annual rate of 22 in the thousand of inhabitants. Since the population is shown to be only 342,505, or about one-tenth less than the estimate, the death-rate is, of course, one-tenth more than the official computation gives. In other words, the return in the week mentioned should be upwards of 24 instead of 22 per thousand. This correction being made, people will have to reconsider the common declaration that Birmingham is "one of the healthiest places in the world;" and the local authorities will perhaps hesitate before reciting its salubrious character as a reason for dispensing with an officer of health. In other places there are also striking differences between the Registrar-General's estimate and the actual results of the census. The following are specimens:—

	Registrar-General's Estimate.	Actual Population.
Edinburgh	179,944	201,067
Glasgow	477,627	675,000
Leeds	153,195	118,130
Hull	379,140	379,295
Manchester	336,233	127,618
Newcastle-on-Tyne	255,247	240,412
Sheffield	74,458	85,535
Wolverhampton		

With the exception of Manchester, where the two sets of figures are wonderfully close, there are considerable discrepancies in all these cases. It is obvious that in those where the actual population is more than the estimate, the rate of mortality is correspondingly less than that stated in the weekly reports of the Registrar-General. Applying this remark to Edinburgh and Glasgow, we find that the impression which has been created as to the death-rate of these cities is entirely erroneous. It is proper to add that the estimate of the Registrar-General is framed for "the middle" of 1871, and also that the census returns have yet to be revised, though the figures here given are not likely to require much qualification on either of these grounds.

CHURCH-BUILDING NEWS.

Wirksworth.—The parish church is being restored, under the direction of Mr. G. G. Scott; and the contractor is Mr. G. W. Booth, of Gosport. The work has been divided into two parts; the first, now in progress, includes the tower and all east, together with the north and south transepts. This portion, according to the contract, is to be completed on the 31st of December next, for £5,065. The restoration of the second division,

comprising the nave and aisles, but which are at present temporarily fitted up for the purposes of public worship, will commence on the completion of the first part, and is contracted to be finished for a further sum of 2,552l., thus making together a total of 7,617l. Already considerable progress has been made in the first division of the contract. The coping and parapet of the tower have been restored, and three new pinnacles have been placed at the corner of the tower, new stone facings inserted into the tower walls where decayed, and the whole of the external walls pointed with Portland cement. The belfry windows have been restored with stone, and new oak louvres inserted. In the ringing-chamber a new oak floor has been laid down, upon stone corbels, the timbers being moulded. The tower arches and pillars are being cleaned, repaired, and pointed; the arcades of the chancel restored to their original form by rebuilding pillars and arches; and it has also been determined to add to the chancel a new clearstory with six cinquefoil windows. The present transept aisles, which were built about the year 1821, are to be pulled down and rebuilt according to their original form. The whole of the foundations have been underpinned and made secure. The entire roof is to be of moulded oak, partly covered with lead, and partly with grey stone slate. It has also, it is said, been in contemplation to take down and rebuild the spire. The whole of the work is under the superintendence of Mr. A. Roome, the representative of Mr. Scott; the contractor's foreman being Mr. E. Houghton. During the progress of the restorations, many fragments of encaustic tiles, supposed to be of Derbyshire manufacture, have been discovered.

Bayford.—The new church which has been erected in the little village of Bayford, entirely at the cost of Mr. W. B. Baker, of Bayfordbury (lord of the manor), has been consecrated by the Bishop of Rochester. The new edifice is erected very near the site of the building it replaces. Mr. Baker being the only large landowner in the parish, determined to carry out the work himself without any aid from his neighbours. How much it has cost Mr. Baker to build the new church we do not know. The architect of the new edifice was Mr. Woodyer, of Guildford, and the builder, Mr. Harris, of Woking, Surrey, who erected Christ Church, Bengeo. Mr. Robinson was the clerk of works. The new edifice is in plan a parallelogram with an apsidal termination at the east end, having small aisles or transepts at the western end of the chancel. In style it is First Pointed. The windows in the chancel are lancets filled with glass by Messrs. Clayton & Bell; those in the nave are two lights, except at the west end, where there is an arrangement of four single lancets with a large wheel window in the gable. These two it is intended to fill with Messrs. Clayton & Bell's glass. There are two circular windows framed in timber in the dormer roofs of the transepts. The south porch has also three light and shafted windows. The walls are faced with Kentish rag quoined with red brick, all other dressings being of Bath stone. There is a fleche of oak, with leaden spire at the junction of the chancel and nave, containing two bells. In the interior the chancel and nave are divided by a screen, surmounted by cruciform timber framing, this framing being a portion of the roof and forming a support to the fleche. The transepts are divided off from the chancel by screens of similar construction, which are also carried up to support the roof plates. The choir seats are of oak. The rood screen reaches up to the roof plate, and contains the east window. It is panelled with arch work, and, when completed, these panels will be filled with mosaics, paintings, &c. On the north side of the chancel a recess has been formed to receive an ancient altar tomb with an effigy of a knight, and some brasses which have been preserved from the old church, or rather from the two former churches which stood on almost the same site. The nave seats or benches are of pitch pine, the pulpit of stone. The pavement of the chancel is of Minton's tiles. Mr. Harris, of Woking, in Surrey, was the builder, and has carried out the plans given by Mr. Woodyer.

Shoring.—Mr. G. S. Kirkman has patented an arrangement for shoring earthworks. This consists in the application of a screw at the end of the shore or strut, so applied as to afford increased facilities for placing such shore or strut in position.

Books Received.

The Readiest Wages Reckoner now invented. By J. WALTON, Accountant. London: Tegg & Sons, Cheapside.

In these tables the fractions of each hour, from 1 to 82½, are calculated and given, and the amount due at wages ranging from 6d. to 7s. a day of ten hours, is seen at a glance. The compiler is said to have practically tested the accuracy and utility of the work in a large engineering establishment for more than two years. The idea is simple and ingenious, but the present form of it is no doubt more suitable to days' work of ten hours than to any other.

VARIORUM.

In the *Dark Blue* Mr. T. Hughes and Mr. W. D. Rawlings give a very interesting but too brief account of Cornell University (U.S.), where men work openly with their hands during certain hours in the day, to pay their student expenses. The object of the founder was to provide an institution "where any person can find instruction in any study." It already numbers upwards of 800 students, "and in a generation will possess endowments rivaling those of Oxford." The same idea has been setting in silently at home, say the writers; "and in another twenty years the institutions and property of the country will be face to face with an educated people. Is there any class amongst us which fears that day? Let them set their house in order and take courage. It is not knowledge, but ignorance, which is the destroyer of anything that is worth preserving." —There is a good deal to suggest thought and inquiry in the new number of the *Rectangular Review*, but its assertions are not to be taken without question. A paper on the "Biography of Mesmerism" professes to be an absolutely historical and impartial narrative of the times and works of the promulgators of the creed, yet omits all reference to well-known detected impostures in connexion with it. The endeavours to reform modern Masonry are good in intention, but not so in tone. Is there any proof that the assassination of Marshal Prim was the work of a Masonic lodge? We have never heard it. —The interesting article headed "Civil List Pensions," in the current *Quarterly*, gives information on this subject which many will be glad to have. Few know that the amount of the Civil List pensions ranges from 18,000l. to 20,000l. a year! —"Thoughts on Poverty and Pauperism." By H. C. Tucker, C.B., Guardian of St. Marylebone. London: Dalton & Lucy." The author of this pamphlet is of opinion that it should be the common object of all to reduce the area of compulsory legal relief to a minimum, and to throw particular cases of unavoidable distress as much as possible on a well-organised, discriminating, substantial private charity. A good deal of the ground he goes over has been long since discussed; and indeed the discussion led to an extreme of severity which rendered the workhouse more intolerable to the poor than the jail,—an iniquitous state of matters. Nevertheless, there is much prudential truth in what Mr. Tucker says, which must not be lost sight of in the reaction to which former errors have been leading. The fact that workhouses are, to a great extent, a misnomer, has much to do with the difficulties involved in the question; but there, too, are new difficulties. Mr. Tucker advocates an improvement in the stamp of men elected as guardians,—a greater personal interest, attention, and knowledge on the part of the ratepayers,—a higher standard of relieving officers, and a consequently increased intercommunication between them and the charitable public; and to these and the adoption of some of his suggestions he principally looks for a better administration of the Poor Law, and a more discriminating and beneficial distribution of private charity.

Miscellaneous.

Mr. A. Lawrence and the Metropolitan Board.—Mr. Alfred Lawrence, of the firm of Lawrence, Brothers, builders, is a candidate for the vacancy created at the Metropolitan Board of Works by the resignation of Mr. How, the member for Shoreditch. It is believed that he stands a good chance of election.

London and Middlesex Archaeological Society.—There has been a large attendance of ladies and gentlemen at a meeting of this society to visit the City of London. The meeting was presided over by the Master of the Leathersellers' Company; and the first place visited was Leathersellers' Hall. The ancient charters and records of the Leathersellers' Company were exhibited, and remarks made upon them by Mr. W. H. Black. The Rev. T. Hugo, one of the vice-presidents of the society, then gave a short paper on the "Hospital of St. Patey, Bishopgate." A large collection of drawings, prints, &c., of Leathersellers' Hall and the neighbourhood were exhibited by Mr. J. E. Gardner. The company then proceeded to the Church of St. Andrew Undershaft (Leadenhall-street), where Mr. W. H. Black gave a brief notice of Hans Holbein, as a parishioner of St. Andrew Undershaft. The will of the painter was read. It showed the artist to have been in poverty and in debt to a money-lender in Antwerp. Mr. Black controverted, as all know, the usually-accepted time of Holbein's death,—viz., 1554,—and from the records he had unearthed fixed it eleven years earlier,—viz., 1543. The records of the church were then commented upon and explained by Mr. W. H. Overall, F.S.A. Proceeding to the church of St. Peter-on-Cornhill, the Rev. R. Whittington, vicar of the parish, remarked upon the history of the church and the archives of the parish.

Discovery of another Roman Tombstone at Lincoln.—An interesting addition to the Roman sepulchral monuments of Lincoln has just been made through the discovery of another tombstone on the site of the new church of St. Swithin, on the west of the lower Roman town. This was found about 2 ft. below the surface, and may well be compared with one now preserved in the cathedral cloister and described in the "Archæological Journal," vol. xvii., p. 4; also with another engraved and described in the same volume, p. 20. It consists of the upper portion of a similar tombstone of Lincoln oolite, 2 ft. by 7 ft. wide, 1 ft. by 6 ft. high, and 8 in. thick. It clearly formed the upper part of a pedimented sepulchral memorial, on the lower part of which no doubt the inscription or epitaph was cut, but now destroyed. Within a niche between pillars and pediment is carved the bust of a young man having unperturbed crisply curling hair, and clothed in a tunic and mantle. His hands are crossed in front, and with them he holds a hare. There was also turned up a small brass Roman coin, bearing on the obverse the bust of Constantius II. This coin must be about 1,500 years old.

Too Safe a Safe!—A mechanic in New Orleans constructed a safe which he declared to be burglar-proof. To convince the incredulous of the fact, he placed a one thousand dollar bill in his pocket, had himself locked in the safe, and declared that he would give the money to the man who unfurnished the door. All the blacksmiths and burglars in the State have been boring and beating at that safe for a week, and the man is in there yet! He has whispered through the key-hole that he will make the reward ten thousand dollars if somebody will only let him out. Fears are entertained that the whole concern will have to be melted down in a blast furnace before he is released, and efforts are to be made to pass in through the key-hole a fire-proof jacket, to protect the inventor while the iron is melting. The inventor swears if he once gets out, that he will in future always try the experiment with a rival patentee inside. He says he never thought he should wish, as he does now, that some one would find a weak place in his armour.

Natural History Museum.—In the House of Commons, in answer to Mr. C. Bentinck, Mr. Ayrton said the design now being exhibited in the Hall of Arts and Sciences at Kensington for the Natural History Museum at South Kensington, was prepared some years ago for information of the Commissioner of Works; various improvements were being made in it, and as soon as those improvements were completed, he would exhibit it in the library of the House if desired. With regard to the design conforming to any other building in the neighbourhood, he presumed that must be an architectural canon, as it was insisted on by the hon. member; and, if so, no doubt the architect would conform to it; but if not, the architect would, no doubt, exercise his professional discretion.

The Widdow Reservoir of the Halifax Waterworks.—At Widdow the work has already commenced. Near to where the bank is to cross the valley, a bridle-path to Burnley leaves the turnpike road on the left side, and crossing the stream by Sandy-gate Bridge, stretches away across the moor. When the reservoir is complete, the top of the embankment will form the commencement of this road, and the road to Colas will be diverted for about half a mile. The bank will be about 220 yards long, and 70 ft. high, its contents being about 170,000 cubic yards. The contents of the reservoir will be 670,000,000 gallons, or 10,000,000 more than all the other reservoirs of the corporation put together. Its length will be nearly a mile, and in the centre it will be an enormous width. At the head it will be shallow and narrow, finishing in a field just underneath the Travellers' Rest Inn. The elevation of the Widdow Reservoir above the level of the sea is 1,100 ft., whilst that at Fly is 1,335 ft. The corporation are about to erect a number of dwellings for the workpeople not far from Clough Foot, and about half a mile from the ridge. The new Widdow Reservoir will cover an area of 95 square acres.

Accident at the Barrow Steel Works.—Five men were employed in removing slag out of No. 2 Bessemer pit, in No. 1 Shed. A man called out for a crane, to hoist from the pit a wagon which had been filled with slag. The boy in charge of the crane misunderstood what the man had said, and instead of turning the crane, raised the converter, which was charged with 5 tons of molten iron. On the five men in the pit finding that the converter had been raised, they endeavoured to make the best of their way out, and four of them succeeded, with serious injury; but the fifth man, in endeavouring to get clear of the molten liquid, attempted to get into a cellar on the south side of the pit. In doing this the metal flew into his face, and he cried out most piteously for help, but almost immediately he fell back into the molten metal. Every endeavour was made to offer assistance to the poor man, but without effect, and before the flow of the liquid could be stopped, he was literally reduced to ashes.

A Brickmaking Dispute.—Thomas King, James King, Charles Smes, Edward King, William Brown, George Wilders, James Perry, and George Butler, brickmakers, appeared by adjournment of summonses at the Dartford Special Petty Sessions for refusing to carry out their agreement to make bricks, &c., entered into by them with Mr. Daniel Batten, proprietor of the brickfields, at Crayford. The cases were adjourned from the previous week to give the men an opportunity to resume their work, but they had not yet done so, and complained that they could not do so, in consequence of their being unable to pay the men under whom the price they asked. The Bench remarked that the defendants must have known at the time of signing the agreement what they would receive, and to what they were binding themselves. They were each ordered to resume their work, and to pay the damages sustained, amounting to 5l. each, and costs.

The Restoration of Carlisle Cathedral.—A correspondent of the local journal says:—A good deal has been said about the improvement of our cathedral, by opening out and restoring to it the most ancient portion of the fabric, so long walled off and used as a parish church for St. Mary's parish; and there can be no question that it is a very great improvement. But it is asked why the character of the ancient building thus added has been so far interfered with as to make it altogether inconsistent in itself? The true mode of dealing with it would have been to preserve in all points its contrast with the more modern erection, to preserve it entire in the Early Norman style. Instead of which we find the pointed window introduced, and thus a jumble created which is really offensive to good taste. It might have been made a remarkably good specimen of the Early Norman style, in which it was originally erected. It is now neither one thing nor another. Whose blunder is this?

Selby Board of Health.—An inquiry has been held in the Town-hall, before Mr. Arnold Taylor, an inspector sent down by the Secretary of State for the Home Department, as to certain complaints brought against the Selby Local Board of Health by Captain Parker, Gowthorpe House. The inspector has not yet made his report.

London City Market Improvements.—A sub-committee has considered the proposal to erect a new fruit and vegetable market at Farringdon. They went to the existing market there, accompanied by their architect and the president of the Market Gardeners' Society, and it was decided that the City architect should get out plans, take the necessary levels, &c. It is the intention of the committee to make the new market on a level with Farringdon-street. A new street is about being formed from Holborn to Ludgate-hill, which will be a great accommodation to the public and give a capital approach to the new market. The market-gardeners have, during many years past, been memorialising the Duke of Bedford to improve Covent-garden Market, by covering it in. As soon as the plans are decided on a public meeting will be called, with the view of soliciting support from all persons sending their produce to London.

Hard Words.—Mr. Hampden, who staked 500l. against the belief that water on the face of the world is convex, and was declared to have lost it, requests us to insert a libellous letter, calling his opponent frightful names. Of course we decline. As he has already charged all the philosophical societies in London, severally and collectively, with being a "set of knaves, impostors, and cowards" (we are using his own words), the gentleman in question will probably think he is in sufficiently good company to let the matter pass. As to Mr. Hampden's particular belief that the world is not a globe, and the language he is now using, we hold him to be entirely in the wrong; but whether or not the test in question was properly made and determined is, of course, quite another question.

Conversazione: Institution of Civil Engineers.—This year the annual conversazione of the president has been fixed for Tuesday, the 6th of June, one week later than usual, as Whitsuntide occurs at the end of May. Mr. Vignoles, F.R.S., the president, at the last meeting expressed the hope that the members and their friends would aid him in the endeavour to bring together an interesting collection of novelties in the way of models, small pieces of mechanism, and scientific instruments, as well as a small number of paintings and water-colour drawings, by ancient and modern masters of eminence, representing some engineering work, object, or matter, as "a bridge, lighthouse, harbour, aqueduct, &c., set in its appropriate landscape."

St. James's Theatre.—The revival of Mr. Planche's excellent little comedy "Secret Service," shows Mr. William Farren to us in another character made famous by his famous father. It is a very finished and effective piece of acting, all to nothing the best old man's part yet presented by Mr. Farren. The other parts are fairly filled. Admittedly founded on a French piece, "Secret Service" is greatly superior to the original, and plays as freshly as if it had been written yesterday. The new burlesque, "Poll and Partner Joe," is very lively of its kind, and includes some very good singing and dancing, in which, of course, Mrs. John Wood particularly distinguishes herself.

The Society of Biblical Archaeology.—Amongst the business done on May 2nd, Dr. S. Birch, in the chair, read a paper upon a hieroglyphic tablet of Alexander II. (Argus) son of Alexander the Great, recently discovered at Cairo. This tablet was dedicated to the goddess Buto, and is dated in the seventh year of Alexander (B.C. 311). It records the restoration to the priests of Buto of the district formerly given to them by Khabash, an Egyptian monarch contemporaneous with the later years of Darius and Xerxes, which last monarch is mentioned in disparaging terms, probably to flatter Ptolemy, the Macedonian ruler of Egypt, who is styled on it "the satrap of Alexander."

Mortuary Buildings.—The City Commissioners of Sewers have reconsidered the resolution passed by them a month ago, to postpone the construction of the mortuary buildings in Golden-lane until Lady-day, 1872, and determined to carry into effect the resolution passed on the 7th of March, which provides for the immediate erection of the buildings, at a cost not exceeding 5,000l.

A Freemasons' Hall for Oldham.—The Freemasons of Oldham have opened a new hall, built at a cost of about 2,500l., in Union-street. The building is of stone, with ornamental work, and has been erected from plans drawn by Mr. Thomas Mitchell, architect, Oldham, by Mr. Emanuel Whittaker, contractor.

Value of Property: Cornhill.—Three undivided fourth shares, being a portion of the premises occupied by Messrs. Purcell & Co., confectioners, were sold by auction by Messrs. Debenham, Tewson, & Farmer. The property consists of a large house, with frontages to Cornhill and Finch-lane, and covers a total area of 960 ft. The auctioneer stated that the three fourth shares in question were let on lease, which will expire at Christmas next, at a rental of 450l. a year. The biddings commenced at 8,000l., and after considerable competition the property was declared to be sold at 12,000l.

The Parish Church of Ampney Crucis.—As it has been resolved to replaster the walls of the church as an instalment of the restoration so much needed here, a careful removal of the numerous coats of whitewash, with which they are at present disfigured, has been begun, under the superintendence of the vicar, in order to discover, if possible, fragments of the paintings with which, according to local traditions, the walls are covered. A representation of a martyrdom, probably that of St. Lawrence, has been brought to light.

The Trades Movement.—The threatened strike of about 8,000 house painters, in Sheffield has been averted through an interview between masters and men, which has resulted in an arrangement. Some other trades have obtained a reduction of five hours and a half in their weekly labour. The strike among the joiners in Newcastle and elsewhere in the North continues, and subscription-lists are being started. The whole of the engineering trades in Sunderland, who have been five weeks on strike for the nine-hours movement, have gone to work, the masters having conceded their demand.

The Storm of Monday last.—About four o'clock, while the storm which raged over the metropolis and its suburbs was at its height, the lightning struck a stack of chimneys immediately over the house No. 41, High-street, Wandsworth. The chimneys fell on to the roof of the upper portion of the premises, the wood and brick work falling into the street, seriously bruising some persons who were passing. Fortunately no person was in the upper portion of the house at the time.

New Synagogue and Jewish School for Sheffield.—The designs of a select number of competitors, those by Mr. J. B. Mitchell-Withers, architect, are adopted, and the necessary operations will shortly be commenced.

Robert Owen's Centenary.—A committee, holding its sittings at 256, High Holborn, has been constituted to celebrate the one hundredth birthday of the late Robert Owen, the founder of infant schools and co-operation.

A Powerful Magnet.—A magnet is in course of manufacture at the Collingridge Works, at Westminster, which, when completed, will weigh nearly 2 tons, and will be of the value of 500l.

TENDERS

For office improvements at the Town-hall, Brighton. Mr. P. C. Lockwood, borough surveyor. Quantities by Mr. J. C. Lansdown:—

Cheesman & Co.	£2,728 0 0
Lockyer	2,625 0 0
Nightingale (accepted)	2,617 0 0
Blackmore & Howard	2,469 0 0

For house, "Birchholme," Wimbledon. Mr. T. Goodchild, architect:—

Howard	£3,383 0 0
Todd & Sanders	3,373 0 0
Adamson & Son	3,245 0 0
Hurst (accepted)	3,060 0 0

For stabling to the same:—

Howard	£ 50 10 0
Adamson & Son (accepted)	365 0 0

For additions to Cottahall Hall, Norfolk. Mr. R. Makins-Phipson, architect:—

Newell	£1,755 10 0
Downing	1,468 14 0
Cornish (accepted)	1,438 0 0

For bal. &c. for the Holloway Hall Company, Limited. Mr. George Trustick, architect:—

First Contract for Carcases only.	
Dove Brothers	£2,775 0 0
Grover	2,667 0 0
Williams & Son	2,520 0 0
Bywaters	2,460 0 0
Manley & Rogers	2,313 0 0
Stimpson	2,293 0 0
Emm	2,189 0 0

For the erection of sheds and warehouse at Church-street, Mile-end, for Messrs. H. & I. Isaacs & Sons. Mr. W. Emden, architect:—

Sheds.	Warehouse.	Total.	Credit for old Materials.
Parkiss	£738 4 9	£1,466 255	
Groomer	792 0 0	1,466 30	
King & Son	698 0 0	1,458 25	
Cohen	710 65 0	1,383 00	
Henley			
Ayres	450 648 10 0		
Bullcock			

* Extra for pulling down, 10l. Tender for warehouse lies between Mr. Cohen and Messrs. Henley & Ayres. † Tender for sheds accepted.

For new Wesleyan Chapel and Schools to be erected at Homerton. Mr. Alexander Leaver, architect. Quantities supplied by Messrs. Leo & Watson:—

Hill & Sons	£4,575 0 0
Dove Brothers	6,145 0 0
Hobson	6,144 0 0
High	6,325 0 0
Bartlett & Sons	5,920 0 0
Hill, Reddel, & Waldron	5,919 0 0
Allen	5,910 0 0
Colman	5,766 0 0
Emm	5,675 0 0
Brown & Robinson	5,607 0 0
Henslaw (accepted subject to certain deductions)	5,518 0 0

For the erection of a warehouse for Messrs. Pickford & Co., Great Howard-street, Liverpool. Mr. George R. Larn, architect. Quantities supplied:—

Mallen	£6,398 0 0
Winton	6,145 0 0
Rome	6,160 0 0
Tomkinson & Sons	5,997 0 0
Haught & Co.	5,947 0 0
Holmes & Nicol	5,938 0 0
Jones & Sons (accepted)	5,930 0 0
Sir William Arncliffe & Co. for hydraulic machinery above warehouse (accepted)	905 0 0

For rebuilding Ashurst Lodge, Langton, near Tunbridge Wells. Mr. Jos. H. Ede, architect. Quantities supplied by Messrs. Smith & Co.:—

Macey	£7,444 0 0
Patman & Fotheringham	6,666 0 0
Conder	6,414 0 0
T'Anson	6,387 0 0
Axford & Whillier	6,164 0 0
Foster	6,018 0 0

For building three houses in Mamel-street, Old-street, St. Luke's, for Messrs. Leage & Alberty. Mr. G. R. French & Mr. W. S. R. Payne, architects. Quantities by Mr. E. Morfee:—

Blott	£1,337 0 0
Perry Brothers	1,333 0 0

For English Baptist Church at Neath, Glamorganshire. Messrs. Lander & Beddie, architects:—

Davies & Morgan	£2,855 10 0
Moreland	2,695 0 0
Roderick	2,419 10 0
Cribb & Thomas	2,197 0 0
Messrs.	1,947 15 0

For proposed national schools at All Saints', Plimstock Place, Bradford. Plans and quantities supplied by Messrs. William G. Libberson & Prie:—

Pearce	£3,285 0 0
Davies	3,239 0 0
Nightingale	3,168 0 0
Sherman	3,139 0 0
Wilcox	3,050 0 0
Lorrigan	2,990 0 0
Harrison	3,016 0 0
Dover, Doel, & Co.	2,969 0 0
Kirk	2,964 0 0
Cooke	2,949 0 0
Capps & Ritso	2,846 0 0
Parsons	2,881 0 0
Stiff	2,860 0 0
Machin	2,870 0 0
Cooke & Green	2,845 0 0
Gooding	2,750 0 0
Bartholomew	2,777 0 0
Crab	2,650 0 0
Cripps	2,630 0 0
Watson	2,620 0 0
Heardson	2,611 0 0
Louis	2,610 0 0
Blake	2,585 0 0
Perry	2,580 0 0
Crooke & Wall	2,575 0 0
Blackmore	2,556 0 0
Kirk	2,519 0 0
Tay	2,419 0 0
Myatt	2,495 0 0
Moore & Grainger	2,410 0 0
Watling	2,364 0 0
Groom & Dard	2,334 0 0
Tongue	2,330 0 0

For the erection of a shop and six cottages at Oakley, Bishop's Stortford, for Mrs. Chamberlayne. Mr. Alfred W. N. Burder, architect:—

Roberts	£2,200 0 0
Brown (accepted)	1,763 2 8
Cole Brothers	1,697 0 0

For the erection of new printing premises for the Standard newspaper, 103, 104, and 105, Shoe-lane, for Mr. James Johnson. Mr. Rawlinson Parkinson, architect. Quantities by Messrs. George Lansdown & Pollard:—

Cello & Sons	£2,200 0 0
Crabbe & Vaughan	6,089 0 0
Deards	6,749 0 0
Foster	6,727 0 0
Sewell & Sons	6,660 0 0
Henshaw	6,556 0 0
Morton	6,678 0 0
Jackson & Shaw (accepted)	5,553 0 0

For erecting a house at Harrow-on-the-Hill, for Mrs. Bailey. Messrs. E. Habershon & Brock, architects:—

Falkner	£1,397 0 0
Lander	1,316 10 0
Woods	1,232 0 0
Nightingale	1,197 0 0
Haynes	1,153 0 0
Rendell	1,094 0 0

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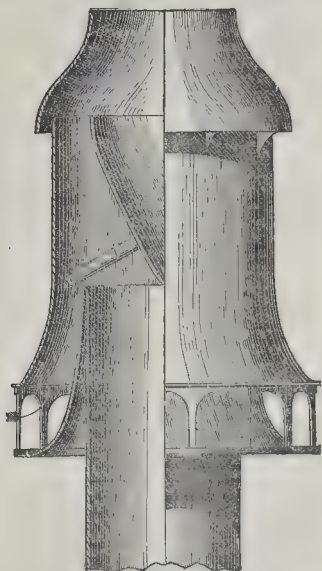
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WINDHAUSEN & BUSSING'S PATENT.

A PERFECT SMOKE-PREVENTING CHIMNEY COWL AND A MOST EFFECTUAL VENTILATOR.

In soliciting the attention of the public to this Invention, which I have introduced into this country, after purchasing the right of Patent for the same, I beg to state that the DEFLECTOR is not only largely in use on the Continent of Europe, but also in the United States of America. AS A SMOKE-PREVENTING CHIMNEY-COWL, it has proved the most, and I may say the ONLY, successful remedy for the intolerable nuisance to which so many households are subjected. Its construction is based upon thoroughly scientific principles, which I can best explain by quoting Messrs. WINDHAUSEN & BUSSING'S own description in their patent specification, as follows:—

"Many attempts have hitherto been made to construct a Chimney-top or Cowl to prevent down-draught and the entrance of wind, rain, or the rays of the sun into the flues, and to cause a draught in Chimneys situated in exposed positions; but all such Chimney-tops or Cowls have been more or less open to objections, those with revolving parts being liable to stick fast and to become deranged; others, constructed with external lids or coverings, have impeded the egress of the smoke; and, again, some have been so formed as to cause the smoke to pursue a tortuous course, and thus its velocity in escaping has been lessened, and the draught interfered with, whilst many have been so complicated as to render the cleaning of the flues difficult, and in some cases altogether impracticable.

"Taking all these points into consideration, we have invented a novel construction of a Chimney Top or Cowl, which we call the 'Deflector,' because it is constructed on a peculiar principle which deflects the wind or rain, and is not open to any of the objections hereinbefore mentioned, and we claim for the said invention the following advantages:—1st, that it has no moveable or revolving parts; 2nd, that it has no external lid or covering; 3rd, that it allows the column of smoke to pass through without tortuous and injurious bendings, and without reducing its sectional area by a current of air surrounding such column of smoke; 4th, that under all circumstances it renders the entrance of wind, rain, and the rays of the sun into the flues impossible; 5th, that its peculiar internal form compels wind coming from any quarter, and even that descending vertically upon it, to conduce to the draught in the Chimney; 6th, that its external form is ornamental, yet rigid and strong, and can easily be adapted to any style of architecture."

AS A VENTILATOR, it will be seen that the same scientific principles which have made the Deflector so successful as a Remedy for Smoky Chimneys, render it quite as efficacious as a means of Ventilation. It can be applied with confidence to Hospitals, Churches, Barracks, and large public and private Buildings, Manufactories, &c., as well as to Railway Carriages, Ships, &c. But besides these hitherto more general purposes, it is valuable to health when attached to the flues of Bedrooms, and other apartments in which fires as a rule are not used, and where it is so desirable to obtain an unimpeded up-current of air, without the counteraction of a down-draught. By its internal form it not only prevents the draught and damp from entering the Chimney Top, and thus disturbing the soot and other matter, thereby causing constant unpleasant smells, besides frequently removing valuable articles in the room, but, as we have before described in its action upon smoke, its construction conduces to the creation of an up-draught, thus keeping the room in a pure and wholesome state.

Numerous Testimonials from abroad and in this Country have been received, and can be shown on application. Amongst many from Government Officials and Manufactories in Germany, is one from Krupp, of the eminent Ordnance Works, as follows:—

"Messrs. WINDHAUSEN & BUSSING, Gentlemen,—In reply to your letter, we have the pleasure to inform you that the Deflector we have received from you has proved a very good protection against the heavy winds and gales, and also acts well as a draught-creator, &c.—Yours obediently, FREDERICK KRUPP."

Also the following Testimonial from the Royal Polytechnic School of Hanover:—

"In the month of April, 1868, Messrs. WINDHAUSEN & BUSSING, Engineers, of Brunswick, made some very remarkable experiments at the Royal Polytechnic School in this city, and in our presence, with one of their newly-invented and patented CHIMNEY-COWLS, called 'DEFLECTOR,' a wind-guard, especially designed and constructed to conduce to the draught of chimneys, and to do away with the unfavourable influences of the wind and rays of the sun on Chimney-tops. In this trial, as to the efficiency of their invention, wind-gusts were produced by means of a Ventilator, placed in various ways, so as to produce wind coming from different directions and in varied strength. These experiments have proved in a most magnificent manner highly successful. In the Drawing Class, a building adjoining the Royal Polytechnic School, surrounded by high buildings, the Chimney was found to draw badly in windy weather, and on similarly afflicted Chimneys of the County Lunatic Asylum, at Göttingen, 'DEFLECTORS' have been placed, all of which have proved highly successful, and in every instance have given perfect satisfaction.

In addition to the above testimony, we have pleasure in stating that the 'DEFLECTOR,' owing to its simple scientific principles in construction, in our opinion, cannot in any case fail to achieve a well-merited success.

KARMARSCH, Director of the Royal Polytechnic School.	}	Professors at the Royal Polytechnic School.
Dr. G. VON QUINTUS TILIUS,		
HEINRICH KOEHLER,		
C. W. LUEB,		
W. HASE,	}	Engineers to the City of Hanover.
L. DEBO,		
H. BODE,		
L. SPIKS,		
G. DROSTE,		

HANOVER, the 12th of June, 1868."

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The Builder.

VOL. XXIX.—No. 1476.

The Great Painters of North Italy.*



ESSRS. CROWE and CAVALSELLE have dedicated their new work, on the "Painters of North Italy," to the Crown Princess of Prussia, "painter and critic;" and in its execution both authors and publishers have evidently endeavoured to make the offering worthy of the recognition of her Imperial Royal Highness. The contents of these two new volumes must be considered as a division of the History of Italian painting by the same authors; for the fact of the exhaustive treatment of the works of some of the greater masters in the

former work has excluded them from other than incidental mention in this: consequently, the two works should stand side by side. From the manner in which the authors have executed their present task, it is open to them to supplement it by a second elaboration of any division of it, or by the addition of particulars of any school affecting it; for, though seeking to show the influence of circumstances upon the styles of artists in the course of their biographies, they commence the story of their lives and catalogues of their works without preamble, and finish without valedictory remark. Hence, we must look upon this production as another instalment of a great and able survey of European art, of which the lives of Flemish painters have also furnished a part.

The leading theory in the work under notice is that Venetian and Lombardic art reflects the progress and blending of several styles. The authors state at the onset that the information they have collected renders it easy to see how the Tuscan style was introduced among the Paduans by Donatello; how Mantegna extended the Paduan style to Venice and elsewhere; how Antonello effected a revolution in technical treatment and pictorial feeling; how Bellini commingled the Byzantine, Muranese, and Umbrian manner, which consolidation ultimately developed into the Titianesque, the Giorgionesque, and the Palesque. In Venice, at the commencement of the fifteenth century, pictorial art was flowing in three currents,—the old Veneto-Byzantine style imbedded in the hearts and traditions of the people; a style employed by two strangers working for the State, Gentile da Fabriano and Pisano, which located itself afterwards on the island of Murano, and was known as Muranese; and another, created by Jacopo Bellini, who, taught within the walls of Florence, had imbibed ideas which largely influenced his manner. All three styles ultimately

blended and formed the school of Gentile and Giovanni Bellini, the so-called fathers of Venetian art. Again, the first Muranese, Giovanni and Antonio da Murano, soon engrafted upon the style they borrowed from Gentile da Fabriano and Pisano other attractions. Giovanni leant so decidedly towards the German treatment that an attempt was made, in subsequent times, to prove that there were two Giovannis, one of whom was a German; and after awhile his successor in partnership with Antonio, Bartolommeo, entirely departed from the Muranese manner, and adopted the Classic treatment of the Paduan school. And so on through the work that issued from all the *ateliers* of the cities in Northern Italy; there was always the progress of the world reflected in it: it expanded; it engrafted; and it embraced the new methods with which it came in contact.

After the delineation of this theory, the authors' strongest points are their description of the several pictures by each master, and their swift insight into the technical means used to present the results gained in them, and those missed that would have secured greater effects. It would seem almost as they gaze at a picture they see the palette of the painter, and have heard the directions given to the colour-grinder. By their aid the reader may fancy that he, too, sees the lofty cool *atelier*, the enthusiastic assistants or scholars at their easels, the colour-grinders busy, the great artist, apart, finishing work that in its perfection appears already completed; or he may believe that he, too, can see the long and gorgeous vistas of pictures converging to open doorways, giving access to further gorgeous vistas in the renowned galleries from which the authors quote examples. They insert a letter written by Luigi Vivarini to the Venetian authorities asking employment:—

"To the most Serene, the Prince, and the most excellent Signoria, I am Aloise Vivarini of Murano, a faithful servant of your Serenity and of this most illustrious State; and I have been long anxious to exercise my skill before your sublimity, and prove that continued study and labour on my part have not been useless. I therefore offer, as a humble subject, in honour and praise of this celebrated city, to devote myself, without return of payment or reward, to the duty of producing a canvas in the 'Sala del Gran Consiglio,' according to the method at present in use by the two brothers Bellini; and I ask no more for the said canvas than that I should be allowed the expenses of the cloth and colours, as well as the wages of the journeymen, in the manner that has been granted to the said Bellini. When I have done I shall leave to your Serenity, of his goodness, to give me in his wisdom the price which shall be adjudged to be the just, honest, and appropriate return for the labour; which I shall be enabled, I trust, to continue to the universal satisfaction of your Serenity and of all this excellent government, to the grace of which I most humbly recommend myself."

Can we not see the Grand Council Hall full of scaffolding, the Bellini busily directing their journeymen and giving masterly touches to the glowing canvases that were gradually lining the walls under their auspices? Can we not realise, too, the dreary longing waiting of Luigi Vivarini for his time to come, and, at last, his goaded resolve to write and ask for it? "The prayer of Luigi," write Messrs. Crowe & Cavalcaselle, "was heard almost immediately; he was authorised by an order in Council, issued on the 29th of July, 1488, to receive the canvas he required; he was furnished with the necessary journeymen and colours; and he was told to fit his picture for the place hitherto occupied by the fresco of Pisano." Then they tell us how the frescoes of Pisano and his companion Gentile da Fabriano had been damaged by the dampness of Venetian climate; and of the deliberation of the Council concerning the best means of replacing them; with the ultimate resolve to adopt the newly-introduced method of painting in oil as then practised by Antonello of Messina, the Bellini, as well as the Vivarini. Luigi painted two subjects for this famous hall; Otto promising to mediate between Venice and Barbarossa, and Barbarossa receiving his son; but both were destroyed, with the contemporary work of the Bellini, in the fire of 1577. Dissecting his mode of work, his biographers declare, "The vehicle which he employed was

apparently tenacious and fibrous, and when he spread the local tone over the surface of his picture he had great trouble to model the lights into half tones and darks. During this process he sacrificed the transparency of his shadow to the necessity of increasing its depth, or he gave up depth for the sake of transparency. Failing to obtain the effect of sharpness by pastose touches, he was forced to define form too frequently by coarse lines of a dark and liquid substance; and the rawness thus produced was only mitigated by a general scumble resulting in blindness, opacity, and sounbreness of key." And then we know why Luigi Vivarini never rose to the first place among Venetian artists, and think of the harsh lines and abrupt contrasts of light and shade with as much regret as that with which he must have viewed them.

Before going further into detail of treatment, we must give our readers a general idea of the scope of this work, by explaining that it opens with an account of the painters of Venice in the fifteenth century,—Jacobello, Donato, Giambono, including a slight notice of Morazone. From them to their *confrères* on the island of Murano is the first step. Here we are introduced to Giovanni, Antonio, Bartolommeo, and Quirio da Murano, artists content to work with the wonderful glass-makers, whose daughters were at liberty to marry princes, in recognition of their supreme skill. These men retained the old Byzantine method of gilding the stucco ornaments and backgrounds of their pictures; but they threw off the old coarse incorrectness, and seized the softer manner in which Gentile da Fabriano and Pisano had rendered their creations for the great council-hall, and, as we have seen, passed through further developments, as time passed by them. The career of Bartolommeo is minutely followed, through his gradual rise to eminence to his unrecorded death in comparative obscurity. A chapter is devoted to the painters under the influence of the Vivarini and Mantegna, Jacopo da Valentinia, Andrea da Murano, and the Crivelli; and then three chapters are apportioned to the three Bellini. After a consideration and an enumeration of the works of the leading pupils of these last, we come to Squarcione and his great disciple Mantegna, and the host of Squarcionesques and Mantegnesques of Padua and other cities. The Vicentines, the Veronese, the Ferrarese, and the painters of Parma and Romagna follow. These conclude the first volume. The second commences with the Milanese school of the thirteenth century. The Neapolitans, Sicilians, and Antonello da Messina follow this; and then Giorgione appears on the scene. The early painters of Friuli, Domenico, and Gian' Francesco da Tolmezzo, Giovanni Martini, Pellegrino da San Daniele, and Morto da Feltre are next marshalled, and their works examined. Giovanni Antonio da Pordenone, with his numerous titles, and his manifold changes of style, from Friulian to Venetian, and thence to Raffaellesque and Titianesque, is honoured with a distinct biography, as is Sebastian Luciani del Piombo. The Brescians and Cremonese are condensed into one chapter; Palma Vecchio is expanded into another; and Lorenzo Lotto, the Santa Croce, Cariani, and other Bergamesques form the subjects of the concluding section of the work. It will be seen that it is difficult to draw a line between the painters of North and South Italy. For the sake of Antonella da Messina, it is necessary to bring in the Neapolitans and Sicilians; and then, on the other hand, some of the Northern painters wrought in the South. Titian is only casually mentioned, owing, doubtless, to the fulness with which his biography has been given elsewhere. But, with the exception of a few drags of this kind, we feel that the joint authors have spread out to view a fair chart of the creatures and creations of this portion of the art-world.

* "A History of Painting in North Italy." By J. A. Crowe and G. B. Cavalcaselle. London: John Murray, 1871.

Looking minutely at the fuller biographies we are struck with the care with which each influence upon the manner of a painter has been traced. We select Mantegna, as an illustration, because his numerous works preserved at Hampton Court have made him better known to the general public than some others. Adopted by the tailor and embroiderer, Squarcione, he was registered at an early age in the Paduan guild. Squarcione, it must be explained, was a tailor and embroiderer, who had travelled in Greece, and had brought thence models and panels, with which he established a school for the instruction of youths, perhaps first in designing for embroidery, and subsequently in art matters generally, by means of which he acquired a wide reputation and a small practice ultimately as a painter. We have his word that 137 pupils were taught in his atelier in the course of his career. Mantegna and some other pupils were deputed by him to decorate the Chapel of San Cristoforo, at the Eremitani, and by the excellence with which they executed the commission, contributed to increase his renown. This is the commonly-received version of Mantegna's first starting-point; but Messrs. Crowe & Cavalcaselle remark they must doubt that Squarcione taught him, and inquire whether it is not much more likely that Mantegna taught in his atelier. They attribute the superiority of the latter to the study of the great frescoes of Fra Filippo in the Paduan churches, and the masterpieces of Uccelli and Donatello, then to be seen in Padua, and his intimacy with Jacopo Bellini and his sons, who were living in Padua, and proved themselves not hostile to the new life of the Florentine revival. Eventually, however, Squarcione and Mantegna quarrelled, and broke the connexion that existed between them. Squarcione spoke slightly of the younger man's work as an imitation of the hardness of marble, instead of the flexibility of flesh; and our authors point out that a strong attempt to correct this fault is apparent in all Mantegna's work of this time. They dwell with delight upon the martyrdom and removal of St. Christopher painted by him, as an example of the relaxation of this grimmess. After a description of the treatment of this subject they observe, that it is in this work that we become fully acquainted with Mantegna's lofty position amongst artists. They compare the St. Christopher with Titian's "David and Goliath," and with the "Death of Abel" on the ceiling of the Sacristy at the Salute, in Venice, and proclaim that the Venetian framed his rules by the achievements of the Paduan, who was incorably scrupulous and searching in working out laws for himself. Mantegna, they aver, levelled the road leading to perfection with the power and will of Donatello and Buonarroti. His knowledge of Classic architecture and antiquities generally, was also a source of power, besides his wonderful perspectives; and the local antiquaries, charmed with his introduction of Classic arches and columns, and veritable inscriptions in his work, lauded him to the skies. So far, then, we may trace the sentiment of Mantegna's designs to three influences: Squarcione's Greek antiquities, his visits to the rival ateliers of the Florentines established in Padua, and his archaeological and perspective sympathies. He appeared to revel in the mastery of perspective difficulties. He subjected, his critics aver, the human form to the same maxims as architecture, and chose attitudes for his figures in accordance with this novel treatment; and it is even probable, they think, that before he laid on some of his frescoes, especially that of "St. James being led to Execution," in the chapel we have mentioned, that he set his models at given distances, and worked out the drawing of each by a separate operation. In this particular fresco he chose the most difficult centre of vision, as if he was determined to show his power to his critics; and not content with lines so precipitate that the lower parts of all the figures are out of sight, save of those in the uttermost foreground, he introduced a distant tower placed angleways. But in this last feat, it is contended, he did not quite master the scarcely-developed rules of perspective, for repeated tests applied to the picture show the tower not to be rectangular, and it would be unlikely that he intended it to be otherwise. But the fault was not found in his own time. An author, writing on perspective, while the chapel was yet sparkling with its new decorations, pointed out this fresco as an admirable instance in which the exigencies of science had been overcome by a votary of art. Messrs.

Crowe & Cavalcaselle dash past the error of Coddé, who gives a lady of the family of Novuloso to Mantegna in marriage, and assign him the daughter of Jacopo Bellini, which union, with its necessary intimacy with the Bellini family, they think, accounts for the Bellinesque spirit that pervades some of his work. We will carry the notice of Mantegna into another article.

AMONG THE INTERNATIONAL PICTURES.

CONSIDERING the sublime irregularity with which the paintings in the long galleries at Kensington are hung and numbered, it is matter for congratulation that, at least, the grouping of nationalities has been pretty well adhered to, and that we are enabled readily enough to compare the broader characteristics of style, manner, and choice of subject, peculiar to various nations, by the mere passage from one gallery to another, a few steps sufficing, in some cases, to bring before us diversities of theory, practice, and predilection in the art, which, as national characteristics, might easily be missed in the comparison of isolated paintings, but which come out vividly enough in contrasting the large groups collected in the various galleries assigned to the different European schools. If we cannot promise to follow any consecutive order in reference to the numbers or positions of the pictures mentioned, we can, at least, give so much of system to our comments as may arise from the separate and comparative consideration of each main group. And (as in courtesy bound) we give first attention to our foreign contributors, in the east galleries, and look round the Belgian collection.

It can hardly be said that what is called "historical painting" (long considered as indubitably the highest walk of the art), offers in any of the galleries, least of all in this, the most marked and forcible illustrations of national feeling or style of treatment. Such pictures as Slingenever's "Cameos Shipwrecked" (815), Wappers's "Charles I." presented with a rose by a young girl, on his way to the scaffold (875), or Karlbach's "Crownwall at Lady Claypole's" (822), present too little either of individuality of style or intensity of feeling to be accepted as typical in any way, except that the two latter afford fresh instances of what we have before noticed, that in general Continental artists are not successful in subjects of English history, with which they seem to have too little sympathy to treat them in any but a tame and commonplace manner. Wappers's "Mary of Burgundy entreating Pardon for her Councilors from the Sheriffs of Ghent" (876), is a noticeable contrast to these in force of painting and character, though not telling its story very clearly. We owe a debt, however, to Van Lerius for rescuing one of our most hackneyed English subjects a little from the regions of commonplace: since Tennyson gave additional popularity to the legend of Coventry, it has been a standing resource of mediocre painters wishing to display their powers in a nude study, and we refer again to the Belgian artist's "Godiva," not only to note the bright yet harmonious combination of colour in the green curtains and the warm though not strong red and brown of the architecture, but to express satisfaction at a treatment of the subject totally free from the taint of vulgarity, which has become almost universally associated with it. "Vexation," by the same artist (869), is a brilliant study of a yellow satin dress, reminding us of Lewis in tone, though not in scale. Perhaps the best specimen of a class of painting in which the Belgian artists excel is Portaels's "A Box at the Theatre, Pesth" (823), where three ladies are observing the representation (as the playbill informs us) of "Othello,"—the elder one in the centre, with slightly clasped hands and eager face intent upon the play, which excites a more languid and perhaps not quite enjoyable interest in one of her young companions, while the haughty brunette opposite looks with almost a cold indifference upon the mimic passions, which are, perhaps, but a pale reflection of her own, actual or possible; the picture is as fine in colour as in character. Hannebic's "Field Labourers" (800) is a clever and interesting picture, out of very simple materials; nothing but a row of men hoeing, in which monotony is happily avoided, and interest attained by variety of attitude and expression. As specimens of *genre*, Baugniet's "Good Luck" (766), with its happy contrast of the aristocratic smartly-dressed lady

with the fortune-telling gipsy, may be mentioned; De Groux's "Pilgrimage" (791), with its juxta-position of surly and "devoted" expressions, is sarcastically indicative of the variety of feelings with which such religious duties may be entered on; and A. Stevens's "Un Peintre" is a clever and original study of the studio of a sadly vulgar-looking painter directing the "model" in her partial divestment of drapery; the yellow colour of an under-petticoat being apparently the *quid pro quo* in this case. The Belgian Gallery is weak in landscapes, and with curiously little indication of any feeling for what may be called the poetry of this branch of painting. Marie Collart's "Flemish Orchard" (784) bears the label "Medaille," a distinction which such a comparatively weak study of thin trees would scarcely have gained in an English exhibition; and other landscapes here are open to the charge of being mere cold studies, without either feeling or effect. An exception is Lamorinière's "Netherlands—Autumn" (819), a quiet and expressive twilight sky seen over a high bank, and reflected partially in the pool beneath, and Montigny's "Winter" (823; lent by H.M. the King of the Belgians), fine in the desolate aspect of the waiting horses and wagon on a lonely road, and the heavy, threatening grey sky beyond. Rollaen's "Mont Ross, from the Foot of the Riffelhorn," is a fine and very careful study of green rocky foreground and distant snow, with the vast cold blue shadows from the western sun traversing the mountains. Perhaps the distance is a little hard. The want of feeling for the sea among Belgian painters is even more noticeable in this collection. There is, indeed, in Artin's "Sea Storm" (762), a fine indication of the wild drive and impetus of a stormy sea, though with a texture and surface very different from anything we are accustomed to accept as a representation of sea-water; but in others, in the well-known calm seas of Clays, for instance, there is evidently only a certain favourite acquired manner of handling water, not surely based on constant reference to nature. Bouvier is less measured in this way; but contrast his "Abandoned Vessel" (773) with the well-known picture under the same title by Stanfield, and how weak and tame does the Belgian artist appear in comparison. In architecture, in combination with landscape, on the other hand, the Belgian painters show precision, a correctness in colour and detail, and a feeling for the picturesque in architectural composition worthy of all praise, especially as exhibited in F. Stroobant's two paintings, "Le Quai du Roesaire" and "A Flemish Town" (855-7); and in still life the artists of this country exhibit all their traditional excellence; and if Van den Bosch only appeals to our risible faculties in his representation of the "Torments of Tantalus" (a mouse contemplating a cheese under a glass cover, and contemplated in turn by the cat through the closed window), we have other admiration for such a painting as Robie's "Flowers and Still Life" (837), where the grouping of gold vases and glass with a background of flowers, displays not only a mastery of execution, but such a rich harmonious blending of colour and reflected light as we have rarely seen in paintings of this kind.

Passing to galleries XVIII. and XIX. (which, by the way, are mixed up together in the catalogue, so as to jumble together Bavaria, Prussia, and Italy in a fortuitous manner), we find ourselves at once in a different region of landscape at least from that presented in the Belgian Gallery; indeed, there is probably no branch of painting wherein national tastes and habits are so strongly marked as in landscape, involving as it does not only differences in mere manner of painting, but in the way of looking at nature, and in the aspects of nature with which the respective artists are most familiar. Looking to the right, as we enter the room next to the Belgian Gallery, we have come into a land of tremendous mountain and lake scenes. But we are constrained to confess that there is a mannerism in sublimity, as well as in tameness and flatness. We know the scenes of Len, and others of the Prussian and Saxe-Weimar school, as well in their main characteristics,—even down to the inevitable little scratch of light on the water in the middle distance,—that an uncomfortable idea of mechanism and mere painter's labour takes possession of us; we cannot relish all those masses of mountain and lake sublimity so very like each other—it is *toujours pareil*. One of the best of this school is perhaps Ludwig's "Scenery among the Hartz Mountains," the tone of which somewhat varies from the established recipe, and which

shows a fine, but rather overdone, gloomy mass of sky in the rear. Dante has some of his well-known winter scenes, in which snow, landscape, and architecture combine, the latter exhibiting really a remarkable variety of picturesque outline and treatment in a long series of pictures of similar subjects, some of the best of which are exhibited here. But Bavaria, with less pretence, comes out far better in the more refined qualities of landscape-painting than Prussia; in such artistic treatment of quiet scenes as Hellrath's "Stonepit near Polling" (896), reminding us of Linnell in subject, though not in colour, Wenglein's "Fall of the Leaf" (934), Lier's "Potato Harvest" (907), and (by no means least) Tiesenhausen's "Bay of Woerkm, Easthonia, Baltic" (928). This last, a small picture, representing a wild flat coast-scene, with a belt of trees in the middle distance, is certainly one of the best landscapes in all the foreign galleries; admirable in the tone of the water, the shore, and the moor, and in the consistency of tone and feeling throughout: it is worth looking at carefully. In other branches of painting there are few among the Bavarian and Prussian pictures which challenge attention particularly. Müller has a fine study of heads, "Two Moors" (915), one holding a skull; and Seitz's "Murder of Rizzio" (925) is a fine and carefully-finished picture, though the two main groups seem to want relation to one another. Tidemand's "Grandparents' Visit" (953) is a pleasant little picture, as also Rosenthal's representation of "J. Sebastian Bach's Family at Morning Prayers" (921), singing a *chorale*, to which good old Johann is playing the accompaniment, while a puzzled junior member of the family endeavours, with the help of his sister, to make out the intricacies of his "part." Pauwels's "Pastimes for the Count de Buren, at Antwerp, under Philip II." is a very pleasing group of figures in a boat, with one or two beautiful and characteristic faces. But we turn with greater interest to the small, but in many respects interesting, collection which represents Italy. That modern Italian art is greatly progressing of late years cannot be doubted. We have already called attention to the excellence of much of the sculpture exhibited by Italy on this occasion; and in painting, though not equalling their sculpture, the Italians of to-day seem in a fair way to take a place very different from what they have for a long time held in modern art. The Southern lack of force and vigour, which has so often been the accompaniment of Southern elegance and refinement of manner, is still apparent; and we cannot accept the pretty and elegant figures and bright colouring of Amiconi as contributions of lasting importance to art, though they have their admirers. His "Portrait of Mrs. T. L. Bristow" (1,032), however, has more of force and vigour than many of his ideal figures; and Giordani's "La bella Giardiniera" (1,044), a young lady with flowers in her apron, is a charming, bright, life-size painting, reminding us a good deal of Millais's recent manner in portraits, though with a difference of execution. Ciseri's "Autumnment" is a picture of much pathos in colour and composition; and G. Müller's "Woman of Albano with her Infant" (1,048) is an admirable life-size half-length, with a real flesh-and-blood fulness and ripeness in the head and bust. Bacani, in his "Grecian Idyl" (1,034), reproduces for us, in delicate drawing and colour, the old Greek pastoral. Among several good landscapes, we particularly notice two by Castelli (1,039 and 1,040), and a very clever effect by Joris, "Returning into Rome on a Rainy Day" (1,096), consisting mainly of a straight wet road, reflecting the tone of the sky, the composition broken by one solitary tree standing up on the left of the picture. This is a very original painting of its class. Tancredi's large picture, "Buoso di Duina" (1,053) ought not to be passed over, as indeed one of the best historical paintings in the foreign galleries, in grouping, composition, and expression, only failing to a certain extent from a lack of interest, to general spectators, in the subject. We leave the Italian gallery with hope for the future.

And what of the French Gallery, into which we step from the last? It would be difficult to imagine a more decisive change of style, a more complete revolution not only as to methods of execution, but as to the whole intellectual view of the art of painting, its objects and its limits, than is forced upon our notice in leaving the Italian pictures to look at the large collection which represents modern France; not, most of them, very recent pictures,—for, unhappily,

France has had to depend a good deal on the works of some past years, and on the liberality of their present owners in lending them, for the fine show she is able to make on this occasion. Perhaps what we should note as special characteristics of French art, in comparison with those of the other nations represented, are the strong individuality of manner of style, and even of subject, characterising a large proportion of the leading artists, and (still more) the evidence of special study and handling with a view to special ends in painting. Here again these qualities, the national idiosyncrasies of the art, are nowhere so strongly shown as in landscape. The whole French treatment of this branch of the art suggests questions as to what are its real ends and true principles. A casual English observer, accustomed chiefly to the grand scenic effects of Vicoat Cole, of Graham, and others, might walk away with the impression that France had done little in landscape art that was worth notice in comparison with the larger and more effective representations of natural scenery which he is used to see on the walls of our own Royal Academy. But do not let us be in too great a hurry to come to such a conclusion. The question is an open one, at least, whether it be really the highest object of landscape-painting to imitate on canvas the effects of nature, in the closest manner possible, either in detail or on a grand scale; or whether it be not in truth a higher and more intellectual use of the art to employ it as the medium of representing certain phases of feeling, using natural forms merely as the material, the instrument on which we play; and if the latter, have not the leading French landscape-painters succeeded? What is it that is given us in the numerous works of Corot, Dupré, and Daubigny, so largely and beautifully represented in Room XX. at the Exhibition? There is scarcely any minute detail of nature recognisable; we can scarcely name Dupré's trees; we perhaps doubt whether landscapes like those of Corot exist in nature; and yet are they not beautiful? are they not replete with subtle and harmonious poetic feeling, which appeals, in some way we can hardly analyse, to the inner eye of the mind, more than perhaps the most laboured and successful reproduction on canvas of special aspects or details of natural scenery? This, at least, is our impression. We mention in particular, of Corot's, "Border of the Forest" (1,169), "Evening, near Rome" (1,172), and, above all, the "Orpheus" (1,174), with the single figure in the centre in a rapture of inspiration; and of Dupré's, 1,214; a beautiful "Sunset" (1,220), and a "Landscape" (1,224), reminding us very much in composition and tone of Nasmyth, though totally different in touch and execution. In 1,355 the same hand creates poetry for us out of nothing, almost; "Cows in a Meadow" is the title; and "A River" (1,360) is perfect as a composition. Notice also Diaz de la Pena, the "Woodman's Wife" (1,209), and sundry solemn wooded scenes, under evening skies, by Daubigny, to be come upon here and there in the gallery (one of the best, a wooded lake under a twilight western sky, has got by mistake into either the Prussian or the Italian gallery, we forget which). In a picture labelled "Médaille" (1,330) Breton, gives us his view of "Snow"; it is just a field and one or two hay-ricks covered with snow, but with striking individuality of tone and treatment, and a total absence of "paintiness," if we may coin the word. Another snow picture by Michel (1,458; also marked "Médaille") is a more elaborate and remarkably truthful representation, but interests us less than the former. We have dwelt a little on the French landscapes, feeling that their merit, and the nature of it, is not fairly appreciated, nor likely to be quite understood by those who are wedded entirely to the realism of the English school. However limited the French range may be thought to be, either in this or in other branches of painting, it is at all events evident that their artists know what they mean to do, and how they mean to do it; that they have fixed principles, and a definite perception as to the theory of their art. It cannot be said that the walls of English exhibitions, with more variety of style, no doubt, afford much evidence of this certainty of purpose and intellectual comprehension of his subject by the artist. As to seapieces, the French, on the other hand, do not show well at all. They have no feeling for the sea; and the best of Gudin's are tame and spiritless, in comparison with the productions of several painters amongst ourselves. French

figure-subjects, of various kinds, are not quite so well represented as landscapes. There is one of Caraud's best, the students of St. Cyr sailing Racine's "Athalie," in the presence of the author. Delacroix, Delacroix, and others are represented by some well-known works: Cabanel only by one,—"Solitude" (1,160),—a standing half-length figure, in face and costume companion to the beautiful sitting figure bearing (if we remember rightly) the title of "Melancholy." Schœffer is represented by one picture,—not one of his best, for the figure is far too thin and meditative-looking for the "Marguerite" of Goethe, if that be the intention. The class of subjects in which several of the best French painters excel so highly, viz., small single figures, expressive or some peculiar turn of feeling, grave or gay, and generally in the midst of a highly-finished interior, is not very well represented at the Exhibition. One very beautiful specimen of Goupil's there is, lent by our present Premier, "Resignation" (1,229); but this phase of French art, which presses all the externals of the highest luxury and civilisation into the painter's service, merely as accessories to the expression of human feeling, and which is, to our thinking, something far higher and more refined than the pathos of cottage life with which Faed and others have dosed us almost *ad nauseam*, must be studied this year at the gallery in Pall-mall. There are some pleasant bits of *genre* and "still life," but scarcely among the best efforts of the French in these branches; in the latter, Bouvin gives, for those who like it, the picturesque of a pickle-jar (1,324). Two pictures we will allude to, large and important works, as specimens of what French art might adroitly be without. Regnaud's "Execution in a Moor's Palace" is one (1,469), a picture representing, on the largest scale, the decapitation of a man, whose head and headless body lie on the stairs on which he has suddenly met his doom, the blood running down in a pool, and painted evidently with great gusto and exactitude. The taste for what is nakedly horrible evinced in this and former French works, is a very repulsive trait in the art of the nation; and not much more desirable is that evinced in Lecondre's "Nude Figure: a Study" (1,453). A nude study is all very well, and one may learn a great deal from it (witness Mulready's capital "Life School" studies), but it is not necessary that such a figure should assume an attitude and expression which can only be rightly designated as lascivious. This combined taste for the horrible, and for the mere sensuous representation (to use the mildest term) of female charms, shows a real retrogression from the highest idea of civilisation, for which we fear the Second Empire, among other sins against society, must answer. Let us hope that when France has recovered from her present difficulties, a healthier rule and a less self-indulgent and more vigorous habit of social life will give wider and higher scope to her art, and turn from all ignoble expressions that remarkable genius and talent which she has at her command.

We shall return to the English pictures as well as other departments of the International Exhibition.

THE ROYAL ACADEMY EXHIBITION.

The interest of the present exhibition is enhanced by the fact that it may be considered as the first in which foreign artists of high fame have competed on equal terms with our own for the applause of the English public.

Jean Leon Gérôme, who now dates from 17, Southampton-street, Strand, has sent two pictures to the present exhibition. The first of these (144), "*Cléopâtre apportée à César dans un Tapis*," is already well known to many of us, either by former exhibition or by an engraving. The Emperor is seated at a table, in the hall of an Egyptian palace or temple, adorned with hieroglyphics. At a second table, before him, sit his four secretaries, for all of whom the great Julius found work by dictation at the same time that he wrote with his own hand, which holds the *stilus*, and rests on a roll of papyrus. A powerful black slave has just set down his precious burden in the apartment; and, as he unrolls and draws back the thick veil, the Egyptian queen, dressed, or rather undressed, to represent the goddess Isis, flashes on the astonished eyes of Caesar, on whom she bends a steady, half-reproachful look. The gaze of the Emperor is arrested by the brilliant vision. His left hand is even more expressive of his surprise than is his face. Each secretary is

seduced at the same moment to glance from his tablets. The figure of the queen is wonderfully modelled,—her face, none can doubt, irresistible. The conqueror of the world is her prey. The story is at once told and explained.

Still more masterly in its treatment is the new contribution of the foreign honorary associate of the Royal Academy, No. 1,150, called "A Vendre." We are introduced to a dark, ill-lighted apartment in which a beautiful Circassian woman, clothed only in her dark hair, which she has tossed carelessly back, and one enamelled anklet, leans despairing against the wall. At her feet crouches a black Nubian, wrapped in a white cotton robe, exposing the dusty and travel-soiled soles of her feet; beside whom nestles a monkey, more like the negress than she is to her white sister in captivity. Through an aperture is dimly seen the stolid profile of the slave dealer, and some rich weapons and ornaments hung at the window. It must have been of express purpose that such a master of colour as M. Gérôme subdued the light in the apartment so much as to give a dusky hue to the beautiful figure of the Asiatic. The pure white that often accompanies such coal-black hair might have been too brilliant a contrast to the negress. Still, we could wish it had been tried. The drawing is magnificent,—the hips rather too low for the sculptor's ideal, but the flesh solid and life-like. A blue macaw and a red flower light up the scene. The moral is not far to seek. As a gallery picture "A Vendre" commands the highest admiration.

Next to this painting in importance, and rising far above it in dignity of subject, is the "Moses" of Mr. Millais (191), a powerful and remarkable picture, which may almost mark an era in English art. Not that we can praise the grubby clouds and the impossible fiery scabbles of the battle going on to the left. Nor can we altogether admit the propriety of the brown Capuchin's frock, without sleeves, in which Moses is attired. But the group is very grand. The prophet, with eyes fixed, mouth open, and outstretched hands, is an evident *energumene*. The idea of supernatural possession is perfectly rendered. In the treatment of the hair, the conventional attribute of the horn-like rays, which Michelangelo has turned into the horns of a satyr, is admirably hinted at. Aaron is a noble figure, with far more of the traditional beauty of his line than his brother. Dressed in blue, and with a coloured drapery over his head, he sustains the right arm, while Hur, in a more warrior-like dress of red, with the gourd slung by the side, presses the left, and looks with hungry eyes at the battle in which he fain would join. With a little additional care bestowed on the background, the picture will live as a lasting triumph of English art. Mr. Millais has again approached the night side of nature in "The Somnambulist" (313), a stately girl in her night-dress wandering on the edge of a precipice. The dusky gloom is an excuse for the somewhat rough treatment of her attire. She holds a candlestick in her hands, but lets it hang down, which is rather a painter's indication than a physician's observation, "The eyes are open, but the sense is shut." Viewed from the proper distance this fine picture lingers long on the imagination.

No. 14, "Chill October," is, we believe, Mr. Millais's first landscape, pure and simple. It shows a wonderfully poetic reading of nature, and a faithful and powerful, though unequal, rendering of her charms. The feathery reeds in the foreground might almost be heard to rustle. The glancing willows are hardly less true. The water, close by, is real. But that in the distance is frozen and covered with snow. The want perhaps in this fine landscape, the weakness of many of our painters,—not of landscape alone,—is neglect of scale. We cannot better illustrate this than by reference to two pictures, of small size, and not placed in positions at all equal to their deserts (433 and 440), by Mr. Albert Breisstadt. In that peculiar excellence which we call truth of scale,—the proper subordination of the distance,—he is, we think, quite unrivalled. Hence the wonderful effect of range which he can command in a few inches of canvas. The tall firs in the foreground, the crested mountain scarps fading away one after another in magic aerial perspective, the colour of earth and sky,—all are admirable. But the chief charm lies in the mode in which the greater or less detail is rendered in precisely the same way as that in which the eye catches the features of nature. This treatment may be contrasted with that of such pictures as "Roy

Cheeks" (70), in which there is no atmosphere at all, every detail coming out like the photograph of a volcano in the moon; or with "Blackberry Gatherers" (66), which is all atmosphere, the figures being dim and misty. In addition to these two schools or styles we find a third, which resembles fresco-painting laid on too thin and wet, so that the colour ran; a fourth which is like painting on majolica; a fifth which is like mosaic; and a sixth which is like a tapestry carpet. The fact that each of these imperfect methods has more than one adherent is a very strong argument as to the necessity for some more stringent law than those of the individual fancy being applied to our native schools of painting.

"The Morning and Evening of Life," by A. A. E. Hébert, is a fine picture, admirable in its drawing, and touching in its moral. A girl, full of exuberant youth, stands boldly up, while an aged grandmother sits by; yet you see that the two figures are but two stages of the same individual life. The effect in this, as in other Continental paintings, is that of work which has been examined by some independent master, before it is allowed to be sent from the studio. With English pictures, as a rule, the amount of finish seems matter of chance.

We are glad to find that another of the great foreign exhibitors, who is not, however, an Associate, is so raced in his own peculiar way of art by at least one of our English painters, as to warn him to look to his laurels. M. Alma Tadema sends two pictures to Burlington House this year. Of one of them we have only to object to the title (1,101). "The Grand Chamberlain to his Majesty King Sesostrius the Great," is a wonderful life-like portrait of a powerful Nubian, dressed in Egyptian attire and ornament. Which of the very different claimants of the name Sesostrius is indicated by the artist is not clear. But the Ethiopic dynasty in Egypt was later than either of those monarchs to whom the name has been attributed, and the Egyptian, not the Negroid, type, would be naturally expected in one of their state officers. The Moslem meaning of the word chamberlain was unknown in the days of the grand old Egyptian monarchy. Apart from this criticism (provoked by the pedantry of the title), we call attention to the power and breadth with which the artist has rendered a very remarkable specimen of humanity, if humanity be the right word.

"A Roman Emperor, A.D. 41" (210), is a more ambitious subject, treated on a smaller scale. Deficient as it is in the leading rays of composition, by the manner in which it is broken up, and by the mode in which the advance of the eager and motley group is arrested by an invisible, if not unintelligible, line, leaving a vacant space in the centre, it is a painting of extraordinary power, of high finish, and of outspoken felicity in the mode in which it tells its story; the very *penetrabilia* of the Imperial palace, containing the marble *term* of Augustus, and the altar of *giallo antico*, on which incense should be burned in honour of the *lares* of the family, is invaded by a motley group of legions, including two half-cad women, who are, however, arrested by some inexplicable awe in a row to the left of the scene. The sacred character of the spot has proved no protection to those whose corpses are tumbled on the floor, and the marks of whose blood-stained fingers show on the white sides of the *term*. In a sort of recess to the right a helmeted soldier draws aside a curtain, and recognises the Imperial heir of whom the party are in quest by his purple *citharus*, which he is stooping to examine. The abject terror of Claudius is half ludicrous and wholly repulsive. The picture loses from it in dignity, though not in effectiveness. The Dacian who grasps the quaint silver eagle, the Tenton who is by his side, the heterogeneous features of the soldiers, among whom the grand old Roman type is sought in vain, the eager curiosity of the women, the action of the shield-bearing soldier, who is proclaiming the discovered Emperor, the gleam of the marble, and the well-imagined ornaments of the walls,—all these go far to make up a picture. Certainly, in spite of some faults, it is an impressive and memorable one.

With these two works should be examined the pair exhibited by Mr. Poynter, A. (115),—"The Suppliant to Venus," and (238), the girl "Feeding the sacred Ibis in the Halls of Karnac." Mr. Poynter worthily contests the dominion of Egypt with his Dutch *confère*. Simple as is the incident of the latter scene, it rivets the attention by its admirable truth to

nature, under the weird aspect of the most ancient civilisation, and the solemn light of a southern atmosphere. The birds are a zoological study. The incised marble of the columned hall is solid and glossy; the girl is African life, and African life seen under that veil of poetry which youth flings over all the aspects of nature. Rather as a proof of what the painter can do than as a subject picture, this bit of old Egyptian worship is very precious. The same conscientious labour has been bestowed on the temple scene, with the exception of the hue of the soil, which is of too dirty a green for the Ionian gulf, all here is truthfully conceived, and rendered with the touch of a master. We think that some of the brightest promise for the future of art in this country waits on the case of Mr. Poynter.

We confess to much disappointment in the study of the three contributions by Mr. Leighton, R.A. Lamenting, as all did, his enforced absence from the Exhibition of 1870, and remembering the rare beauty of the "Helios and Rhodios," we hoped to find Mr. Leighton's pencil redipped in its richest hues, to the entire abandonment of the sickly olives and the unmeaning sentimentalities of feature, which we hoped he had cast behind him for ever. Alas! he is somewhat retracing his steps. It is extraordinary to see a painter with such a power of producing beauty waste himself in the production of what, though powerful enough,—is not beautiful. The "Cleobulus instructing his Daughter Cleobaline" (the framer of the catalogue, if he adopts, like the new master of Peisistratos, or Peisistratos Caxton, the Oloos, should write "Kleo") has perhaps the least of the defects of which we complain. Still, though a fine and carefully painted, it misses of being altogether a pleasing picture, and the father would certainly have paid more attention to his toilet in the presence of so young and fair a girl; neither is the figure all that it ought to be. In the most ambitious picture (215), "Hercules wrestling with Death for the Body of Alceste," Mr. Leighton has not taken Euripides for his guide. Had he faithfully followed the wise and well-tried laws of the Greek drama, the power, vigour, and imagination which he has displayed in a picture which is as admirable in its execution as it is imperfect in its conception, would have produced a really noble work. As it is, we have a crowd of people of whom Euripides knew nothing. The girl who kneels behind the bier is a lovely creature. The man in red behind the tree has a face of wonderful expression and power. The terror of the group is admirably rendered. But what business have all these witnesses of the awful shadowy awe of the Hero, and the silent Genius of the tomb? Who is the old man in the centre of the picture, and who is the girl who is almost mimicking the main struggle? The fine, strong young man, with no clothes, is not the Greek Hercules, any more than the sightless corpse whom he grasps by the wrists (not, as Euripides tells us, by the small of the back) is Thanatos. The picture is a heedless misconception, wrought out with marvellous power.

In 567, "Greek Girls picking up Pebbles on the Sea-shore," there is not only an utter disregard of any idea of linear composition, or any effort after harmony and balance of colour, but an impossible arrangement of wheel-shaped drapery, borrowed from the quaint forms of Pergino's angels. The four beautiful girls no more form one picture than do the sketches so often multiplied by Raffaello on the same piece of paper. This is the more to be deprecated, because there are more than indications, in the great beauty of form, expression, and colour, which wait upon Mr. Leighton's pencil when he commands their appearance, that he could, if he would, give us pictures worthy to be placed by the side of, if not before, those of any living artist. Why does he not? How many a bad picture would be replaced by a good one if the artist would only subject the first sketch to a thorough critical investigation!

With these revivals of the old life of classic Greece and Italy, ranks the one picture by Mr. Leslie, A. (103), "Nausicaa and her Maids," a most agreeable and pleasing painting. It seems to possess every requisite for a good picture, except the pressure of atmosphere, a very general failing in many English pictures, which we regret to observe in this, and a more fitting title. The colours, with the exception of the clouds, are harmonious, and well chosen; the lovely bride, in delicate white attire, with the odorous stars of the myrtle gleaming in her hair, is a perfect

study. Mr. Leslie's one picture may almost be called the lion's cub of the Academy, ranking it among those works of which the object is rather to please than to stir or to elevate the mind.

Seven hundred and fifty-eight oil-paintings, 98 water-colour drawings, 75 crayon drawings, engravings, and etchings, 76 miniatures and enamels, and 260 pieces of sculpture (not to mention the 111 architectural designs which we have already noticed) form a total of imposing interest, and we may yet return to it. We have no desire to seem captious, but we renew our protest against the charge of a shilling being made for the catalogue, and add a new complaint at the extravagant charge of nippence or a cup of coffee and a roll. The Royal Academy should not be conducted on the principle of the truck-shop.

GENIUS OR INSPIRATION, PERFECTED BY RULES OF ART, PRECEPTS, AND INDUSTRY.*

"I am persuaded that by imitation only, variety, and originality of invention, is produced. I will go farther; even genius, at least what generally is so called, is the child of imitation." SIR JOSHUA REYNOLDS.

ALL who are conversant with the art injunctions bequeathed to us by Sir Joshua Reynolds will fully understand the force of the above declaration; and comprehend the wide difference between basing or engraving our thoughts upon the treasures of ancient and modern art, and cross plagiarism.

In early days, when ancient buildings, prints, drawings, and books were inaccessible, an artist who displayed unusual intelligence was considered to be a genius by birth, and to have received his inspiration from Heaven. Sir W. Temple argued that "genius can never be produced by any art or study, by pains or by industry, which cannot be taught by precepts or examples; and therefore is agreed by all to be the true gift of Heaven or of nature, and to be a fire kindled out of some hidden spark of the very rare conception." In another part of his work he speaks of "learning or genius," and contradicts himself by pleading that "though invention be the mother of poetry, yet this child is, like all others, born naked, and must be clothed with care, clothed with exactness and elegance, educated with industry, instructed with art, improved by application, corrected with severity, and accomplished with labour and with time, before it arrives at any great perfection or growth."

Much has been said on this subject; but it is now well understood that genius or inspiration is dependent upon rules, precepts of art, and industry, for perfect development; and, further, that a natural genius cannot exist upon itself; it must be nourished, prepared, and cared for, equally as a cornfield, otherwise the mind, however gifted or inspired, will remain as barren as nature's mountains, and produce no crops. Digestion is as necessary for the health of the body as thought is for the cultivation of the mind. If there be no sustenance to digest, the body fades; in like manner the mind, if not continually replenished with knowledge, can never expand. Men with lazy and vagabond inclinations have often been mistaken for geniuses.

Architects are apt to rely too much upon inspiration, which, without education, avails but little. The president of a provincial architectural society speaks of "a rough sketch dashed off in a few seconds to rear the stately palace and the superb cathedral." Imagine the intrinsic value of this! Then he quits mother earth and takes a flight heavenward. "Yes," says he, "ever since architecture existed, this god-like faculty has been at work to bring forth objects of love, and veneration to couple with the eternal hills and everlasting rocks, and the tender ministries of the woods and waves, to influence, exalt, and purify the heart of man, to ameliorate, and soften, and release him from the hard grip of commerce, and to subjugate the gigantic selfishness of thousands to higher aims and loftier aspirations."

The situation of the cathedral at Basle is majestic, but the architecture is extremely clumsy. All inspiration in this case is derived from nature; no credit is due to the architect.

Natural scenery, mountains, valleys, trees, cascades, clouds, &c., are magic accessories to a cathedral, or church; but time, as well as brains, is required to create beauty. The building

must be duly proportioned, its architecture harmoniously adjusted, and its sculptures and decorations carefully set, like diamonds and precious stones in articles of virtu. Nature and art, when thus combined, are truly sublime.

Genius or inspiration, although a natural gift, is dependent upon rules of art, precepts, and industry for perfect development. I drew attention to this in 1860,* and observed that, "although a man of genius may design and create wonderful productions, yet they may be all in bad taste. To appreciate and to understand the best works of the age of Pericles, and the Middle Ages, requires education. Thus the importance and necessity of obtaining and possessing examples of correct art for educational purposes are self-evident. Works of genius, unless in good taste, are better avoided, at least as far as the pleasure to be derived from the examination of beautiful objects is concerned. Deformities in nature are exceptions to the rule: in the Renaissance and Elizabethan styles, distortions form the rule. It is of importance to distinguish good art from art *per se*: it is an art to sculpture monstrosities. They may be spiritedly executed, and with much talent; but to admire or to encourage such productions, would exhibit a morbid taste, to the injury of good or perfect art, and consequently dangerous to art-progress."

Genius has been for ages too much extolled, and used as a weapon against rules. At the present period the subject is seldom alluded to, and even maxims and rules are ignored. Genius may be compared to a graceful plant, and unless carefully sustained and guided, is certain to run wild. In former times it received occasional attention, and although difficult to describe, was understood. In a "New Critical Review of London and Westminster," 1736, the author says "but though genius cannot be learned, it may be improved; and though the gift of designing is born with a man, it may be methodised by study and observation." And that "without taste, even genius itself wanders blindfold, and spends itself in vain. Genius is, indeed, the first quality of the soul."

The talent or aptitude for excelling, observes Blair, in some one particular is what we receive from nature. By art and study, no doubt, it may be greatly improved, but by them alone it cannot be acquired. As genius is a higher faculty than taste, it is ever, according to the usual fragility of nature, more limited in the sphere of its operations.

Michelangelo, Inigo Jones, Vanbrugh, and Sir Christopher Wren, have been cited as "architects by inspiration," men who did not receive regular education as architects, and yet contrived to execute some very extraordinary works. "The whole secret of the matter," says the writer, "seems to lie in a very small compass, viz., that if a man possesses strong powers of a high order, to which he adds great industry and an untiring perseverance, he will unquestionably accomplish more in ten years than the man of mediocrity will if he were to labour incessantly until doomsday."

In "Observations on the West Front of Wells Cathedral,"† an architect remarks that "although ordinary artists may fairly be trammelled by such canons as are well set forth by Pugin and others, there have been and ever will be men of such originality of thought that their productions cannot be controlled by every-day rule. Their works are stamped with genius, and no better evidence of this assertion can be met with than will be found by those who care to study both the composition and details of the west front of this cathedral." If the writer alludes to the architectural design of the front, it would have deserved more praise had its author been guided by every-day rule, as the composition contains many puerile errors; if it be the sculptures that are "stamped with genius," their conception is good, but their execution remarkably bad, out of proportion, and many of them caricatures. Had the simple "every-day rule" been applied they would have been much more slightly; but, as *Punch* says, "simplicity is fast disappearing from our language. Be fine, be grand, or you are robbing."

All fine-art productions and imaginative works, let them emanate from either the poet, architect, painter, sculptor, or novelist, should be based upon probable—nay, possible—truthfulness, to be of service in elevating the human mind. A

grand opportunity presents itself to the rising generation, to study the past, to cull beauties and to reject defects, and to give to their works a greater exactness and conformity with truth. It cannot be denied that the great Italian painters have scandalised Scripture, beautiful as their works may be as regards form and colour; the most celebrated architects have committed serious errors in their works; and the poets and novelists have outstripped reason and truthfulness. Milton has no authority in Scripture for the greater part of "Paradise Lost;" and Byron has essayed most unwarrantable thoughts in his "Caio." The Scripture details the events alluded to with beautiful plainness and simplicity, without one superfluous expression. Contrast with this the painters, poets, and novelists' imaginative narrations. Nothing is more common than to see the Virgin Mary at Bethlehem, arrayed like a queen, with royal robes, and a crown on her head; and on the other side, the infant Jesus lying in a manger by her side. It has been correctly asked, what analogy is there between a manger and a crown? In another painting Poussin has portrayed our Saviour standing up to the knees in the river Jordan; whereas the Baptism of Christ was actually performed by dipping or immersion. Again, in the picture of the Last Supper the disciples are represented sitting instead of standing, in direct opposition both to the Old and New Testament; and in the picture of the resurrection of Christ the soldiers set as a guard appear all in a profound sleep about the sepulchre, in direct opposition to the matter of fact. Again, the ignorance of celebrated painters of perspective is extraordinary; no modern painters would be guilty of such absurdities. In Raffaele's cartoon representing the miraculous draught of fishes, the men in the boats appear of full size, the features of their faces strongly marked; and the boats are represented so small, and the men so large, that any one of them appears sufficient to sink either of the boats by his own bare weight. And the fowls on the shore are likewise drawn so large as to seem very near the eye of the observer, who could not possibly in that case, distinguish the features of the men in the distant boats; or, supposing the observer to be in either of the boats, he could not see the eyes or beaks of the fowls on the shore. And in his historical picture of our Saviour's Transfiguration on the Mount, the mother of the boy on her knees is more than half as tall as the mount is high.

There are numerous other paintings by eminent masters falsifying holy writ, and exhibiting an absence of optical knowledge, thus affording a fine opportunity for modern painters to exercise their genius, guided by Scriptural and scientific knowledge, in presenting to the public truthful representations of the Scriptures.

Notwithstanding the boasted merit of imaginative works, if they cannot stand the test of reason, based upon nature or truthfulness, they will gain no immortality. Of what value would Scott's novels have been, had they not been enriched by his indefatigable antiquarian researches? The like of Victor Hugo, in his "Notre Dame;" and Harrison Ainsworth, in his "Tower of London."

It is a great question whether the education of young children is promoted by irrational stories, such as "Jack the Giant-killer," and poetical fictions relating to the phoenix, fairies, satyrs, sirens, &c. Surely natural history abounds with the most interesting and instructive anecdotes of the animal creation, founded upon truth itself, without the aid of ideal or imaginative and unreasonable stories. When fiction is resorted to, the youngest child will invariably ask, "Is it true?" Some even of Shakespeare's plays would not be endured if they were modern performances.

There is something very offensive to a cultivated mind in observing Nature's work artificially trammelled. What is more painful than to witness birds in cages, flowers arranged in artificial forms; flowers stuck in pots on shelves in greenhouses, like regiments of soldiers; books with artificially gilt and lettered backs, with, perhaps, blank insides, fixed as furniture in cases, or even handsomely-bound books locked in bookcases, not to be read? Books, like flowers, should be left about, here and there and everywhere,—to be culled in odd moments, as the bees use the flowers; and useful and instructive extracts should be made. Even of these, not many can be obtained without much labour.

As the public generally believe that which they see in print to be reliable information, the

* By Mr. W. Pettit Griffith, F.S.A.

* *Builder*, vol. xviii., p. 839. † *Ibid.*, vol. xi., p. 101.

‡ *Trans. Inst. Archts.*, 1870.

press holds a responsible position as public educator, and ought to restrain the enunciation of erroneous assertions. An editor's trust is a sacred one; he deals with mind, not with matter, and when he admits statements the reverse of acknowledged facts, he adulterates his work, and poisons the public mind. Plato says, that "there is much greater danger in the purchase of learning than in that of food." False opinions are so readily believed, that it requires a lifetime to re-establish truth.

The most important office of literature is to express in a concise (retaining clearness), and simple, and truthful manner, the subject-matter to be described or discussed. In perusing the literature of this and other countries, during its various periods, it is surprising to observe the vast amount of imaginee or discourses presented to the reader. The ignorant light in which many learned men reflect religious subjects is truly remarkable; for instance, Dr. Thomas Burnett ingeniously set forth the "sacred theory of the earth," in direct opposition to the plainest facts of geology and natural philosophy.

All real knowledge can be concentrated into a comparatively small compass; the more clearly the student examines the writings of former times, since the first existence of literature, the more he will find an extraordinary repetition, or rather remodelling, of old ideas, each author preferring to reword facts rather than quote authorities: consequently no credit can be awarded to an idea for originality, without previously reading the literature of all countries from the earliest periods.

Genius consists of a gifted desire or aptitude for gaining knowledge and imparting it in an unshakable manner. The pursuit must be congenial with the disposition. Genius must have talent, says Coleridge, as its complement and implement, just as, in like manner, imagination must have fancy. In short, the higher intellectual powers can only act through a corresponding energy of the lower. Victor Hugo says that genius is virtue. Now, as virtue can exist without genius, the definition is not satisfactory; but when he says that popular events call forth genius, he is nearer the truth; as Homer, in the Heroic ages of Greece; Virgil under the triumvirate; Ossian on the ruins of his country; Dante, Ariosto, and Tasso, in the midst of the convulsions of Italy.

The Welsh poetical triads concisely note the foundations of genius as the gift of God, human exertion, and the events of life.

Gwilt recognises genius as the power or faculty of inventing. This with architects must be considered a *rara avis in terris*, as the most celebrated modern architects have simply composed with the architecture of early times.

If genius be a gift, it can hardly be said to be one of birth; *id est*, it is evidently not hereditary, but an individual or personal gift; and this must ever be a great encouragement to men of humble origin, proving, at the same time, that study in a right direction may lead them to eminence. The following well-known facts will prove this assertion. Demosthenes and Sophocles were the sons of blacksmiths; Hesiod, Butler, Beattie, Logan, Burns, and La Place, of small farmers; Homer, a beggar; Horace, son of a tax-gatherer; Juvenal, of a freedman; Virgil, of a potter; Albert Durer, of a goldsmith; Inigo Jones, of a clothworker; Walsley, Drayton, Akenside, Defoe, H. Kirke White, sons of butchers; Luther and Claude, of humble origin; Calvin, son of a cooper; Shakespeare, of a glover; Cowley, of a grocer; Kepler, of a tavern-keeper; Ben Jonson, bricklayer; Sir J. Vanbrugh, of a sugar-baker; Bishop Jeremy Taylor and Falconer, sons of barbers; Dr. Thomas, Bishop of Worcester, Barrow, and Pope, of linen-drappers; Dr. Mountain, Bishop of Durham, son of a beggar; Rembrandt, of a miller; Bunyan, of a tinker; Cromwell and Talford, sons of brewers; Ray, son of a blacksmith; Hulley, of a soap-boiler; Crabbe, of a salt-maler; Bentley, of a yeoman; Bloomfield, of a tailor; Rousseau, of a watchmaker; Matthew Prior, Harrison, and Richardson, sons of joiners; Cooke, son of a farm-servant; Franklin, of a tallow-chandler; Allan Cunningham, of a gardener; Dr. Black, of a wine-merchant; Kant, of a saddler; Priestley, of a woollen manufacturer; Poyson, of a parish clerk; Flaxman, of a seller of plaster casts; Whitehead (poet laureate), of a baker; and Southey (poet laureate), of a shopkeeper. D'Alembert owed none of his eminence to birth or fortune; his foster-mother was a glazier's wife. Lagrange used to say that had he possessed fortune he should never have turned his attention to the

science in which he excelled; and Pope boasted that he was "indebted to no prince or peer alive" for his fame.

A boy, of the humblest position, rising by dint of mere industry and integrity, to wealth and dignity, is proverbial among citizens. But how much more encouraging for a youth to learn, however mean his origin, that by studying the rules of art, combined with perseverance, he may become a Newton, a Flaxman, or a Claude. There is no soil in which genius and virtue cannot grow up.

Contrast the above facts with the recent teaching of the Slade Professor of Oxford; "the real secret," says he, "of the success of the Greek and Florentine artists is, that they were gentlemen, in the best sense. In England we have a theory that the clown should produce art, and the gentleman look at it. The rule of all really good art is exactly the reverse of this. The true artist must be a cultivated gentleman." In 1756, an architect in a preface "to my worthy friends, the masters and journey-men of the several professions belonging to the noble art of sound building," urges that "if our English nobility and gentry had encouraged you in the study of architecture, with but one tenth part of that spirit which the major part of them have shown for the encouragement of vice, ignorance, and luxury, you would have been the best proficients in the world."

It is a matter of astonishment with many, that the reward usually conferred upon genius is an empty purse. Upon reflection this is a natural consequence, as the mind seeking to accomplish its elevated object or pursuit, which it raises by its onward course, is heedless of pecuniary returns. Hence poverty:—

"Hanger a master is of arts,
Who brightens much the mental parts."

Vangelas sold his body to the surgeons to support life; Tasso was often distressed for a shilling; Boethius died in a gaol; Plantius tilled a mill; Terence was a slave; Cervantes died of hunger; Spencer died in want; Milton sold "Paradise Lost" for fifteen pounds, and died in obscurity; and Goldsmith was as poor as a rat. Poverty, in youth, is an incentive to the production of genius, inducing hard work, and consequently development of ability.

Lorenzo de Medici created his own greatness, notwithstanding the genealogist's ingenuity to fabricate an imposing pedigree. His ancestors only emerged from the inferior orders of the people of Florence. Coleridge says that we may talk what we please of lilies and lions rampant, and spread eagles in fields of or or argent; but if heraldry were guided by right reason, a plough in a field arable would be the most noble and ancient arms.

Cicero observes that there is no vice more detestable than avarice, more especially in great men; and he cites examples of the contempt of money among the ancient Romans. An essayist, in 1681, considered that of all the passions avarice was "the most sordid, the most clogged and covered with dirt and with dross, so that it cannot raise its wings beyond the smell of the earth."

Genius is sometimes rewarded, although rarely. Allan Cunningham was desired to describe the influence which men of genius have in this land. His answer was, "They have none." Genius, however,—

"Hath the immortal faculty
Of bringing grief to other peo's mills,
While for itself so office it builds,
And cannot choose but starve amazingly."

It is well known that the man of genius soars above the consideration of shillings and pence, though their presence may be necessary for procuring to-morrow's dinner; while the economist will not enjoy his meal to-day without considering whether he can dine to-morrow.

The same enthusiastic desire to excel, ever attendant on rising men during their early life, generally continues until the last moment of their existence, exhibiting "the ruling passion strong in death." Plato died while actively engaged in teaching; Petrararch was found dead in his library, leaning on a book; Bede died in the act of dictating; Nelson told Collingwood to bring the fleet to an anchor; Napoleon's last words were "Head — Army;" General Lee (American army) uttered, "Stand by me, my brave grenadiers;" Leibnitz died reciting some verses of his own "Pharsalia;" Halliwell continued his labours till within a short time of his death; Clarendon's pen dropped from his fingers when he was seized with the palsy; Boyle pointed to a proof ready for the printer; and

Waller died repeating some lines of Virgil. And many other instances are on record, all of which tend to prove that when the fire of genius is once ignited by nature, aided and strengthened by real perseverance and kind patrons, is never extinguished until life itself has ebbed away.

As a rule, men of genius come like meteors, and so depart. The blood of beings of that order can seldom be traced far down even to the female line. Men of genius rarely leave more than a very brief line of progeny behind them — men of imaginative genius, almost never. Chaucer's only son died childless; Shakespeare's line expired in his daughter's only daughter. None of the other dramatists of that age left any progeny; nor Raleigh, nor Bacon, nor Cowley, nor Butler. The grand-daughter of Milton was the last of his blood. Newton, Locke, Pope, Swift, Arbuthnot, Hume, Gibbon, Cowper, Gray, Walpole, and Cavendish, never married. Neither Bolingbroke, nor Addison, nor Warburton, nor Johnson, nor Burke, transmitted their blood. It has been remarked that when a human race has produced its "bright consummate flower," in this kind, it seems commonly to be near its end.

Finally, it may be relied upon that genius is a natural gift, perfected by hard work, in a right direction; for "human life is but a loan, to be repaid with use." Alexander said that he was more obliged to Aristotle, who had instructed him, than to Philip, who had given him life and empire; and Horace, Juvenal, Boileau, and the greatest writers in every age, have strenuously opposed the vanity of a man's valuing himself upon his ancestors, and have proved that true nobility consists in virtue, not in birth. Even kings esteemed genius before nobility. Francis I., king of France, receiving the dying Leonardo da Vinci in his arms, rebuked the court for expressing astonishment, by exclaiming, "I can make as great many such lords as you every day, but only God can make such a man as I now lose." And, again, in modern times Penn observed, "To be descended of wealth and titles fills no man's head with brains, or heart with truth: those qualities come from a higher cause." Genius consists of the faculties of judging and creating, which are essentially necessary in all spheres of operation, mutually subservient and united with talents dependent on rules, and combining the fire of enthusiasm with the correctness of nature. As society becomes more educated, genius becomes less frequent. By the progress of taste all great exertions of genius and endeavours to excel are repressed. We have gained in correctness and elegance what we have lost in force and sublimity.

COAL SUPPLY OF THE METROPOLIS.

THERE are instances of competition in which the competitors inflict ruinous loss upon each other without conferring any benefit worth consideration upon any one else. There are other instances in which firms or companies having the command of a trade or a traffic are able to levy enormous contributions upon the public. The carriage of coal to London belongs to the last category, as appears from the evidence given before the committee on the Coal Owners' London Associated Railway Bill, which has occupied the attention of Sir Hedworth William, son, the chairman, and his colleagues, in a private Bill Committee of the House of Commons, for above a fortnight.

It may be convenient, before referring to the evidence, to state briefly the objects of the Bill. It is the project of an independent company promoted by the owners and lessees of the coal fields of South Yorkshire, which are 300 square miles in extent. The coal-owners have not the freedom of access upon equal terms to the London coal market that they think they are entitled to, and this Bill is designed to rid them of this disadvantage. The Bill is for the incorporation of a company for making railways for the conveyance of coal and goods,—one short branch from the Lea Union Canal, near the Homerton lock to the Great Eastern Railway at Leyton; the other to make a new line from the St. Ives and Cambridge branch of the Great Eastern, at Long Stanton, near Cambridge, to junction with the Market Rasen Branch of the Manchester, Salford, and Lincolnshire, at a point—Greatwell not far from the city of Lincoln. The portion last referred to, about 75 miles in length, is a new line to be made, over a level country, to have no station with their expensive accompaniments, but to have at convenient distances and localities

sidings for loading and unloading, and as passing places for trains travelling in different directions. Such a line will be made, if sanctioned by Parliament, for less money than almost any line hitherto laid down in the United Kingdom. The scheme is promoted, as has been said, independently, by the South Yorkshire coal-owners. Divers arrangements and agreements have been entered into of late years by the great railway companies as to "rates" and "differential rates;" but in these arrangements the South Yorkshire coal-owners have felt that they were "left out in the cold." The companies have done what suited them best, and a differential rate of 1s. 4d. per ton has been imposed against the South Yorkshire coal-owners, and they have the idea that this is neither in accordance with their interests nor the interests of the people of London; they have accordingly taken counsel together as to the best mode of bringing their collieries and the London coal-consumers, and the London Docks, into direct communication, and the projected railway is the result.

Here it should be said that the portions of the Great Eastern, and of the Manchester, Sheffield, and Lincolnshire lines over which the proposed coal traffic is to be carried, are much less crowded than any of the other great coal-carrying lines, which have sixty trains each way per day, whereas the lines we are referring to have only half that number. Upon the proposed new line, of some 75 miles in length, unbroken, the coal, goods, and agricultural traffic will be undisturbed by the exigencies of passenger traffic. The Great Eastern and the Sheffield companies heartily support the scheme, but they give little more than a species of "moral support." Lord Salisbury, in his evidence before the committee, stated that the Great Eastern had no capital to advance, but that they had agreed, upon the best advice, to assist the new company to the extent, as a maximum, of 5,000, as part of the preliminary expenses. The relations of the Sheffield line are similar.

If the promoters of this hopeful line fail, it will not be because they have not deserved success. They have put their case on an indisputably capital style. Nothing has been spared in the way of maps, documents, witnesses, counsel, and all the adjuncts necessary to establish a case. For nearly a fortnight they have continued to pile up argument and evidence, constantly called in question by the host of opponents they had to confront. Here, perhaps, we ought to mention that the small but powerful phalanx in support of the bill, have been Mr. Rodwell, Q.C., Sir Mordaunt Wells, and Mr. Bidder. Retained by opponents were Messrs. Merewether, Q.C., Venables, Q.C., Cripps, Q.C., Chandos Leigh, Vaughan Richards, Horace Lloyd, and a host of Parliamentary agents.

Much of the evidence given before the committee has related to agreements between the coal-carrying companies as to rates. It would scarcely be to the edification of the reader to follow the litigants in these particulars. The public has an interest, no doubt, very direct, in such matters, but no voice.

The direct interest that the inhabitants of the metropolis have in the passing of this coal-owners' railway is sufficient to justify a popular demonstration in its favour. The railway companies, like the Chancellor of the Exchequer, may sometimes put on the screw, but they have been, without perhaps intending it, great public benefactors. In 1850 the coal traffic of the Great Northern Railway produced 4,944l.; in 1868 it had risen to 838,405l. The competition in carrying coal to London commenced about 1850. Its effect was to reduce the price of coal about 8s. per ton, a saving to the inhabitants of London of 2,400,000l. The promoters of the new company state that if they obtain their Bill they will be able to deliver coal at a shilling a ton cheaper than they can do now. This reduction will be equal to a saving to the inhabitants of London of 300,000l. per annum.

It may well be that the South Yorkshire coal-owners and the two companies that support them are dissatisfied with the present state of things. We subjoin some interesting statements from the evidence. In 1868 there were sent to London:—

From	Miles.	Tons.
Derby and Notts	112	1,000,000
South Yorkshire	172	2,400,000*
Durham	281	250,000
Wales, Gloucestershire, &c. ...	209	332,850
Warwickshire, &c.	160	172,930
Lancashire and Cheshire	180	1,000,000
Midland and Yorkshire	163	71,800

* In 1868 there were 400,000 tons from South Yorkshire delivered in London.

Another statement given in evidence is interesting, and curious in at least two of the items. It relates to the quantities of coal brought by rail to London in 1870:—

By the	Tons.	Cwt.
Great Northern	978,049	0
London and North-Western	835,281	6
Midland	923,680	0
Great Eastern	507,344	9
Great Western	470,552	13
South Western	27,890	7
South Eastern and others	15,341	17
Total	3,768,089	12

In 1870 the quantities of coal brought to London were:—

By sea	Tons.	Cwt.
By sea	2,993,710	0
By rail	3,758,089	12
By canal	17,277	8
Total	6,768,007	0

The receipts of coal in London show an increase year by year of 175,000 tons. Of the gross amount brought to London, from 700,000 to a million tons leave it again for distribution in the southern counties or for shipment. Twenty years ago the quantity was only 88,000 tons. London promises, as it is already a great corn and money market, to become a great coal market.

A competent judge and witness has expressed the opinion that in the course of five years the imports of coal to London will reach ten millions of tons. Whether this speculation is correct or not, we cannot but think that Sir Hedworth Williamson's Committee of the House of Commons will do well to declare the preamble proved of the "Coal Owners' London Associated Railway."

IMPROVEMENTS IN WATERFORD.

AFTER four years' labour, vessels drawing 13 ft. water at all tides may now safely ride into the harbour of Waterford. The Commissioners have expended the sum of 23,000l. in deepening the channel. The engineer, Mr. Cook, of London, was present on the day that the contractor gave over the work to the Harbour Commissioners, and it was the occasion of a public demonstration, at which the mayor and other corporate officials attended. Another desirable work, that of clearing away the bar at the mouth of the river, is also spoken of, and is likely to be soon commenced. The cost would probably exceed over 50,000l. If this were accomplished, the city of Waterford would be more often resorted to as a port of call for American liners.

Another crying want we would point out, the erection of a new stone or iron bridge over the River Suir in the city. The present old timber structure, the work of an American architect in 1794, has outlived its time, and is neither safe nor handsome, and it ought at once to be replaced by one more suitable. Visitors and tourists *via* Milford Haven to Waterford and the county of Ireland cannot but marvel at this one old platform bridge, resting upon trestles, with its antique machinery and central draw-lifts for allowing vessels to pass up the river.

Now that improvements are about being commenced along the very fine quay, and increased railway service is about being added, it behoves the corporation of Waterford to show a little more public spirit by furnishing a proper bridge communication over the Suir, between the city and the county of Kilkenny.

CONSECRATION OF THE DANISH LUTHERAN CHURCH IN HULL.

THE new church of S. Nicolai, which has been erected for the benefit of the Danish and other Scandinavian residents in Hull, and of the many foreign seamen who enter this port every year, has now been consecrated by the Very Rev. Archdeacon Rothe, of Copenhagen, who had been commissioned to represent the Right Rev. Bishop Martens, the Primate of Denmark. The ceremony was an interesting one, and derived additional importance from the fact that it is the first church of the kind which has been duly consecrated in England, and where Scandinavians are enabled to meet together for public worship, according to the rites of their own church. We gave an account of it in our volume for last year (p. 641).

The structure, which is in the Gothic style, of somewhat Continental type, consists of a nave with apsidal chancel, and a reading-room with

dwelling for the person in charge, on a parallel with the west side of the church. The building is of red brick with Ancaster stone dressings, and the entrance is through a porch underneath a tower, which is surmounted by a belfry and spirelet. The nave, which is 42 ft. long by 28 ft. in width, is seated with open stalls of stained deal, and affords accommodation for 300 persons. The floor of the nave is paved with Minton & Co.'s tiles, while the obtrusion is heated by Perkins & Sons' apparatus. The roof is of open woodwork, supported by framed principals and curved ribs, the spandrels of which are pierced with trefoil and other openings, with the ends resting on plain stone corbels. The nave is divided into six bays, and is lighted by double lancet windows filled with Hartley's patent quarry glass; the windows are faced on the inside with red bricks. At the end of the nave is a gallery for the organ and choir, it being supported by ornamented pillars. The chancel is 15 ft. by 13 ft. It is lighted by three windows filled with stained glass, the subjects represented being the Swedish, Danish, and Norwegian arms, on shields; the subsidiary parts being filled in with diaper work and bordering. These windows, we understand, were supplied by Mr. C. A. Gibbs, of London. Over the chancel arch is a little trefoil window, with the sacred monogram in stained glass. The roof is of slate with an ornamental cresting on the ridge; and the spirelet is also slated. The designs were prepared by Mr. Botterill, of Hull, architect, and the contract for building was carried out by Messrs. Lison & Wilkinsons.

THE DUBLIN MAIN DRAINAGE AND THE LIFFEY.

LAST week, during the sitting of the committee in the House of Commons upon this Bill, evidence was given on the part of the opposers of the measure, and reasons also for that opposition. The opponents did not deny a main drainage was desirable, but they considered that the corporation were exceeding the scope of their original scheme, and that the city would, in consequence, be taxed beyond the power of its endurance. With the unclaimed wastes of sand known as the North Bull, existing in sight of the harbour, no body of wise men would be guilty of pouring the sewage of the city, unused and untillied, into the Bay of Dublin. Every man of common sense, and of the least practical knowledge, who knows aught of the Irish capital, and who is not personally interested, is opposed to what seems to be a persistent and deliberate attempt to run counter to public opinion by flinging what constitutes the public wealth into the sea. We trust the corporation of Dublin will think twice before committing itself to that part of the scheme which relates to the disposal of the sewage, and retrace its steps in time.

NEW FEVER HOSPITAL, BRADFORD.

THE series of buildings which will be devoted to the purposes of a fever hospital for the town, and which have been in course of construction for some time past, are now in an advanced condition. The mason's work has been completed, and plasterers and joiners are now busily engaged finishing the interior.

The hospital stands on an elevated site at Pennyroyke, in Leeds-road. It is erected on the pavilion system. Entering at the north side, the front of the "Administrative Department" is reached. This is the largest of the buildings. It consists of three stories, each eleven windows in breadth. The ground-floor consists of the hall, waiting-room, two rooms for the surgeon, the board-room, two store-rooms, matron's room, and the kitchen. The first floor comprises two surgeons' bedrooms, matron's room, two store-rooms, bath-room, &c. The second-floor consists of servants' bedrooms. A glass-covered corridor leads from the "administration" building down to the typhoid fever wards behind. These are six in number, three of them for the treatment of convalescents. They are parallel to each other, but stand several yards apart. The corridor leading from the "administration" opens out in the centre of another glass corridor, which is 245 ft. in length by 10 ft. in width, and the latter communicates with the wards, which are about equidistant along the corridor.

The fever-wards are 62 ft. by 27 ft., and will accommodate ten beds each, and are lighted with eight deep windows. The walls

are plain, and a bright white, and the roof pointed. The floors are of polished oak, and in the centre of the floor towards either end there is a grate of a peculiar construction; for, while the fire is visible, the smoke is conveyed outside by a flue running under the floor. A circular portion of each window rests on a hinge, and forms a ventilator. Each ventilator is attached to a rod running along the apartment towards the roof, and all the ventilators can be opened or closed simultaneously by the touch of a handle communicating with the rod, besides an abundant number of regulating ventilators fixed in every ward. A convalescent-ward adjoins each fever-ward, on the opposite side of the corridor; and they are reached by a short flight of steps. They are 22 ft. by 27 ft.; and each will accommodate five patients. The architects are Messrs. Andrews & Pepper; and the contractors are:—mason-work, Mr. Holdsworth; joiner-work, Mr. William Crabtree; plumber-work, Mr. John Schofield; plaster-work, Mr. B. Dixon; painting-work, Mr. Pullan.

KING'S CROSS, LONDON.

SIR,—The writer of the "Sketch of Early London" is slightly mistaken respecting the name of King's Cross. When the great dust-heap was removed, and building commenced on the spot, there was a speculation for a public garden of entertainment. As a means of improving the property, the higher-sounding name of "King's" Cross was adopted. The company was not successful, but the theatre still remains that was part of the project. It was after this by a subscription, I believe, that the "statue" of George IV. (not William) was erected by Mr. Geary, a local architect.

In a popular ditty of the time, "The Literary Dushman," we have—

"King George's stately at King's Cross,
Was built by my design, sir."

W. BRITTON.

THE "DEVIL TAVERN," BY TEMPLE BAR.

My attention has just been called to the interesting note about "Du Val's House," which appears in your number for May 6th, and at the same time I read your correspondent's remarks about the "Devil Tavern," by Temple Bar, with more than ordinary interest, having, as you are aware, given some little attention to the history of that "time honoured" hostel in my recently published "Memorials of Temple Bar," a work which has already been honoured with a favourable notice, at some length, in your journal.

The materials at command for a history of the "Devil Tavern" had to be very seriously condensed at the time I issued my small volume, but I hope when another edition of the "Memorials" appears, I shall be in a position to prove that the old haunt of Ben Jonson, and the poets and wits of a former age, has been, in reality, very slightly noticed by London topographers.

It may, however, be interesting to some of your readers, if you will allow me to reproduce a note or two from page 110 of my publication:—

"In the 'Battle of Temple Bar,' print of 1789, the devil is represented with a long beak, holding the sign with one hand, and offering the other with the invite, 'Fly to me, my bairns!' Hogarth, in his plate, 'Burning of the Rump,' shows the sign, but places it on the wrong side of the street. An opposition tavern, was called the 'Young Devil' (No. 8, Fleet-street), under the present shop of Messrs. Dun & Duncan, and the entrance thereto was from a flight of steps leading down below ground, from the adjoining narrow passage of entrance to Dick's Coffee-house. On December 6, 1707, Wansley and a few other literary characters (afterwards the Society of Antiquaries), having 'agreed to meet together each Friday in the evening, by six of the clock, upon pain of forfeiture of sixpence,' at the Bear Tavern, in the Strand; they on January 9th, removed to the 'Young Devil,' Peter le Neve, Norrey, being chairman, and Humphrey Wansley, secretary. Mr. Gooling, the bookseller (and banker), a member, subsequently received the Society's letters; and the meetings from 1728 till 1763 were held at the 'Mitre.' About two years after the Society met at the 'Young Devil,' the host failed, and they removed to the 'Fountain Tavern,' 'as we went down into the Inner Temple against Chancery-lane,' a tavern mentioned in 1639, and whose proprietor in 1648, Widow Hicks, was prosecuted for keeping a disorderly house."

Another note may also prove of interest, taken from page 120 of the "Memorials." While examining some of the parochial records of St. Bride's, I found, in the rate-book for 1748, eight houses in Black Horse-alley, Fleet-street, described as "Devil's Nook."

Finally, I beg to refer my literary friends to *Notes and Queries*, March 4, 1871, wherein I

have reproduced an interesting document relating to the hero of the "Devil Tavern,"—"O Rare Ben Jonson!" T. C. NOBLE.

THE ENGLISHMAN'S HOUSE.

In our last volume we reviewed at some length a book called "Picturesque Architecture," by Mr. C. J. Richardson.* The work recently published by Mr. Hotten, entitled "An Englishman's House, from a Cottage to a Mansion," is the same work in a condensed and much cheaper form. It would have been better if this fact had been made clear, as persons in the country possessing the first may be led to order the new book, believing it a fresh work. The new version, however, is addressed to another class of persons,—to members of building societies and all interested in selecting or building a new house." With some things that are questionable it contains a large number of suggestions that will be found useful by many. We are enabled to give two of the designs. One, "A Small Country Rectory," was made for a country clergyman near Montacute, in Somersetshire, and was founded on examples of wooden architecture in his neighbourhood. The view shows the principal front. On the ground plan, *a* is a small hall, having a window looking into the Conservatory on the right; *f*, the door leading to the servants' apartments is on the left; *c* is a small study, 16 ft. by 14 ft. The drawing-room, *d*, is 28 ft. by 15 ft.; *f* is the kitchen, the scullery, and *h* the larder. A small enclosed servants' yard is in front of the kitchen.

The design for a villa at Tepitz was made for an Austrian nobleman who wished to have a villa of the Elizabethan character. The plan was arranged after his own figured sketches. The porch was approached on four sides by flights of steps, 12 ft. 6 in. in diameter; it opened into a hall, *b*, 20 ft. in length, by 14 ft. in width. The drawing-room, *c*, with two bay windows, was 36 ft. in length, by 22 ft. in width. The dining-room, *d*, in the opposite side of the hall, was 28 ft. in length, by 18 ft. in width. The butler's pantry, *k*, and the servants' offices and kitchen, *g*, with a large store-closet, *h*, and scullery, *i*, adjoined. A broad-room is shown at *j*; *l* is the servants' hall, *m* a china-closet, *n* a store-room, and *o* the servants' staircase; *q* *q* are the servants' entrances, and *r* the closets.

Returning to the principal portion of the building, the chief staircase, *v*, opens from the entrance-hall, *e*, *e* *e* *e* are nurseries, and *f* is the library.

Whether or not the design was carried into execution is not stated.

In the course of his volume, Mr. Richardson gives some particulars showing the rise which gradually took place in the value of land at South Kensington, and which may be usefully condensed.

The Harrington Estate at Kensington Gore, containing in the whole 93a. 3r. 27p., was the joint property of the Earl of Harrington and of the Baron de Villars, through the right of his wife, the Baroness de Graffenried Villars. Previously to 1855, it had been some time in Chancery. In that year Mr. John Gaunt Lye was appointed auditor and agent to the fifth earl of Harrington for the whole of the property. The rental of the Kensington Gore Estate amounted at this time to 2,779l. 9s. per annum. Through Mr. Lye's exertions, a division took place on the 7th of May, 1850. For the purpose of division, one portion—that charged with maintaining the Cromwell Almshouses—was valued at 41,996l., and the other at 40,552l. Cards representing each portion were placed in a hat, and the one representing the 41,996l. was taken out by the Baron.

In 1851, the Earl's portion was let to Mr. W. Jackson, on a building agreement for 99 years, at 100l. per acre, or 4,600l. per annum. In 1852 the Baron de Villars sold his moiety to the Royal Commissioners for the Exhibition of 1851 for the sum of 153,793l. The Commissioners only wanted a small portion of the Earl's property. The first offer made by Mr. Cubitt to the surveyor of the estate was 40,800l. for 17 acres, or at the rate of 2,400l. per acre. This was declined, and after a little negotiation, the sum of 54,716l. was obtained. The matter was settled on the 7th of March, 1853; Mr. Jackson, the builder, received 7,964l. as compensation for the loss of so much of his building-land. More land was purchased by the Royal Com-

missioners to make up the site they required; in the very middle of the latter was a field which had only been used as a place for boating carpets. It belonged to the Smith Charity estate, and fetched a rent of about 40l. per annum; this field was obtained by giving in exchange an outlying one on the Villars estate, the building value of which was estimated at 800l. per annum.

The Royal Commissioners, after squaring the site they required, and putting aside the portion now occupied by the Department of Science and Art, parcelled out the remaining outlying portion into three blocks, and let them on building leases. The first and most important of these was secured by Mr. Richardson for an employer, at a rental of 1,600l. per annum, on condition that the fee of each house plot could be purchased within six years after the lease was granted; it contained about 2 acres. And these are now the only freeholds that can be obtained. This plot is now covered with buildings of the selling value, as leaseholds, of 250,000l., and it produces an improved ground rental. For the purchase of the whole fee, says Mr. Richardson, the sum to be paid was 46,500l., so that for a portion of this land which the author of this work, as surveyor of the property, sold in 1852 for little more than 3,200l. per acre, the value had risen in 1860, to no less than 23,250l. per acre.

The first great rise in the value of land in this neighbourhood, took place under our own cognizance. A plot of land about 3½ acres in extent, adjoining Holy Trinity Church, Brompton, and the site of a then well-known school, was in the hands of the conductor of this journal, professionally, and in 1851 was laid out with a view to building operations.

The late Mr. Scoles, the architect, proposed to purchase it, but the offer was at first declined; ultimately, however, the owner offered to take for it a sum which, invested in Consols, should produce the rental that was expected from the land. This brought the price to about 5,000l. an acre. The offer was accepted, and the "Oratory" was soon afterwards built on the site.

THE BARONESS BURDETT COUTTS'S FOUNTAIN, REGENT'S PARK.

This fountain has lately been completed, and presented to her Majesty's Commissioners of Works by Baroness Burdett Coutts. It is placed immediately opposite to the principal entrance to the Zoological Gardens in the Regent's Park, and is intended to serve several purposes, as the following short description of the design will show.

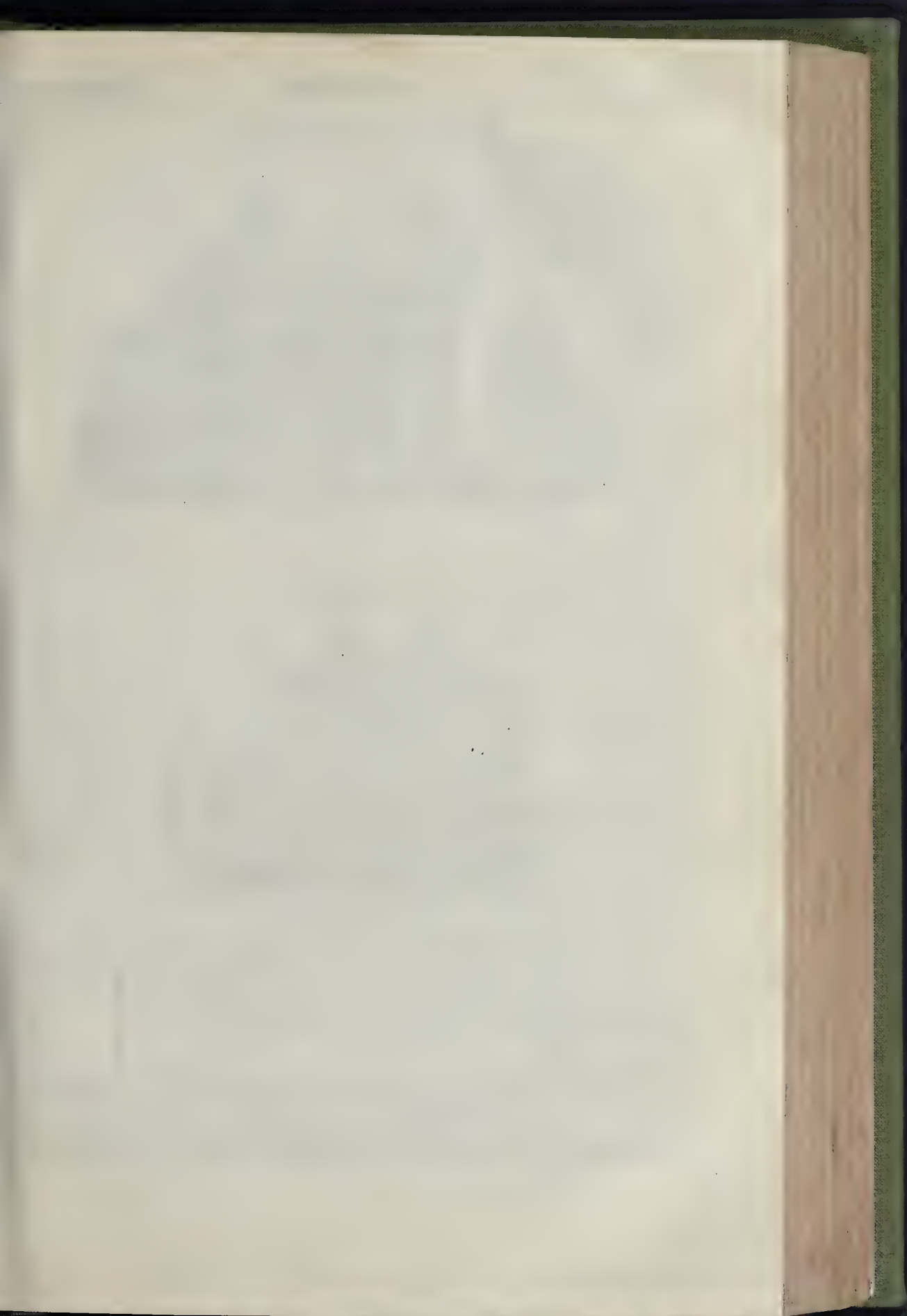
The lower portion consists of four basins of polished red Aberdeen granite, 6 ft. 4 in. in diameter, having a guttersole plan. These rest upon thirty-six detached shafts of the same material, with carved capitals of Sicilian marble. The base or general plinth upon which these stand is raised 4 in. above the ground, and contains four sets of gun-metal dog-troughs, which are supplied with water from the overflow of the basins above; between each set of troughs is a stand-pipe, with patent lever for the supply of buckets for the use of horses, &c.

In the centre of each basin is an ornamental jet d'eau, and from the centre of the group of basins rises a canopied pedestal, 6 ft. high, and 3 ft. 6 in. span, of the finest polished Sicilian marble, with carved dolphins at each angle to supply water for drinking. The base of the pedestal, a few inches above the general water-level, is divided into four richly-moulded niches, containing groups of figures and animals, the former holding vases, from which the basins derive their chief supply of water. Above the niches the pedestal becomes pedimented, and is enriched with crocketed pinnacles and terminals, so as to serve as an ornamental base for a lamp standard, which, at the height of 15 ft. from the ground, branches into eight foliated bracket lamps. A larger and more ornamental lamp rises from the centre of these, and terminates the composition, which is altogether 24 ft. high.

The workmanship throughout is remarkably good. The metal work is fine and cleanly cast, and richly gilt; and the granite and marble work is some of the best which has been executed in London. Underneath the fountain itself is a roomy subterranean chamber lighted with gas, which contains all the pipes and valves that regulate the supply and discharge of the various water services.

The works have been executed by Messrs. W. Cubitt & Co., of Gray's Inn-road, from the design and under the direction of Mr. H. A. Darbishire.

* See pp. 277, 328, vol. xlviii.



PICTURESQUE ARCHITECTURE.



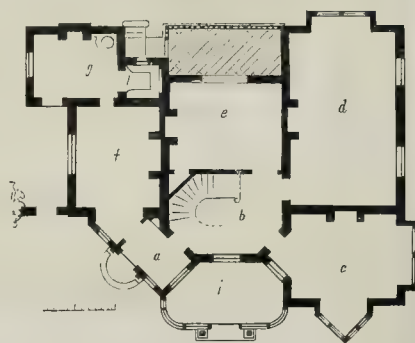
COUNT KINSEY'S VILLA AT TEPLITZ.



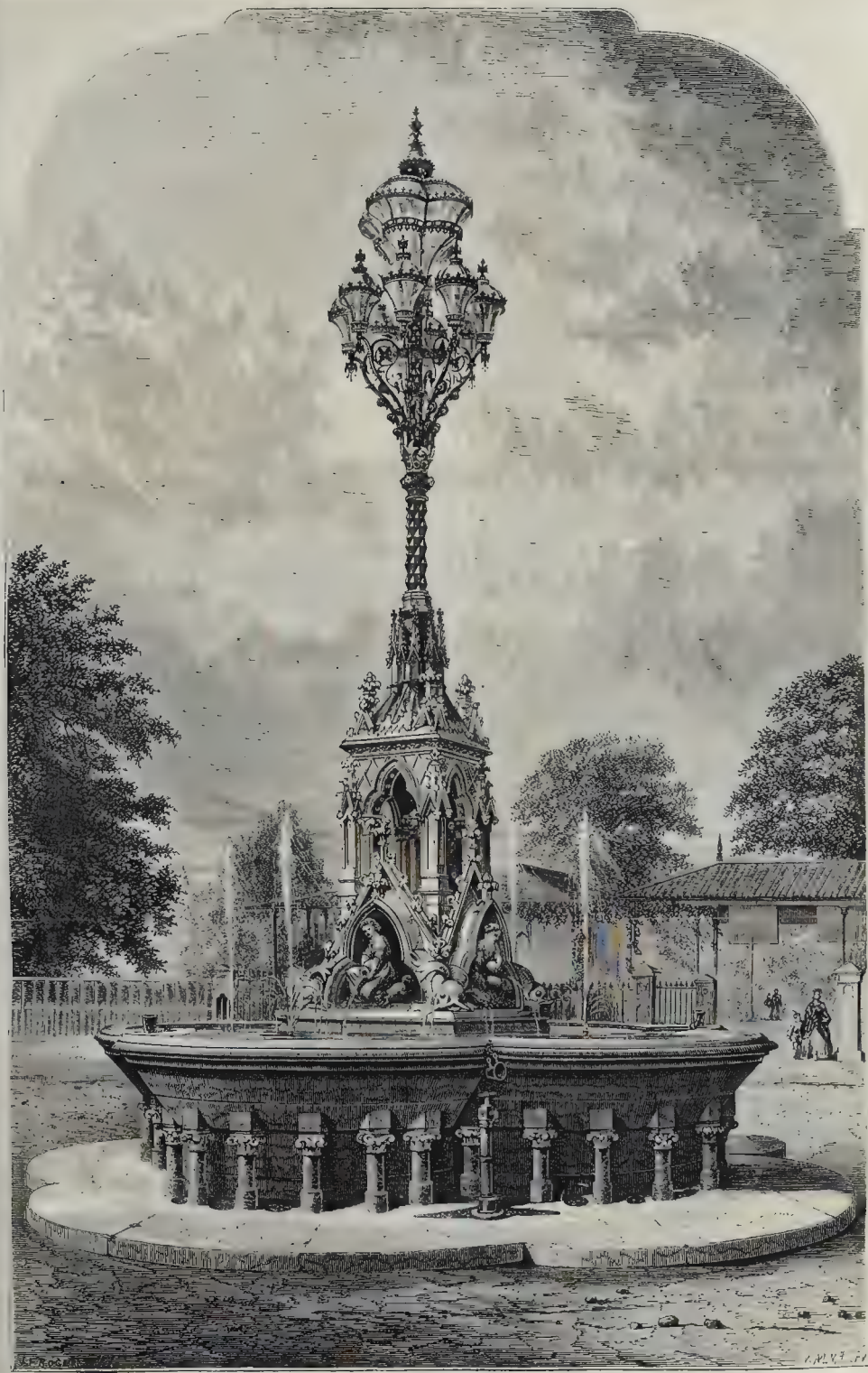
A SMALL COUNTRY RECTORY.



Ground Plan of Count Kinsey's Villa.



Ground Plan of Country Rectory.



BARONESS BURDETT-COUTTS'S FOUNTAIN, REGENT'S PARK.—MR. H. A. DARBISHIRE, ARCHITECT.

"EXTRAS AND OMISSIONS."

A QUESTION asked by "Justitia," in the *Builder*, on p. 290 (April 15th), does not seem to have hitherto elicited an answer, though involving a point of some interest,—how ought works omitted from a contract to be valued?

1. At their probable cost, if tendered for separately, or carefully valued at average rates?

Or 2. At a sum strictly proportionate to the whole amount of the builder's accepted tender which included these works?

Or 3. At the builder's own valuation? or by the amounts stated in his priced bills of quantities, supposing that he submitted them for inspection?

It is evident that either of these three courses could bring about nearly, if not exactly, the same result, except when a contract had been taken at a very high or at a very low price. If at a very high price, the contractor would probably not make any considerable and sustained objection to Method 2, by which fairly would be ensured to the employer also. But—in the case of a very low contract amount?—(below that an impartial person would consider current rates), if the work had been fairly carried out, with an endeavour to comply with the "real intent of the drawings and specifications, &c.," the employers or architects would desire to press against the contractor the letter of a contract made in error, when the evident result would be to take away all remuneration for his labour,—perhaps to lead to a considerable loss out of pocket. A contract should be kept rigidly on both sides; but there may be moral claims entitled to every consideration, though secured by no writing or agreement. In such a case (in theory a rare and exceptional one, and therefore demanding an exceptional course with reference to it), a liberal treatment might result in the deduction of something much less than the possible cost of the omitted works,—as a matter of grace.

To keep to a somewhat strict legality,—as an architect would be obliged to do in the case of a public body, magistrates, guardians, &c., who *may not have a sense of natural equity*, or if subjected to a keenly critical attention on the part of a client considering legal right to include all possible rights,—Method 1 would seem the only course, though the tendency would be to approach Method 2 in doubtful instances. The presumption must be that the parties to the contract have both thoroughly considered the general bearing and details of their agreement; and the value of any work must be some absolute quantity,—and cannot in cool consideration be put under some certain amount. Has the architect in "Justitia's" case valued the work not only without reference to the contract amount, but also out of relation to all ordinary standards? If so,

The above would necessarily be subject to special reservations. Although the legal and binding clauses of a contract very properly endeavour to take away from a contractor all legal claim for compensation in case of any modifications, there is no doubt that a contract is usually signed on the faith of an understanding that the works are really at that time intended to be carried out in a certain general manner, and with a certain gross outlay. Thus extensive omissions,—even though an attempt is made by special clause to prevent vitiation of the contract,—may, where extensive plant has been provided and orders given for materials, &c., endanger the validity of the clause; making it turn on questions of countermandings, dates, &c., but perhaps this and such like refinements, that could be pointed out in any quantity by an ingenious person, might be considered assisting an enemy to batter down our own bulwarks!

A lump-sum contract following the "general endings" lately settled between the Royal Institute of British Architects and the London Builders' Society would, under clause 7, direct the valuation of deductions, "according to schedule of prices or fair measure and value;" with arbitration clause 20 referring if necessary to question of "quantity or value of omissions, &c." If these clauses were universally adopted, as they have been in effect in most cases for years by many architects, a means of practically solving "Justitia's" difficulty would be at hand by allowing out the directions of the contract itself. An arbitrator once possessed of authority in such a matter would open up the whole case; and, being bound to give a decision and not the reasoning on which he has based it, would wisely keep the argument to himself. He can use his

best judgment, give free course to any amount of equity (with a little *é-not Equity necessarily*), and it will not be proper to question his silence.

Method 3 might seem likely to lead to the same result as 2; but there is a practical difference. In presenting their accounts, builders sometimes begin a page of "deductions," but from some cause or other seem to remember few items, and those imperfectly. So weak is the contracting memory at times that it would be refreshing to have an account delivered with a heading of—"Deductions."

"These items have been entirely omitted in order that they may be supplied in full by the architect."

Even if priced bills were shown, judgment would be required in revising relative values of items, so as to correct any disproportion. Instances have been known in which prime-cost works to large amounts have been priced at the provided sum, (without any addition for profits or other charges), and a percentage deducted from the total in the summary, so as to trim the ship cleverly for the competitive struggle.

The architect is often described in a phrase as "agent to employer till the contract is signed; then an arbitrator" (between employer and contractor); obliged, of course, in ordinary cases, to help the employer most, as the side that may be at a disadvantage. This has been well expounded by Sir D. Wyatt as Slade Professor, 1870, Lecture IV., page 109.—"The architect must be rigidly just both to his employer and to the builder or workpeople with whom he may have dealings. He must not allow the one to impose upon the other; but must stand as a righteous arbiter between the two. His duty to his client is in nowise to assist him to any harsh or unrighteous exercise of plenary power towards an honest and well-intentioned tradesman, but to reserve those powers for his client's protection in case of his having to deal with a dishonest tradesman."

"Justitia's" special instance would, no doubt, furnish some good occupation to skilled lawyers' minds and tongues,—involving eventually a reference of the case to be decided on its merits. His solicitor would be able to obtain, when he knew all the facts, a *formal opinion* about the "uncertainty" or "uncertainties." The above general considerations cannot claim that class of authenticity, not being the "opinions" of solicitor or counsel, but the notes of

AN ARCHITECT.

BURNLEY UNION COMPETITION.

SOME months ago the Guardians of the Burnley Union invited the following gentlemen to send in competitive designs for their intended New Workhouse, viz.:—Messrs. Lockwood & Mawson, of Bradford; Mr. Bradshaw, of Bolton; and Mr. Waddington, of Burnley. After much discussion, the plans sent in by Mr. Waddington were selected. The accommodation will now be for about 320 inmates, instead of 500, as previously contemplated. The cost will be about 15,000l.

LEEDS MARKET COMPETITION.

THE Corporation of the borough of Leeds offered premiums of 75l. and 40l. for the most approved designs for new markets. The first premium has been awarded to Mr. Swallow, Leeds; the second, to Messrs. T. D. Steel, C.E., & E. A. Lansdowne, architect, Newport, Monmouthshire.

ARCHÆOLOGY AND ART.

At the approaching conference of architects, to be opened at the rooms of the Royal Institute of British Architects, No. 9, Conduit-street, on Monday, the 22nd inst., one section of the conference will be devoted to the consideration of topics having relationship to archæology and art, and will occupy the evening of the next day, the 23rd inst., when Mr. Beresford Hope, M.P., will preside. The honorary secretaries of this section have obtained promises from well-known members of the profession, of the requisite number of papers whose subject-matter will give ample occasion for instructive discussion. The following is the list of papers provided:—

"An Ancient Military and Monastic Architecture in the North of England," by F. R. Wilson, Associate, president and delegate of the Northern Architectural Association; "On Classic Art," by R. P. Pullan, Fellow; "The Effect of

Ecclesiastical Law on the Arrangement and Decoration of Churches," by C. Rolfe, Associate; "On the Principles of Chromatic Decoration," by J. P. Seddon, Fellow; "Should Perspective Views be excluded from Professional Competitions?" by E. Sharpe, M.A., Fellow.

PREVENTION OF WASTE IN FURNACES.

SIR,—A perusal of Mr. Prideaux's paper "On the Utilisation of Waste" which appeared in your pages afforded me both instruction and pleasure; and it will in nowise detract from the general excellence of his remarks if I, with your permission, point out a slight fallacy in his theoretical deductions concerning the prevention of waste in furnaces.

Your correspondent lays great stress upon the saving which his conceives would be effected if (by admitting a sufficient volume of heated air) the carbonic acid were retained in the furnace long enough to be split up into carbonic oxide and oxygen, both these substances being, when formed, combustible, and therefore capable of generating heat. This, air, would be a splendid saving if no heat were consumed in effecting the separation. But it is a well-substantiated principle of science that a chemical compound in decomposing absorbs as much heat as would be produced by the combustion of the elements; and in the case under discussion this process of deoxidation or unburning,—for such it is,—of the carbonic acid would abstract from the fire exactly the same quantity of heat as the subsequent burning of the carbonic oxide and oxygen so liberated would generate; consequently no gain could possibly ensue.

But Mr. Prideaux further says that the carbonic acid would become decomposed, carbonic oxide formed and burnt, "and the poisonous carbonic acid given off in quantities so small as to be all but innocuous." The fallacy of this is so palpable that it is difficult to see how a gentleman of Mr. Prideaux's ability could have so misapprehended the matter. If there be any utility in decomposing carbonic acid, it is that the products of the decomposition,—carbonic oxide and oxygen,—may be afterwards utilised; and what is the meaning of carbonic oxide being burnt? Why, its combination with oxygen, and the formation of carbonic acid. If the carbonic oxide were not burnt, you would lose the heat absorbed in its production, and it would escape as a still deadlier poison. If it were consumed, only the heat absorbed in its formation would be returned to the furnace, and the original quantity of carbonic acid would be again formed.

As it is desirable that such a fallacy, appearing in a journal so extensively read by the working classes, should not go unchallenged, I trust, sir, that you will print this letter.

TEACHER OF PHYSICS.

BLAST FURNACES.

THE INSTITUTION OF CIVIL ENGINEERS.

ON May 2nd, the paper read was a "Description of Two Blast Furnaces erected in 1870 at Newport, near Middlesbrough," by Mr. Bernhard Samuelson, M.P. The author, having called attention to the enormous development in the production of crude iron during the last thirty years, now four times as great as in 1840, and having shown that it had increased three hundred fold since 1750, at which time the whole annual produce of the United Kingdom was only equal to two-thirds of that of a single modern blast furnace, proceeded to describe the general arrangements of a furnace plant recently erected under his direction, and for his account, by Mr. Richard Howson, the resident engineer of the Newport works.

The works were so arranged that all the raw materials entered at one end, whilst the iron produced and the mineral trucks when empty, left at the opposite end, both being connected with the main line of the Stockton and Darlington Railway; and the western end also with a wharf on the river Tees, forming part of the works, at which vessels of from 600 to 800 tons were loaded.

The kilns were cylindrical, built up of wrought-iron plates, and lined with fire-brick. The bottom was tapered, and had openings all round for the admission of air and the withdrawal of the calcined stone, which was directed to the openings by a central cone, having its apex upwards. Each kiln had a capacity of 15,800 cubic feet, and held 630 tons of ironstone

and limestone. The foundation of the blast furnaces was brickwork, resting on clay; on this a circular base of solid brickwork, 7 ft. in diameter, was erected, having a stone curb, on which were the columns, 18 ft. 6 in. high, which carried the upper part of the furnace, the lower part being supported partly by a wrought-iron conical case, and partly by the brickwork and stanchions which surrounded the hearth. From the tuyères upwards the furnaces were cased with wrought-iron plates, varying from $\frac{3}{4}$ in. to $\frac{1}{2}$ in. in thickness. The interior was lined with fire-brick lumps, 5 in. thick, backed with ordinary fire-bricks. The lumps forming the bottom of the hearth, which was 4 ft. 6 in. in thickness, consisted of two courses set on edge, and breaking joint. These lumps, as well as those forming the lining to within a short distance above the tuyères, were chisel-dressed on both faces and joints. The principal dimensions of the furnaces were: Diameter of hearth, 8 ft.; diameter at the bosh, 28 ft.; total height from hearth to platform, 85 ft.; depth of hearth at tuyères (four in number), 3 ft. 6 in.; diameter of bell opening, 13 ft.; and onbal capacity, 30,085 ft.

The peculiar construction of the bell and hopper, an ingenious invention of Mr. Wrightson, of Stockton-on-Tees, was next described. The apparatus was used for charging the furnace, and for closing its top except when it had been opened for that purpose.

The heating-stoves consisted of nine sections to each furnace, of which eight were always in use, and a ninth cooling or being cleaned.

The four blowing engines, coupled in two pairs, which furnished 8,000 cubic feet of air to each furnace, condensed to a pressure of $\frac{4}{5}$ lb. per square inch above that of the atmosphere, were of vertical construction now almost universal in Cleveland.

The entire cost of the works, of which full details were given, was 56,331.4s. 4d., exclusive of land. The principal contractors were, for fire-lumps, Messrs. William Stephenson & Son, of Throckley Works; for the heating stove-pipes, Messrs. Smith & Thomson, of Stockton; for the boilers, hot-air valves, &c., Messrs. Cochran & Grove, of Middlesbrough; for the blowing-engines, Mr. John Stevenson, Preston; for the gantry lift cylinder and slagging engine, Mr. Martin Samuelson, Hull.

ARCHITECTS AND GUARDIANS.

At the last meeting of the Derby Board of Guardians, Mr. Heawick, in accordance with his notice of motion a fortnight ago, proposed that as a competent and efficient architect was required, a number of respectable architects be requested to make application, so that a suitable selection could be made by the Board. He thought 3 per cent would be a fair remuneration.

Mr. Oakden seconded the motion, and was also of opinion that 3 per cent. was sufficient. Mr. Earp said if the building cost 12,000l. the percentage would amount to 360l. He considered 3 per cent. was too much, and begged to move an amendment that 2½ per cent. should be given.

The amendment having been seconded, the Board voted upon the question, when Mr. Earp's amendment was lost by a large majority, and the Clerk was instructed to insert an advertisement in the local newspapers in accordance with the resolution passed. We shall hear what architects say.

CHURCH WORK IN LINDISFARNE.

The Archdeacon of Lindisfarne held a visitation last week, and in his charge gave some information that is interesting. He said,—

"While upon the subject of church extension, I cannot forbear referring to Mr. E. R. Wilson's admirable work, lately published, on the Churches of Lindisfarne, and I may be allowed, for your encouragement, to lay before you some abstracts from this work to show you what has been accomplished in building, restoring, and enlarging our churches since the foundation of this archdeaconry, in the year 1833. From the minute survey of each church, Mr. Wilson has ascertained that upwards of 50,000l. have been expended in building fifteen new churches in the last twenty-eight years. The first church built during this period was the Lonsdale Church at Hareley; then followed the noble churches of St. James the Great at Morpeth, and St. Paul's, Alnwick; Howick Church, the little church at Dadlo, the churches of Crowell, St. Mary's, Berwick, Chevington, Otterburn, and Etal Chapel were soon after erected. The Duke of Northumberland's new churches at Charlton and Acklington followed. In 1862 Ellingham Church was rebuilt, and last year Ailsa Church was consecrated. A new church at Spittal has for some years been licensed for the celebration of Divine service, and arrangements have been made to complete its consecration, and for the formation of a new parish, with a competent endowment. Nor is this all, for the

work of restoration and enlargement of our churches has, at the same time, been carried on with surprising vigour and success. I have Mr. Wilson's authority for stating to you that the sum of 75,000l. has been thus expended since 1833; and it may serve as an encouragement to us to set about what is still required to preserve a few of our ancient and beautiful churches from a further decay, if I briefly pass in review what has been already accomplished in this matter. Not less than 41 sacred edifices appear on this list. Beginning with Lindisfarne, in the parish of Holy Island, and coming along the coast, the Brierley, Tweedmouth, Berwick, Norham, Cornhill, and Carham churches all restored, and placed in a condition most highly creditable to those charged with the duty of their preservation. Among the mountains which divide us from the kingdom of Scotland we have Kirkcubright, Rothbury, Alwinton, Holy Stone, and Alnham, all rebuilt or restored within the period of which we are treating. On the coast, Woodhorn, Newbiggin, Warkworth, Lesbury, Embleton, Longhoughton, Bamburgh, and Beadnell churches have been placed in a similar condition through the liberality of churchmen. These further remain to be mentioned the restoration and improvement of the churches of Kyle, Lowick, Chilton, Bewick, Eglingham, Alnwick, Whitingham, Holton, Rock, Remington, Brinkburn, Felton, M. wright, Elgham, Longsley, and Harburn. In some of these the good work has not been completed; but better taste and a desire to improve has been introduced; nor will our parishioners ever leave off so interesting a work when once they become fully engaged in it, until they have accomplished all they desire. Mr. Wilson further informs me that his survey shews that a sum of between 14,000l. and 15,000l. has been expended on stained glass, and 6,000l. on organs or harmoniums, and that the above improvements do not include the ordinary repairs and heating of our places of public worship by the churchwardens, upon which has been expended 15,000l. We get, then, this valuable information,—that since the year 1833 there have been expended on fifteen new churches 53,000l.; forty-one restorations and enlargements, 75,000l.; stained-glass windows, 14,500l.; organs and harmoniums, 6,000l.; annual repairs and heating by churchwardens, 15,000l.; total, 169,500l.

MONUMENTAL.

National Memorial of the late Sir J. Y. Simpson, Bart.—A meeting of the London committee has been held in Stafford House, the Duke of Sutherland presiding, for the purpose of receiving a deputation of the Edinburgh committee. There were present from Edinburgh the Lord Provost and other authorities of the city, the Provosts of Leith and Portobello, and others. Dr. W. L. Playfair reported the proceedings of the London committee, and Dr. Wood, on behalf of the Edinburgh committee, stated that upwards of 5,000l. had already been subscribed. An influential organisation had been formed in America, where the matter had been enthusiastically taken up. Dr. Priestley suggested that public attention in London should be more fully directed to the movement. The Hon. Arthur Kimbird, 2, Pall-mall East, is hon. treasurer to the fund. It is proposed that the memorial shall consist of a great hospital, a monument in Edinburgh, and a bust in Westminster Abbey.

The Palmeston Statue at Southampton.—An action has been brought in the Court of Exchequer, by Mr. Thomas Sharp, sculptor, against Mr. Alderman Perkins, late mayor of Southampton, to recover 300l., alleged to be due for a memorial of Lord Palmerston. The plaintiff said he had received instructions, in 1866, from the committee of which the defendant was president, to execute the statue for 800l. The defendant pleaded that it was agreed that if not more was collected, 500l. only should be paid, and he should not be held liable beyond that amount. This the plaintiff denied. The jury, after considering for some time, said they could not agree, and were discharged.

The Goutly Monument at Brighton.—This monument, in the Extra Mural Cemetery, Lewes-road, has been unveiled. The monument, which is near the church, on the right-hand side of the path leading up to the Bristol portion of the ground, cost 100l., was made by Messrs. Bennett, and is a plain granite obelisk, standing on a slab of Yorkshire stone. It is to the memory of the late Rev. John Nelson Goutly.

THE TRADES MOVEMENT.

Sheffield.—The master painters do not seem to be united, as some have declined to enter into the arrangement with the men to which others have agreed. The men, on the other hand, refuse to recognise private arrangements with individual men, although willing to refer the whole question to arbitration, or to treat with the masters as a body. A number of the masters have signed a resolution "not to raise what is called the standard of wages, as they consider the present price (6d. per hour) quite as high as they are justified in paying for the lower class of workmen."

Leeds.—A meeting of the builders of Leeds has been held, to consider a demand made by the joiners and carpenters of Leeds, requesting

an advance of wages and an alteration of the present working hours. Mr. J. Woolley was in the chair. The workmen ask for a reduction of time to nine hours a day, and payment at the rate of 7d. an hour, with the abolition of piece-work. Some time ago a board of arbitration was established, but the workmen gave notice to the masters that they would not abide by arbitration. That notice, however, does not expire till the 1st of July, and in the mean time the masters have agreed to adhere to arbitration.

Preston.—The joiners of Preston have been agitating for a cessation of work at noon on Saturday, on the ground that it is a privilege which has been long enjoyed by other branches of the building trade. The employers have, however, resisted the demand, which they hold to be opposed to the terms of agreement existing between employers and employed, which require that six months' notice shall be given of any proposed alteration.

ACCIDENTS.

Fall of a Balcony in Oxford-street.—Three workmen came out from a workshop on to a balcony some 13 ft. or 14 ft. high to look at a fight. The front railings of the balcony on which they were resting suddenly gave way, and the men were pitched head foremost on to the flags below. One fell upon his head and was killed. The jury at a coroner's inquest returned a verdict of "Accidental death."

Fall of a Building in Salford.—While several children were playing near an old building which was formerly used as a dyework, in Springfield-lane, Salford, a portion of it fell, and injured two of them. The building belongs to Messrs. Collier & Co., machinists, Greengate.

Fire at the St. Helen's Town hall.—This building has been partially destroyed by fire. The buildings are insured for 2,000l. The damage is estimated at 2,500l.

CHURCH-BUILDING NEWS.

Great Waltham.—A new church at North End has been consecrated. The architect was Mr. Chancellor, of Chelmsford. Mr. Tufnell has contributed largely. The cost of erecting the church has been 2,500l., the whole of which has been subscribed, and of the parsonage-house, 1,500l. The new church, which stands in the centre of a large burial-ground, laid out and planted with shrubs, comprises a nave, 60 ft. long by 22 ft. wide; a south aisle, the same length by 10 ft. wide; a chancel with octagonal apse, 27 ft. 6 in. long by 19 ft. wide; a tower at the east end of the aisle, the ground floor of which will serve as a vestry; and a porch, the whole accommodating 285 persons. The period of Gothic architecture selected for the edifice is that which prevails during the early part of the fourteenth century, but the principal feature of the church is the extensive use of moulded and stamped brickwork. The church may be said to be constructed entirely of red brick inside and outside, stone only being introduced very sparingly. In the interior of the nave the walls are constructed of plain red brick, with plate tracery to the windows, with moulded brick relieves and arches the whole surmounted by a stone string course. The aisle is constructed with stone columns, the shafts of which are of red Mansfield. The arches are of moulded red bricks, with bands of stamped bricks. The north windows are twelfth lights; the west window is four-light, with geometric plate tracery; and the south window forms an arcade of light, three to each bay, with plate tracery. The whole area of the nave is covered with one roof, with double principals tied together, and resting on double stone corbels, upon the sides of which are carved the symbols of the apostles, on shields. All the timbers of the roof are exposed, the span between the rafters being plastered. The roof over the aisle is a continuation of the nave roof, or similarly treated. The benches of the nave are aisle are of plain deal, simple in design, and slightly stained. The gangways are paved with red Staffordshire tiles. The font is of simple outline, consisting of a stone bowl, with incised ornaments on a moulded base. The glazing of the windows is arranged in geometric forms with glass of different tints. The interior construction of the church is in harmony with the rest of the church, except that stamped brick

have been more freely used, the upper part of the walls being diapered with them. Each face of the octagonal apse has a single-light window, filled with geometric glazing, with glass somewhat richer in tone than that employed in the other parts of the church. Triple-clustered shafts, with moulded and stamped brick arch, forming the chancel arch, separate the nave from the chancel. The roof is constructed with single principals resting on shafted corbels, and is a close boarded with a simple perforated pattern, in bands. The fittings of the chancel are all constructed in walnut wood. The altar-rail is in open arcade. The benches are simple in character and design, with a considerable amount of carving. The whole of the wood carving has been executed by Mr. Neville Tufnell. Externally, the church is essentially a red-brick building, relieved by the plate tracery of the windows and by moulded and stamped brickwork. The tower rises at the east end of the aisle, and is plain in character up to the belfry windows, these being two-light, and repeated on all four sides. The tower is surmounted by a spire, covered with plain tile, the whole being 78 ft. high. An oak porch, constructional in its design, protects the south doorway, and is a prominent feature in the south elevation. It was originally intended that this porch should be of inferior material, but we understand the architect desired to carry it out in oak, and has made the building committee a present of the difference in cost. The tower contains three bells, put up by Messrs. Warner & Sons, of London, and is shortly to receive a clock. The cost of the bells has been defrayed by Mr. J. J. Fufnell. The whole of the works have been executed by Mr. Brown, builder, Chelmsford and Booking, from the designs and under the superintendence of Mr. Chancellor, architect, Chelmsford. The church is heated by hot-water apparatus, erected by Mr. Dennis, of Chelmsford.

Tewkesbury.—The first step towards the restoration of the choir of the Abbey Church, Tewkesbury, has been taken by a Disaster, Mr. T. Collins, who has undertaken, at his own cost, to restore the original oak stalls, and to add whatever may be required, "by reason of its veneration for the building and his love of Medieval architecture."

Newark.—The foundation stone of the new church of St. Leonard, at Newark, has been formally laid by the Lady Charlotte Denison. On its site, when Newark was surrounded with gates and walls, stood an ancient church, but the edifice being outside the ramparts, was destroyed in 1615, when the town was besieged by the Scottish army. The old fabric was attached to the ancient Hospital of Saint Leonard; hence it was deemed not inappropriate to associate the new structure with the history of bygone times by giving to it the same designation, or rather dedicating it to the same saint. The new church is intended for the benefit of the northern district of Newark. The style of the proposed edifice is Early Decorated, and the plan consists of a nave, 72 ft. by 25 ft.; north and south aisles, 72 ft. by 11 ft.; chancel, 30 ft. by 25 ft., with chancel aisles for the organ and the children. The bell-turret is to be of sufficient size to accommodate three bells, and there is to be a western doorway as well as a south porch. The chancel is to have in it a large east window, composed of English tracery, and the chancel aisles are to be divided from the chancel by screens of traceried woodwork. The exterior walls will be faced with rag-stone from Ancaster quarry. It is proposed that the seats shall be free and unappropriated. The total estimated cost is £4,000, and towards this £3,850 have been already promised, together with a further sum of £500 towards the endowment fund. The architects are Messrs. Evans & Jolly, of Nottingham; the builders, Messrs. Hodson & Facon, for the edifice, and Mr. S. Fretwell for the foundation; and the clerk of the works is Mr. Hancock.

South London.—A new church, dedicated to St. Stephen, situated in Villa-street, Walworth, common, has been consecrated by the Bishop of London. The style of this structure may be described as Italian Gothic, and consists of a nave, 81 ft. long by 30 ft. wide, with side aisles and a chancel, terminating with a three-sided apse. The roof is groined, having moulded stone ribs supported on cloistered shafts, surmounted by carved caps. At the side of the chancel are two tiers of windows, glazed with tinted cathedral glass. The upper tiers are three-light lancet windows, and the lower tier four-light windows, in front of which is a stone

arcade supporting an ornamental terra-cotta balustrading, which forms the front to a shallow gallery, contrived as a means of access to the windows round the chancel. The communion-table is of carved oak, the gift of Mr. S. Hansome. The nave, which is surmounted with a close-boarded arch-shaped roof, is divided from the aisles by four Portland stone columns, with carved capitals, which support lofty, well-lighted clearstories. The edifice is constructed of brick, with Bath stone dressings, and sittings (all free) are provided for 750 persons, including the west end gallery. The total cost, including the site on which the church stands, is about 7,500l. The builders were Messrs. Tarant, and the architects were Messrs. H. Jarvis & Sons, of Southwark.

Hucham (near Exeter).—The parish church has been re-opened, and reconsecrated by the bishop. The building is Decorated in style, and consists simply of nave and chancel (the one being divided from the other by a late Norman arch), south-west porch, and small bell-turret, the latter being surmounted by a gilded vane. It has been entirely rebuilt, with the exception of the chancel, which was restored four or five years since, from the design of Mr. J. Hayward, architect, Exeter. The exterior walls are built mostly with rused stone that came from the old building, and the roof is covered with slate, and ornamental tiles running along the point. The interior walls are built of Thorveton stone, from the quarry of Mr. Pleace. The roof is an open wagon-headed stained deal one. The label mouldings of all the windows are stopped with carved heads. The nave is slated with open stained deal benches, with curved and moulded ends. The seats in the chancel are of wainscot oak, and the fronts are of open traceried wood, and have carved finials. The cost of these seats, we understand, will be borne by the incumbent. The chancel-screen, which is of late Perpendicular style, has been restored. The pavement is encaustic tiling. The building is capable of seating about 100 people, and the cost of the restoration will be about 500l. The money has been raised by subscription, Lord and Lady Poltmore and the Incumbent contributing liberally. The architect was Mr. B. Ferrey, of London; and the builder, Mr. Inch, of Crediton. The wood and stone carving was done by Mr. Harry Hems, of Exeter. Messrs. Hart, Son, Peard, & Co., supplied the brackets for the reading-desk, and Messrs. Cox & Son the lectern.

Books Received.

Manual of the Science of Colour on the True Theory of the Colour Sensations and the Natural System. By WILLIAM BENSON, Architect. London: Chapman & Hall. 1871.

Our readers may recollect that a series of letters, by Mr. Benson, appeared in the *Builder*, in 1868, on the Science of Colour. The present volume is based upon the views then given, and afterwards, at the Institute of Architects.

In reference to the proofs and uses of the science of colour, according to his ideas, and in furtherance of what was expressed in the *Builder*, the author here says:—

"In several letters to the *Builder* (in the latter part of 1868), and in a paper read at the Institute of Architects (See Paper No. 7, 1869), the author himself has endeavoured to expound the proof and uses of the science of colour. Since then, he has met with a treatise on colour, prepared at the suggestion of the directors of the Imperial Austrian Museum of Art and Manufacture, by Ernest Brücke, Professor of Physiology in the University of Vienna, and which has been translated into French (Des couleurs au point de vue physique, physiologique, artistique et industriel, par le Dr. Ernest Brücke. Traduit d'allemand par J. Schützenberger, Paris, 1869). The progress of the science of colour on the Continent appears from the fact that in this work the whole subject is treated in a scientific manner, and what is wrong in the common theories is rejected, though no complete system of colour is proposed. Field's doctrine of chromatic equivalents, which has long held too much authority in England, Professor Brücke declares 'is false from beginning to end, and owes its origin to an incorrect interpretation of natural phenomena.' Sir J. F. W. Herschel, after his life-long labours for science, may be allowed to speak with authority here. In a letter to the author, he tersely describes the prevailing opinions about light and colour as 'idols,' which, from a jargon, have fixed themselves into a doctrine. It may be long before that doctrine loses its hold on the public; in lectures, and even in new treatises on Natural Philosophy, its truth is still sometimes assumed by persons who ought to know better; but at least those who direct the education of students in art should take care not to fall behind the age, or allow errors perpetuated in Germany and France to remain unchallenged in England."

Under present circumstances, and before giving adhesion to any new theory as a substitute for that which, with all its short-comings,

has so long been current, it would be well for those interested in the subject of light and colour to glance back at theories which it superseded, and especially St. Pierre's and Goethe's, as there may be germs of truth, in the ideas of such writers, which have only been obscured and thrown out of view by false principles subsequently entertained. There was a feasible simplicity in St. Pierre's theory, so far as we can remember it. He maintained, we think, that colours were produced in the eye by light whose force was more or less broken down, as it were, in a direct and continuous line, through all the varying shades of white, yellow, orange, red, purple, and violet, to black, where the force was utterly destroyed. The acceptance, since St. Pierre's time, of the vibratory theory of light, in the place of Newton's colour-particles, gave decided countenance to St. Pierre's ideas, although these were not inconsistent with Newton's either; but even the vibratory theory, as enunciated, does not seem to contain a thorough analysis to first principles, inasmuch as vibration is a twofold thing, or involves the operation of a twofold and alternative motion or force, one of which, rather than both, may constitute light proper, which seems to be a radiative force and not a concentrative, whereas vibration consists of an alternative approach to, and recession from, a mean point, or seems to involve opposite movements, which may indicate the operation of two contrary forces,—an attractive and a repulsive, or, at least, a concentrative and a radiative; and the one of these, the radiative, alone, may constitute light proper, and alone emanate from the sun, while it may demand or imply that the opposite, or concentrative, emanates from the planet so lighted by the sun. There would thus be a sort of compensatory action and reaction involved, the one dependent on the sun, and the other on the planet. And then, too, we have to consider the nature of the perceptive agency in the eye. Does not that itself involve the operation of a physical force of the organism, actively measuring, or estimating, the ever-varying amounts of the radiative force which we call light or colour? And may not that estimating agency be of one and the same nature, physiologically considered, as the telluric or concentrative, which appears to alternate, vibratorily, with the solar or radiative force which we call light?

Our purpose, however, is not to propound another new theory, but merely to point attention to the publication of the volume under notice. Practical men will here find something that may be of service to them in relation to the use of colours in decoration, as in the sixth chapter, on the Harmony of Colour. To the psychologist, too, the volume will be of considerable interest.

VARIORUM.

FROM a bundle of reading-books that have reached us we select for commendation "A Peerless Wife" (Bentley & Son), a story in three volumes, by Mrs. Henry Mackarness, author of the well-known "Trap to Catch a Sunbeam," and other much-esteemed books. It is a purely domestic story, dealing with ordinary people in ordinary life, but is, nevertheless, so interesting that few novel-readers who begin it will leave it unfinished. Rita, a neglected imaginative child is a new character. "A Peerless Wife," like all this author's works, may be read by young and old alike.—The motive of Mrs. Jerome Mercier's little story, "Only a Girl's Life" (F. Warrs & Co.) is to help on the scheme of the Ventnor Hospital, and a very good motive it is. The tale shows some of the dangers that beset a young girl coming from the country to London, and may be found useful as well as interesting. Let us hope that all the young people who come up to the big city may find such friends as Marjory Earnshaw found.

Miscellaneous.

Conversazione at South Kensington Museum.—The president (Viscount Strarford de Redcliffe) and council of the Society for the Encouragement of the Fine Arts held a conversazione at the South Kensington Museum, on the 11th inst., when between 600 and 700 members and their friends assembled. The invitations were for eight o'clock, and it was eleven when the company dispersed. In the north court, a programme of vocal and instrumental music was performed.

Death of Sir John Herschel.—We regret, with our contemporaries of all classes, to have to announce the death of Sir John Frederick William Herschel, bart., F.R.S., which took place at his seat, Collingwood, near Hawkhurst, Kent, at ten o'clock on Thursday morning in last week. The late baronet was born at Slough, near Windsor, in 1792, and was the only son of Sir Frederick William Herschel, the celebrated astronomer, and first president of the Royal Astronomical Society of England. His first work of note was "A Collection of Examples of the Application of the Calculus to Finite Differences," published at Cambridge in 1820. As early as 1826 he had received from the Royal Astronomical Society a gold medal for his observations of double stars. In addition to his astronomical work, there appeared by him, in 1830, a "Treatise on Sound;" in 1831, a "Treatise on the Theory of Light;" both published in the "Encyclopædia Metropolitana;" and his celebrated "Preliminary Discourse on the Study of Natural Philosophy," published in Lardner's "Cyclopædia" in the latter year. In 1836 was published in Lardner's "Treatise on Astronomy," which proved his power as a popular expositor of the peculiar science of his family. During his well-known absence at the Cape of Good Hope, the Royal Astronomical Society again (in 1836) voted him their gold medal. He was made a baronet on the coronation of the Queen, and a D.C.L. of Oxford in 1839. In 1842 he became Lord Rector of Marischal College, Aberdeen, and in 1843 was elected President of the Royal Astronomical Society. In December, 1850, when the office of Master of the Mint was made into a permanent one, it was conferred on Sir John Herschel, who retained it until February, 1855, when he resigned it on account of ill health, being succeeded by Professor Graham, the eminent chemist. Sir John married, in 1828, the daughter of the Rev. Alexander Stewart, D.D., of Strathgarry, Perthshire, by whom he had issue; and he is succeeded by his eldest son, now second baronet, William James, born at Slough in 1833, who entered the Bengal Civil Service in 1853, and is now a magistrate and collector of revenue in India. The burial of Sir John Herschel will take place at Westminster Abbey on this Friday at noon. The place selected for the interment is close to the grave of Sir Isaac Newton, at the east end of the nave, close by the organ screen.

Recent Street Architecture in Birmingham.—The local *Post* draws attention to a building designed by Messrs. Martin & Chamberlain, architects. The premises have been built for Mr. Scruton, in the principal street. The dimensions of the shop, though not large, as such places go, are, nevertheless, considerable, the frontage towards New-street being 57 ft., and the depth being 28 ft., at which limit the new building is connected with an extensive range of show-rooms and work-rooms in the rear. The style of the building is Early English. The front consists of two masses, one containing five windows, and the other three windows, these blocks being separated by the entrance-doorway, an important feature, carried boldly above the window-line, battlemented, and enriched with carved pinnacles and mouldings. The windows are deeply sunk, with moulded frames, and are divided from each other by engaged columns, with carved capitals, and chamfered into square cut bases, carried to the street-level. The work is executed throughout in Pillough stone, close and hard in texture, and agreeable in colour. Instead of shutters, each window is protected by a wrought-iron grille; and, in order to preserve the harmony of effect, and to avoid obtrusiveness, the name-plates running along the base of the windows are of copper, slightly bronzed, instead of the customary brass. The building was done by Messrs. W. & J. Webb, of Hockley; and the carving throughout, of stone and wood, by Mr. Barfield, of Leicester; and the painting by Messrs. Whitworth & Higginson, of Birmingham.

Opening of the New Basin at Chatham Dockyard.—The first of the three large steam basins constructed at this dockyard, the whole covering nearly 100 acres, was opened in the presence of Colonel A. Clarke, Royal Engineers, Director of Admiralty works, under whose direction the whole of the works have been carried out, and several of the officials from the Admiralty, and belonging to this dockyard. The water was slowly admitted into the basin, which has a water area of between thirty and forty acres, the work of filling it occupying some days.

Shakespeare's Birth-place and the Museum.—At the annual meeting of the trustees, held at the Town-hall, Stratford-upon-Avon, on the 5th of May, 1871 (the anniversary of Shakespeare's birthday, O.S.), the statement of the trustees said,—"The number of visitors to the birthplace cannot be exactly ascertained, as many decline to enter their names in the visitors' book; but it is certain that the number far exceeds that of last year, and may be stated at considerably more than 7,000. The amount received for admissions is 195l. 5s. 3d., against 160l. 10s. 9d. last year; the donations and incidental receipts amount to 7l. 5s. 6d., making the total receipts 202l. 10s. 9d., which is the highest amount attained since the tricentenary year. The expenditure amounts to 126l. 17s. 9d., leaving a balance in the treasurer's hands of 79l. 0s. 5d. The receipts for admissions to the museum for the past year amount to 68l. 15s. 3d., against 42l. 4s. 6d. last year, to which is to be added, for donations, 2l. 12s. 6d., making a total of 71l. 7s. 9d. In accordance with the resolution of a former meeting, sums amounting to 70l. (in addition to 40l. before reported) have been transferred from the museum to the New Place fund, to repay Mr. Halliwell advances made by him from the Shakespeare fund; and, although the trustees have no control over New Place, they could not refrain from noticing with pleasure the great additions and improvements made there during the last twelve months. Numerous gifts to the museum were acknowledged.

A Building Speculation.—An action in which Mr. William Wadsworth, of Sheffield, builder, was the plaintiff, and Mr. Charles George Smith, also of Sheffield, sharebroker, was the defendant, was brought upon a building agreement, and was to have come on for trial at the Leeds Spring Assizes of this year. The pleadings, however, were so long, and raised so many questions, both of law and fact, that the action and all matters of difference were, by consent of the parties and by order of the judge, referred to Mr. W. C. Beasley, as arbitrator. Mr. Ryalls, for the plaintiff, contended that he was entitled to recover from the defendant the difference between the value of the buildings and the amount of the advances under the defendant's promise; or if that promise was not made, that the defendant had acted wrongfully in turning plaintiff out of possession, and that the same sum was due from the defendant to the plaintiff, as damages for the wrongful act. Mr. Gould, for the defendant, relied not only on the defendant's denial of the promise alleged by the plaintiff to have been made on August 19, but also on two clauses of the agreement between the plaintiff and the defendant. The arbitrator's decision was that the defendant Smith had to pay the plaintiff 993l., and all the costs of the reference and award.

Telegraphic Progress : "Braie."—In the House of Commons, in reply to Sir J. Hay, who asked whether the Postmaster-General had received any information with reference to a material for insulating telegraphic wires named "braie," Mr. Monsell said his attention had been called to the material, which was a preparation of coal-tar. Five years ago the Dutch Government tried experiments with it, which were not very successful; but he had received from them a letter to the effect that they were about to try new experiments, their opinion being that a perfect judgment could not be formed upon the last trial. They stated, further, that upon the whole the material was not unfavourably thought of. The scientific officers of the Post-office Department had taken the matter into their consideration, and their opinion as yet was not favourable to the adoption of "braie" as an insulator. The House of Commons is, no doubt, a capital "advertising medium," but will it tend much to the public good that any hon. member can rise and ask the Government if they have received information as to the value or progress of anything of supposed public importance, — say Griffith's Sates, — and why not these as well as "braie?"

Preservation of Monuments in Churches. The Synod of the Irish Voluntary Church, now in session, have passed a canon forbidding any changes in the structure, ornaments, or monuments of any church without the sanction of the incumbent, select vestry, and bishop. This is a wise and judicious proviso. We trust it will be faithfully carried out in practice, and that such changes as those to which it refers will not be effected without the joint and concurrent assent of the three authorities are required.

New Pulpit, St. Andrew's, Plymouth.—St. Andrew's Church, Plymouth, has a new pulpit of Bath stone and Devonshire marble, in the Early Perpendicular style. It consists of a base of Cornish granite, from Messrs. Freeman & Sons' quarries, Penryn; and this stem is relieved by slender columns of red Dartmoor granite at either angle. The plan of the upper part is octagonal, the main portion being Cornish stone, whilst the panels, columns, and angles are of Devonshire marble from the Ipplepen quarries near Newton. The marble is red, relieved by veins of cream colour. In the centre panel, facing down the church, and standing upon a moulded base, is a figure of St. Andrew, patron saint of the church. The figure is in Caen stone, and leans upon the X-like cross, upon which, according to early tradition, the saint suffered martyrdom. The panel in which the statue stands is more deeply recessed than the rest, and the increased shadow obtained by a concave back throws out in strong relief the outline of the figure. The capitals and cornices are profusely carved. Its height from the floor is 7 ft. 10 in. The pulpit was designed by Mr. James Hine, and has been carried out in a successful manner by Mr. Harry Heas, sculptor, Exeter. The total cost of the pulpit is, we believe, about 130l.

The Milan Exhibition.—The programme of the exhibition to be held in Milan during the course of the present year, has just been published by the Italian Industrial Association. This association propose holding periodical exhibitions in the building which has recently been erected in the Public Gardens, the first of which is to be opened on the 1st of September, and will comprise "Construction and the Common Arts." It will include the following classes:—Class 1: Materials and Processes used for Construction.—Raw materials, natural and artificial stone, marble, stucco, limes, cements, asphalt, models of furnaces and kilns, molds and machines for the preparation of materials and construction, prepared timber, flooring (parquets), metals used for construction, cast-iron. Class 2: Apparatus and Processes for Heating and Lighting. Class 3: Ceramic Arts. Class 4: Furniture and Decoration.—Cheap and fancy furniture, iron bedsteads and furniture, paper-hangings and upholstery, carpets and mats, utensils and implements for domestic use, domestic telegraphs and bell-hanging, fireproof safes, locks, door-furniture, cornices, inlaid work, carving, painting, and varnishing.

Wellington Monument, St. Paul's.—In reply to Mr. Goldsmid (House of Commons), the Chancellor of the Exchequer said arrangements had been made for the completion of the Wellington monument. The principal difficulty was that of dealing with Mr. Stephens, who had been intrusted with the work. Mr. Stephens was a man of very considerable ability, but not a good manager of pecuniary affairs, and therefore it was found necessary to put an end to the monetary transactions with him. At the same time it was felt to be very desirable, considering how much had been already done, and the aptitude Mr. Stephens had shown for this kind of work, that he should if possible be continued as sculptor to finish the monument. Therefore a contract had been entered into with a gentleman qualified to complete the work, who would retain the services of Mr. Stephens until the work had been completed in a manner which would, he hoped, be worthy of the nation, and of the illustrious man to whom the monument was raised. The cost would, on the whole, be moderate, and the work would be completed in a year or two.

The Proposed Alteration to Brighton Town-hall.—The Local Works Committee reported they had received four tenders for making certain alterations to the town-hall, in accordance with plans already approved by the Council. The tenders were, — from Messrs. Blackmore & Howard, King-street, Brighton, 2,459l.; Messrs. Ghesman & Co. Kensington-street, Brighton, 2,728l.; Mr. G. R. Lockyer, York-place, Brighton, 2,622l.; and Mr. B. E. Nightengale, Albert Embankment, London, 2,617l. The committee resolved that the tender of Mr. Nightengale be accepted.

A Liverpool and Manchester Ship Canal.—Mr. Hamilton Fulton, C.E., has estimated that a ship canal, permitting vessels of 22 ft. draught to pass, can be constructed from Liverpool to Manchester for the sum of 3,500,000l.

The New Temperance Hall at Gainsborough.—The chief stone of this hall has been laid. The edifice will be built on a site of 65 square yards of land on Spial-terrace. The entrance to the large room will be a passage, 10 ft. by 5 ft. The principal room will be 2 ft. by 32 ft., and 30 ft. high, with a roof made of wrought iron, and will be chiefly lighted with gas from the roof. There will be a gallery to seat 100 people. At the south or east end there will be two committee-rooms, which can, when required, be opened to the large room. In this way accommodation will be provided for seating over 600 persons. At the north end are to be two ante-rooms provided with closets. Over the entrance and two committee-rooms there will be a lecture-room, 3 ft. by 22½ ft., suitable for tea gatherings, &c. The four committee and ante-rooms have been arranged with a view to their ultimate use as reading-rooms among other purposes. The cost of the hall exclusive of the site, is estimated at £2000., to be raised by public subscription, and upwards of 2500. have already been given. The architects are Messrs. Lister & Son; and the contractors, Mr. Croft, builder, and Mr. Burton, joiner. It is proposed to convey the land and building to trustees for the Gainsborough Temperance Society.

Importance of Irrigation.—It is well known that the land in most parts of the country is by artificial means now thoroughly overdrained, and the quantity of rainfall, which has of late years been much below the average, is said to be affected thereby. The injurious effect of long-continued droughts has, therefore, become a question of vital importance. It is now proposed to make use of some of the natural valleys of the small tributaries of the Wye near the town of Rhyayder for the construction of storage reservoirs. These reservoirs, it is said, could be kept filled by the surplus water during heavy rainfalls, and the surface of the water in them would be at the height of 590 ft. above the level of the sea, so that the water would command and could be pumped over an area of more than 2,000,000 of acres. It is estimated by Mr. Hamilton Fulton, an engineer, that the probable cost of irrigating the land on a large and systematic plan would not exceed an outlay of 12½ per acre. Such land, now valued at 1½. per acre rental, would be worth at least 4½. per acre per annum, or a fee-simple value of 100½. per acre.

Sheffield Architectural and Archaeological Society.—The May excursion of members of this society took place on the 11th, Rotherham and Wentworth being the places visited. A party of ladies and gentlemen drove off from the school of Art about 10 a.m., and on their way called to look at the fine oak room in the old hall at Carbrook; at the old Roman station of Templeborough, near Rotherham (Tolke), respecting both of which places the Rev. J. Stacey are some particulars. After visiting Wentworth (by the kind permission of Lord Fitzwilliam), the party were met at the church by Mr. Massey, of Wentworth, who pointed out many interesting particulars, and read to them a careful paper, "On the ancient history of the place." Returning to Rotherham, the party were met by Mr. J. Guest and Dr. Shorran, who conducted them over the New Hospital, now in course of erection, and after visiting the old parish church, the party assembled in the Mechanics' Institution, to hear Mr. Guest read an interesting paper "On the Ancient history of Rotherham."

A Novel Application of Collodion.—At a recent meeting of the Berlin Photographic Society, some details were given of a curious collodion possessed by collodion, which has been lately discovered by M. Kleffel, and which may, it is thought, lead to some useful application. He has found that if a glass plate is coated with collodion in the ordinary manner, and, after the plate has set, a printed sheet of paper is pressed on the surface lightly with the hand, a very exact reproduction of the printed matter will be obtained and impressed upon the collodion after the removal of the paper, the design or type remaining perfectly visible after the complete desiccation of the film. The greasy nature of printer's ink, in all probability, prevents it being attacked by the alcohol and ether of the half-set collodion, while the remainder of the paper is completely impregnated and softened by these volatile fluids. For this reason it may be that the printing has the appearance of a bas-relief.

Funeral Rites, Tombs, and Monuments. At the last meeting of the "Bromley Friends in Council," Mr. Vaughan, M.R.I.B.A., read a paper entitled "Funeral Rites, Tombs, and Monuments." It was illustrated with many diagrams. In his introductory remarks, he said veneration for the dead was inherent in the human mind; that there were three systems of disposing of the body,—interment, embalming, and cremation; also three distinct sorts of tombs,—caves, tumuli, and structural tombs. Tombs constitute an important branch of archaeological study,—painting and sculpture combined with architecture in their decoration, and many fragile relics of antiquity have been preserved in them, while the paintings on their walls afford invaluable examples of the costumes of peoples thousands of years since. Caves were the most ancient burying-places, and that of Machpelah the earliest mentioned. An interesting review of various orders of funeral rites, tombs, and monuments, was then given.

Wood Carpeting.—The *Scientific American* describes the new wood carpeting, which is coming into extensive use in America, as follows:—The fabric is made of slats or more ornamental shapes, glued or cemented upon a cloth backing. The slats or strips of wood are of different colours, and are arranged to produce all the effects of tessellated floors, mosaic-work, &c.; and, being about a quarter of an inch in thickness, they will wear many years. They are finished in oil, and fit together so tightly that the joints are as perfect as those in solid work. The surface thus produced can therefore be scrubbed, washed, and oiled, when needed, precisely like other floors made of ornamental woods, which floors they resemble in all respects when laid.

New Offices for the Wallasey Local Board.—The public offices for the Wallasey Local Board having become inadequate for the proper transaction of the official business of that Board, it has been resolved, says the *Liverpool Journal*, to remove to new premises, to be erected by Mr. M'Innes, on land belonging to that gentlemen, in Church-street, Egremont, opposite the offices for so many years occupied by the local Board. The foundation-stone of the new building has been laid. The building, which is to be of brick, is in the Italian style, and will have a frontage to Church-street of 48 ft., with a depth to the rear of 72 ft. Mr. James T. Lea, the surveyor to the local Board, is the architect, and Mr. Samuel Ellaby of Liscard, is the builder. The cost, including that of the site, is estimated at 2,000.

The Trade-Unions Bill.—This Bill has passed through committee without material alteration; but in the Criminal Law Amendment (violence, threats, &c.) Bill, the following additional definition of molestation was added:—"If he watch or beset the house or other place where such person resides, or works, or happens to be, or the approach to such house or place, or if with two or more persons he follow such person in a disorderly manner, in or through any street or road." An amendment aimed at the practice of workmen on strike assembling in large numbers and preventing new hands from entering the factory or shop, was also agreed to.

Liverpool Architectural Society.—At the annual meeting of this society, on the 3rd ult., the following gentlemen were elected as officers for the ensuing session:—President, Mr. H. H. Vale; Vice-Presidents, Mr. T. D. Barry and Mr. H. H. Statham, Jun.; Council,—Messrs. Jas. M. Hay, C. H. Beloe, G. F. Chantrell, J. Mercer, and W. H. Picton; Honorary Secretary, Mr. W. Parslow; Librarian, Mr. E. H. W. Barry; Treasurer, Mr. G. F. Deacon. Prizes were delivered to the successful competitors for the students' prize, the first to Mr. E. W. Banner, the two others to Mr. J. Stanley Fox and Mr. J. Green; the subject being a design for a town church to seat 1,200 persons. The President delivered his closing address.

Demolition of an Ancient Mansion.—Workmen have been employed to demolish the fine old large red-brick mansion on Brixton-rise, and which, according to reports, was once occupied by Oliver Cromwell. This is the last specimen in the locality. The property has been purchased by the London Tramway Company, and is to be converted into a carriage depot and a range of stabling. The terminus of the Brixton and Westminster Tramway will be extended to this point.

The Perils of Hyde Park Corner.—These become greater every day, such is the strength of the stream of traffic. Mr. E. M. Barry suggests the formation of a sunk way under Piccadilly, the upper outlet in Park-lane, near to Stanhope Gate, some 300 yards from Piccadilly; the lower outlet in Grosvenor-place, about 400 yards from Hyde Park-corner, nearly opposite to Chester-street. The present roadways in Piccadilly and Constitution-hill would be carried over the low-level road on bridges. The adoption of this plan would separate the cross streams of traffic, and would greatly relieve Hyde Park-corner from the danger which now exists there, and which will be increased by the opening of Hamilton-place. The suggestion is worth consideration.

Fine Arts in University College, London. We are glad to hear that Mr. E. J. Poynter, A.R.A., has been appointed Slade Professor of Fine Art in this college. The buildings, forming part of the north wing, which have been designed for the fine-art school, are nearly completed, and it is intended to open the classes for drawing, painting, and sculpture at the beginning of the college session in October next. The late Mr. Felix Slade has established at the college six scholarships for proficiency in those branches of art, each of the value of 500. per annum, tenable for three years, and which may be held by ladies.

The Vendome Column.—If the Germans had pulled down this monument it would not have been wonderful; but that Frenchmen should do it, passes belief. Admit that it recorded a dynasty a part of the people happen just at this moment to abominate, it also memorialised triumphs of the national arms and the national arts. It was an inexorable and shameful act. If the monuments and records of one dynasty are to be destroyed by the next that succeeds, history will lose her landmarks and evidences, and the world of art be robbed of its glories. The *Times* of the 17th inst. contains a long and interesting account of the Column.

Newspaper Press Fund Dinner.—The annual festival of the Newspaper Press Fund, held on the 13th inst., was presided over by the Earl of Carnarvon, and was brilliantly attended. One very interesting feature was contributed by the presence of a number of gentlemen who had served as war correspondents, Mr. Landells, Mr. Laurence Oliphant, Mr. Forbes, Mr. Kingston, Mr. Skinner, and others. Amongst the speakers were the Spanish Minister, Mr. Arthur Helps, Lord Houghton, Mr. Shirley Brooks, the Marquis of Bute, and others. The subscriptions amounted to nearly 1,200.

Bawmarsh Local Board.—At the last monthly meeting of this Board, held on the 3rd inst., the surveyor, Mr. T. W. Roome, reported the completion of the works for the water supply, comprising about 5½ miles of mains, &c., within one day of the specified time, and at a cost of 447½. below the estimate,—4,211½. submitted in August, 1870. The works having thus been satisfactorily completed, it was resolved, on the recommendation of the Water Committee, that a gratuity of 25 guineas be awarded to the surveyor.

The Literary Fund Dinner.—Under the presidency of the Lord Bishop of Winchester, the dinner in aid of the Royal Literary Fund, was held in the Freemasons' Hall on the 17th, and passed off very satisfactorily. The chairman made an excellent address, and Mr. Wren Hoskyns, M.P., Mr. Anthony Trollope, Mr. Beresford Hope, M.P., M. Walowski, Sir W. Stirling Maxwell, and others, spoke. The total amount of subscriptions announced was about 960.

Safes no longer Safe.—The *Scientific American* says it is now impossible to construct a burglar-proof safe, for the thief, with his cylinders of compressed hydrogen and oxygen, can in a few seconds burn holes of any size in the hardest metal—his fire-drill enabling him in a few minutes to work his way into the strongest safe that was ever constructed.

Free School for Hammersmith.—A medical practitioner in Hammersmith, Mr. John Betts, has just added to the educational agencies of the district, by the erection and endowment of an elementary free school for 400 children in the locality of the Albion-road. The cost of the site and building is between 7,000. and 8,000. —*West London Advertiser.*

Appointment Open in the Office of Works.—There is to be an open competitive examination for the situation of junior examiner in the Office of Her Majesty's Works, on the 30th inst., and following days. A form, which may be obtained at the Office of Works, must be filled up by any desiring to be examined, and returned so as to reach the Civil Service Commission on or before the 23rd of May.

Stone Implements.—A considerable exhibition of stone implements (palaeolithic) is open in the rooms of the Society of Antiquaries, Somerset House. Papers relating to the subject, by Mr. Franks and Mr. Evans, were read on Thursday evening, the 18th. The collection will remain open till Thursday, 25th, inclusive, and strangers may obtain cards of admission on application.

Payments by Postage-stamps.—We are enabled to state that it is not the intention of the Postmaster-General to insist upon the regulation forbidding the keepers of receiving-houses from purchasing postage-stamps, which was to come into force on the 1st of July. Surely more thought should be given than would seem to be the case before regulations affecting large interests are proposed.

Institution of Surveyors.—The next meeting will be held on Monday evening, May 22nd, when a paper will be read by Mr. E. P. Anson, entitled, "London: its Commercial Centres, and their Influence on the Value of Land."

TENDERS

For additions to Newington Workhouse, Surrey, for the Guardians of St. Saviour's Union. Messrs. H. Jarvis & Son, architects:—

Marsland & Sons	£9,995 0 0
Pearce	9,990 0 0
Harrison & Sons	9,487 0 0
Chappell	9,310 0 0
Nightingale	9,237 0 0
Wyatt	9,190 0 0
Kirk	9,173 0 0
Dover, Dowell, & Co.	9,149 0 0
Shepherd	9,100 0 0
Tarrant	9,022 0 0
Kenal	8,977 0 0
Downs	8,972 0 0
Wignmore	8,960 0 0
Gooding	8,900 0 0
Cooper	8,880 0 0
Perry & Co.	8,875 0 0
Thompson	8,873 0 0
Capps & Rizzo	8,797 0 0
Yates	8,750 0 0
Crab & Vaughan	8,727 0 0
Henshaw	8,707 0 0
Watson Brothers	8,470 0 0
Blackmore & Morley	8,452 0 0
Wood	8,430 0 0
George	8,307 0 0
Cooke & Green	8,255 0 0
Kupps	7,994 0 0
Machin	7,634 0 0
Crosker	7,714 0 0

For church in the Archway-road, Highgate. Mr. E. Hoole, architect:—

Dove	£7,270 0 0
Henshaw	7,120 0 0
Hobson	6,425 0 0
Masfariane	6,425 0 0
Nutt	6,340 0 0
Wright	6,168 0 0
Kilby (accepted)	5,983 0 0
Niolet (withdrawn)	5,285 0 0

For completing a residence at Upton, Essex. Mr. J. W. Dennison, architect:—

Auley	£1,690 0 0
Woodward	1,216 0 0
Ennor (accepted)	1,157 0 0

For the erection of the first portion of the West of England Sanatorium. Mr. H. F. Price, architect:—

Beavan & Son	£9,982 0 0
Hands	9,004 0 0
Perry	9,004 0 0
Shorrey	4,950 0 0
Harvey & Sons (accepted)	3,611 0 0

For the erection of Baptist Chapel, Cotham, Bristol. Mr. H. F. Price, architect:—

Hall	£4,798 0 0
Beavan & Son	3,959 0 0
Marquis & Munro	3,890 0 0
Wilkins & Sons	3,504 0 0
Davis & Son	3,585 0 0
Blackbrook & Sons	3,577 0 0
Garrett (accepted)	3,185 0 0

For building a residence at Westmill, near Ware, Herts. for Mr. W. King. Messrs. W. Wilds & Son, architects. Quantities furnished:—

Bint & Son	£859 18 0
Ekiss	851 0 0
Dickinson	850 0 0
Allen	638 0 0
Norris	635 0 0
Green & Sons	624 0 0
Scodes	603 0 0
Fisher	685 0 0
Casle	579 0 0

For repairs, &c., to All Saints' Church, Hartford, for the churchwardens. Messrs. W. Wilds & Son, architects:—

Parkins	£265 0 0
Castle	192 10 0
Norris (accepted)	158 0 0

For a new storehouse at Dover, for the Submarine Telegraph Company. Mr. C. T. Whitley, architect. Quantities not supplied:—

Mathews	£1,200 0 0
Richardson	1,090 0 0
Hayward	1,084 0 0
Shrubsole	989 0 0
Adcock & Rees	979 0 0

For Parsonage House, Somerby. Mr. R. W. Johnson, architect:—

Perkins & Son	£1,108 0 0
Wilson	1,100 0 0
Winkles & Kellett	992 5 0
Kitchen & Fidd	985 0 0
Conquest & Son	919 0 0
Barnes	948 0 0
East	910 0 0
Weaver	979 14 6
Potter	849 5 8

For six cottages at Kettering. Mr. R. W. Johnson, architect:—

Margetts	£1,238 0 0
Wilson	1,190 0 0
Barlow	1,195 0 0
Sharma	1,070 0 0
Briggs	1,060 0 0

For additions to Kettering Cemetery. Mr. R. W. Johnson, architect:—

Henson	£215 0 0
Sharma	230 0 0
Margetts	225 0 0

For works at Knuossington Grange. Mr. R. W. Johnson, architect:—

Bromwich	£1,318 0 0
Halliday & Cave	1,102 10 0
East	1,077 10 0

For alterations and additions to the Baptist Chapel, Cotton-street, Poplar, E.—

Abraham	£1,084 0 0
Tanner	990 0 0
Sheffield	947 0 0
Riddall	891 0 0
Atturton & Latta	780 0 0
Coleman	737 0 0
Lee (accepted)	683 0 0

For the erection of the tower to the parish church, St. Mary Church, near Torquay, in two portions. Mr. J. W. Hugall, architect:—

	1st Portion.	2nd Portion.
Barrow & Sons	£2,295	£1,185
Gibson	2,400	1,400
Jackman	2,230	1,434
Luce mb	1,853	990
Wall & Hook	1,654	1,258
Edlles (accepted)	1,403	1,204

For building new wings, and making alterations and additions to the Infirmary, Fulham Union Workhouse, for the Guardians of the Fulham Union. Mr. J. G. Hall, architect:—

Forley	£4,650 0 0
Pitcey	4,364 0 0
Nightingale	4,039 0 0
Sawyer	3,993 0 0
Luce mb	3,650 0 0
Penhorne	3,515 0 0
Chamberlain Brothers	3,499 0 0
Avis & Co.	3,194 0 0
Lacey & Torkington	3,430 0 0
Rose	2,094 0 0

For the Ebborne Oil Mill, Chelsea. Messrs. Humbert & Cox, architects. Quantities supplied by Messrs. Strudwick & Menzies:—

Newton	£10,150 0 0
Tidey	7,300 0 0
Reacher & Son	6,960 0 0
Wyatt	6,950 0 0
Dover & Dowell	6,853 0 0
Gooding	6,617 0 0
Thorn & Co.	6,500 0 0
Sharlington & Co.	5,977 0 0
Wignmore	6,703 0 0
Heath	5,518 0 0
Lacy & Torkington	5,500 0 0
Capps & Rizzo	6,193 0 0

For rebuilding church of St. Peter, Tootingham, Bucks, exclusive of tower and foundations. Rubble stone supplied. Mr. E. J. Tarver, architect. Quantities by Mr. Riddett:—

Hubbard	£2,523 0 0
Coxford & Co.	2,547 0 0
Past	2,603 0 0
Law & Son	2,311 0 0

For New Coombe farmhouse, Sussex. Mr. E. J. Tarver, architect. Quantities by Mr. Riddett:—

Shearburne (accepted)	£1,230 0 0
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For alterations and general repairs to No. 33, Aldersgate-street. Mr. H. Winstanley, architect:—

Patman & Fotheringham	£243 0 0
Boston	33 0 0
Pritchard	327 0 0
Sewell & Son	313 0 0

For additions to Coombe Head House, Bampton, Devon. Mr. H. Spencer, architect:—

Davis	£210 0 0
ShawBrooks	233 0 0
Spiller	405 0 0
Pollard (accepted)	360 0 0

For entrance-lodge at Henlade, Taunton. Mr. H. Spencer, architect:—

Davis (accepted)	£453 0 0
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For new stables for Mr. Henson, Peckham Rye. Mr. Jewhurst, architect:—

Ellis	£290 0 0
Blackmore & Morley	237 0 0
Steed	236 0 0
Hill	230 0 0
Shapley & Webster	225 0 0

For parish school-room, Hoggston, near Winslow. Bucks. Messrs. Houghton & Spencer, architects:—

King	£230 14 0
Rickard	205 12 0
Kean & Sons	213 0 0
Holey	201 0 0
Cooper	187 10 0
Matthews (accepted)	179 17 0

For Stables at Peckham, for the London Tramway Company. Mr. Edmondson, architect:—

Watts	£2,815 0 0
Coleman	2,737 0 0
Cowland	2,770 0 0
Shapley & Webster	2,690 0 0
Kilby	2,669 0 0
Roberts	2,197 0 0

For building two houses at Fulham, for Mr. R. Roy M.P., at Trebovir Park, Menai Bridge. Mr. R. G. Thomas, architect:—

Simpson	£2,715 0 0
Adamson & Son	1,904 0 0
Shapley & Webster	1,640 0 0

For finishing three houses at Camberwell, for Mr. Purkis. Mr. A. Murphy, architect:—

Sharphington & Cole	£264 0 0
Shapley & Webster	345 0 0
Pebble	315 0 0
Moncreiff	298 0 0

For new entrance lodge and gateway, for Mr. R. Davies M.P., at Trebovir Park, Menai Bridge. Mr. R. G. Thomas, architect:—

	Lodge.	Gateway.
Rogers & Son	£1,262	£270
Jones	934	359
Roberts & Co.	942	213
Williams	875	234
Jones	730	250
Thomas*	720	214
Griffiths	680	180

Framework of Gates and Railings.

Bennett (accepted)	£114 0 0
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* Accepted, subject to deductions.

For new house for Mr. Roger Evans, at Menai Bridge. Mr. R. H. Thomas, architect:—

Perry (accepted)	£1,190 0 0
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For new church school, at Llanfair P. G., Anglesey. Mr. R. G. Thomas, architect:—

Thomas	£423 0 0
Griffiths	388 0 0
Williams	352 0 0

For a pair of gamekeeper's cottages, at Prestwold near Crawley, for Mr. G. Trist. Messrs. Thick & Wilson, architects:—

Ockenden	£370 0 0
Gates	623 0 0
Wilkins	610 0 0
Wickens	403 10 0

For erecting a villa, &c., at Cowes, Isle of Wight, for Mr. H. J. Webb. Mr. G. H. Guillaume, architect:—

Quantities supplied by Messrs. W. & J. Jurd:—	
Stevens	£268 0 0
Wheeler	625 0 0
Ball	621 0 0
Sanders	618 0 0
Dallimore	597 0 0
Chichen	580 0 0

For two shops on Forecourt, at Nos. 77 and 79, King's road, Chelsea, for Miss Struthers. Mr. E. O. Symon, architect. Quantities supplied:—

Stevens	£895	0	0
Wheeler	625	0	0
Ball	621	0	0
Sanders	618	0	0
Dallimore	597	0	0
Chinchon	580	0	0

* Accepted.

For repairs, Clive-road, Addiscomb. Mr. E. O. Symon, architect:—

Shand	£39 18 0
Sawyer	64 0 0
Thomas (accepted)	44 7 8

For finishing No. —, Kingsdown Villas, Wandsworth Common, for Mr. J. T. Stansby. Mr. E. O. Symon, architect:—

Turrell	£248 0 0
Whitlock	238 0 0
Sawyer	198 0 0
Greig	169 17 6
Heaver & Coates (accepted)	140 13 7

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AN ARCHITECT, of experience, possessing high testimonials as to works of importance executed by him is desirous, in consequence of the decline of business in a present office, to accept of an APPOINTMENT as ASSISTANT to an Architect extensively engaged, or to a Civil Engineer carrying out works requiring especially a competent and experienced assistance. He would be prepared to undertake any of these departments, he believes that his assistance would be found valuable. An engagement in London would be preferred. Address, W. 21, Northampton-street, Strand.

TO DISTRICT SURVEYORS.
AN ARCHITECT and SURVEYOR, who has obtained his Certificate, is desirous of ASSISTING in District Surveying, either as Assistant Surveyor or otherwise, at moderate terms.—Address, 735, A.R.B.A. Office of "The Builder."

TO ARCHITECTS AND SURVEYORS.
AN ARCHITECTURAL DRAUGHTSMAN, accustomed to the general duties of an Architect as surveyor's business, requires a permanent ENGAGEMENT. For year, reference. Salary moderate. Age 37 years. Has sketching measured 5000 ancient Gothic windows in England, which he will complete at a fixed price during spare time. Has stipulations of several large works.—Address, W. 21, Northampton-street, Strand.

AS FOREMAN PLUMBER and DECORATOR, by an experienced Man in an approved jobbing business.—Address, A. 120, Rother-street, Bermondsey, S.E.

TO ARCHITECTS.
GENTLEMAN, of seventeen years' experience, wishes for a SITUATION as MANAGING CLERK or to prepare Drawings, &c. at his own Office. A competent draughtsman would not be objected to.—Address, R. 34, Laurel-grove, Finsbury, E.

TO BUILDERS, DECORATORS, &c.
A YOUNG MAN, holding a very good situation in a large Builder and Contractor's Office, has now or THREE MONTHS an EVENING to SPARE, and would willing to take work or turn his hand to other branches if required.—Address, G. L. N. 24, East-street, Manchester-square, Marylebone, W.

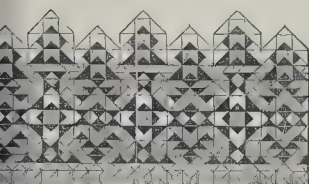
A CHRISTIAN MAN is open to take a PLASTERING WORK by Contract, in Town or country, of reasonable terms. Labour only. Good references can be given as to character and ability.—Address, W. DAVEY, 1, Spring-lane, Portobello-road, Nottinghill.

TO ARCHITECTS.
GENTLEMAN, having recently completed his articles, wishes for a SITUATION as IMPROVER in Town or country, or as CLERK of WORKS. A competent draughtsman can be shown.—Address, DELTA, 1, Fairfield-place, Finsbury, Bow, E.

The Builder.

VOL. XXIX.—No. 1477.

The Architectural Conference.



LARGE meeting of representatives of the Architectural profession in London and the provinces was assembled in the Institute meeting-room on Monday afternoon, to listen to the opening address on the object and aims of the Conference from the President of

Institute, who occupied the chair. The Metropolitan members formed the majority numerically, but there was a fair proportion of provincial architects, including some of the young members of the profession from Ireland, Scotland, and of our largest provincial towns. Wyatt, in commencing his address, stated truly the origin of the idea of inviting such a Conference, which was suggested by an invitation from the Architectural Alliance to the Institute to send delegates to the meeting of the latter. The council of the Institute, regarding its own body as the central representative of the profession in England, considered it their part to invite, rather than to send delegates, and undertook to attempt, on a larger scale, what the Alliance could only accomplish on a smaller scale, and in a more partial manner. The address was devoted mainly to consideration of sundry subjects connected with professional practice, and suggestions as to point of view from which they should be considered in discussion at the ensuing meetings. We have printed the pith of it elsewhere. *Unison fait la force* is a gospel which has yet to be received by British architects, though we get the mere fact of a conference having taken place may be viewed as a proof that its realization has commenced. The question of building Contracts, and the place to be supplied by bills of quantities therein, were subjects afterwards discussed by the meeting. Mr. L'Anson supported the adoption of bills of quantities as part of the contract. Chatfield Clarke stated, that in comparatively small works he had usually adopted the plan of allowing the builders to elect a surveyor or themselves, whose quantities they would be willing to accept, the choice generally being left upon and in accordance with the suggestion of the architect. Mr. Godwin showed the strong objections there were against making the bills of quantities a part of the contract; and Mr. Seddon, supporting the same view in the main, suggested that, in justice to the contractor, should have one month after the estimate accepted to examine the bills of quantities before finally signing the contract. Mr. Charles Fry feared that, in the case of large buildings, a month would be by no means a sufficient time to check the quantities accurately; he pre-

ferred the system of leaving the responsibility of the quantities solely with the surveyor who took them, as the best system for insuring his accuracy and correctness in *minutia*. Mr. Hine, of Nottingham, and Mr. Arthur Cates both supported the system of quantities being furnished by the architect himself, and made part of the contract, the former thinking that the client was unfairly treated if the architect whom he had employed to look after his interests should shirk the task in regard to so important a matter. Mr. F. Hayward was on the same side; and Mr. Rickman varied the proceedings by a little praise of surveyors generally. A Glasgow architect stated, that with them estimates were entirely based on schedules of quantities supplied by surveyors, who all worked on one recognised method, and that these schedules, accompanied by sketches and annotations, in some cases entirely supplied the place of specifications of the ordinary kind. The building, when finished, was measured and valued at the prices in the bills of quantities. This appears to be, at all events, an intelligible and consistent principle. The retention of the bills of quantities as a portion of the contract was urged by other speakers also; but it appears to us that the real principle of the matter was entirely ignored by them in the discussion. The business of the architect is to plan and design a building, and to make drawings which will form the readiest means of showing what is his idea. His question to the contractor is simply, "What are you disposed to carry out such a building for?" and the bills of quantities are in theory simply the builder's method of arriving at a conclusion on this matter. The builder may choose to dispense with quantities, and arrive at a result by "cubing;" in most cases he would be very foolish to do so, but that is entirely his concern. The architect simply wants a building of a certain design and construction carried out; it is nothing to his purpose how many cubic feet of any material there are in it; all he is bound to do is to give the builder full and accurate drawings to enable him to calculate this: and to expect the architect to saddle himself with the burden and responsibility of the quantities, is taking him entirely out of his proper sphere, and wasting his time over mechanical work which the builder or builder's surveyor can do much better; besides that the adoption of the bills, however obtained, as part of the contract, introduces the element of uncertainty, and is likely to form a fruitful source of legal dispute. We should add that nearly every speaker on the subject appeared to assume a competition of builders as a necessary condition in getting estimates for a building; whereas it cannot be questioned that a system of competitions in which the lowest wins is a fruitful source of temptation to bad and scamped work, and that the employer would often get his work much better done, and more economically in the end, by simply obtaining one estimate from a contractor of position, ability, and repute.

The changes were rung on the same subject again at the Tuesday afternoon's meeting, when the proceedings were led off by a paper by Mr. John Hebb (*vice* Mr. L'Anson, who had been unable to prepare his promised communication), on "Professional Charges," which took the form mainly of a consideration of the method to be adopted in charging for quantities supplied; assuming, as one ground for the architect undertaking this part of the work, that the surveyor was under a constant temptation to take out the quantities too fully, to protect himself from the responsibility of omissions, and that the client's interests were better served by leaving them in the architect's hand. After the opinion we have just expressed on the subject, it is not necessary to go farther into the *pros* and *cons.* brought forward in regard to it at this second meeting; we will only

draw attention to an *apropos* remark of Mr. L'Anson, who, to some extent an advocate for the adoption of quantities as part of the contract, pointed out, nevertheless, that the architect is derogating from his own proper independent position in making himself the servant of the builder by supplying quantities to and receiving payment for them from him; and that all such transactions should be between the architect and his client: a view of the subject to which some of the provincial architects seemed to be indifferent. Professor Kerr's paper on Competitions was a communication, at all events, very much to the point, and none the worse because the same thing has often been said in our columns. Architectural competitions differed, the speaker urged, from other forms of competition to which the public were accustomed simply in that the common equity of sale and purchase was not observed in regard to them. A committee or an individual who invited ten architects to make drawings for a building instead of one, simply ordered ten chances of getting what they wanted instead of one, and ought to pay for the ten accordingly, as they would for so many chances in a raffle or lottery. He believed the public were much more willing to do this justice to architects than some of the latter supposed; that they erred through ignorance; and he had known cases where the promoters of a competition had expressed the utmost astonishment on learning by subsequent explanation what the architects had given them for their money. One or two special instances of resolute fair-dealing on this head, adduced by other architects present, tended rather to confirm this pleasing faith in the good intentions of the public. Mr. Seddon thought competitions were not to be defended as a means of bringing forward young architects, as they might be very injurious to them, in the most important sense, by giving them prematurely the conduct of large designs which they had not made themselves competent to deal with rightly. In general, however, there seemed to be no great opposition to the competition system when fairly carried out, nor did any one present oppose it *sans phrase*. Professor Lewis's and Mr. Roger Smith's papers on educational subjects were both suggestive and sensible: the former dealing partly with the necessity of better art-culture for the public as well as the architect, and upholding strongly for the latter the desirability of a wide general culture in addition to education in purely professional matters. Mr. Smith sketched the history of the voluntary examination scheme, urging that the definite aim of study furnished and marked out thereby was in itself a sufficient benefit to the architectural student to warrant the continuance and furnish hope for the increased success of the movement. Mr. Spiers, in his remarks on the student's text-book proposed to be published by the Institute, hoisted the standard of academical as opposed to mere office education, citing the more thorough professional training of French and German architects in support of his views; and regretting that at present the English student, instead of advancing with the times, had in general only the old office hap-hazard training, with the difference that this was shortened from seven to four or five years. This paper brought Mr. Street to the front with a vigorous attack on academical systems of education, urging that architects were artists, and that artists could not systematically be turned out by any academical manufactory; and questioning the superiority of the Continental architects in the really artistic part of the profession. A pretty warm discussion followed, in which, however, the sympathy of a good portion of the meeting appeared to be with Mr. Street; but, admitting much truth in his remarks, he failed to show that the English architects would not, whatever their present merits, be a good deal better for a more syste-

matic education. Mr. Satham, commenting on provincial education, drew attention to the great and disproportionate difference between the advantages for architectural study in London and in provincial towns, the latter furnishing, in comparison, no facility whatever for study; and urged a more conscientious discharge, on the part of architects, of their responsibility towards pupils whom they had undertaken to educate; suggesting, also, the possibility of an impulse being given to architectural education in the provinces by the delivery of courses of lectures at the principal towns by men of recognised position in the profession, possibly in special connexion with the Institute. Whether such a scheme could be made to pay itself is the question; but the same thing is done for literature by persons residing in London as their headquarters; and it is certainly to be regretted that all means of architectural education by lecture should be at present entirely centralised in the metropolis.

The evening meeting on Tuesday was initiated by some remarks on ancient military and monastic architecture in the North of England, by Mr. F. R. Wilson (president of the Northern Architectural Association) supplemented by some comments from Mr. J. H. Parker, and illustrated by a number of sketches. These, as purely historical, afforded little ground for discussion; and, indeed, only the bare outline of the subject could be hinted at in the time allowed, and kept to by the chairman (Mr. Beresford Hope) with, in some cases, a little too much demonstrative rigour. Mr. Pullan followed with a paper on Greek art, which might be regarded as a plea for greater respect for and study of that style of art, in place of the too-exclusive attention given to Gothic art at present. In regard to the adoption of the Greek style in modern buildings, and the causes of its failure under the hands of the architects of the Greek revival of the last generation, we would all to what Mr. Pullan said the observation that the Greek (Doric especially) was essentially a marble architecture, for a clear sky; and its delicate contours and sinkings cannot have the same effect in ordinary limestone or sandstone as in the original material, or be executed with the same delicacy: a modified treatment must be adopted. A general feeling seemed to prevail that Greek architecture was to be regarded as evidencing the same broad principles as Gothic, only applied in a different direction; Mr. Burgess limiting all his emity against Classic to what he termed "Sir-Christopher-Wren-abominations." Architects of to-day may take free leave to quarrel with the detail of the "Wren" period; but they will be fortunate if they leave behind them any one building, the general composition of which will gain as universal and lasting admiration as has been justly accorded to the metropolitan cathedral. Mr. Seddon's paper on "Polychromy" urged with regard to external treatment what we have frequently recommended,—the employment of what may be called natural polychromy of construction obtained by the use of different toned materials: with regard to internal applied painting we think the architects of the present day require much rather to be held back than urged on, and that the reckless manner in which strong colour is constantly applied to our churches, often in direct contradiction to the constructive and artistic design of the architecture, constitutes a very barbaric source of effect, to which we are jealous of even an appearance of encouragement by those who might not use it so inartificially themselves, and therefore should be careful of putting themselves in the way of being quoted as authorities in this direction by "weak brethren." Mr. E. Sharpe, who has recently done much to draw attention to this subject, addressed the meeting "in mitigation of damages" by the over-application of colour, so far as the limited time for speaking would permit. A paper on the "Effect of Ecclesiastical Law on the Decoration of Churches," by Mr. Rolfe, who rather mistook symbolism for art, and specially recommended that the altar should be 8 ft. 5 in. long, caused some amusement, and a check from the chair when the lecturer proceeded to considerations on the Purbeck case, and the theological squabbles of the day. Mr. Sharpe brought the meeting back to architectural subjects by some remarks in favour of the admission of perspective drawings into architectural competitions, urging that the architect ought to think and design in perspective, and that geometrical elevations are merely the mechanical means of conveying the architect's intention to the builder.

These remarks were partly *apropos* of the fact that the Conference had invited an exhibition of geometrical drawings, exclusive of perspectives; but those who joined in the discussion which followed, while fully concurring in the principle that the architect must imagine his design in perspective, appeared for the most part to think that the limitation of the Conference Exhibition was a move in the right direction, as architects in studying each other's drawings, wish rather to see the working out, and construction of, a design, as well as, or even in preference to, the pictorial effect. Those who read our recent remarks on the subject of the pictorial exhibition of architecture at the International Exhibition, will not need a fresh expression of our opinion on this point.

We shall return to some points of interest in connexion with the Conference, hoping that it will prove the inauguration of a new and more intimate connexion between the profession in London and the provinces, which may not be without advantageous results on both sides: only adding, by way of suggestion, that the interest and usefulness of such a conference will scarcely be kept up except by annual meetings; and that in that case it might be worth consideration whether two out of three of such meetings might not advantageously be held by rotation in some of the larger provincial towns, somewhat after the plan of the British Association meetings, and setting apart every triennial meeting for the metropolis.

Amongst the members of the Institute resident in the country who attended the meeting were:—

Messrs. Albury, of Louth; Blaker, Brighton; Botham, Birmingham; Desane, Dublin; Eddy, Durham; Eagles, Brighton; Hoskins, Darlington; Fowler Jones, Durham; Lynn, Belfast; Law, Northampton; McCarthy, Dublin; Peachey, Darlington; Pritchett, Darlington; Robson, Liverpool; Rolfe, Braintree; C. Smith, Reading; Sharpe, Lancaster; Scott, Brighton; and Worthington, Manchester.

The list of visitors from the country, delegates and others, included:—

Messrs. Audley, Liverpool; Barnes, Newbury; Boardman, Norwich; Bateman, Birmingham; Corson, Birmingham; Cousin, Edinburgh; Thos. C. Clarke, Liverpool; John Clarke, Liverpool; John Clarke, Jan., Liverpool; Douglas, Glasgow; Edwards, Dundee; Hay, Liverpool; Hine, Nottingham; Horablower, Liverpool; Hadson, Great Malvern; Gilbert, Preston; G. H. F. Jones, Brighton; Lessie, Edinburgh; Neville, Dublin; Owen, Dublin; Paley, Lancaster; Pys, Colchester; Stratham, Liverpool; Thornton Shiels, Edinburgh; Sherlock, Liverpool; Thomson, Glasgow; and W. Watkins, Lincoln.

OPENING ADDRESS AT THE GENERAL CONFERENCE OF ARCHITECTS.

THE President, Mr. T. H. Wyatt, opened the meeting, as we have mentioned elsewhere, with an address, the principal part of which we print:—

Valuable and interesting as should be all discussions on art and archaeology, on science and education, individually, I attribute more importance to the discussion at this meeting of questions of "professional practice." These are days when the status and influence of our profession have been most unfairly assailed and misrepresented,—when regulations which we have laid down for our guidance, and for the uniformity of our practice, have been compared to the arbitrary rules of "trade-unions," and when it seems to me most desirable that we (despite all this obloquy) should seek to arrive at such fair and honourable conditions of practice as shall, from their equity, be acceptable to our employers, and which, as a powerful body, the Institute should be in a position to enforce upon its members, and, by their example, on the whole profession.

Such congresses (or conventions, as our American friends call them), are not uncommon in other countries, and have been found to work well. I will briefly allude to two, although their details have been fully described in the architectural publications of the day, viz., the Fifteenth Biennial Congress, held in Hamburg in 1868, of German Architects and Engineers; and the Fourth Annual Convention, held by our American brethren in Philadelphia in 1870. The German gathering was on a great scale. They met 800 strong, and in a pavilion "erected expressly for the occasion." And though the results of their meeting showed a great amount of work, and of calculations and subdivisions (such as Germans only are capable of), of which it has been amusingly said, "such labours can only be due to that particular power of systematising which never tires till a straight jacket has rendered its victim motionless;" the parties

then present managed to combine with their labours a vast amount of amusement and recreation. For in their few days' meeting they arranged to have two *conversations*; two excursions down the Elbe; a public breakfast; a public dinner; a special representation at one of the theatres; and an exhibition of fireworks. Gentlemen, after such festivities, ours must appear a dull and laborious programme; but we leave you free to indulge in those British tastes which give such a charm to our metropolitan "Isthmian games" (as Lord Palmerston called them); and the Derby Day is at your own disposal.

In former years, the scale of charges had been so arbitrary, and so various, in different parts of Germany, that it was determined at this meeting to attempt the task of making them uniform and binding throughout all Germany;—this, as it were, anticipating the great union of North and South which has since been so wonderfully realised.

They seem to have succeeded completely, so far as the scale of professional charges is concerned, and as regards the management of competition. And although the ramifications in which they have subdivided the rates of percentage, and the classes of buildings to be operated upon, are such as would appear bewildering to us, and which certainly would be impracticable in this country, they have (believe) ensured perfect adherence on the part of the architects of Germany; and I am informed by one well qualified to speak on the subject, that "both their rules as regards charges and competitions, have the sanction of the Prussian Minister for Works, and that all public and private societies must adhere to them in their dealings with German architects, from the Baltic to the Alps" (I quote his words).

It has been truly said that "no extent system will do away with all disputes, and the dealings between man and man cannot be reduced to rule." This is true in the main; but it is much better would it be if, in our case, there were certain fixed rates of charges for professional services, and rules of practice, which were recognised alike by Government, by the Courts of Law, and by the public generally; and which could only be departed from by the professional man, with a loss of character and of position, and with which the Institute could deal summarily than they are at present able to. That such, unfortunately, is not the case, I state feelingly, for within the last three months I have had five cases of disputed accounts between architect and employer referred to me for arbitration as your president,—certainly a most unenviable task, and which I only consented to undertake as part of my official duty. There is an old saying, "No rose without a thorn." And these are the thorns in the rose which, by kindness, I am permitted to wear.

The German architects recognise a graduated scale of per-centage according to the class of work executed; so, I believe, do the French and American architects; and so, I believe, shall English architects have to do before long; and individually, I cannot doubt the equity of such a system. With us a uniform rate of 5 per cent. has long prevailed,—applicable alike to the plainest or to the most ornamental class of building, to the workhouse and warehouse, to the palace or cathedral; and to an expenditure of a few hundred pounds as to that of six hundred thousand. That architects would be prejudiced by some modification of our present system I fully believe; for they are not much underpaid, in certain cases involving considerable study and detail, with small expenditure, as they are overpaid in cases of large expenditure, with little or no ornamentation, with a number of parts repeating themselves. The German architects evidently do not cost 5 per cent. sufficient remuneration for all purposes. Whilst in some of their plain works, involving a large expenditure, the charge would fall to 2 per cent., it is clear that the average charge for all their classes of work exceeds 6 per cent.

Having settled the rates of per-centage applicable to certain classes of works, the Germans then laid down these general rules:—

1. That measurement of work shall be the expense of the client.
2. The client has to bear the cost of any special supervision, and all the expenses of the clerks of the works.
3. For extra works or trouble, such as surveys, inspections, &c., the architect is entitled to certain fee per day of seven hours, to

selling and living expenses, according to a certain fixed rate.

4. For the loss of time in journeys to inspect works, on which the architect receives the usual remuneration, he is only entitled to half of the sum above enumerated.

5. The architect is entitled to claim, whilst work is being carried on, money on account his fees, in proportion to the advancement of works; the balance being paid at the close of the work.

6. All the drawings remain the property of the architect. (The client can demand copies of them, but he cannot use them for any other purpose than that for which they were executed.)

The German architects added a clause on the question of "excess of estimates," which I venture to think has much equity in it, and which should do well to consider and adopt; for this question is with us a frequent source of misunderstanding, and it would be well to put it on a clear and final footing. The German architects decided that, "if the expense exceeded the estimate furnished by the architect, his fees shall be paid to him according to that estimate, without entitling him to claim anything for the excess of expenditure that he has not foreseen, unless he is able to prove that the increase is the result of extensions or additions demanded by the client. If there has been no estimate prepared, the actual expenditure will determine the fees."

The American architects have been no less cautious than the Germans and ourselves to publish certain fixed rates of professional charges, which shall be binding on all their clients; but they have also met with grave difficulties on this head. Their president had to say, "It is, however, to be regretted that some of us to be found who are willing to barter away their knowledge, their skill, and their professional experience, for whatever may be offered. He speaks with great truth, "there can be no substantial success in any profession in which the practitioners are outbidding each other. The principle of establishing fixed rules is obvious, and the propriety of urging the profession to adopt them generally cannot be questioned; but attempt to enforce them would be to descend to the highly objectionable processes resorted to by combinations called 'trade-unions.' The American Institute of Architects can descend to such measures: it simply adopts a certain schedule of prices, for the purpose of approximating to a uniform scale of professional charges, and being persuaded that the same is just, it expects the profession to conform to it."

I fear I have trespassed somewhat too long on the mercenary part of our calling; but for the sake of all (the client as well as the architect) it is most desirable that this should be established on a just and firm footing, and it is satisfactory to find that the English architect is neither more exorbitant nor more "exigent" than his German, American, or French confrère. It will be observed that the German architects firmly believe that "the drawings remain the property of the architect." The American Institute is not less decided on this head. The report of this body states that "the right of ownership of plans and papers by an architect who has been employed to carry out a work has never been maintained by the leading architects of America during the last twenty-five years, and it has been officially recognised by the American Institute since 1864. The trustees deem it of the utmost importance, not only to the architectural profession, but to those who avail themselves of the services of architects, that the principle of ownership in plans be everywhere maintained and enforced." This custom (to give it no other name) which has thus almost universally prevailed in our country for some centuries, cannot be said to be so unreasonable and unfair to the employer, when it has been acquiesced in and recognised by a calm and deeply-thinking public like the Germans, and an acute and worldly-wise people like the Americans. Be that, however, as it may, and despite all the forcible arguments that have been urged in favour of this custom, and despite the fact that up to a recent period Government and public bodies have, in courts of law, recognised the right of the custom, there seems to have been in recently a certain reaction in the official and legal mind, if not in that of the general public, upon this point, and the Council having taken (by the advice of their honorary solicitor) the best legal opinion they could, can only commend those architects who attach great

importance to the retention of their drawings, or who are prepared to forego public employment, to make a special agreement with their employer to that effect.

I will now pass to the question of "competitions," one on which it will be most desirable that this Conference should express a very decided opinion. It is one which has occupied the anxious attention of conferences, conventions, and institutes; on which much has been ably written, and on which much of the honour and success of our profession depends; and yet it is one in which little practical result has been arrived at. At the German Conference, in 1868, this point assumed a prominent place. It was affirmed,—

1. "That public competitions for great and important works have become a recognised principle of the age, and they are calculated to be of service, both to the public and the profession. The system has these advantages:—

2. It produces a variety of solutions of a given problem.

3. It brings unknown talent under public notice.

4. It prevents monopoly.

5. It helps to increase public interest in architectural works.

6. It creates a healthy emulation amongst members of the profession."

It would, probably, be difficult to gainsay any of these affirmations, supposing the competition to be really carried out with good faith and justice. The German architects then agreed upon certain fixed conditions, applicable to all competitions. These were lodged with the Government offices of works, as the sole conditions on which German architects would enter into competitions. They appointed a central committee, "for the purpose of representing the interests of the profession, and seeing that the rules they had just agreed to were carried out throughout Germany." This committee consists of five members of the Berlin Institute, and all instructions for competitions are laid before this committee for approval.

Here, then, gentlemen, is a happy combination of theory and practice—a word and a blow. The German architects lay down certain principles which they believe to be just; they present them to the authorities and to the public, and they have the courage to say, "these alone are the conditions on which we enter upon your competitions. Take or reject them." The English architects have been less firm. The Institute in 1839 published a report on competitions, which, as far as it goes, is closely reasoned, and has not been controverted; but it has led to no practical result. The Architectural Association went a step further, and even issued a practical series of regulations, well drawn up; but I am not aware that they have been generally noted upon or accepted by the public as conditions virtually binding. The "Architectural Alliance" has taken much interest and trouble in this important question, and has published a series of resolutions (or rather suggestions) in the form of a circular, to be addressed to any committee or individual seeking for designs in competition. They are very clearly expressed, and if acted upon conscientiously would go far to put competitions on a fair and healthy footing; but I fear they have effected little real good, for there are still endless complaints in the architectural papers as to the injustice of recent competitions. How, then, is this evil to be met? It can only be by the same determined and general action that the Germans have adopted. Let us, at this conference, determine on certain fixed leading principles, that shall guide all future architectural competitions (not attempting to make them too numerous or too diffuse). Let us appoint, as the Germans have done, a sub-committee of five (say one from the Council, one from the Fellows, and one from the Associates of the Institute; one from the Association; and one from the Alliance or United Provincial Societies), who shall watch the issue of any advertisements or prospectuses for architectural competitions, and who should then put themselves in communication with the "promoters," and seek to have combined with any local conditions that may appear necessary, the general code of regulations which this meeting may approve, and which are essential to a fair result. The editors of our metropolitan and provincial architectural journals would, I feel confident, readily give insertion to any short report of the above-named committee as to the probably satisfactory or unsatisfactory working of the competition in

question. That report might safely be taken as a professional weather-gauge, foretelling fair or foul weather. Any architect entering on that competition after the "storm-signal" had been hoisted, would only have himself to thank for any shipwreck he might make of his time and money, or for any loss of professional position he might incur by entering upon such a venture. Unless the profession, as a body, determine on avoiding any competition in which these leading principles are not recognised, I know no remedy for the present injustice and heart-burnings of which we hear so much. It will be hard indeed if bringing to bear upon the subject the numbers and influence of the architects, being members of the Institute, and of the Association, and of the numerous architectural provincial societies forming the "Architectural Alliance," we cannot realise something like the independence and influence of our German brethren.

The American architects have not been able so completely to deal with this question of competition as the German architects, and as we may do if we are but true to ourselves. They are not, however, indifferent to it, and their Institute is now engaged in preparing a code of regulations applying to this subject. In a late report it states truly, "The public is in need of knowledge on these subjects, and this should not come from isolated bodies, but from a united profession. When it knows what are our aims and what our principles, it will be more disposed to respect our suggestions. But it is in need of more than this: it requires elementary knowledge of the duties and responsibilities of architects. When it has this, it will learn that the interests of architects and clients are mutual, and that the principles held dear by the profession are safeguards for the protection of both parties, rather than means of extortion and imposition."

The question of general conditions of building contracts has received the attention of this Institute as it has that of other kindred societies. A form has been agreed upon (subject, of course, to such modifications as may be thought desirable by the legal advisers of our clients) between the council of the Institute (subsequently confirmed at a general meeting) and the committee of the London Builders' Society, which may be considered as a fair and honourable agreement between employer and contractor. That such is the case may be inferred from the fact that the Office of Works, after seeking to set aside and modify certain of these conditions, and to introduce others of a more stringent character (a proceeding which was resolutely opposed by the builders who submitted tenders for the Law Courts foundations) have been induced to accept the conditions as agreed upon with the Institute with very few variations. The council will gladly receive any suggestions on this point from country members, whose local experience may throw fresh light on the subject.

I think the subject of the employment of surveyors for the purpose of taking out the quantities in buildings is one requiring a good deal of consideration on the part of architects, and more, probably, than it receives. In cases where competition amongst builders is resorted to, it seems only fair that the employer, who will derive the benefit of the struggle and the competition amongst the builders for his work, should bear the cost of preparing these quantities, and I can understand the grounds on which the leading builders claim the right to appoint some surveyor on their part, so as to have a guarantee that the quantity of work is well covered. I do not doubt the equity of the claim; but, on the other hand, the employer should be protected from any excess of quantity of materials, and this is in theory done by the actual appointment of a second surveyor by the architect, to check the quantities taken out; but I am afraid it is not always so in practice, for I believe there is not unfrequently a division of labour, one surveyor taking out the quantities in one trade and the other in another. This, no doubt, shortens time and saves labour; but, in doing so, all check is lost. It should, no doubt, be a point of honour with the surveyor appointed on behalf of the employer, or to verify every dimension taken, and to check the calculations and additions. This appointment does not entail any additional cost to the employer, for the percentage is then divided between the surveyors. In cases where work is given to an individual builder without competition, I claim the right to appoint the one surveyor employed, taking care, of course, to appoint only a man of the

highest character, in whose hands the employer and the builder would alike be safe. I have never known in my own practice a case where this custom has been objected to by the builder, and it is a custom which, individually, I much prefer to that of competition. The architect need have no difficulty in verifying generally the fairness of the estimate. The builder naturally feels some gratitude for the preference thus shown him, and, as a general rule, is more likely to take greater interest and greater pride in a work of this kind than he is in one in which he owes nothing to employer or architect, and where he feels that he would not have been employed if his estimate had not been the lowest, and the employer proportionately benefited.

There is, I believe, a prevailing impression that the cost of buildings has, within the last few years, increased in a larger ratio than is due merely to the rise in the price of labour and of materials; and the great fortunes made by some of our large leading contractors have not tended to remove such an impression. It would be, I think, very desirable if we could determine upon some universal course of action which would set at rest all doubt on this point; which would satisfy our consciences that the interests of those who have placed themselves in our hands and on our protection have been duly cared for.

I believe that the simplest and most satisfactory arrangement would be to disconnect the surveyor from the builder, to make him (on the nomination of the architect) the agent and adviser of the employer in the matter of quantities, as the architect is in matters of arrangement, taste, construction, and decoration. That he should take out the quantities from the architect's drawings on his own responsibility; that he should be paid by the employer instead of by the builder (half on the completion of his quantities, and half on completion of the work and settlement of accounts); that the priced bills of quantities should be attached to, and form part of, the contract, as much as the drawings and specifications; and when signed and sealed up, should not be referred to again till necessary for making up the accounts except with the consent of both parties; that the builder should not be held responsible for the execution of any works not included in these quantities, and for which naturally, as they have not been included in his priced bills of quantities, he has not been paid; but that, on the other hand, he must be held responsible to execute (or to have deducted from his bill, in making up the final account) any portion of the work included in the quantities which he has not executed. We should thus, I think, have a fair guarantee that only the actual quantity of work shown on the drawings was included in the quantities, and thus the cost of our works would not be unnecessarily swelled. The employer would be fully protected, for as long as his architect and his surveyor were honest men, he would only pay for work actually executed, and there would be no margin taken to cover unknown contingencies. I have adopted this system in my own practice, and can scarcely conceive, though I should be ready to hear any practical objection that can be urged against it.

I can conceive nothing more unjust or more opposed to the spirit of equity, than to require a builder to take the quantities as they come from your surveyor, denying him the right to appoint a surveyor to verify on his part the accuracy of those quantities, and yet to bind him in a contract to execute all the works shown on a certain set of drawings, and described in a given specification, though many of the items may have been omitted in the quantities you force him to take without guaranteeing their accuracy. I hear this is sometimes sought to be done.

It will be seen on reference to a recent notice paper of the Institute that the "Professional Practice Committee" are engaged in the recommendation of the document issued by the Institute, in 1862, on the subject of "Professional Charges," and that all our members are requested to forward to our secretary any observations or facts bearing on this subject. I need hardly say that this invitation is not confined to our members, or to London architects; and in the name of the committee of this Institute, I urge our provincial brethren to aid us in this matter loyally, and to give us the benefit of their varied experience and customs.

Tunbridge Wells Cemetery Competition.—Correspondents are asking for information as to the result of this competition.

"HORE PAULINE" AT THE INSTITUTE.

Those who were disappointed to find in Mr. Penrose's paper on the decoration of St. Paul's Cathedral, read at the Institute on Monday evening, simply a statement of the general idea proposed in carrying out the work, unaccompanied by any illustrative sketches or diagrams, may have felt themselves in some degree compensated by the very animated and not unsuggestive discussion which ensued. Assuming that decoration of some kind was a positive and manifest duty,—a position which in the main was controverted by no one present, and will assuredly not be controverted here,—the discussion seemed to range itself, though not very systematically, under three heads: the internal arrangement of the whole building in regard to its future use as a place of congregational worship; the structural decoration, as it may be termed, of the walls with marbles and inlaid work; and the fine-art decorations in the shape of pictures, whether in mosaic, fresco, or stained glass. The first question is one which is seldom discussed on such occasions without some infusion, tacit if not overt, of religious or ritual motives to influence the opinions expressed; and naturally so, since the idea as to what is best in such a matter must of course vary with the speaker's own opinion as to what constitutes the ideal of religious worship in the Church of England. This is, we need not say, a question out of our province; but, viewing the subject in a combined architectural and practical light, we do not find ourselves able to advocate Mr. Street's wish for an altar and canopy* under the dome as the culminating point for the dome services. The placing of the organ on this choir-screen is as much a *venusta questio* with the Institute of Architects as it is evidently was with Wren; who, perhaps would rather have Anglicised the phrase, and called it a "vexations" question. We think the small organ best where it is at present; and as to the idea mooted in some quarters, of placing the large organ for the nave services in this central position, by mounting the smaller portion of the instrument on the choir screen, and relegating the major portion of it to the two western bays of the choir on each side, we have before expressed a decided opinion (which we know to be in accordance with that of some experienced organists) that such a division and cutting up of a large instrument (burying, too, a large portion of it behind masses of masonry) is prejudicial to its musical effect. The nave organ is certainly an eyesore in its present position in one of the transepts; architecturally and "organically," the place for such an instrument is the west end, where it may be arranged so as not materially to interfere with the windows; but ritual considerations, connected with the position of the choir in proximity to the clergy, are against this. We can scarcely meet all these requirements, and one or another of them must give way, according as musical, architectural, or ritual feelings are uppermost. If, indeed, the musical portion of the great services were reduced, as in the Lutheran churches of North Germany, to the singing of plain and familiar psalm-tunes or chorales, in which all the congregation could join, and be themselves the choir, then nothing could interfere with the position of the organ at the west end. Nor would the musical effect obtainable in such a case be one of the least grand and impressive that can be heard in connexion with a religious service.

Concerning structural decoration, about which, however, we have as yet only very vague intimations of the intentions of the committee, we are inclined to sympathise with those who would put a check on such a very extensive cutting and inlaying of the internal walls with marble, as seemed to be implied by some of Mr. Penrose's remarks. It is very possible to overdo this, and to "venerate" all the repose and solidity out of a great building. Mr. Penrose indeed, in reply, urged that what was contemplated only involved in reality the substitution of genuine marble inlay for artificial treatment of the stone surface in accordance with Wren's directions; but some portions of the scheme as given in his paper seemed to imply a good deal more than this. We are in favour of Mr. Gambier Parry's cleansing

suggestions as applied to the present internal structure; it may be time, when that process has been carried out, to consider more carefully how much is desirable in the way of veneer of finer materials. With regard to the stained glass, it is satisfactory to hear that the Munich glass is not to be used further than in carrying out the group of subjects, part of which are already executed by artists of that school. The very high artistic merit of the figure-drawings in these windows cannot alone for the inherently unattractive use of the material in such picture windows, and can only cause regret that the same ability of composition and draughtsmanship should not have been employed in a class of art which would afford a better and more suitable medium for this style of design than stained glass can ever be. Moreover, it seems to be an understood thing that the most important parts of the colour design in roofs and spandrels are to consist of figure subjects, and we not suggest that a better classification of the whole scheme of decoration would be arrived at, and a greater contrast and balance of interest and effect, if the stained glass were consistently treated, for the future, in an opposite manner, and were to consist entirely or mainly of pure ornamental design; in which case, the mural figures and the windows would respectively form a foil and contrast to one another, instead of presenting, in mutual rivalry and opposition, two sets of figure-designs shown respectively by the different lights, reflected and transmitted; which suggestion we will join a prayer that distance and aerial effect may be consulted in the scale of colour of the stained glass to be for the future employed; reminding those concerned that strong and high colour, when used in such a position, and especially when illuminated by strong sunlight, however rich and glowing may be its effect, has more than any other form of decoration a tendency to destroy aerial perspective, and to lessen the apparent size of the building. A still more important question is involved in the consideration as to the use of figure subjects in mural decoration, or, rather, we should say, two questions. The first is, as to the effect of large figure-subjects, such as those already executed in some of the spandrels and the dome, on the apparent scale of the building. The very first view we had long ago of one of these executed spandrels, suggested this effect, amounting, indeed, nearly to conviction,—that this treatment had already an effect in lessening the scale of the dome; an effect which would, of course, be intensified when the whole circle of spandrels is similarly filled. Mr. Street urged this point during last Monday's discussion. The dilemma is a difficult one; for while, on the one hand, colossal figures must have this tendency to reduce the architectural scale, on the other hand there can be no doubt that mere life-size figures would have but a paltry appearance in the interior of such magnitude. We should suggest that the difficulty might, perhaps, be met by giving to the figure-subjects not a mere plain gilded ground (supposing them to be in mosaic) but a diaper ground of small ornamental features so designed as to assist the eye of the spectator in a measurement of the wall-space covered, and, consequently, in a right estimate of the actual size of the figure. Then there is the question as to the style of the figures. It is gratifying to find even some of the most enthusiastic Gothic architects recognising fully its claim of St. Paul's to be treated entirely in Renaissance building, and not confused in style and character by the application of a more or less Gothic type of ornament, notched and chamfered out of its proper in any way. But we feel some alarm at Mr. Gambier Parry's claim as to the figure-decoration, that in the first place "the figures must be religious." What is meant by a "religious figure"? Is it that the effigies of the saints are to look, as Kingsley put it some time ago, "like starved rabbits with their necks wrung"? Or does Mr. Parry mean that there are to have gold dishes behind their heads which seems to be considered a kind of mark of a religious painting nowadays? The only possible excuse for such a style of figure-art as has frequently been recently practised in decorated old and new Gothic churches,—viz., that it represents the type of art prevalent when the Gothic style arose,—is cut away in the case of Renaissance building like St. Paul's. There can be, and there must be, in this case no excuse for anything but the best and highest class of figure drawing the modern school of painters can furnish us with. On this head it was a relief

* As we happen to live in England, and not Italy, we can see no reason for calling the said canopy a *baldaquin*, still less for the nondescript Anglo-Italian "*baldaquin*," which has also been used during this discussion. The very use of the term suggests that the thing signified does not belong to an Anglican communion-table.

en to the clear and artist-like remarks of Mr. Poynter, who at once assumed it as "impossible" that we should reproduce the old style of mosaic work, where the real *art* element is so low that the process became rather a manufacture by a skilled workman than the rying out of an artistic design. On this and it was that Mr. Poynter deprecated the employment of mosaic, as the artistic carrying out of a mosaic picture involved a double process, the first making an elaborate coloured cartoon, production of which occupied time and skill, and might as well be employed in painting a picture at once, that would not have to be tied again by workmen employing a fresh process. Such a question, of course, depends on the ultimate conviction which may be arrived at with regard to the durability of fresco in this climate, on which head Mr. Poynter held that he believed grave misconceptions to exist. Into this subject we cannot now go; but earnestly hope the key-note struck by the remarks of this artist will not be ignored in the partial decoration of our only Renaissance medal.

VISIT OF THE CONGRESS TO THE BRITISH MUSEUM.

Members of the Congress were met in the first Græco-Roman room by Mr. Chas. Newton, keeper of the Greek and Roman antiquities, and by Mr. R. P. Pullan, who had been selected by the committee to conduct the party through the Gallery of Antiquities. After Mr. Newton had called the attention of members to a remarkable representation of Hæcæan architecture in a bas-relief of Dionysius and his followers, in which a fawn is seen in the act of decorating the eaves of a house with garlands, and the arrangement of an interior, with a table, couch, and hanging, is shown, Mr. Newton described the finding of the Cnidian Lion, and stated that the tomb upon which it was originally placed gave him a clue to the restoration of the Mausoleum, as it had a pyramid surmounted by a *tholos*. The similar construction of the Mausoleum was probably in imitation of that employed in the Lion Tomb, which was supposed to have been built about fifty years before the Mausoleum. The party then followed Mr. Newton to the Lycian Room, where some discussion ensued as to the date of the Harpy Monument. It was generally considered to be a somewhat rude rendering of good Hæcæan architecture by Lycian builders. The similarity of its main features to the Mausoleum was also the subject of remark. In the Mausoleum and Priene Room Mr. Pullan explained the construction of the Mausoleum, referring to the stones in the room, and showing how they had fitted into one another. He also directed attention of the meeting to the results of recent discoveries at the Temple of Minerva, at Priene, with reference to the similarity of style existing between these two monuments erected within fifty years of one another, and probably designed by the same architect. Mr. Newton then kindly explained the theory of the restoration. He said that the quadriga which occupants represented the Apotheosis of Solon; that, according to the analogy of Greek art, the female figure in the chariot by the side of the king was not Artemisia, but a female divinity. A similar treatment was to be given to coins and gems representing a like subject. The pyramid was used as a pedestal. He wished the meeting to remark the difference of style between the Phidian style, and the style of the time of Soops, observable by a comparison of the frieze of the Parthenon and of the Mausoleum. In the latter there was no action, and in battle-scenes more *antiquarian*, a characteristic of the later school. A visit to the Elgin and Hellenic rooms, Mr. Birch joined the party, and called their attention to the egg-and-tongue moulding of the Assyrian ivories, and also to an ornament on them in the form of a volute which seemed to show the Assyrian origin of the Ionic capital. Mr. Newton then conducted the members through the vase rooms, exhibited several vases of early date, on which a system of ornamentation resembling the division of the Doric frieze by triglyphs was seen. He also pointed out several others which were depicted tombs, houses, and animals. He described the colours used in polychromy of the Greeks. They were, for the most part, primitive; the blue was a silicate of copper, and the red vermilion. He then

pointed out some curious ancient compasses and rules found at various places, dowels from the columns of the Mausoleum, hinges, and various other articles of bronze furniture used in temples and other buildings. At the conclusion of the meeting Professor Hayter Lewis proposed a vote of thanks to Mr. Newton and Mr. Pullan for their explanation of the curious and most interesting contents of the Galleries of Antiquities.

THE CHELSEA EMBANKMENT.

The Board of Works have determined to build a new retaining-wall, a long distance in front of the existing one, extending from Chelsea Hospital to Battersea Bridge. The Engineer of last week gives plans and sections of the work and some particulars. The land thus gained from the river will be utilised in a manner very similar to that which has been followed in those lengths already reclaimed. A couple of ornamental plots, measuring about 500 ft. in length by 60 ft. in breadth, will be laid out in the neighbourhood of Cheyne-walk, and a continuous road-way will run the whole length of the Embankment. The new thoroughfare will not have those ample dimensions which distinguish its predecessor lower down the stream on the same side of the river. Its total breadth will be about 70 ft., which allows 40 ft. for the roadway proper, and 12 ft. and 18 ft. respectively for the two pathways, the wider of the two being placed riverward. The road is to be constructed in the manner now usually adopted in the metropolis; that is, with a good concrete foundation, 12 in. in depth, covered with 6 in. of broken granite for metalling.

A low-level main sewer will run parallel with the course of the wall, except for a short distance near the Battersea end, where it diverges somewhat inland. The section of the main sewer is of the barrel form, having three different diameters, varying from 6 ft. 9 in. to 5 ft. 9 in. They will be built of blue brick, set in cement, and will constitute a very expensive portion of the contract, inasmuch as parts of them are more than 30 ft. below the level of the ground. The sewers are embedded in concrete, and a glance at the drawings is sufficient to demonstrate what an important part this valuable material plays in the construction of the whole work. The cement will be tested in the manner already adopted on previous works of a similar nature by the Metropolitan Board of Works. This testing, which was once regarded by manufacturers as an exceedingly severe and almost unjustifiable condition, is now looked upon as a matter of course. The improvement that has taken place in the quality of cement since testing has been rigidly insisted upon, as one of the most important of benefits that have accrued to materials of a constructive character. In external appearance, the wall, viewed from the river, differs from those already erected alongside the Thames, inasmuch as the stones are rusticated on the face, instead of presenting a smooth-dressed surface.

EDINBURGH WATER SUPPLY.

A NUMBER of the largest cities and towns of Scotland are already, or are in a fair way of being soon, in a much better position as regards the supply of the prime necessities, water and gas, than the metropolis is now, or seems likely to be within a definite time. If London suffers from a scanty supply of indifferent water, and from gas that will do nothing but smell, except to ruin the eyes and exhaust the pockets, it is not because Bills are not brought forward abundantly to cure the evils. There is a crop of metropolitan Gas and Water Bills every successive session, as regularly as the sessions come round; but they begin and end in palaver, never in anything to the advantage of the consumers. It is to be feared that the current session will be followed by no better or more practical results than its predecessors, and that we are not yet in sight of constant and sufficient supply of good water, at high pressure and moderate price; and the so-many-candle foul air that makes darkness visible must be taken for some time to come at the high price paid for it, to the enrichment of those who are fortunate enough to hold gas stock.

The difference with the promoters of private Bills affecting Scotland is that, when they come to Parliament they mean business, and usually also, hard fighting, and plenty of it, if need require. The opponents are usually as thoroughly in earnest, and if they are beaten in one House

they carry the contest into the other, regardless of expense. Already several important Gas and Water Bills relating to Scotland, some of them stoutly opposed, have made all the progress possible at this period of the session, in having passed the committees and third readings in one House. Among the gas Bills are the Aberdeen, Perth, and Forfar Bills. Among the Scottish water-supply Bills that have passed the Commons, is an excellent measure for a full high-pressure constant supply of the towns of Musselburgh and Dalkeith; and this week the hearing of a much more important measure, to which we have before referred, has been concluded, viz., that of the Edinburgh and District Water Bill.

The length and protracted character of the contest in this case, is likely to entitle it to rank as a *cause célèbre* of the session, especially if the opposition is renewed, as is now threatened, in the House of Lords. The committee entered upon the hearing, with Lord Bury as chairman, on Monday, April 24th, and continued the hearing, day by day, until Monday last, when the first day of a fourth week was occupied with it, but happily only in settling the clauses, the preamble having been declared proved at the previous sitting.

The evidence during that time was, as may be supposed, very voluminous, and much of it, given by scientific and professional men, was so closely connected one part with another throughout, as to defy the process of epitomising. There were, notwithstanding, some statements of fact made, that are worthy of record, even although they may appear abrupt and fragmentary.

It may be proper first to refer to the origin and objects of the Bill, and to the nature of the opposition. The promoters are the trustees or association charged with the water supply of Edinburgh, who recently bought up the old water company. The principal opponents are a portion of the ratepayers of Edinburgh, who raised a large subscription, but not large enough, they have found ere now, to oppose the Bill. The present water supply of Edinburgh is drawn from reservoirs on the Pentlands Hills, which have for many years proved totally inadequate to furnish the quantity essential for cleanliness, comfort, and health, not to speak of the needs for manufacturing and business purposes. During a portion of last year, the supply was reduced 14 gallons per head of the population, and there were times, with the "water turned on," when not a drop was found flowing into the cisterns, and, in some instances, indeed, there was no water found in the mains! The trustees were, of course, careful to avail themselves of the best available assistance to guide them as to the scheme they ought to adopt, to secure a supply of water sufficient in quantity, good in quality, and moderate in cost; for right of gathering, and of conveyance to the area of consumption. They had numerous surveys made by local engineers, and reports thereon, and also called in Mr. J. F. Bateman, of London, as consulting engineer, who made a thorough survey, and presented an exhaustive report, which fully endorsed the report of their own engineer, Mr. J. W. Stewart, to the effect that the best possible additional supply of water for the city of Edinburgh, the town and port of Leith, the town of Portobello, and districts and places adjacent, would be from St. Mary's Loch and the Loch of the Lowes, in the counties of Selkirk and Peebles. The reports of the engineers had regard to the essential items of quantity, quality, and cost. As soon as the intention to apply for an Act to carry the scheme into effect became known, an "ignorant impatience of taxation" aroused a section of the ratepayers, and an organisation was formed to oppose the Bill. A subscription list was opened for a resistance fund, when the time came; a monster petition against the Bill was "got up;" and the boardings of Edinburgh and the district were covered with magnified and exaggerated portraits of the "water-flea" that, it was alleged, almost thickened the water of St. Mary's Loch. The Bill passed standing orders, was read a first and second time, and committed, and then came the tug of war. The number of houses to be supplied under the Bill would be about 240,000 in all. Glasgow had commenced with a rate of 1s. 3d., which was now reduced to 8d. They proposed to commence with a 1s. rate, and it was believed they would be able in a few years to reduce it to 8d. also. Among other witnesses examined, was Mr. William Chambers, the well-known publisher, late Lord Provost, who, when in office, was mainly instrumental in effecting some of the

most important sanitary and street improvements, such as sewers, that have been made in Edinburgh during the present century. He denounced the sanitary condition of some parts of Edinburgh, as being "as bad as Constantinople," and urged the absolute necessity of an abundant supply of pure water as part of the remedy.

The rentals for 1870-71 of the towns to be supplied were put in:—

Edinburgh	£1,211,036
Leith	234,062
Portobello	32,615
	1,477,713
Glasgow, 1856	1,365,168
" 1870-71	2,126,324

The following shows the rapid increase in the rental value of property in Edinburgh during the last fifteen years:—

Rental	1855-56	£761,983
"	1860-61	812,024
"	1865-66	1,003,793
"	1870-71	1,214,040

The rental of the three towns is greater, it will be seen, than was that of Glasgow when the Loch Katrine Water Scheme was adopted. The increased rental value in Edinburgh alone now, as compared with last year, is as much as £5,300. The estimate for the scheme is £50,000. The contention of the ratepayers' opponents was that the supply from the Pentland Hills is not exhausted, and that a sufficient addition may be obtained from that source. Dr. Letheby, Professor of Chemistry, and medical officer of health for the City of London, was also called by the opposition, and gave a large amount of evidence. He objected to the St. Mary's Loch water as having too little saline and too much organic matter, and as being much too soft. In cross-examination, Mr. Clerk submitted to Dr. Letheby extracts from evidence he had given in the East London, the Brecon, and other water-bill inquiries, in one instance last summer, which were certainly not in harmony with the evidence given on the present occasion. The effect was unpleasant. Counsel probably think that they only may legitimately sing the praises of soft water to-day, and of hard water to-morrow, as it may be written in their brief, and that everybody else should have stereotyped principles and opinions, incapable of change. Still consistency has its value.

THE SELECTION AND USE OF STONE FOR ENGINEERING AND ARCHITECTURAL PURPOSES.*

THE use of stone dates back to the earliest of times; at first for sling-stones, arrow and spear heads, and in the catapult. It is not as a weapon of offence, however, that I propose to treat on it, but principally as a weapon of defence against the two elements, air and water, in the construction of breakwaters, docks, and public and private buildings. For these purposes it was the first material used; and although various artificial materials, such as brick, terra cotta, cement, concrete, &c., have been invented, and used with varying success, still it holds its own against them all; neither can we be surprised when we consider its great natural advantages. In the first place, it is ready to hand; no making, baking, burning, or mixing to be done, but widely spread in large and small quantities of all qualities all over the world. In the construction of breakwaters, piers, and arches of bridges, river walls, and littles over wide spaces, or for heavy cornices,—indeed, wherever strength and weight are required, or heavy blows or weights have to be resisted,—it is unequalled; it can be had of any size or shape, and of any quality, from the great blocks of rough, hard granite, tons in weight, used in sea defences, down to the fine even grain of the oolites, some of which are capable of being carved almost as elaborately as wood.

Some have argued that stone is not so durable as brick or terra cotta, or indeed cement. I have no desire to dispute the powers of lasting of these materials when good. But surely our own old cathedrals and castles, to say nothing of the Pyramids of Egypt, supposed to have been built 1600 years B.C., are sufficient proof to show that where reasonable care is exercised in its selection, it is good for "all time." In all materials there are various qualities, and it is no argument to take the best example of, say,

cement work, and compare it against the worst of stone, and then contend that cement dressings are as good as stone. Where clay is plentiful, brickwork is generally cheaper than stonework; but if much labour is required, as in axed arches or moulded and rubbed brickwork, stone can be used generally quite as cheaply. If we take terra-cotta, there is no economy in its use, unless you make a great number of articles of the same pattern; even then the burning twists and warps it, so that if of any size, it is very difficult to get the work true. Whereas, stone can generally be had hard or soft, of various colours, and of any size.

Some short time ago a gentleman writing on stone endeavoured to prove that stone used out of the district where it was quarried did not stand so well as in the neighbourhood, because the foreign climate did not agree with it. Nothing can be more absurd or illogical. Why should a piece of granite from Guernsey decay faster if used at Aberdeen instead of at St. Peter's Port? How such an idea could ever have been seriously promulgated all reasoning persons must be at a loss to understand.

Stone having so many advantages and being so much used it is surprising that it has not been made a branch of study in the education of the engineer and architect. The remarks of the late Sir H. De la Beche on this point, although written upwards of thirty years ago, are still applicable to the present time; he says, "There was much excuse for the accidental durability of the stones employed in public or large private edifices in former days, when the mineralogical structure of building materials was so little understood, and the architects of those times could not always have churches or castles before them, from which they might judge of the relative durability of any stone they were about to employ, the queries opened by them being also then first worked to any considerable extent. The architects and engineers of the present day cannot, however, avail themselves of these excuses, for the necessary chemical and mineralogical knowledge is readily acquired, and the number of public and private edifices of various dates scattered over the country is so great that the relative durability of the materials employed in their construction can easily be seen. It is nevertheless well known that, with some few exceptions, the mineralogical character of the stone employed in public works and buildings has hitherto received little attention from either architects or civil engineers in this country, more especially from the former, whose value of a material seems commonly to have been guided by the opinion of the mason. Now the mason seems almost always guided in his opinion by the freedom with which a stone works,—no doubt an important element in the cost of a building, but certainly one which should not be permitted to weigh heavier in the scale than durability, and hence many a fine public or large private building is doomed to decay, even in some cases within a few years.

It is a common practice for young men who are intended to be brought up to be civil engineers to serve for some time in the works of a mechanical engineer, with a view to learn the uses and properties of metals. So with those intended for the architectural profession; they are taught first to be carpenters or joiners, to learn the uses and properties of timber. Why should not a young man who is desirous of entering either profession also learn some knowledge of quarrying and masonry by practical experience in the quarry and at the banker? Surely stone is as important a material as either iron or wood in the construction of engineering and architectural works. Perhaps no more practical engineer ever lived than Thomas Telford, and he began life as a stonemason in Scotland.

The importance of a proper knowledge of the selection and use of stone to engineers and architects can hardly be overrated. Indeed, some idea of its commercial importance may be gained by a knowledge of the fact that the value of the stone raised every year in the United Kingdom is said to be nearly, if not quite, 5,000,000. I shall, therefore, without further comment, commence the first part of my paper, namely,—

The Selection of Stone.

Geologists tell us that one great division of rocks are classed according to the fossils that are found in them, and by the term fossil must be understood to mean any body, whether animal or vegetable, buried in the earth by natural causes. Rocks known by this term are

termed generally aqueous sedimentary or fossiliferous, supposed to have been formed by the action of water on the earth's surface; they are stratified or divided into layers. From these rocks are raised most of the principal building-stones, certainly those easiest to work. Other rocks are classed as volcanic; these are for the most part unstratified, and devoid of fossils; they are supposed to have been forced up through the various overlying strata, and flow into and over the same by the action of fire. They are known generally by their conical and globular structure. These produce only building-stone, but stones which are used for ornamental purposes more than any other kind of rock. Further, we have Plutonic rocks, highly crystalline, and destitute of organic remains; they are supposed to be of igneous origin, but to have been formed under great pressure. They have been melted, but cooled and crystallised very slowly. They differ from the volcanic by their more crystalline texture, and by the absence of pores and cellular cavities. From these rocks we have some of the finest, hardest, and most durable of building stones. Lastly, we come to the metamorphic stratified crystalline rocks. The origin of these is more doubtful than any of the other three classes; they contain no pebbles, sand, angular pieces of stone, or traces of organic bodies, often as crystalline as granite, and divided into beds. They are supposed to have been deposited from water, but afterwards altered by subterranean heat so as to assume a new texture. Building-stone is not raised largely from these rocks as from the others; many of the white marbles are, however, metamorphic. Nearly all the various systems embraced under the name of aqueous rocks produce sandstones and limestones of various kinds. It is important to remember this, as very frequently a stone is called oolitic or carboniferous in the system to which it belongs, when perhaps the eye it might not exhibit the more particular characteristics of the formation. In a paper read by our president, in March, 1862, he treated of all the various building-stones in each geological formation: I purpose, therefore, making my remarks more on the practice than the theory of the selection and use of stone.

In selecting a quarry from which to get stone best suited to the purpose for which it is wanted, great care is required. Having satisfied yourself that the stone of the quarry required can be obtained, and at a reasonable price, the next and most important step of all is to find out if it is a durable stone. Too many quarriesmen, that the particular bed, which is the cheapest for them to get, is the best; by that word I mean, the most durable,—not, as is often understood amongst quarriesmen, a masonry the prettiest-looking stone and the easiest to work. Again, it does not follow that because certain old buildings, small or great, in the neighbourhood have lasted so long, therefore all the quarries in the neighbourhood produce the same stone. In some cases the beds have been worked out, because the stone only crop out at one place; and for the same reason a quarry on one side of a hill very often produces much better stone than that on the other. Specimens of stone, dressed up square, sent by the quarryman or agent, known as being specimens, are very dangerous things to go on an opinion on, because what looks very small pieces is really often of an inferior quality, and a stone that would appear coarse and rough in a specimen would not do so when in the mass. Stones that rub up to a smooth face are often not so durable as those of a rougher texture. To give an example, "best bed" Portland is much superior in colour and texture to "blue bed" Portland, but far inferior to it in durability. Examine all the different beds in a quarry, not the particular grain, texture, and colour of each bed; compare them with the buildings around, and if there be any old quarries near with face exposed, see which of the beds stand out most, and show the old tool-marks, and so on. Frequently happens that the best stone in quarries is neglected, or only in part worked from the coast of bearing and removing the beds with which it may be associated, and, in consequence, the inferior materials in such cases quarried, especially when large supply is required in a short space of time and at an insufficient price, which often the case with respect to works undertaken by contract. As an economical supply of stone

* By Mr. Arthur C. Pein, C.E., read at a meeting of the Civil and Mechanical Engineers' Society.

particular localities would sometimes appear depend on accidental circumstances, such as cost of quarrying, the degree of facility in export, and the prejudice that generally exists in favour of a material which has been long in use, and as the means of transport have of late years been greatly increased, it becomes essential to ascertain whether better materials than those which have been employed in any given case may not be obtained from other, although more distant, localities upon equally advantageous terms. The relative facility with which materials may be obtained in a district is to a certain extent, marked by the appearance of towns and villages in it, the comparative facility of obtaining them being in general better shown by the character of the ordinary houses, than by that of the public buildings and large mansions, the stone for which may sometimes have been brought from comparatively considerable distance. From the frequent practice, however, of selecting those stones which yield readily to the tool, and are hence commonly used freestones, whatever may be their mineralogical characters, the most durable, and, therefore, eventually the cheapest, are far from being always employed. And it sometimes happens that we find the common cottages built of durable materials, while larger mansions and public buildings are not, the materials for the latter having been selected because they were more readily worked up for ornamental parts, while those for the former may have been thrown aside in the same quarries because they yielded more freely to the tool.

In passing through the chief towns of Great Britain, it will be easily seen that if more attention were paid to the mineralogical character of the stone employed in the construction of the buildings, that frequent decay or decomposition, even in those erected within a few years, which so often observe, would be avoided at comparatively small cost, and we should find fewer public edifices losing all traces of the finer qualities of the original structure. In estimating the durability of any given stone which may be used to resist decomposition from atmospheric influences in the country, no doubt due allowance should be made for the power of lichens to protect the external surface. These are not usually found in large towns, particularly those in which there is much coal smoke. We should not expect sandstones formed of quartz grains loosely cemented by calcareous or argillaceous matter to so long when exposed to the weather, as one in which quartz grains were firmly bound together by a compact argillaceous or silicious substance. According to the texture and variable composition of the different calcareous and argillaceous rocks, a judgment may be formed of their relative durability, and granites in which the composition has already commenced in the quarry cannot be expected to remain firm under atmospheric influences. The unequal state of preservation of many buildings often produced the varied quality of the stone employed in them, although it may have been taken from the same quarry, shows the propriety of a minute examination of the quarries themselves in order to acquire a proper knowledge of the particular stone from whence the different varieties have been obtained; an inspection of quarries is also desirable, for the purpose of ascertaining their power of supply, the probable extent of any given bed, and many other matters of practical importance. An excellent and ready test when the quarry is to chip a number of small pieces of each bed or block, and carefully examine them under a small but powerful magnifying glass. If the fracture is clean and sharp, and the grains are well cemented together, then it may be considered a durable stone; but, on the other hand, if the fracture has a powdery appearance, and the grains are ill cemented, then the stone is very likely to decay. Another test of a durable stone, not alone applicable to limestones, is to soak a number of small pieces in diluted acetic acid for some days: its resistance to disintegration under this test shows its suitability for building purposes, in a large town as well as where exposed to the salt rains of the sea in situations near the sea.

In the construction of lines of railway and other large public works, stone is frequently used, and which is obtained from the cuttings or excavations. Now the contractor, generally to save cost, blasts out the stone, which is a most fatal mistake if durability is required; for although it may not be at first apparent, the blasting shakes the stone, and before many years are over the stone begins to crumble to

pieces. Of course, in the case of granite and other very hard stones, this remark does not apply; for, having little or no stratification, it cannot be quarried without blasting.

If it is desired to put nothing but good stone into a structure, the material should be quarried and weathered for some time before being used, as this serves not only as a check against the use of inferior stone, but prevents the unsightly greening after erection, which, for a time, so often disfigures a building, even if built of the most durable stone. At the Bath quarries some of the stone raised in the winter time is stacked in the workings, and dried by coke fires in brasiers. Some stone is wrought and put into a building green, with the quarry water in: it will go to pieces under the first frost, whilst the same stone, if seasoned under cover, will often stand well. In choosing a particular bed of stone in a quarry, it must be remembered that the lowest beds are not always the best. For instance, in the Portland series the hardest and most durable bed is on the top. It is often desirable for stone to be tested by having a chemical analysis made, also by hydraulic pressure for the crushing strength, as well as in a testing machine, to obtain its tensile strength. In all these cases the specimens should be taken from various parts of the quarry, and from each bed, and certainly not less than six specimens should be selected from each to arrive at reliable results. We now come to the second division of my paper.*

THE TRUCK COMMISSION REPORT.

THE Report of the Truck Commission is now being issued, and it bears out the evidence adduced a short time ago in the *Builder*. The Report as a whole is not so exhaustive of its subject as it might have been made, but in its entirety it presents us with many dire phases of the evil and its working in places where it has been least suspected.

The Commissioners acknowledge at the outset what we have already ascertained, the wide-spread existence of the system, declaring that it prevails more universally than what the public can dare to imagine; and they do not hesitate to say that they fear no legislative enactments would succeed in entirely stamping it out. So much has it interwoven itself in the customs, habits, and social life of certain districts, that it has almost, in their opinion, become an institution not to be easily eradicated, although it may be modified.

The Commissioners do not boldly recommend any remedy, but suggest that employers or masters should be encouraged to pay their men weekly wages, and they think at least 10 per cent. of those now paid by the system of truck could be paid in money. Indeed, we have no hesitation in saying that not only 10 per cent. of the amount paid by truck, but 30 per cent. could be as easily paid in money, and after a certain time the evil could be so far got under as to be rendered powerless as an example or an institution.

There were some witnesses before the Commission who urged drunkenness as a reason for not paying weekly wages, and that men would drink more the oftener they were paid. With this fallacious argument, we are glad to observe, the Commissioners do not agree. What bar, let us ask, would more fortnightly payments offer to men getting drunk, when inclined to the practice? Workmen who are known to be constantly employed will always be trusted by the beer or dram shops in their neighbourhood, and the payday is very closely watched by the agents of those who give credit, particularly in drink.

In districts where the truck system is general there is a system of "off-takes." This is a deduction made by the masters to pay for the use of tools and for education. In speaking of "off-takes," the Commissioners suggest its abolition in some cases where pickaxes and other implements and tools are used by workmen; but they agree that the deduction or "off-take" should still continue in the matter of schooling. In respect of doing away with the "off-take" for schools, the Commissioners concluded that such a step would seriously interfere or derange the educational arrangements of the country. Combined with the general report there are a number of special reports relating to several particular trades of the weaving branches, and to watch-making and its kindred branches.

In the general report, a series of amendments

* In our next.

are brought forward by the Commissioners which they think ought to be made to the present Truck Acts.

In the matter of Scotland, the Duke of Buccleuch's lead-mine at Lochead, and the system prevailing in the Shetland Islands, is touched lightly upon. The Commissioners think that the abuse of the Truck Acts in Scotland is owing to the difficulty of applying the Acts to the Scottish legal procedure; and they suggest that all trials in that country for infractions of the Acts should be taken out of the hands of the justices and transferred to the sheriffs. Further, that after three offences have been committed the fourth should be sent for trial to the High Court of Justiciary. This is very liberal, indeed, with respect to our friends across the Border: four offences must be committed before the evil-door is brought to justice. In relation to Shetland, the Commissioners quite agree that a case has been made out for inquiry. If so, why have we not been furnished with a special report of the island where men and women are married by the truck system, where their first-born are nursed in a truck cradle, physicked by truck, buried in a truck coffin, the sexton being also paid by truck for digging the child's grave and tolling the dead-bell.

Having already in these pages entered pretty fully into the evils of the truck system, we do not feel it necessary at present to dilate upon the subject. The evil is acknowledged. The system is pernicious, and in its working it is often most cruel and heartless. Workmen under the truck system, in some country districts, are mere white slaves; they have no spur to exertion; and by long continuance under the yoke they become both morally, mentally, and socially degraded. Forms of truck may still continue to exist for centuries; but truck, pure, open, and unadulterated, could be done away with at once, with the energetic interference of the Legislature. Men and women on low wages, half paid by truck, or wholly paid, as it is in some cases, cannot advance a step above grinding poverty. Want and misery stare them in the face, whichever way they turn; and, as work they must to support life, their work is always performed with reluctance. Weekly wages are the only remedy, and the happiness of the working man can only be secured by an agreement with the Scriptural maxim which says, "The labourer is worthy of his hire."

In conclusion, we may add, that the Report is well worthy of the careful attention of every philanthropist and social reformer; and our only regret is that the Commission's work is not of a more exhaustive character. The cancer might have been bared in many places in the kingdom that we wot of, so that the influential and the influential might have meted out to them even-handed justice, and the sufferers and their friends might see at once whether it would be better for all to submit or all to rebel together.

DUBLIN HARBOUR IMPROVEMENTS.

SOME remarkable works are in progress here; under Mr. Doherty, a Belfast contractor. The project may be briefly stated as a design to build a wall of solid masonry, bolted and cemented together, with granite and cut stone on dry land; secondly, to clear the foundations, not by excluding the water, but under the water; and, finally, to transport the wall, ready-made, to its berth, and then swing it home to its resting-place. The excavations for the purpose are daily advancing, numbers of labourers and navvies working in a diving-bell, and clearing the bed of the river. The wall is being built piecemeal, about a quarter of a mile distant, in columns 22 ft. high, 18 ft. long, and 16 ft. broad, and weighing about 400 tons each. These are to be laid side by side together, so as to form the front wall of the proposed new docks. The ends, which lie in direction, are made perfectly vertical and smooth; and the outer face makes an angle of about 95° with the horizon. A granite bitt, containing some 30 cubic feet, will lock each section of the wall to its neighbour. The manner of transfer of the columns is devised by the same engineer, who has had an immense barge constructed for the purpose, by Messrs. Harland & Wolff, Belfast. By complicated machinery it is expected to raise the pillars from where they stand, transfer them to the barge while thus grasped up in mid-air, and suspend them over its stern, above the water. The vessel will be slowly towed until the columns are brought to position and lowered down. Within the past few days the machine has, we believe,

been several times tested with regard to the general strength of its parts, and the endurance of the strain which is to be put upon it; and the result has been reported all that could be desired. The process of laying will soon be attempted.

THE ORNAMENTATION OF THE TRANSITIONAL PERIOD.*

THE Transition style is, as our readers know, a term applied to that class of buildings which exhibit the decline of the semi-circular and the rise of the pointed arch system (it is so defined in Britton's "Dictionary," A.D. 1838), and Mr. Sharpe has long sought to emphasize this division of architectural history, with its own manner and characteristic ornament, some of which was destined to die out entirely under the advance of the true Gothic, while other features of it became the germs of some of the most characteristic and typical forms of Gothic design and ornament throughout the subsequent progress of the style. So much inherent vitality, indeed, does our author attach to the architecture of this period that he is of opinion it is quite a chance that the Gothic style did not assume a totally different aspect on the basis of this phase of it, and, discarding the temporarily introduced pointed arch, develop into a round-arched style of essentially different character; an opinion similar to that expressed by Mr. Fergusson with reference to the possibilities of the early round-arched German style.

The work before us, which is to be completed in three parts, and of which the first part, containing forty-two plates and a portion of the letter-press, is now published, constitutes Mr. Sharpe's vindication, unavoidably delayed for some time, of his claims for the "Transitional" Gothic as a distinct period in itself; presenting at the same time means for its further study in a large number of lithographed plates of details, chronologically arranged in the main, or at least so far according to the general sequence of the style as to furnish a means of readily tracing the successive changes and developments of the ornamentation of the principal architectural features; the present number being chiefly given to the illustration of capitals and pier-arch mouldings, which, the former especially, exhibit the most marked characteristics of the period. In a short preface the author, after defining the limits of the Transitional period as the forty-five years included between the dates 1145—1190, returns again to a subject before noticed by him in other works,—the introduction of the pointed arch; contending that a study of the period of architecture now under review establishes almost beyond the possibility of doubt the fact that the first introduction of the pointed arch arose entirely from constructive and not from artistic considerations, as indicated by the fact that in at least four-fifths of the churches of this period, where pointed and round arches are mixed, the former are only employed in the large arches of construction, to escape the flatness at the crown, which forms the weak point of the round arch when used on a large scale; while all the smaller arches and arches of decoration in the same building are circular: so that a building which, on exterior view, appears to belong to a round-arched style, will be found internally to possess an arcade of pointed pier arches. Commenting on the almost simultaneous universality of this style, in its main features, over nearly the whole of Europe during the latter half of the twelfth century, Mr. Sharpe points out how much more originality was displayed by the English architects in their attempt to work out a style on a basis of classic or Romanesque form than by those of France and Italy:—

"Thus at the same moment that the builders of Northern Europe were shaping for themselves, out of the heavier forms and ruder decoration of the earlier periods, styles of architecture that were to astonish and confound all Christendom with new and beautiful results, those of Italy were occupied in copying the Corinthian and Composite capitals of Imperial Rome, and in reproducing with greater or less fidelity the foliage and decorative features of the Classical period; and although we have in that country numerous grand and important examples built during this period in characteristic Medieval forms, there is not one in which, in the treatment of its ornamental detail and carved work, this tendency to Classical imitation is not plainly stamped.

Nor was this rage for Classical imitation confined to Italy alone. In the South of France, where such numerous remains of Roman art, in a state of tolerable pre-

servation, must have still existed, this practice prevailed also during the Transitional period. It seldom happens, however, in France, that this copied work is found unaccompanied by distinctive marks of the period to which it belongs. The Pointed arch itself is, indeed, there often found decorated with the egg-moulding and other Classical features, a circumstance which has led one historian of church architecture—who, however, probably never visited the buildings which he describes—to commit the ludicrous error of supposing that the use of this form of arch in the South of France was anterior to that of the circular arch; and has caused him to attribute a high antiquity to buildings which were in reality constructed at the close of the twelfth century."

We are, then, to regard the British Transitional style as pre-eminently an *experimental* architecture, exhibiting the gradual and almost natural development of the square Norman capital and round or octagonal pier, through the various stages by which these features reached the form of the carved lancet capital and the compound pier, as well as the tentative experiments in ornament which were made apparently with the view of trying their effect, and dropped out of use again without being further worked out. In the piers of the transept and nave of Peterborough (plates ii. and iii.) we see the first indications, during the Norman period, of that tendency to grouping and subordination of the mouldings and members of the pier indicated first in the bracketing out of the capital on each face for the roof-shafts, which it was afterwards the work of the Transitional builders to develop into the complete and artistically planned and subordinated Gothic compound pier. In the subdivision in the nave capitals of Peterborough, of the large "cushions" of the earlier Norman capital into small parts, we find the germ of that singular and unique feature, the scallop ornament, afterwards played with by the Transitional architects in every imaginable way, until it was finally evident that nothing more could be got out of it, and it was discarded for the foliated capital. In Mr. Sharpe's examples we trace the peculiar form of capital from its first complete appearance in one of the heavy circular capitals of Malmesbury Abbey Church (the earliest building probably in Great Britain in which the Pointed arch appeared, and there only in constructive arches), through the more elaborate forms to be found at Kirkstall, Buildwas, Sutton St. Mary (Lincolnshire), and Northorpe Church in the same county; in which latter the ornament has assumed most peculiar and unusual forms (plates ix., x. and xi.); and it is interesting to see the same kind of process going on in styles so far apart in character and chronology as Early Greek and Early Gothic; for the change from the earlier form of the scalloped capital to that which it assumes in the upper capital on plate x., is of the same nature as that which transformed the Doric capital of the Parthenon into those flattened-out, distorted specimens found among the remains of temples at Pæstum. On plate xi. we meet an early and most peculiar attempt at a foliated capital, discarded again for more ornate treatment of the scalloped capital, with the assistance of beading and other devices. At Steyning Church (plates xvii. and xviii.), the capital assumes a concave instead of a convex curve, and the original scallop ornament is nearly lost under a treatment so diverse from its earlier forms as almost (in the second example), to appear like a very stiff and formal leaf capital. We meet the scallop ornament again, however, but in its concave form, in the curious capitals of St. David's (characteristic of the Welsh district), where we see this form of the ornament associated in the same pier with very tolerably advanced foliated capitals, just as we may see them in the arcades of the interior west wall of Peterborough, where various types of capital have been placed in a row as palpably for comparison and trial of effect as anything can be. And in another example from St. David's we actually "see the grass growing," as it were; we see the very genesis of the early stiff-stemmed Gothic foliage in piers in which some of the caps are left with simply the concave scallop ornament; while in another part the very same feature, following the same curves, begins to sprout into a primitive bad-leaf foliage, leaving us almost with the impression that the others will follow suit at a favorable season. Here, too, we see some of the later elaboration of the Norman zigzag ornament, crossing and interlacing, and laying the foundation of the "dog-tooth" decoration of the Lancet period. Subsequently we can follow also the gradual development of the foliated capital, from the strange wide cabbage-like leaves at Kirtou Church to the more delicate work at St. Mary's, Shoreham,—still, however, sufficiently distin-

guished from the foliage of the Lancet period by the up-and-down straightness and stiffness of the stems, the work of carvers whose hand has learned breadth and largeness of manner, but not freedom and grace. Some of the capitals from this church and Abbey Dore (the latter especially) might furnish starting-points for completely new decorative treatment of the capital, containing as they do forms most suggestive in themselves, though in a rough and crude state, and which have never yet been worked out to their possible refinement and elaboration. Plate 39 shows us at Selby Abbey Church the most remarkable variety of combinations in the treatment of the zigzag ornament in the different orders of the west doorway-arch, and in the remarkable example of a window from St. David's (plate 41) we actually meet with a complete specimen of the square Greset, carried round the joint and arched over as a band of ornament to a circular-headed window with a sub-arcade of pointed arches,—we presume, from their appearance, a later addition.

The gradual transmutation of the Romanesque circular pier into the compound pier with subordinate shafts, and the logical relation established between these and the various orders of the arch-mould, may also be readily followed, in its main features, through the series of illustrations here offered. Some remarks of the author relative to the position of the circular column pier, in regard to Gothic design, are very appropriate at a period when the columnar form of pier has been so largely adopted as the regulation form in modern Gothic churches. Speaking of the compound pier, Mr. Sharpe says,—

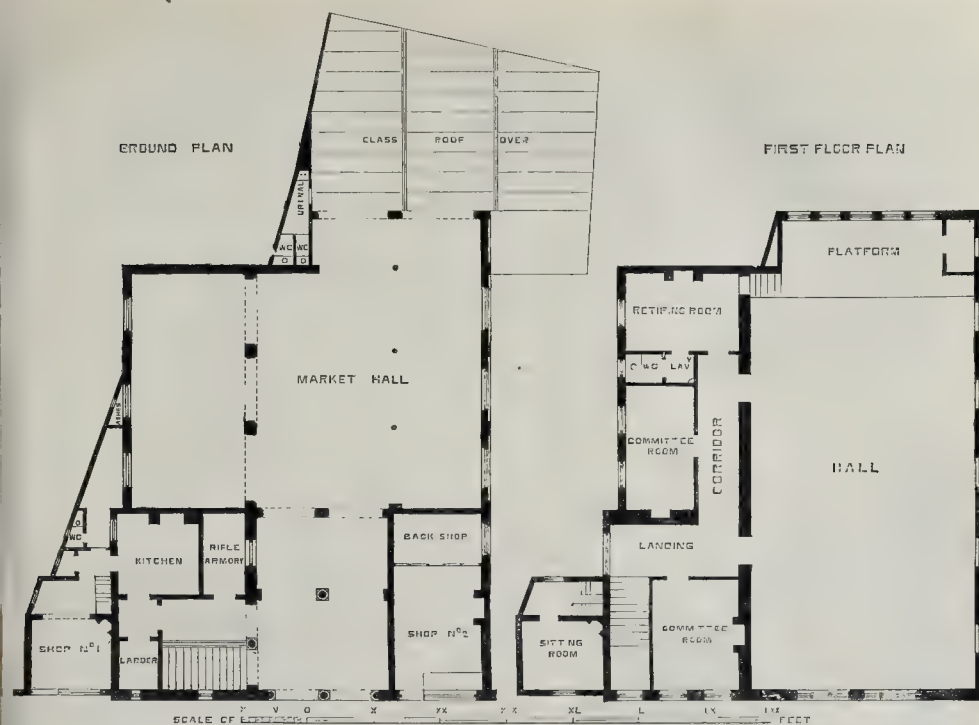
"The constructive principle introduced by the arch here visibly and agreeably communicated through the capital to the pier, and carried to the ground; the compound of the thrust of the arch by the division there of the weight of the superincumbent wall is readily traced, on both sides, along each order of the arch, through its corresponding capital, and down the shaft to the floor. In the column pier this visible continuation of the constructive principle is wanting; a further trace of the descending thrust, intercepted and absorbed by the broken lines of the undivided capital is lost sight of at the top of the column.

The truth remains; the circular column, graceful as its application on a smaller scale to the details of buildings, and as such, in its use, as a pier, to carry a main wall, foreign to the spirit of Gothic architecture. The all-pervading principle of subordination, characteristic of the works of these periods, and so plainly exhibited in the Medieval arch, is totally wanting in the circular column. Used originally as the vertical pier of the horizontal beam, it may be doubted whether having attained, as such, its highest development in the excellence of Grecian art, and having passed through its subsequent debasement in the earlier building of the Romanesque period, its ultimate employment as a main pier in the works of Gothic architecture can be regarded otherwise than as a graceful barbarism."

What will the designers of some of our modern churches say to this? The cylindrical polished granite pier has become almost the mark of the "Victorian" Gothic; but, on the other hand, must be admitted, that most of those who employ it tacitly admit the truth of the above strictures by using arches mostly without recesses, planes or orders of moulding, but in one flat soffit. The style, especially when carried out in brick and marble, or granite, is more piquant but certainly less harmonious and satisfying to the eye than the true Gothic form of compound pier and recessed arch.

In giving due praise to the admirable nature of the illustrative lithographs in this work, delicate and precise, and yet picturesque in touch, we are only mentioning what every one acquainted with previous works brought out under the same hand would expect, as a matter of course. We may add, that the valuable series of examples of this style, which will be comprised in this and the two succeeding numbers of the work, may be regarded as more than material for mere archaeological study of historical facts connected with the genesis of our national style. We have hinted at the experimental and suggestive character of the ornamental detail of this period, where, in many cases, an idea is found as it were, in the rough, and only wanting consideration and a little more refinement than its originators could boast of to elaborate it into modern architectural ornament of entirely novel form. In this way the Transitional period of English architecture may really be regarded as a mine from which to dig wealth, in the shape of hints and suggestions for the modern designer, the more profitable as there is much less effort for direct "cribbing" than for thoughtful adaptation. In addition to this, the style is also valuable as a study, from the massive solidity and genuine architectonic character of masonry treatment to be found therein, and the manner in which (as before pointed out) in these columns the detailed ornament is precisely adapted to

*"The Ornamentation of the Transitional Period of British Architecture, A.D. 1145—A.D. 1190," by Edmund Sharpe, M.A., F.R.I.B.A. No. 1, London, E. & F. N. Spon. Birmingham: S. Birbeck.



PROPOSED MARKET-HALL, HOWDEN.

Plat.

the granular material in which it is to be worked; the mode of treatment appearing to result naturally from consideration of the nature of the material, and making no attempt to imitate or adopt a form or treatment only suited to a finer-grained or fibrous material. Having in view these broad characteristics of the work of the Transitional Period, we can very cordially thank Mr. Sharpe for having drawn more attention to, and offered new facilities for, the study of a style marked by such fine and truly architectural qualities and such absence of littleness and futility, independently of its archaeological interest; and concur with him in thinking that it is not to be doubted that the contemplation and study of the pure and graceful outlines, the vigorous handling of the general design, and the simple but effective grouping of the mouldings of pier and pier-arch, to be seen in such buildings as still remain to us at Byland, Roche, Abbey Dore, Furness, Tynemouth, Aberbrothock, Margam, and Jedburgh, can produce other than healthy results in the mind of the architectural student."

MARBLE SHOW-ROOMS, GROSVENOR-ROAD, PIMLICO.

WE illustrate in our present number a building of a somewhat novel character, consisting of offices and show-rooms, recently erected at Carrara-wharf, Grosvenor-road, Pimlico, for Mr. B. Fabbricotti, the marble merchant and owner of quarries at Carrara, in Italy, but now in the occupation of his agents and successors in this country, Messrs. Aylwin, Stampa, & Co.

The novelty consists in the free use of marble in the front, and which has been so applied as best to withstand the detrimental effects of the London atmosphere; this will account for the absence of anything approaching intricate

detail calculated to harbour smoke and dirt. The plinth under the ground-floor windows and the arch over the centre gateway are of grey Aberdeen, and the piers of the gateway of red Peterhead granite, all polished. The whole of the window and door dressings, string-courses, pilasters, and niche-heads are of Carrara marble (known in the trade as Sicilian), as high as the entablature, which, with the balustrade, is of Bath stone.

The general walling is a good specimen of gauged brickwork, in red bricks, and contrasts at present somewhat strongly with the white marble, which, however, is further relieved by inlays of Genoa green marble, in the panels of various portions of the work. The pilasters, which are about 10 ft. in height and 2 ft. on the face, are each in one stone, as are also the pediments over the two side-entrances, the receding mouldings of the cornice being sunk in the solid. Full-sized drawings of every part were prepared, and sent to Italy; and the whole of the work, including the carved caps of the pilasters and columns, was executed in Mr. Fabbricotti's studios at Carrara, all being packed and sent on to the works ready for fixing.

The frontage is about 52 ft., and the height from the footpath is 41 ft., with another building at the back, 40 ft. in length, and three stories high. On the ground floor are four offices for the transaction of business, and a large packing-room at the back. The left-hand doorway is the entrance to the show-rooms, which occupy the whole of the first floor of the main and back buildings, and are approached by a marble staircase, the hall being paved with tessellated tiles. The show-room floors are of pitch pine. The chimney-pieces are of special design; the hearths of tessellated tiles, surrounded with marble fenders. The right-hand doorway is the manager's private entrance to his apartments; and in the right-hand part of the basement is a

household arrangement for his use, the other part being arranged for stowage.

The centre gateway communicates with the wharf, which extends down to the river, where the marble is landed direct from craft lying alongside.

The cost of the building was about 4,200l. The commission was originally given to Mr. F. G. Widdows, architect, whose early death transferred it to Messrs. Woodzell & Colcott, who have brought the work to a satisfactory completion. The builders were Messrs. Newman & Mann.

HOWDEN MARKET HALL.

A COMPANY having been formed for the purpose of providing improved market accommodation and a public room for the use of the inhabitants, plans were procured in a limited competition, and the design we now illustrate was prepared by Messrs. Hadfield & Son, of Sheffield, and selected by the committee. On the ground-floor there is a covered area for market purposes, approached through a double arcade; a broad stone staircase leads from this entrance to the upper floor, which contains a hall, 74 ft. by 34 ft., with retiring-rooms, committee-rooms, &c.; and the building is terminated at each side by shops for sale purposes. The structure will be of brick, and the illustration shows the mode of treatment; the gable defines the hall; whilst the turret of brick, with timber spire and louvred openings, will contain space for the town clock and bells. The upper portion will be covered with tiles; the principal front is towards the market-place, and in the centre of the elevation is placed, in a niche, the effigy of old Roger de Howden, of whom it has been quaintly said, in allusion to him as historian of Howden, — "*Quod Bona fecit ille perfecit.*"



MARBLE SHOW-ROOMS, PIMLICO.—MESSRS. WOODZELL & COLLOUTT, ARCHITECTS.



HOWDEN MARKET-HALL.—MESSRS. HADFIELD & SON, ARCHITECTS.

THE WELLINGTON MONUMENT FOR ST. PAUL'S.

The public has heard from the Marquis of Lansdowne, in the House of Lords, the arrangement that has been made as to the completion of the Wellington Monument. What the Marquis said, in brief, was this, that, after consultation with Mr. Fergusson, they had come to the conclusion that it would be impossible to secure the services of any sculptor of eminence to complete the work which had been carried on so far by another sculptor. It was improbable that any man of great genius would be found to devote his time to finish a work designed and completed in part by another; and even if it were intrusted to some other sculptor, in all probability, considerable incongruity would be the result. Having been begun by Mr. Stevens, and finished by some other sculptor, it might not be so harmonious in design and execution as it was desirable it should be. The course, therefore, which the Government finally decided to adopt was that Mr. Stevens himself should be allowed to complete the work. Mr. Stevens's workmanship, he believed was of undisputed excellence. Whether his design was original or not, it was highly artistic. However, as Mr. Stevens had exhibited unpunctuality in carrying out his business engagements, a contract was now entered into with Mr. Collmann, who had been engaged in connexion with a great number of works of art; and while Mr. Stevens was intrusted with the artistic portion of the monument, Mr. Collmann was charged with the general superintendence of the work, and the pecuniary responsibility would centre on him. Thus a security would be obtained against the unpunctuality of Mr. Stevens. It was calculated that the monument would be completed in two years and a half, at an additional cost of 9,000l. Mr. Stevens would be paid by Mr. Collmann, on the joint certificate of two officers of the Board of Works. He thought that this arrangement was better calculated than any other to secure the speedy completion of the monument; and the additional expense, though large, was not greater than what was warranted by the nature and character of the work.

We must congratulate the Government on this arrangement. The artistic knowledge and known probity of Mr. Leonard Collmann guarantee a successful result. Mr. Collmann very properly makes it an entirely business arrangement, but his long friendship for Mr. Stevens and belief in his ability have doubtless borne no small part in inducing him to accept the responsibility involved. Arrangements have been made with Mr. Young as bronze founder, and Mr. Stevens is anxious to get to work again. Nothing is now wanted but the completion of the agreement by the Government, who, it is to be hoped, will not delay. Every hour of the two years and a half stipulated will be needed for the work that is still to be done. We venture in kind feeling to add an exhortation to Mr. Stevens. His initial mistake was, undertaking to produce the monument for too small a sum, and this led him to make several serious mistakes afterwards. He has now a chance of redeeming his position before the public, and we earnestly trust that he will avail himself of it. The commission, up to this time, has probably brought him little less than ruin: let its completion bring him triumph. We have not the remotest doubt in our own mind that if the monument be completed as intended, and in the manner the sculptor is capable of completing it, it will be a credit to the country, and mark an era in the history of our monumental art.

SCIENCE AND ART AT SOUTH KENSINGTON.

In reply to Lord Cairns, in the House of Lords, the Duke of St. Alban's, on behalf of the Board of Works, explained that when, at the close of last session, Parliament sanctioned the erection of the proposed Natural History Museum, a contract was entered into with Mr. Waterhouse, the architect, for the preparation of sketch-plans. As soon as these were prepared, they were forwarded for consideration to the trustees of the British Museum. Some time was required to settle questions which arose; but as soon as the sketches had been approved by the trustees and the Treasury, instructions were given to Mr. Waterhouse to prepare the complete plans and drawings for the construction of the building. He was accordingly now engaged in completing

the final plans and drawings for the new building; and as soon as they were ready, which would be within two or three months, tenders would be invited for the construction of the building. An estimate had been laid on the table of the House of Commons for 40,000l., to be expended on the building this year. The Commissioners for 1851 sold this piece of ground some time since to the Government for less than market-value, stipulating that it should be applied to purposes connected with science and art. This being the case, the First Commissioner of Works considered it right and fair to give the temporary use of a small strip of this land to the Commissioners to assist them in their endeavours to promote science and art. This would not interfere with the erection of the proposed public building.

MR. PEEK'S PRIZES.

SIR,—My attention has been drawn to a footnote in a recent number of the *Builder* (p. 300), in which, from insufficient information, you speak in terms calculated to derogate from the motives which led Mr. Peek to select Eastbury House, Barking, as the subject of the prizes which he has offered through the R.I.B.A. As I was the channel of communication between Mr. Peek and our president in the affair, I can with authority state that Mr. Peek has no interest of any kind in the place, which is another man's property, and that he selected it out of pure love of art and appreciation of its architectural merits.

EX-P.R.I.B.A.

NEW BATH, HEREFORD.

A NEW swimming-bath is being built in Hereford. The building itself is 70 ft. long, and 32 ft. 6 in. wide. At the end there will be sixteen inclosed dressing-boxes, and on one side there will be a range of stalls, affording sitting accommodation. The building,—the walls of which will be lined on the inside with white Suffolk bricks, ornamented with red ones, in reticulated work,—will be covered by a handsome roof, constructed of iron and wood, and light will be furnished from the top and from the side windows, and ventilation has been cared for. The dimensions of the bath itself are,—length, 52 ft.; breadth, 23 ft. 6 in. There will be a constant flow of cold and hot water, provision being of course made for an outflow, and also for the bath being thoroughly cleaned as often as may be necessary. The temperature of the water will be tepid, and arrangement can be made for an increase or decrease of temperature, according to the season. The maximum depth of the water, to the top of the outflow pipe, will be 5 ft. 6 in., and the minimum depth 3 ft. 6 in. The bath is lined with enamelled bricks, and will be approached by corridors, one on each side, from the lobbies of the present baths. By the facilities which will be provided for the use of hot and cold water, the bath can be used at any time of the year; and when completed it will be one of the best establishments of the kind in any of the surrounding counties. It is being built from the designs and under the superintendence of Mr. J. Nicholson, architect, Hereford; Mr. Gough, of Bishop's Castle, being the builder.

BRIGHTON.

At a dinner recently given by the promoters of the Prince's Dairy Estate, Mr. Lancaster, the architect and surveyor of the Stanford Estate, stated that "over 40 acres of a most important portion of the estate had been let, on which building operations would be immediately commenced." The local *Herald* has since ascertained that the spot referred to is that portion of the Stanford estate which lies on the sea-frontage between Adelaide-crescent and Palmeira-square and the southern part of Cliftonville, and its appropriation to building will, when the operations are completed, effect the long-predicted junction,—at least, so far as "bricks and mortar" are concerned,—of Brighton, East Hove, and Cliftonville.

The land just let forms the southern portion of that particular section of the Stanford Estate the plans of which were issued last year. Since then, however, a revised plan has been published; and this contains some important alterations and improvements in connexion with the development of the estate, both in detail and general arrangement, and which will be adopted

in the building operations now to be immediately carried out.

One of the most important improvements in the revised plan is, that the estate generally will be rendered more open—there will be more breathing room and less "bricks and mortar."

Several houses are already erected on the estate, at the north-east corner of Church-road, and immediately to the north of the Church of St. John the Baptist. In these houses, the endless compo in which local builders indulge, and which necessitates continual renovation in paint, &c., is discarded, and a light-coloured brick—manufactured in the Isle of Wight—is substituted.

As showing the demand for land upon other portions of the Stanford Estate, our authority states that some land—about 15 acres—lying to the north and north-west of Holy Trinity Church, Cliftonville, and between the road to the Cliftonville Station and Hove Drive, has been recently advantageously let, and houses are already built upon it, and others are in course of construction.

The town council have approved of the surveyor's plan, for converting the stables, coach-houses, yard, and offices (known as the "Eastern Court") of the northern Pavilion property into a building suitable for all the requirements of a public library, picture-gallery, and museum, at an estimated cost of 6,000l.

THE BOARD OF WORKS' COMPETITION.

SIR,—You correctly mentioned that the Metropolitan Board of Works had given the second premium offered for a design for a fountain to their own gardener. Why did you not also tell the public that the first premium was awarded to one of their own clerks? Mr. Weldeck is in the engineer's office there. The fact is, you always screen governing bodies too much.

A COMPETITOR.

CONDITION OF PRIVATE LUNATIC ASYLUMS.

SIR,—Seeing through your columns that some philanthropic gentleman has appropriated 30,000l. for the purpose of a lunatic asylum, allow me, as a victim to the present disgraceful system of private asylums, to draw your attention to the undermentioned remarks.

The great evils of private establishments are, that they offer so many temptations to unprincipled doctors to realise large and rapid fortunes out of a class of unfortunates who, as a rule, are quite unable to protect themselves. I can assure you that the proprietors often study money-making more than they do insanity; that is a secondary consideration with them. These gentlemen, instead of exerting themselves to relieve the mind diseased, court outside favour with the inhabitants of the town, and patronise them, paying retail prices for goods used and consumed, which must cost them something considerable in comparison with what they could do with wholesale houses. Their motive for so doing is this, that the tradespeople of the town, being interested parties, speak well of the place to visitors; and in case of any sudden death occurring, the jury being the doctor's friends, the inquiry is reduced to a mere farce. If the cemetery in connexion with an asylum I know of could only unfold some of its tales of filthy cruelty and barbarity, the establishment would be closed in twenty-four hours. This seems strong language, but any one acquainted with the interior working of the place would answer for its truthfulness. When you consider how parties in the full possession of their intellect are imposed upon and swindled, you cannot be surprised at poor demented creatures, who cannot protect themselves, being made tools of. The commission that Government supplies is a very defective check.

The lavatories as a rule are not large enough on the gentlemen's side (for they accommodate that class here). The bath-room has been out of order for years. The airing courts for epileptic-fit cases are of rough gravel-stones, so that patients fall and cut themselves.

Tradesmen paying commissions to servants of places like this is a very dishonest and inhumane practice, as by that means inferior articles are supplied to that represented in the invoices, and the sick and unprotected suffer. I have no doubt this system is carried on in connexion with workhouses, and the practice wants putting a stop to. A conscientious manager, with a knowledge of goods used and consumed, could check

invoice prices, and accurate bookkeeping would detect fraud in weight; but it wants those in power to inspect the stores, and pay daily visits at meal-times, or the vices I complain of will creep in.

If the parishes were to combine and erect asylums of their own, they would then have the benefit of patients' labour, and treat lunacy much better at about half the cost, besides giving the patients a legitimate chance of obtaining their discharge, as there would be no interested motive in keeping them, and save taxation at the same time. The Southampton guardians have saved 600*l.* a year by removing about forty patients from a private establishment to Dorset County Asylum. I am not prepared to say what treatment they receive, but I can go as far as this, that if an establishment were built with the only motive of curing this dreadful disorder, where all sanitary inventions that science has brought to light were used for the benefit of the patients, and labour went to lessen the general expenses of the institution, many lives would be saved, much cruelty dispensed with, and it would not cost about half what those private places charge.

Drunkennes is one of the great supporters of insanity; and nearly half the attendants are victims to the curse: so that, if a patient gets released upon society, under this treatment, it is almost a certainty that he soon gets into trouble again. Criminal patients are mixed, in the place whence I write, with pauper patients, which is a great injustice; for the criminal, if he will only work, is allowed to exercise all his brutal propensities at the expense of the pauper.

If temperance and examples of cleanliness could be introduced in these places, it would benefit those who get restored to society.

In conclusion, I can only say that private asylums are a disgrace to the country, and the sooner they are closed for ever, the more creditable it will be for this country.

EXPERIENCE.

AN AGRICULTURAL AND INDUSTRIAL TRAINING COLLEGE.

HAVING read some of the proposals submitted to you for effecting the best means by which the greatest good may be obtained through the investment of Half a Million sterling, I am induced to suggest a plan which, while differing from all others, will, I believe, accomplish more satisfactory and lasting practical results, having an element of permanent good which other proposals do not possess.

The plan, I may observe, is not an untried theory, but the result of practical experience derived from my residence at Hofwyl, and as the organiser of the successful agricultural colony at Ralahine, in the south of Ireland, and the originator of the industrial training system at Ealing Grove Agricultural School, under the auspices of Lady Noel Byron.

I would combine the leading features of these establishments in an agricultural and industrial training college, to be self-supporting, under trustees and a charter, where labour should be the basis in the training and in the formation of the habits and character of the pupils.

A farm, with suitable buildings, school-rooms, dormitories, workshops, &c., should be secured. As there is an intimate relation between physical organisation, capacity, and character, youths should be selected at eight, nine, or ten years of age, possessing good elements of health, strength, and average capabilities to be admitted to the industrial college, and to remain till twenty-one years of age.

The pupils should have the best possible practical training for industrial life, uniting labour with educational training, so that each would acquire the means of obtaining a livelihood by reproductive industry.

Having had the advantages of a good education combined with a healthy, well-developed constitution, the pupils would be prepared to pass through life with happier results than could be otherwise attained. In these results the greatest good would be attained, and the most lasting.

The labour of the pupils might be regulated as at Ealing Grove, and at the Middle and Agricultural Schools at Hofwyl; in part industrial and in part educational. The elder pupils, from fifteen and sixteen years to twenty-one years of age, might be regulated so as to secure due attention to practical farming and mechanical pursuits, with a view to cover both the current cost and the expenses of maintenance at the earlier period of their residence.

Agricultural labour and mechanical pursuits would afford ample means for developing the higher faculties of the student; and by a residence under constant and judicious superintendence and training, till twenty-one years of age, there would be practical industrial habits formed which would last through life.

The advantages of this plan would be that the establishment might be made self-supporting, while the pupils would obtain an efficient practical knowledge of agriculture, arts, trades, physiology in relation to health, &c., so as to make them highly valued agents in the productive industry of the future.

The junior pupils, on their first admission, might pass through a preparatory training for labour, as at Ealing Grove Agricultural School. The superintendence should be constant, as with Fellenberg; and when they have attained strength and experience their labour should be industrial and reproductive, as at Ralahine.

The advantages of such a practical scheme would be many, and withal very great in its self-sustaining power, its high moral and intellectual training, contained till the habits had become fixed and established. Its great good would be involved in the profitable investment of money in that which gives health, mental power, and moral strength to human character. An establishment of this kind might be viewed as an industrial college, exercising a lasting influence of the most practical and beneficent tendency on the future condition of the people: a central institution, from whence could radiate the best practical training to supply the requirements of any other portion of the empire.

The plan proposed is no imaginary scheme: all the details necessary to success were in active operation either at Hofwyl, Ealing Grove, or Ralahine.

An agricultural college of industry of the kind here indicated would exercise a very powerful and lasting influence, and be the best means, and at the least expenditure of the original investment, in attaining its proposed object. After a few years it would remain an ever-fertile fountain of renewed vitality, strength, usefulness, and the greatest good.

E. T. CRAIG.

ART TREATMENT OF THE LORD'S SUPPER.

SIR,—Though I presume that Biblical criticism can hardly claim admittance into your columns, except under special circumstances, I venture to offer a few lines in connexion with Mr. W. P. Griffith's remarks on the conventional art treatment of the subject of the Lord's Supper. His statement with regard to Poussin's well-known picture touches a question on which there is a wide difference of opinion; besides which there is a possibility of the attitudes of the figures being judged to favour either view. But with regard to the Lord's Supper, and the feast at the close of which it was instituted, there is abundant evidence as to the usages in our Lord's time. In each account of this institution we are told that He sat down with the disciples. John enters further into details, and leads us to the conclusion that the Jews had, to some extent at least, adopted the Perso-Roman custom of the *triclinium*. Hence we might conclude that the error of Da Vinci and others consisted in representing the disciples as sitting upright, instead of reclining. As the Old Testament in no single instance prescribes the actual position, but in the first instance very fully describes the required preparations for the special journey so soon to be commenced, it has been suggested that these did not form any part of the permanent institution. The wearing of shoes at a meal was sufficiently unusual to suggest an extraordinary occasion, but it by no means follows that the people adopted the standing position, so utterly different from Oriental usages; nor does it appear probable that they would so far depart from their usual habit, unless by some special command, of which we read nothing.

If I were to enter more fully into the discussion of this matter, I should probably weary you, and justly lose the opportunity of submitting these notes to your readers; I will therefore conclude by stating that they have been gathered, not only from the sacred text, but also from the authority of Patrick, Kittó, Chardin, Whitby, and Brown. Those curious on the subject of the modern forms of celebration used in this and other Jewish feasts, may find ample details in Henry's "Classbook for Jewish Youth."

CHAS. K. GILLESPIE.

HEATING CHURCHES.

SIR,—Will you oblige me, and, I may say, the public generally, by inviting, through this letter, the attention of scientific and experienced persons to the very important subject of heating public buildings.

Having planned a scheme for heating my church with hot water, viz., by carrying 550 ft. of 3-in. or 4-in. piping, about 3 in. from the floor and 1 in. from the wall, a length which would go completely round the church and the chancel, and in addition to that by distributing six sets of coils in different parts of the church, I am suddenly checked by a friend, an architect of experience and eminence, who tells me it will be an absolute failure,—that it will give little or no warmth, whilst it will occasion draughts of cold air which will be intolerable to the congregation, unless the piping could be carried up into the roof itself.

The subject is one of such wide importance that I am sure you will consider your columns usefully occupied if employed in ventilating it.

The public will be materially helped by learning the actual experience of clergymen and others attached to churches and chapels of considerable area, used only once a week, where they are heated, and successfully heated, by hot water; and such instances will supply a contradiction to the condemnation of the hot-water system for warming buildings,—as, on the other hand, it will be useful to know where the system has failed. In this way the controversy will be a valuable contribution to the science of warming public buildings.

I have known many instances where the Gurney stoves are recommended and approved, and met with others where they have failed; whilst I have observed that, as a rule, for them to be successful they must be inconveniently and expensively multiplied in large churches. That being the case, it seems that one fire, requiring not a very large amount of fuel to heat one boiler, which shall distribute an equal amount of heat over a whole building, so as not to roast those in the immediate neighbourhood of the stove or hot-air gratings, and starve those at a distance, is a thing very much to be desired, supposing it be not, as asserted, a failure.

ORLANDO W. W. FORESTER.

** We can scarcely open our columns to the statements of inventors and patentees in reply to this inquiry: the writer must be understood as seeking to obtain the results of the experiences of disinterested persons.

EFFECT OF FROST ON A WALL.

AT the Suffolk County Court, held at Ipswich, John Wylie, claimant, v. George Kibben Esq., builder, Ipswich, to recover $\$4$, damages for not properly performing a contract to build a garden wall.

Mr. Burdett, for the plaintiff, said that the owner of a house in Oxford-street, in which he lives, and in September last determined to surround his garden with a wall, and a plan was prepared on which notes were made as to the materials to be used. The materials to be used, and among them by the defendant, whose tender was $\$66$, 9*s.*; that sum having been paid upon by him in consequence of his having ascertained that another tradesman had sent in a tender for $\$67$, 10*s.* The work was completed, and Mr. Wylie paid the defendant 70*l.* 6*s.*, or $\$7$, 17*s.* more than he ought. Some months after Mr. Wylie found that the wall was not in accordance with the plan, and employed Mr. Butterworth, architect, to examine the wall; he did so, and made a strong report against it.

In his evidence, Mr. Butterworth said that if the mortar had been good the frost would not have had the effect on it that it had, it would not have come out to the extent it did. The early frost would have assisted in drying it. If the frost was followed by rain and then by frost again it would affect it. There was more mortar in the joints than there ought to have been, and the weather had a greater effect upon it.

Other evidence for the plaintiff was given. For defendant, it was submitted that the work had been done by a first-class architect, and if it had not been adopted there had been a waiver of any breach by the architect. Defendant's witnesses said that the work was well done, and that it was owing to the early and severe frost that the wall got into the condition that had been described. Defendant's counsel also submitted that the architect's certificate barred the plaintiff from recovering any damages against the defendant.

The judge said it was clear that Hubert was employed in the capacity of surveyor to see that the work was properly done, and one of the provisions of the contract was that he was to examine the wall. The reasonable interpretation of that was that what he passed were to be used, and if he passed them there was an end of the matter. The plaintiff would not pay till he had the certificate of Hubert, but when it was given he paid it. The first breach of the contract was that second-class white bricks were used instead of best; the breach was proved, but Hubert said the bricks were as good as best, and he trusted, and he passed them, and that was the same as if Mr. Wylie had passed them. As to the red bricks, Hubert passed all that were used, and when he found that out of 2,000 bricks, only 200 were selected as being bad, he could hardly say that it was such a breach of the contract that an action ought to be maintained on it alone. Then came

the main question whether the mortar was badly made, and for that reason fell out, or whether it was owing to the natural effect of the frost that the joints fell out. Mr. Butterworth's report was certainly very strong, but the last paragraph appeared to be a little highly coloured; and he could not put the same confidence in a report that was highly coloured that he could put in the language of what was more moderate. On the other side, there was Mr. Luff, who thought, perhaps, not a member of so elevated a grade of the profession as Mr. Butterworth, had been very largely employed in building works; Mr. Kerridge, who had been many years in business; and others, who said in their judgment the frost was sufficient to take the mortar out of any joints. On the whole, he thought there was a great deal to be said on each side, the performance of it was dispensed with; and further, that the falling out of the mortar was to be fairly attributed to the effects of the elements and not to the work being bad; and if he had any doubt on the point, he should have given the benefit of it to the builder, the burden of proof being on the plaintiff. Judgment must, therefore, be for the defendant.

THE PALMERSTON STATUE AT SOUTHAMPTON.

SIR.—On reading the notice in the *Builder* on the subject of the above statue, I would ask those who have seen it, whether artists or otherwise, whether they could suppose that an artist of any standing could execute such a statue and pedestal for £600, when the original estimate was £800. The sculptor, in an unguarded moment when he might have been told that £500 was the only sum that had been then subscribed, and conditionally, might have stated that he would commence the work, fully relying on the honour of the committee that the additional £300 would be subscribed or raised. It is, therefore, to be hoped that the town council will not attempt to evade paying over to the artist the additional sum, considering the great expense he has been compelled to incur to establish a just right of remuneration for his time and labour. To evade such an act would be nothing more nor less than a slur on the town and a bad compliment to the memory of the late Lord Palmerston, as also to the county member, the Right Hon. W. Cowper-Temple,—that they should erect a statue to no distinguished statesman, and not be enabled to raise £600.

Other artists would have received about 1,000*l.* or 1,500*l.* for such a statue and pedestal.

A FRIEND TO JUSTICE.

THE PERILS OF HYDE PARK CORNER.

SIR.—The idea of separating the north and south traffic from that going east and west at this point, advocated by Mr. Barry, in the *Times*, and in your last number, was put forward by me in 1865, and was approved by the *Times*, and the Civil Committee of the Council. The route then proposed diverged from Park-lane, between Stanhope Gate and Hertford-street, passed under Piccadilly, temporarily disturbing the basement only of one house, across a corner of the Green Park and of the Palace Garden under Constitution-hill, and emerging into Grosvenor-place, opposite Holkin-street.

It would, doubtless, as well as modify this so far as to take advantage of the early alterations now being effected in Hamilton-place; but we apprehend that Mr. Barry's line would interfere to an unnecessary extent with the Palace Gardens, and with the level of Constitution-hill roadway.

The cost of this improvement would be so small that it ought to prove a strong recommendation to the present Board of Works. We are in favour of a trial of our original scheme.

TENDERS.

SIR.—I see you have favoured us with a note of admiration in your last number in respect of our tender for the Eborac Old Mills, Culesea. But the tender of Mr. Newton for 10,150*l.* was deemed simply absurd, and we are quite prepared to carry out our tender of £1,150*l.* for the specified work.

CARRS & RISCO.

WIDE TENDERS.

SIR.—Seeing so many letters in your paper with respect to wide tendering, I beg to send you my opinion of the cause from experience in the West of England. I believe the cause of such differences is through the incapacity of the person who takes out the quantities, or prices out the work, but in most cases in pricing out the work.

I have known when quantities are supplied to builders that a figure has not been put on the bill, yet a tender has been sent in; and when the quantities have not been supplied, they have done nothing but write or fill in the form of tender. I have known men come and look at the drawings, and go away as if they did not intend to tender, and to my surprise a tender has been received from them.

In my opinion it amounts to nothing more than a dishonest way of living. Men guess at the cost and quantities of work, and send in tenders not knowing whether it will pay or not. Proprietors accept the lowest tender, and consider the architect in the position of a policeman, thereby throwing a large amount of trouble on the architect, for which he gets no recompense or credit from the work carried out by such persons.

It appears to me that a man gets discharged from a firm of good standing, and the following week he is competing against his former employers, and offers to execute work worth hundreds of pounds without capital, stock, or plant (leaving out the point seasoned stock). His tender is often accepted, and he is pressed by commercial soliciting orders. Of course, he has to buy on credit; he then draws money from the proprietor to pay wages, and at the conclusion of the work the architect has trouble to get the contract completed; and finally the law steps in and protects him against his creditors. This, I believe, is the greatest cause of such wide tendering, having seen it in many instances myself.

How this is to be corrected? First, by judges of bankruptcy courts demanding the bill of quantities of work which bankrupt builders say they have lost money by executing, before they are allowed to pass the court. This would show whether those men are capable of carry-

ing on a business as builders. Secondly, by architects not granting certificates for payment so often as they do after the work has commenced; and last, but not least, by merchants not supplying such men with their goods without sufficient security: they would then be able to sell cheaper to the honest trader, and not make so many bad debts.

I think it would be a good plan if architects would insist on having the detail bill of quantities from the builder whose tender has been accepted to carry out any work, as no respectable builder would object to this if he had confidence in the architect.

AN ARCHITECT.

MULLINGAR.—THE EPISCOPAL RESIDENCE COMPETITION.

SIR.—Has the Building Committee power "to reject," as it does, "all the plans sent in" for the following reason, as it says, "one class having the requirements being far too expensive, and much above the sum mentioned in the advertisement; the other, for not having the necessary accommodation, and, consequently, not acceptable?" or could the competitors compel the committee to award the premiums offered?

The affair seems to me to have been little better than a hoax, and I should like to see what other competitors think of it.

A COMPETITOR.

HORSES AND THEIR SHOES.

SIR.—I beg permission to reply to Mr. Armistead's observation on the anatomy of the hoof, for which I bow. I do not wish the screws to wear their way into the hoof as if it were a log: a rim shoe with an inner flange for the short broad screw-ends to tighten against, the shape of hoofs is favourable for securing an shoe (not a nailed-on tip) without screws or nails, or the present tip could be riveted to a leather and gutta-percha shoe neatly and firmly, pressed warm: other modes might be devised superior to the above. As A. proclaims me ignorant of the anatomy of the hoof. Be it so. I believe the R.V.C.S. are no conjurers, or ere this they would have bestowed a safe and comfortable shoe on man's best servant. It is astonishing how long professors and legislators repeat and lament for a want. Are they too poor to offer premiums? Government would profit by engaging a few consulting inventors in lieu of stock lawyers: there would be less talk and more remedies. The horse poor horses may be better footing: nailing must be abolished (except at friendly meetings). The horse will neigh a grateful assent, or if he has to put down three and carry one he will not long carry you.

R. T.

MASTERS AND MEN.

At the Southwark County Court last week a case was tried which materially affects the building trade.

A bricklayer, named Percy, summoned Messrs. Crockett, Dickinson, & Oliver for 1*s.* 8*d.*, being 4*d.* per hour on forty hours, as between 8*d.* per hour claimed and 7*d.* per hour paid. The facts proved were:—The plaintiff worked forty hours; the rate per hour at which he was assessed by his foreman was 7*d.*, and when was duly paid to him. The present action was brought to recover the 4*d.* per hour on the differential scale as mentioned above. It was stated that the contractors in this case pay the highest wages now paid in the building trade, viz., 8*d.* per hour; this sum being graduated according to merit to not less than 3*d.*

Mr. G. A. Smith, the defendants' solicitor, contended that the plaintiff, a bricklayer, was an artisan whose merit could not be defined by credentials; and that in this, as in every case, any man who came to be employed must show his ability by the best of tests,—ocular demonstration by actual workmanship. The contractors cannot, of course, do otherwise than simply overlook so large an undertaking as the building of the Lambeth New Work-house, but they employ several foremen as the heads of sections of the work, whose duty it is, and who report to the contractors the value of the work performed by each person, and upon that report such person is rated and paid. The plaintiff was rated and paid at 7*d.* per hour, but he claimed 8*d.* per hour. In addition, this being the subject of the present action. The contractors also proved that it was the custom of the trade to pay each workman according to his merit; that the terms they paid were undoubtedly well known, and were the highest in the trade. The amount claimed in this action was in itself absolutely not worth naming, but the principle involved was a great and general one; and, therefore, in order to obtain a judicial opinion on the subject, the defendants at considerable costs and personal inconvenience defended this action.

The Judge, upon proof of the facts, at once gave a verdict for the defendants.

THE TRADES MOVEMENT.

Newcastle-on-Tyne.—The agitation in favour of the nine-hours movement among the engineers of Newcastle and Gateshead has taken a practical shape. Between 300 and 400 men engaged at Messrs. Clark, Wilson, & Gurney's, of Gateshead, turned out without notice. The workmen at several other works followed the example, with a week's notice. The movement is extending throughout the entire district. At a meeting of the employers, Sir William Armstrong presiding, it has been unanimously resolved that a united opposition be given to the strike which has commenced.

Preston.—The dispute among the joiners of Preston, which at one stage threatened to result in a strike, has been arranged. The masters have conceded the Saturday half-holiday, but, in order that the half-yearly accounts may not be affected, the new arrangement is not to take place until the first week in July.

Kidderminster.—A meeting of carpenters and joiners has been held, with a numerous attendance. The men employed at Messrs. Binnian's shop had been withdrawn from work, in consequence of the demands the men generally have made for an increase of wages and a reduction in the hours of labour on Saturdays not being conceded. Regret was expressed by the speakers that the matter in dispute could not be settled amicably by arbitration or other means. It was resolved that the men at Mr. Thompson's shop should be withdrawn from work, an amendment that the strike should be made a general one being lost by three votes.

Trade Unions Bill, &c.—The Trade Unions and the Criminal Law Amendment Bills have been read a third time and passed in the House of Lords.

ST. JAMES'S PARK.

SIR.—I beg to be allowed to call the attention of whomever may be responsible for the appearance of this park, to the present and increasing destruction of the grass in several parts. I would particularly point to the inclosed plot between the gate opposite to the steps leading from the Duke of York's Column and the water. The hurdles, as at present constructed, are no protection to it; and every winter, especially, a broad strip is regularly trodden into dust by the crowds passing to the ice. The board erected at the gate, in mild protest of this, serves merely to provoke insult to injury. Either this passage should be blocked up by shrubberies; or, which would be better, as there is a vista here worth preserving and making more of, a broad walk should be made, lined with flower-beds, and perhaps with an avenue. In other parts of the garden, where the hurdles were removed last year, the grass for some distance on the sides of the pathways is of course fast disappearing. Inclosing such small plots for grazing purposes cannot be desirable, and is besides unnecessary, but it is absolutely essential that the sides of every pathway should be protected by hedges at right-angles to it. Every access is allowed by this to the grass, while the formation of continuous footways is checked. If short-cuts are persisted in, they must be prevented by hurdles, properly constructed, or by an alteration in the present paths. This last suggestion will equally apply to the other parks.

A. P.

FIRE ESCAPES.

SIR.—I resided recently in a large house, erected some seventy years since, I believe, in Fitzroy-square, London,—formerly a fashionable locality,—which contained several floors of sleeping apartments; but until recently no mode of egress for their tenants in case of fire, except by means of doors on the ground-floor. This house contains a handsome stone staircase; but in case of fire, the persons in the upper rooms might be unable to use it. The tenant pointed out to me a ladder and door at the top of this house, which he had caused to be constructed for persons to escape over the roof in case of fire. The plan deserves to be adopted in all cases of town houses, even where there is a parapet accessible by windows, as in Beaufort Buildings, London. In the construction of old houses the omission of this plan was a serious and sometimes a fatal deficiency in cases of fire. The suggestion also of Mr. Symons, in the *Builder*, 11th of March,—that the ladder and trap-door should be in a room and not on a landing,—deserves notice, as does that of a correspondent in the *Builder* for 18th of March,—that the ladder should be fixed, and not movable.

CHR. COOKE.

ST. MICHAEL'S CHURCH, NOTTING-HILL.

The new church of St. Michael and All Angels embraces the northern part of the district of All Saints, Notting-hill, in its new extension towards Kensal-green, in the Ladbrooke-avenue. The vicar designate is the Rev. Francis Kerr Gray, formerly curate to Dr. Robins, of St. Peter's, Kensington Park. The plot of land on which the edifice stands, and that on which a parsonage is yet to be built, are the gift of Messrs. Blake and Parsons, who are freeholders in that part. The style of architecture is Romanesque (the committee interdicted Gothic), and is executed chiefly in terra cotta and ornamental bricks, by Mr. Cowland, of Notting-hill, under a contract (exclusive of tower

and fittings) for 4,800*l*. The architects are Messrs. Edmonston. The plan consists of a nave 99 ft. long, exclusive of chancel and western apse, by 43 ft. wide, roofed in one span, with an eastern, western, and southern apse, leaving a northern apse to be added at some future time. The interior is yet unfinished, and only sufficiently fitted up for the performance of worship. The pulpit, desk, organ, and chancel furniture are all temporary. The contract for the decoration is given to Messrs. Howland & Fisher.

We understand that land for a more extended chancel has been secured, to be erected when the time comes.

BUILDERS' BENEVOLENT INSTITUTION.

THE 35th election of pensioners on the funds of this Institution took place yesterday (Thursday) at Willis's Rooms, King's-street, St. James's. Including the two annuitants elected yesterday, there are now on the books of the Institution twenty men, each in receipt of 24*l* per annum, and twenty-five women, each receiving 20*l* a year. The candidates at yesterday's election were,—Males: William Peters, Francis Sandon, William Gale, and Mark Mintry. Females: Harriet Proctor, Frances Leare, Mary St. George, Jane Brothill, Elizabeth Trevelian, Ann Budd, and Eliza Lambert, there being vacancies for one male and one female only. In the absence of the President of the Institution (Mr. Alfred J. Mansfield), Mr. George Plucknett (Cubitt & Co.), on the motion of Mr. Joseph Bird, seconded by Mr. Dines, took the chair, at twelve o'clock, and declared the poll open until three o'clock. At three o'clock Mr. Joseph Bird was moved into the chair, in place of Mr. Plucknett, who had been compelled to leave on urgent business, and shortly afterwards the scrutineers (Messrs. Thos. Stirling and Matthew Hall) came into the room, and Mr. Stirling announced the numbers of votes recorded for the different candidates, in accordance with which the chairman declared that William Peters and Harriet Proctor were the successful applicants. Mr. A. G. Harris, secretary, then read a letter from Mr. J. Waldram (Hill, Keddell, & Waldram), inclosing a cheque for twelve guineas as a special subscription, to be equally divided between the two unsuccessful candidates (one male and one female) highest on the list of votes. (Mrs. St. George and Mark Mintry were announced as the fortunate recipients of this bounty.) Mr. John Thorn, in proposing a vote of thanks to Mr. Waldram for his generosity, warmly commended the excellent example thus set to the other subscribers to the Institution. Mr. Richard Richardson having seconded the proposition, it was carried by acclamation. Mr. W. Nicholson proposed, and Mr. T. G. Smith seconded, a vote of thanks to the scrutineers: Mr. Stirling replied. Votes of thanks to the members of the committee who had attended, proposed by Mr. John Thorn, seconded by Mr. R. Richardson, and acknowledged by Mr. James Simpson; and to the chairman of the day, proposed by Mr. Thomas Stirling, seconded by Mr. Richardson, and replied to by Mr. Joseph Bird, brought the proceedings to a close.

CHURCH-BUILDING NEWS.

Bayham.—A large attendance of visitors was attracted to Bayham on the 7th to be present at the opening, by the Bishop of Dover, of the new church recently erected, from the designs of Mr. David Brandon, for the Marquis Camden, in the park at Bayham. The building is situated on a very picturesque spot, sheltered and surrounded by foliage, near to the interesting ruins of the abbey, said to have been erected in the twelfth century, of which considerable remains exist, and are now protected and preserved from further injury with care. The new church is built in the Early English style of architecture with the local sandstone, abounding in the neighbourhood, faced on the inside with bricks; and consists of a nave, chancel, vestry, and a tower and spire containing a peal of bells, at the intersection of the nave with the chancel. The seats in the nave, and those for the choristers in the chancel, are intended to provide accommodation for about 160 persons. The communion floor is paved with marble and encaustic tiles, and exhibits an effective combination of design and colour: it was executed by Messrs. Minton & Co., of Stoke-upon-Trent. The stained glass in the east win-

dow, presented by Mr. Alexander J. Stewart, in memory of his uncle, the second marquis, was manufactured at Munich from the designs of Messrs. Mayer & Co. The font was presented by the late Lord Dynevor, and was carved in Mansfield stone by Mr. Earp. Messrs. Widdicombs & Oakley, of Tunbridge Wells, were the contractors.

Westerham.—Speldhurst Church has been consecrated by the Bishop Suffragan of Dover. It consists of chancel, nave, side-aisles, and organ-loft, and it is built in the style predominating in the thirteenth century. It is calculated to hold about 450 persons, the stone used in its construction being obtained from quarries in the parish. There is a stained-glass window in the chancel, erected, in memory of the late Lady Musgrove, by Sir John Musgrove, bart. This window was the workmanship of Messrs. Lavers & Barraud. The carving was the work of Messrs. Farmer & Bridley, and the altar-rails were supplied by Mr. Skidmore, of Coventry. The north porch has been erected at the expense of Mr. Charles Powell, one of the churchwardens. The southern porch has a stone roof. The roof of the chancel is of pitch-pine, and that of the remaining part of the church of fir, the exterior being composed of red tiles. The pulpit, which is of carved stone, is the gift of Mr. John Field. The designs for the edifice were furnished by Mr. J. Oswald Scott, son of Mr. Gilbert Scott, and under his superintendence the erection of the edifice has been executed by Mr. Constable, of Panshurst, builder. The cost of rebuilding the church is about 4,500*l*. There is an organ, subscribed for by ladies of the parish, at a cost of about 800*l*. Messrs. Bevington & Sons, of Soho, were the builders.

Rochester.—A committee, appointed at a meeting of the seat-holders of St. Margaret's Church, Rochester, to consider as to the desirability of restoring the parish church, have consulted Mr. Gordon Hills, architect, London, as to the alterations and improvements to be carried out, and the following alterations have accordingly been decided upon being carried out, should the funds warrant:—Reseating the whole church with open seats, in lieu of the present high pews; taking away the present pulpit, and placing a new one on the south side; fitting up seats for the choir, renovating the chancel, and putting in a new east window; new glazing with cathedral glass all the old windows; making certain improvements in the warming apparatus. The architect advises that the organ should be removed to the east end of the south gallery, and that a portion of the west gallery should be cleared away, so as to open to the church the tower-arch, now completely lost to sight. The estimated cost of the whole of the proposed alterations is 1,400*l*.

Saffron Walden.—Littlebury Church has been reopened, after having undergone extensive alterations and improvements in the nave and north and south aisles, leaving the chancel, however, still in its dilapidated state. Under Mr. E. Barr, as architect, with Messrs. Brown Bros., builders, Lynn and Saffron Walden, the restoration of the nave has been completed. The chancel is ere long to be taken in hand by the patron of the living. The roof has been raised to the originally intended pitch, as far as conjectured. The round clearstory windows have taken the place of the square ones, and every window except the west is new, a lancet-window being added to the baptistry. The western arch has been thrown into the church by the disappearance of the gallery. The old square pews give way to open seats, and a new oak south door has taken the place of a very old one, and a three-decker has given place to the present stone pulpit, paid for by the proceeds of needlework done by ladies of the parish. At the north porch a small arch in the wall, doubtless originally meant for holy water, has been discovered and restored at the expense of a parishioner. The date of the church is supposed to be about Henry VII's reign. A dress of a priest in full vestments exists in the church, dating at the close of the fifteenth century. The organ has been placed in the chancel.

Bathwick.—The new nave and choir of St. John's Church have been consecrated. The new portion of the building consists of a nave (to which the original building will now stand in the relation of a north aisle), chancel, and sanctuary, the last-mentioned term being applied to the extreme east end, in which the altar stands. The material employed in the main fabric is precisely similar to that used in the older part of the building, viz. stone from one of the Combe-

down quarries, the outside surface of the walls being axe-picked, and relieved by smoothed dressed bands. The roof is of slate of a uniform tint, with red cresting from end to end, and crosses at each gable. The nave is divided into four bays by arches of the First Pointed style, with capitals at present plain, though intended to be carved at some future time. Above these is the clearstory, which consists of four circular windows with simple foiled tracery, the glass being arranged in geometrical pattern. There is only another window on this side of the nave, in the centre of the north wall between the western end and the first bay. The south side is lighted by six windows, including a stained one higher over the door. The plain windows consist of three lower lights, with cinquefoiled head, devoid of tracery or elaborate ornamentation, and the glass employed is of two tints, disposed in a simple pattern. The western window, the largest in the building, consists of two lower compartments corresponding in every respect with the nave windows, while above these lower lights is circular head work, slightly more elaborate in character, though essentially in keeping with that of the other windows. The subject of the window over the south door is the Flight into Egypt. The floor is of concrete, and the roof is a high-pitched one, the timber being of stained deal, and the principals springing from plain corbels. The interior walls of the nave show the rough undressed surface of the stone, tooling and plastering being alike discarded, and from floor to roof the string-course are the only relief to the plainness of the stonework. The chancel is divided from the nave by a screen, consisting of three principal bays, the pillars being of serpentine marble, with Portland bands. The spaces between the pillars will shortly be filled in with ironwork, and iron chancel gates will also be erected. Running along the façade of the screen is a band of Mosaic marble work, and the whole is surmounted by a cross, about 5 ft. in height, the material of which is alabaster of three colours. The spandrels of the screen are filled in with carved stonework, pierced with quatrefoil openings. On the north side of the chancel is a bay opening into the chancel of the original edifice, which it is said will be appropriated to the purposes of a private chapel. Double rows of stalls for the choir are ranged on either side. On the south side of the chancel the organ transept has been built, but as the instrument is an electric organ, only a part of it is placed here, the other portion, at which the organist sits, being in the northern bay. The chancel is lighted by a stained-glass window, consisting of four parallel lights, and divided into two compartments by a serpentine column; the two sides of the window being flanked by columns of the same material. The subjects treated in the window are—"The Marriage of Cana," and "The Raising of Jairus's Daughter," to each of which two lights are appropriated. The roof is of stained deal, but not open, as in the nave; and the surface presented is laid out in squares, and painted in diaper pattern, the sacred monograms and various Medival devices being prominent in the ornamentation. The floor, which is on a rise, is covered with plain red and black diamond-shaped tiling. By night the chancel is lighted by a row of jets placed at the back of the façade of the screen, along which plates of brilliant reflectors are placed. The sanctuary is divided from the chancel by a principal arch, substituted in the present case for a chancel arch. The walls, as is also the case in the chancel, are fully dressed; the roof is diapered in similar, though more elaborate, fashion to that of the chancel; and the paving is composed of Moore's encaustic tiles, set to a geometrical pattern, comprising colours many and brilliant. The altar is placed upon a platform, at an elevation of 1 ft. or more from the floor of the sanctuary. An arch is built in the wall over the altar, the spandrels of which are ornamented with diaper-work, and within the trefoiled head of the arch the reredos is fixed. The columns are of serpentine marble, with carved capitals. The subject of the reredos, "The Adoration of the Magi," is worked in Salvati's mosaics. The east window contains three lower lights, each enclosed within a niche-shaped compartment, the columns being of polished serpentine, with carved Caen stone capitals. The central light is occupied by a representation of "Our Lord upon the Cross," and the two others are divided into two tiers, the upper representing "The Agony in the Garden" and "The Resurrection," and the lower "Christ's Baptism" and "His Burial." The rose compartment which

fills the head of the window is devoted to the subject "Our Lord in Glory," the central circle depicting the Saviour seated upon His throne, while allegorical representations of the seven angels fill the openings of the tracery. Coloured windows are also inserted in the north and south walls. They are both similar in shape, each having two lancet lights, with a circular heading. The subjects treated in the north window are "The Feeding of the Multitude," and "The Raising of Lazarus;" and in the south, "Christ Walking on the Water" is the theme of the whole design. The windows are all memorials. The architect was Mr. Blomfield, of London; the contractor for the masonry, Mr. C. Mann; for the woodwork, Mr. Mercer; for the gasfitting and ironwork, Mr. Farham. Messrs. Bell & Almond, of London, supplied the stained windows. The church will be warmed with Haden's apparatus.

Brighthelm.—The foundation-stone of St. Leonard's Church tower has been laid. The old tower was taken down some time since, upon the recommendation of the architect, Mr. Slater, who, on examination, found it in a very dangerous and dilapidated state. Several stones of a Norman appearance were found, and are preserved to be used in the rebuilding of the new tower. In August last tenders for the work were received from several building firms, when Messrs. Escourt's, of Gloucester, was accepted, the amount being £1,000, exclusive of chimneys and clock, stained-glass window, and other incidental expenses.

Moccas.—The parish church of Moccas has been re-opened for public worship. The church, though of small dimensions, is of Early Norman architecture, consisting of nave, chancel, and apse. The rector (the Rev. Sir George Cornewall, bart.), who is also the patron of the living, engaged Mr. Gilbert Scott, jun., as the architect. The work includes the re-seating of the church with open seats of oak, the removal of the whitewash ceiling, and the substitution for it in both the nave and chancel of a flat, panelled roof of oak, carved; the roof of the apse being also of oak, though of course not flat. Both chancel and apse have, too, been raised to their original pitch. The tracery of the chancel windows,—which, though the style of architecture is in every other respect Norman, are in the Decorated style,—has likewise been restored; a new oak porch takes the place of the old porch; the ivy by which the exterior of the building was formerly enoased has been removed, and the walls pointed in parts and restored, blocks of Travertine, of which the church is built, being, where necessary, let in. Some difficulty was experienced in obtaining this particular kind of stone; however, by the kindness of Sir E. Winnington, bart., Stamford Court, that difficulty was removed, a supply being obtained from the hon. baronet's estate sufficient to complete the work. An altar-tomb to one of the knights of the De Freyne family, the ancient possessors of Moccas, has been removed from its former position against the chancel-wall to the centre of the chancel, the position which it is supposed to have occupied originally. New oak seats are placed in the choir, the pulpit, lectern, and reading-desk, also of oak, carved, are likewise new; and an oak organ-gallery has been added to the west end. Moule's apparatus has been fixed for the warming of the building. The execution of the restoration has been carried out by Mr. Franklin, contractor, of Deddington, near Oxford.

Miscellaneous.

New Police Station for Kingsnorton.—The police at Balsall-heath have for some time been placed at great inconvenience by the fact of all prisoners apprehended in the locality having had to be taken for trial to King's-heath. A new station is therefore being erected at Balsall-heath. It is situated in Edwardes-street, is a brick building, and in its details is adapted to the purposes for which it is required. Near the entrance is a charge-office. There are four cells, also rooms for the accommodation of the constables, who will reside on the premises. There is a house for the use of the superintendent, and another for the sergeant. The building is so constructed as to allow of a court-room being made by raising the roof. The cost of the premises is 2,000*l.*; the builder is Mr. Bennett, of Birmingham; the architect, Mr. Rowe, of Worcester.

Bishopsgate Ward Schools.—Last week the Marquis of Lansdowne laid the foundation-stone of a chapel in connexion with the new schools of the ward of Bishopsgate, now in course of erection in Skinner-street. On arriving his lordship was very cordially received. According to a statement made by the Rev. William Rogers, it appeared that the Great Eastern Railway Company, for the extension of their works from Shoreditch to Liverpool-street, obtained powers from Parliament to remove the Church of All Saints, together with the ward schools. Their Act compelled them to rebuild the church, and they purchased a site in Skinner-street for that purpose. The parish authorities, however, looking at the reduced number of the inhabitants, did not consider it necessary that a new church should be erected, and proposed instead that a school chapel, which might serve for educational purposes, as well as for occasional services, for the benefit of the children and their parents, should be built. Another Act to carry out that arrangement was obtained, and upon the site in question a chapel will be erected, together with class-rooms and a residence for the clergyman. On ground adjoining the proposed structure the new ward schools will be built. They were intended for the children of the labouring classes, and in the rooms attached to the chapel those children who were able to remain a longer time at the school would be given opportunities for acquiring a more advanced education. The chapel will hold 500 persons, and the class-rooms adjoining 200. The cost is estimated at about 6,000*l.* Mr. Clifton is the architect, and Mr. Brass the contractor.

The Late Industrial Exhibition in Hull. A meeting of the executive committee and creditors of the late Hull Working Men's Art, Industrial, and General Exhibition, has been held. The chair was taken by Mr. Gillyatt, a working man, who exonerated the committee from the charge of squandering the funds. The liabilities amounted to 780*l.* 5*s.* 8*d.*, inclusive of 48*l.* due to Messrs. W. & J. Hall, the contractors for the building. To meet this deficit, the treasurer had 364*l.* 1*s.* 8*d.* in hand (86*l.* 13*s.* of the guarantee fund had not been paid, and the guarantors to the amount of 31*l.* 1*s.* repudiated their liability altogether). The deficit amounted to 576*l.* 4*s.* 0*d.*. The secretary said if they could get the 86*l.* 13*s.* guaranteed, they could offer 10*s.* in the pound; at present they had only 7*s.* 9*d.* in the pound. Many of the creditors seemed disposed to accept this composition, but it was positively refused by Mr. Hall. It was stated that the contractors agreed that if at the close of the exhibition the building was to remain the property of the committee they would erect it for 1,900*l.*, but if it was to be taken down, and the ground left in its original condition, the amount of the contract would be only 1,400*l.* Since then the hall has been sold to the Hull Artillery Volunteers as a drill-shed, for 700*l.*, and the committee thought that, having made this profit on the affair, the contractors ought to be satisfied with the composition offered. As no terms could be made with the principal creditor, the meeting arrived at no definite conclusion.

Scaffold Accident in Newcastle-upon-Tyne.—At the new building in course of erection for the Royal Fire Insurance offices, corner of Queen-street, Sandhill, Newcastle, a labourer was fixing a temporary scaffold, for the use of the stone carvers at the top part of the building facing Akenside-hill, and had got the job nearly finished, when the planks on which he was standing, not having been properly fastened, suddenly gave way, and he was precipitated along with them to the ground, a distance of between 40 ft. and 50 ft. In his descent he alighted on the roof of the shed which protects the masons, but as it was constructed of only thin deals, it was smashed, and he fell on the ground below. The planks flew in different directions, one of them hitting a mason, and knocking him down; another struck a youth on the head as he was passing along the street, and knocked him down. The chief sufferer was found to have sustained a very serious compound fracture of the skull.

Statue of Robert Stephenson for Euston Square.—The London and North-Western Railway Company are about to erect a statue of the late Robert Stephenson, C.E., at the entrance gates of the road leading to the Euston-square station. The required permission has been granted by the St. Pancras Vestry.

Civil Engineers for India.—In the Commons, in reply to Sir F. Goldsmid, who asked the Under Secretary of State for India whether there would be an examination for 1871, similar to that for 1870, of candidates; and whether after the present year there would be any, and what mode, besides the modes indicated in the revised prospectus of the Cooper's Hill College, of obtaining admission to the service of the Government of India as civil engineers; Mr. Grant-Duff said an examination would take place in July. Various objections had been made to the arrangements contemplated. The Government proposed to admit candidates up to the age of twenty-four, and to give them appointments, provided they satisfied the requirements of the examiners. This examination would take place in 1874. The Government would continue to make appointments of experienced engineers to the service in India, as they had always done.

Haymarket Theatre.—The view of Ravenhill, painted for Mr. Byron's new comedy-drama, "An English Gentleman," is a bright, pleasant view of the exterior of a red-brick house of Queen Anne's time, on a turfed slope, with avenue and charming landscape, very creditable to Mr. O'Connor. The drawing-room scene for the last act is very completely fitted up, as is their wont with interiors at this theatre. The popularity of the play increases. Mr. Sothorn has a part that suits him well, and has never acted better. His vivacity, ease, and truthfulness in the dining scene of the last act produce a highly well-deserved recall. The new lady, Miss Amy Roselle, promises to be an acquisition, and Miss Fanny Gwynne plays very artistically an unsatisfactory part.

Shelley's Estates.—The village of Southwater, in the parish of Horsham, on the line of railway from London to Brighton, is well known to the admirers of woodland scenery, and till now a few acres of freehold land could not be purchased at any price; but the disposal of about 300 acres, in lots of from five to sixty acres each, will enable persons to have well-timbered parks for mansions or villas. We understand Messrs. Debenham & Tewson have received orders to sell the ground by auction, but several merchants have already visited the district to view it, and a wealthy merchant prince, we are told, well known at Kensington, has secured a park of fifteen acres by private treaty at a moderate price.

Completion of the Edinburgh Scott Monument.—We have already alluded to the completion of the museum, and the proposal of Messrs. Brodie & Hutchinson, sculptors, to furnish thirty statues for the niches, in freestone, for 50*l.* per figure. The figures will be selected from the leading novels and poems of Scott. It is proposed to raise the necessary funds by subscription, each subscriber of one guinea, and upwards to be presented with a photograph of the statues. A committee has been formed in Edinburgh under the presidency of the Lord Provost: Mr. James Ballantine is the honorary secretary. An auxiliary committee is now being formed in London.

Worship-street Police Court.—A new police-court for the Worship-street district has recently been completed, within a minute's walk of the old building. The site is leased from the Ecclesiastical Commissioners. Messrs. Haward Brothers executed the work; Mr. F. H. Caiger, the surveyor to the metropolitan police, furnished the designs. The court is 35 ft. in length by 25 ft. in width; it has a lantern roof, and is lighted and ventilated by Strode's patent sunburner. It is heated by Messrs. Haden, of Trowbridge, in Wiltshire, with appliances for the admission of fresh air. From Windmill-street there is an entrance for the prison van to set down and take up.

The Erection of Mansions and Palaces for Englishmen at Cairo.—The Duke of Sutherland is building a palace at Cairo for a winter residence. It will be supplied with every Oriental luxury. Cairo is becoming quite a favorite winter residence with the English nobility; and the Duke of Hamilton and Earl Duncraig were there last winter, as well as the Duke of Sutherland. A large number of houses are being built at Cairo by enterprising Egyptians.

The Courts of Justice.—A select committee to consider the Bill for obtaining additional land for the site of the new courts of justice has been appointed, and will commence their inquiry as soon as practicable after the holidays.

Opening of a Public Drinking Fountain at Stansted Mountfitchet.—At the "four-way" way, where the high road from London to Cambridge crosses the one from Benfield End to Stansted street, a block of buildings which was no ornament to the place, having been entirely cleared away. A public improvement has thus been effected, which has just been enhanced by the erection of a drinking-fountain, around which are planted half a dozen chestnut-trees. The cost of the whole is nearly 500*l*. The fountain itself is of cast iron, and was supplied by Messrs. Macfarlane & Co., ironfounders, Glasgow and London. It has been fixed, and the base constructed by Mr. J. L. G'asscock, of Bishop Stortford. The structure is 9 ft. 6 in. high, and consists of four columns, from the capitals of which consoles, with griffin terminals, unite with arches formed of decorated mouldings, encircling ornamental shields. Surmounting this is an open and highly encircled dome, on the apex of which is a public gas-lamp, with three burners. Under the canopy stands the font, crowning which is a gilded stork, with a basin 2 ft. 6 in. in diameter. There are four supply taps, with the same number of drinking-cups. The water is not continuously running, being held in suspension by means of a "bib-valve," one being placed under each tap. The cup is taken in the hand, and while the back of it is pressed on the valve, which will immediately cause the water to flow, the cup is sufficiently wide to receive water from the tap, and but one hand is required as if the water was continuously flowing. By this means a far greater degree of cleanliness than usual is obtained about the base of the fountain. The base consists of three steps of Portland stone, which surround the fountain, access to it being obtainable from any direction. The topmost step is paved with Maw & Co.'s encaustic tiles, Early English pattern. The chief promoters of the improvement were Messrs. W. & H. Gilbey.

The New Reservoir for Oswestry.—This undertaking is completed. It is situated at the Mount. Its depth from the water-line downwards is 21 ft., and from the water-line to the surface 3 ft., making a total depth of 24 ft. The quantity of clay excavated, which was of great compactness and density, was 43,000 cubic yards, and its removal was equal, in round numbers, to a weight of 73,000 tons, or 140 lb. to the cubic foot, and it was blasted with gunpowder to detach large quantities from the bulk, often bringing down from 40 to 50 tons at a time. These again had to be split by boring and fresh charges of powder. After loosening, the clay had to be lifted to an elevation of 30 ft. perpendicular, before it could be conveyed away to an adjoining piece of land. The works were conducted at first under the direction of Mr. Smith, the borough surveyor, and afterwards under a contract with Mr. Jaynes. Mr. T. E. Mitchell was the engineer, under whose superintendence the work was completed by Mr. McDermott, of Wrexham, a bondsmen for Mr. Jaynes, who had become bankrupt. The present consumption of the town, from all causes, is about 125,000 gallons per day. The three reservoirs will hold upwards of 9,000,000 gallons of water, which will afford 72 days' full supply. During that period 1,440,000 gallons will have flowed in from Penygwelly, giving 11½ days' further supply, and at the end of the 11½ days there will have run in from Penygwelly 230,000 gallons more, or two more days' supply will have flowed in, making a total, including that which keeps coming in at the rate of 20,000 gallons per day, of 85½ days' supply, equal to a period of nearly a quarter of a year.

The Present Population of London.—The Registrar-General announces the actual population of London on April 3rd, as 3,251,804. This agrees in the most remarkable manner with the estimates which had been previously weekly made for the purpose of calculating the rates of mortality. The estimate for that same date was 3,247,631! As the registrar justly observes,—"The closeness of the estimate is another example of the consistency of the laws which rule human life and determine English progress." The population of London has increased nearly half a million within the last ten years.

Eastwood Church Competitions, Rotherham.—Thirty-two architects sent in designs for this church, and the committee have selected the design of Messrs. T. D. Barry & Sons, of Liverpool.

The Sewage of Wisbeach.—A committee of the Wisbeach Town Council, appointed to collect information respecting the sewerage works (in consequence of orders sent down by the Home Secretary to provide sewerage for Wisbeach), after visiting Rugby, Warwick, Leamington, Banbury, Bedford, Romford, Haslingworth, Croxson, Aldershot Camp, and the Brigat on Farm, Barking, have issued their report. They state, that in their opinion the best method of utilising sewage may be advantageously applied throughout the entire year to any description of soil either naturally or artificially drained. They consider that a properly managed sewage farm is neither injurious nor offensive. Those living near recommend that the sewage farm should be the town property.

The Tay Bridge.—The contract for the erection of the Tay Bridge has just been signed, and will now be carried out with speed. The firm by whom the work has been undertaken is Messrs. Deberg & Co., London, and the sum for which they have agreed to complete the works is 117,000*l*, being 12,000*l*. It has thus been fixed in an agreement which formerly subsisted with another firm, and which had to be departed from in consequence of the death of one of the partners. Operations are to be begun at the south side of the river, and the piers are expected to be above the water within three months.

Fat Works.—To make pomatum, the first requisite is a perfectly inodorous grease; and to make this grease some premises have been elaborately fitted up in Hatfield-street, near Blackfriars Bridge. In the upper part of the building are situated the various departments for the preparation of scents used in the manufacture of soaps, gages for cutting the same into bars and squares, and presses for stamping. "Violet powder" has a department to itself, in which the ingredients are mixed, and packed ready for the home trade or foreign export. Mr. H. L. Grantham was the architect employed in adapting the premises to their present use.

Board of District Surveyorship Examiners.—The following gentlemen have been appointed by the Institute examiners under Section 33 of the Metropolitan Building Act, 1855:—Messrs. G. Atchison, B.A.; J. Belcher, W. A. Doull, H. Dawson, C. Fowler, C. F. Hayward, F.S.A.; E. P'anson, F.R.G.S.; J. Jennings, Professor Kerr, J. T. Knowles, Professor Lewis, F.S.A.; E. Nash, C. C. Nelson, F.S.A.; H. Oliver, J. Whichcote, F.S.A.; and S. Wood.

A Fountain at Frome.—The public fountain, which the Hon. and Rev. R. C. T. Boyle has presented to the town of Frome, has been inaugurated. The fountain was designed by the Hon. Mrs. Boyle (the "E. V. B." in art circles), and executed by Mr. Joseph Chapman. On a plinth of grey Pennant stone rests an octagonal bowl of red Pennant, from the centre of which rises a cylindrical pedestal, the whole being crowned by an Early English cross of red Devon marble, the entire structure being nearly 13 ft. high.

New Building Compound.—Mr. W. A. Battersby and others, of the U.S., have patented in England a "silicious building compound." This consists of the following ingredients compounded in about the following proportions:—716 parts of silicious matter, such as sand, pounded stone, or grit, twenty-five parts of manganese, seventy-five parts of oxide of iron, sixty parts of kaolin, sixty parts of sulphate of lime, one part of sulphur, two parts of silicate of soda, sixty parts of resin, and one part of petroleum or other hydrocarbon.

Vandalism.—I cut the following from the *Newcastle Daily Journal* of May 22nd. The memory of such things should securely be preserved in your pages:—"Morpeth Old Cross has been sold by the Corporation to Mrs. King, builder, and the work of demolition will be proceeded with as soon as the new Fish Market has been erected at the Old Clock Tower. It is said to be of a style of market-cross architecture of which few specimens now remain in England." A.O.V.P.

A Convict Prison, to be erected by Convicts.—The Government have decided on the erection of a large convict prison in the city of Rochester, to accommodate 1,000 convicts. The new buildings are to be erected entirely by the labour of convicts from Chatham, where there are nearly 1,700 confined.

Portraits.—It is thought desirable by the Institute of Architects that the series of portraits of past presidents, on the walls of the meeting-room, should be rendered complete up to the present time, by the addition of those of Professor Donaldson and of Mr. Breckford Hope; and a subscription has been opened for the purpose. Mr. Charles C. Nelson is appointed treasurer to the fund, and will gladly receive subscriptions.

Christchurch Cathedral, Oxford.—The dean has appealed to the public for additional funds to go on with the restorations, including the exterior, under the care of Mr. Gilbert Scott. The restorations already completed and in hand will have cost 6,135*l*, and the balance in hand will then be 4,068*l*. The internal fittings, floors, and pavement are yet to be gone on with. The substantial repairs of the fabric will fall upon the corporate funds.

Sewage of Warwick.—With reference to a paragraph as to a native guano company, Mr. E. Pritchard writes that,—"It is incorrect to state that the sewage of Warwick has been treated by any other method than that of passing it over the land."

A Grand Drill Review, organised by the Society of Arts, of 4,000 boys, with their bands, will be held by Prince Arthur, in the Horticultural Gardens, on Wednesday, June 14th.

Conversazione.—The conversazione of the Society of Arts will be held on the 16th June, at the South Kensington Museum, instead of the 1st, as originally intended.

TENDERS

For a pair of semi-detached villas at Gladstone-road, Chertsey, for Mr. J. Marriott, Mr. S. Rolinson, architect:—

Maw & Waite (accepted) 2,272 0 0

Accepted for the erection of St. Andrew's Church, Southampton. Messrs. T. D. Barry & Sons, architects. Quantities supplied:—

Greenwood	2,185 0 0
Freestone and Bricklayers' Work	880 0 0
Smallshaw	880 0 0
Cropper's, Joiners, and Iron Work	780 0 0
Duxfield	780 0 0
Stair and Plasterer's Work	358 0 0
Robinson	358 0 0
Plumber, Painter, and Glazier's Work	128 0 0
Boyd	128 0 0

For alterations and repairs at No. 47, Ludgate-hill, and house adjoining, for Mr. J. H. Dunn. Mr. H. G. Gribble, architect:—

Rykes	4886 0 0
Byth	880 0 0
Blackmore & Motley	882 0 0
Capps & Risco (accepted)	834 0 0

For proposed new workhouse, Cardiff. Mr. E. W. Stephens, architect. Quantities supplied by Messrs. Bateson & Hunt:—

Doors	21,740 0 0
Biggs	10,439 0 0
Evans	10,400 0 0
Webb	1,250 0 0
Barnes & Sons	8,733 0 0
Bolt & Co.	9,061 0 0
Bird	9,060 0 0
Jones, Brothers	9,560 0 0
Moorland	9,100 0 0
Price	9,280 0 0
Wood & Sons	8,967 0 0
Smith & Frink	8,469 0 0
Miles	9,400 0 0
Wood	7,030 0 0

For restorations to Church of St. Andrew, Horncastle, Essex, exclusive of flooring and benching. Mr. Ernest C. Lee, architect. Quantities supplied by Mr. Riddett:—

Shearburne (accepted)	21,554 0 0
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For building the tower and spire of Emmanuel Church, Clifton, Bristol. Mr. John Norton, architect:—

Baker	23,883 8 4
J. & J. Foster	8,114 0 0
Thorpe	3,185 0 0
Wilkes & Sons	2,780 19 0
Diment	2,500 0 0

For new store at the Chichester Corn Exchange. Mr. Elkington, architect:—

Gambrell & Sons	21,179 0 0
Johnson	1,155 0 0
Ellis	1,147 0 0
Light	1,067 0 0
Marshall	1,023 0 0
Barnes & Moody	1,010 0 0
Quick	833 0 0
Gammon (accepted)	880 0 0

For the rebuilding of premises, Nos. 6 and 8, Bow-lane. Mr. Theodore K. Green, architect:—

Ramsay	22,164 0 0
Swell & Sons	2,138 0 0
Kill & Keddell	1,997 0 0
Browne & Sons	1,880 0 0
Hendray	1,837 0 0
Wicks & Bangs	1,818 0 0
Browne & Robinson	1,808 0 0
Scrivenor & White	1,802 0 0
Sharrington & Co.	1,811 0 0
Goodman	1,745 0 0

By order,
Office of the Local Board of Health, Trinity road, Sheerness,
May 11 1871.

The Builder.

VOL. XXIX.—No. 1478.

The Architectural Conference.



OLLOWING up our previous notices, we have to say that the meeting held on Thursday, the 25th of May (after the interval of a day allotted for the benefit of those wishing to attend the "Isthmian games"), for the consideration of constructive and scientific subjects, turned out one of the most interesting as well as practical of the series. Professor Donaldson took the chair, and in a short address alluded with sorrow to the destruction of the public monuments in Paris, expressing his conviction that she would again rise from her ruins grand and glorious as ever. He then proceeded to treat of the various materials employed in the art and science of construction, the warming and ventilating of buildings, and other matters connected with building and the business of the architect.

Mr. Fowler initiated the proceedings of the printed programme by reading, in the unavoidable absence of Professor Lewis, that gentleman's remarks in regard to the construction of fire-proof floors. He drew attention, in the first place, to the different conditions under which fire-proof construction had to be carried out in warehouses as contrasted with private houses; the latter containing usually only a small proportion of readily-inflammable materials, while the former were often closely packed with materials of such a nature and in such quantities as to give rise, when inflamed, to a heat so intense as to melt iron and even vitrify brickwork. Dwellings might be made to a great extent fireproof by the use of solidly-pugged floors, even between wooden joists; but, of course, more effectually with iron joists, provided the latter were carefully shielded from the immediate action of the flames by a good coat of plaster below, rendered on the pugging so as to combine with and form a solid mass. The difficulty, practically, in this case, was to bring the pugging down to a low enough point between the joists to enable the plaster to be rendered up to it; some other means of supporting the pugging than the usual fillets nailed between the joists would be requisite. The thin scantlings used in modern house floors and roofs were very prejudicial to the attainment of fire-proof qualities; a thick joist might be charred over its external surface to some depth without losing its bearing capability, while a thin one would soon lose all its bearing substance under the same circumstances. Stone must be looked upon as one of the very worst fire-resisting materials, cracking and splitting in all directions under the action of heat; he had even known a case where stone stairs were totally destroyed, while the landings, which happened to be of timber joists and pugging, were left practically uninjured. In

warehouses iron, too, must be looked upon as a most prejudicial material, if in such a position as to be exposed to the direct action of flames, as the great heat often generated in a burning warehouse causes the iron to twist and expand and assist in the destruction of the walls. On the whole, he believed no construction was so near being entirely fire-proof, for warehouses, as simple brick walling and vaulting, which would resist a heat such as no other building material could survive. Mr. Fowler followed with a paper of his own on "Fire-resisting Materials, with reference to the new Building Act." The materials regarded by the Act as "fire-resisting" were the hardest timbers, as oak, teak, &c.; slate and tiles; flag stones when used as a pavement with a vault and solid backing under them; granite and stone. These two last could not be regarded as *constructively* fire-resisting. The same remark would apply to slate. A mode of preventing the spread of fire was suggested in the straining of iron wire under the joists, with concrete on it between the joists and plaster on the under side. The cost in excess of ordinary timber flooring had been estimated at about 35s. per square. Mr. Fowler brought forward also a specimen of new fire-resisting construction for beams and bearers, manufactured by Messrs. Allen & Sons. This consisted of a cement concrete formed of a small proportion of Portland cement, and a considerably larger quantity of breeze, worked up into the shape of a kind of concrete joist with a stiffener of thin plate-iron in the centre. From the effect of the concrete in always keeping the plate of iron precisely on edge in the direction of its greatest strength, a very thin piece of iron might be depended on for giving a great amount of stiffness. Only 10 ft. or 12 ft., however, were named as the maximum bearing for a joist of this kind; and as the ends of these must rest on some larger (probably iron) beam, the question of stability of the construction against fire seemed, after all, to turn on the manner in which the main beams, which must be of some more tensile material, behaved. This point was either overlooked or not made by any means clear by the lecturer. Mr. C. Barry read a communication from Mr. Groves, explanatory of a method of constructing fireproof floors and ceilings by fan-groining in cement-concrete. Apparently, however, this could not be, in a strict sense, entitled groining, any more than some so-called arched concrete floors can be called "arches;" they are only concrete worked into the form of an arch or groin, but owing its stability to totally different causes from those which affect an arch. Mr. Hornblower explained the fireproof-floor construction invented by Mr. Cunningham, of Liverpool, which consisted of a series of sheet-iron joists, twisted into flanges the opposite ways, at top and bottom, and placed close together so as to form, in fact, a row of tubular hollow joists, upon which a concrete floor was laid. It had been tried, and made a very good floor. The objection raised by another speaker as to the possibility of unforeseen oxidation of the iron, in a situation where it could never be inspected, was not, however, without weight. Mr. Aitchison thought iron doors, when properly hung and bolted, and especially if double, would generally be found efficient in resisting the action of fire, and that cases of such doors crumpling or bending from the heat were owing rather to the way in which they were hung and fastened than from direct action of the fire on the doors themselves. He confirmed the opinions which had been expressed as to the durability of brick under fire, which he had seen stand where granite would not. Neither slate, terra-cotta, nor cement could be depended on. He had seen piers of the latter material crack and give way just like stone. As a coating, lime gauged with plaster of Paris, would stand without cracking. He also suggested the use of an iron jacket round columns,

with an air-space between, as a preservative of iron columns against fire. Mr. Parker thought the nearer we came to the Roman system of building the more proof would our walls be against everything that might tend to disintegrate them. Messrs. Allen's system of fireproof joists, brought forward by Mr. Fowler, was substantially the same as the Roman system of using thin tiles, imbedded in concrete. Subsequently Mr. Aitchison followed with a paper on the progressive use of iron in building, the general aim of which was to advocate the increased use of iron in modern buildings, as essentially the modern material of the architect, to be adopted and made use of by him in the best and most artistic manner possible; urging that the Mediæval builders, whom so many of us were now professing to copy, would have done the same had they possessed the knowledge and means for working iron on a large scale, and as the constructive basis of buildings. The constructors of such works as the Crystal Palace and some of the large modern railway station roofs were the really modern Mediæval architects, taking the same place in regard to the present day that the builders of our cathedrals occupied in the thirteenth century. That to imitate the style of Mediæval buildings is to act on a principle directly contrary to that of the Mediæval architects themselves we have often pointed out; but as to what they might possibly have done with iron, we can only say that had they used iron roofs, for instance, in those days, it is very probable that we should know nothing of it now, inasmuch as no trace of them very likely would be left; and Mr. Aitchison and others who use this kind of argument about iron forget that, whereas wood and stone are natural substances, used by us without any chemical or mechanical alteration in their nature, and merely shaped to the desired form, iron is in comparison an artificial substance, which undergoes important changes in its composition before being ready for use in building, and that therefore we have no *a priori* assumption in favour of its enduring qualities, while all experience so far (short as it is), goes to show it as a most capricious and untrustworthy material, requiring great care, and frequent examination even to ensure it lasting *in statu quo* for the limited time which any iron construction has as yet survived. Whether the rapid changes in the conditions of modern life and property may be such as to render unnecessary and useless anything like monumental endurance in buildings, is a question which may be fairly put, but which we trust may be answered in the negative. In reference to this subject, we cannot but concur with Mr. C. Barry, in feeling somewhat tired of hearing the Crystal Palace constantly mistakingly cited as an example of scientific iron architecture. In his paper on the strength of certain building materials, Mr. Barry gave some very valuable schedules of the results of sundry experiments on the strength of terra-cotta, bricks, and cement, which will, doubtless, be published; the results of experiments on the first-mentioned material, in regard to resistance to crushing weight, were remarkable, showing a power of resistance, seven and a half times greater than that of an average brick. In reply to a question, whether he had ever known bricks to be crushed in a lower portion of a wall, by the mere weight of the superstructure, Mr. Barry replied in the negative, except with regard to one instance when, from partial subsidence in the foundations, the bricks in the lower portion of a wall were exposed to an unequally-distributed pressure on certain points; but this might be looked on as an exceptional case. The matter was further discussed by Mr. Mackinnon, of Monte Video, Mr. Hall, Mr. Wyatt, and Mr. Parker; the latter, alluding again to the method of construction adopted by the ancient Romans. Some details

given by the same speaker, with regard to the operation of a gas cooking-stove, on what was said to be a new principle, were felt to be not quite in place at such a meeting; besides, that the principle described was not altogether new, though some of the mechanical details might be.

Mr. Wonnacott's short paper on the "Use of Concrete as a Substitute for Stone in Walling," was a valuable and very sensible communication; but not the less so that the author did not fall into the error of claiming for concrete more than its real value, as a substitute for stone in certain special cases. Its use must be regarded as a practical, not an artistic expedient: the best and most durable concrete for the purpose, he said, would be that made in about the proportions of 1 of cement (Portland) to 7 of gravel and sand; clay or loam was fatal to its stability. The walls should not be too thin; by building them thin it might be possible to construct them at a cost of 12s. per cubic yard, but a well-built, substantial concrete wall could not be had at a less cost than 18s. or 20s. Estimates put out for public information on this head were very delusive in many cases, and tended to mislead persons about to build in concrete as to the price; such estimates being commonly given independently of the cost of apparatus, &c., which might add a considerable per-centage to the amount, especially as the moulds are soon worn out and require replacing. The material was in the highest degree damp-proof and water-proof; but its occasional partial disintegration in chimney-stacks showed that it was not altogether uninduced by the action of heat and smoke. Sounds, moreover, were very distinctly heard from one room to another of a concrete house. It could scarcely be recommended for localities much exposed to severe frost. Every wall should be rendered in cement externally, and the chimneys parge-plastered inside as in a brick house. On the conclusion of Mr. Wonnacott's paper, Mr. E. W. Tarn read some remarks on the subject by Mr. Blomfield, who thought that cement concrete should not, or need not, be looked on as a "sham," but was a good and useful building material when rightly treated; among other points he suggested that, as a concrete house was necessarily built in several stages, owing to the necessity for raising the apparatus from time to time, the masking of these stages by the use of a differently tinted cement or a differently finished face should be made a part of the design, which might on such a system of treatment be as truthful a construction in its way as brick or stone. Mr. Tarn corroborated, from his own experience, the statements made by Mr. Wonnacott, and alluded to the exaggerated assertions made by patentees of concrete building machines as likely to prove a hindrance to its adoption. A short discussion on the subject brought this very interesting and practically useful meeting to a conclusion.

The dinner on Thursday passed off satisfactorily. The President of the Institute occupied the chair, and discharged its duties agreeably and well. Colonel Scott (of Albert Hall) returned thanks for the army; and Mr. Vignoles, president of the Institution of Civil Engineers, who spoke vigorously, and said he was over eighty, for the volunteers. Professor Kerr discoursed at some length with reference to the Conference generally. Mr. Beresford Hope, with much geniality, gave the health of the chairman. Sir Digby Wyatt proposed Art and Literature, calling upon Mr. Burgess and Mr. Godwin, who both responded. Mr. Owen, of Dublin, spoke for the architects of Ireland, and Mr. Charles Barry, Mr. T. R. Smith, and others, had each congenial themes. Besides those already named, we noticed Mr. Blomfield, Mr. D. Brandon, Mr. Talbot Barry, Mr. Cates, Mr. Christian, Mr. T. O. Clarke, Mr. Currey, Mr. Cockerell, Mr. Edis, Mr. Benjamin Ferrey, Mr. J. H. Hawkswill, Mr. P. C. Hardwick, Mr. Hayward, Mr. Heathcote, Mr. Jennings, Mr. Horace Jones, Mr. Marriable, Mr. C. C. Nelson, Mr. Papworth, Mr. Roudmieu, Mr. Slater, Mr. S. S. Teulon, Mr. Statham, Mr. Worthington, Mr. F. R. Wilson, Colonel Chesney, Mr. Henry Shaw, M. Arles Dufour, and many more whose names, as we are writing wholly from memory, have escaped us. In a figurative kind of way, every one shook hands with every one else, and all went merry as a marriage-bell.

There was an adjourned meeting on Friday morning, not part of the original programme, but which will certainly have to be so on another occasion; for as the intermediate meetings subsequent to the general opening one were nominally "optional" meetings only, for the con-

sideration in each case of a distinct class of subjects, to which the programme was limited, it seems a *sine quâ non* that there should also be provided a general closing meeting, when the sense of the general Conference can be taken, and the conclusions come to at the sectional meetings put into form and ratified. Owing to a tacit feeling of the necessity for such a gathering the Friday morning meeting was called, but not very numerously attended, partly in consequence of the want of time and opportunity to communicate with all the members, who could only be informed of the appointment and time of the meeting by a notice posted in the room. The president of the Institute resumed the chair, and after a good deal of desultory discussion, in the effort to arrive at some definite line of action, it was finally resolved that the Conference should meet again at about the same time next year; it being left open to decide on that occasion whether the future meetings should be annual or not, and where they should be held. In regard to the subjects which had been specially before the meeting, it was resolved that the question raised as to professional practice and charges be referred to the professional practice committee, with the addition of Mr. Watson and of Mr. Hine, the president of the Architectural Alliance. The question as to competitions to be referred to a committee of five, consisting of three representatives from the three branches of the Institute (Council, Fellows, and Associates), one from the Architectural Alliance, and one from the Architectural Association. This committee to fully consider the subject of competitions, and be prepared at the next conference, to submit to the meeting a form of conditions, approved by the Institute, on which alone all architects connected with, or recognizing the Conference, should be willing to compete. At the suggestion of Mr. Seddon, Mr. Douglass Mathews was appointed as an additional member on the first committee (professional practice), to correspond with, and obtain the views of, the provincial architectural societies, and represent them at the committee, and Mr. Spiers was requested to undertake the same task in conjunction with the members of the committee. The question as to the taking out of quantities and the employment, and remuneration of surveyors for so doing, and other matters connected with this subject, also to be referred to a committee of five, to whom were added Mr. A. Cates and Mr. Rickman, as surveyors, to assist the deliberations of the committee. On the subject of education it was resolved that it was not desirable to take any further step at present. Mr. E. Sharpe caused some amusement by bringing forward a proposed rule for the regulation of perspective drawings in architectural competitions, contending that such drawings should in all cases be admissible, but only under restrictions; that one colour only be used; and that all "horses, dogs, carriages, &c." be disallowed in the drawings, and that any human figures introduced should be on the correct scale, and not be falsified in scale in order to exaggerate the size of the building. After some little discussion, however, it was decided that the point could not be argued on that occasion, but that it be referred to the competitions committee. Votes of thanks were then unanimously passed to the President of the Institute, Mr. T. H. Wyatt, for his address, upon the motion of Mr. Thompson, of Glasgow, seconded by Mr. Hine, of Nottingham; to the committee of sections, proposed by Mr. F. R. Wilson; to Mr. O. L. Eastlake, the secretary of the Institute, who worked hard throughout to ensure success, proposed by the President; and the meeting was then declared officially closed.

At half-past two, on the same day, about fifty members of the Conference assembled at the Albert Memorial in Hyde Park, where Mr. Coad exhibited the working drawings, and explained the construction from the foundations to the summit, and by means of large photographs of the monument in its present state propounded the whole scheme of its decoration. Mr. Skidmore explained the principal features of the metallurgic ornamental decoration. The party then entered the temporary wooden sheds which shelter the marble workers at the base of the monument, and Mr. Armistead and Mr. Phillip exhibited and explained, respectively, the groups which they were executing on the podium.

At half-past four the members crossed over to the Albert Hall, where they were received by Colonel Scott, who, in his study, explained, by the working drawings and diagrams, the various places which the building had gone through,

from the time when the form of it was first designed by the late Captain Fowke, to be straight-sided with curved ends, until it had assumed the oval shape finally designed and carried out by himself. Colonel Scott then described the difficulties which beset him in securing good acoustic properties for the Hall, explaining that after adopting wood linings for the walls and for the coives of the ceiling, in preference to all other materials, with success, he found it necessary to provide a velarium below the glass and iron roof. Experience of the velarium had proved to Colonel Scott that the lining of which it was composed was too thin: he had therefore starched it, and intended to starch it again, and finally to iron it. After describing the various schemes he and others had proposed for the iron roof, Colonel Scott explained that though he considered the light iron web-like form finally adopted was the best, yet if he had to execute it again he would put half the amount of iron into it. After ascending by the ladders the parapet of the hall externally, and entering and examining the iron roof above the velarium, and descending to the vaults to inspect the steam bellows and apparatus for the organ, the members, before leaving, passed a hearty vote of thanks, on the motion of Mr. F. R. Wilson, as president of the Northern Architectural Association, to Colonel Scott, for his great courtesy to them.

The members then dispersed; and thus the Conference of Architects for 1871 was pleasantly and finally closed.

We commented last week on the necessity of holding the Conference annually in order to make it of much real service, and were glad to find the meeting, since those remarks were written, taking the first step to a similar conclusion, by deciding on calling one next year. The second conference will probably be better attended, and productive of more practical result, than the first. Those with whom the management rests will see their way better by the experience of this occasion; and we should suggest that next year fewer subjects should be undertaken, and a longer time given to each instead of running over such an extent of ground within limits as to time, which only left opportunity for a few hasty remarks from each speaker. Other points for improvement will, no doubt, suggest themselves, especially with reference to the press; but in the meantime this Conference has been a very fair success so far, in only as the means of making the *premier pas* towards a better "solidarity," as the French say, among the architects of this country.

BUILDING APPLIANCES

AT THE INTERNATIONAL EXHIBITION.

SOME large and well-considered machines for the manufacture of bricks and tiles are to be seen in an annex to the Eastern Gallery. This range of halls, as our readers are aware, is chiefly filled with numerous, and we may almost say glorious, specimens of the art of the potter. The power of man to give permanently graceful form to such a material as clay, to tint it with the richest hues ever produced by art, and to clothe it with the lustre of jewelled enamel, or the very iridescence of the pearl-shell itself, has never been more admirably illustrated than in the present Exhibition. It would be hard, indeed, to award the palm among the four or five English manufacturers who contend in such noble competition. A blue ovoid vase, painted with Cupid by Minton, is one of the products of which the memory lingers the longest in the mind. A exquisite case of cabinets, or small *décorés* set one in royal blue, jewelled and gilded, and others painted in rose and other tender colours, which, perhaps, the most attractive of any in the interior gallery. Without, in the arcade, the specimens of the application by Messrs. Doulton of pottery to industrial purposes are so numerous, and so excellent, as to teach us that our manufacturers are not altogether dependent on our supply of iron. That our ceramic manufactures should, since 1851, have made such giant strides in two opposite directions, attaining a delicacy as beautiful as that once special to Dresden, even to Royal Sèvres on the one hand, and strength, solidity, and pliancy of form equal to that of the best castings of Staffordshire, on the other hand, is a subject for national pride, and, for honest self-congratulation.

The first detail that commands the profound attention of the builder we take to be the machinery for the manufacture of bricks and

ies. Two or three machines for this purpose demand careful attention. We fail to find them in their proper place in the catalogue, the involved perplexity of which document is a matter of general lamentation. Nor are they at work in such a manner as to enable a judge to speak positively as to their respective merits. But it is evident that great thought and great skill have been applied to the design and the execution of this powerful machinery. The clay, as to the mechanical tempering of which we have now little difficulty, is forced into form by powerful screws,—archimedean screws they would be naturally, though not quite correctly termed,—it is carried forward on revolving bands, it is cut by wires. In rapidity, in certainty, in solidity, and thus in economy, of work there can be no comparison between the mechanical process of brickmaking and mere human labour. The latter, as we have before had occasion to remark, is perhaps the most brutish process carried on by man in connection with industrial art; at the same time it is one in which the greatest interest has been defended with a more reckless and savage persistence than has been the case in almost any other branch of productive industry. No one who visits the South Kensington Exhibition can doubt as to the ultimate triumph of the mechanical mode, a triumph as much to the advantage of the wretched brick-bonders themselves as to that of bricklayers, builders, and occupiers of houses; but which the former are far from regarding in that light.

With the brick-making machines proper are to be seen simple and elegant machines for the production, by pressure, of encaustic tiles, and of tesserae for mosaic in terra-cotta, fit for the urnace. The perfect accuracy of these little engines, and their ready obedience to the hand of the workman, are little less than magical. Close by is an apparatus which has attracted a larger number of admiring spectators than perhaps any other exhibit within the building. It is the oldest human invention, so far as history, or as these relics which are the materials for history yet unwritten, teach; and, although very recently it has received no inconsiderable improvement in detail, it is still wonderfully simple. There is nothing in which the mathematical and the casual, the mechanical and the artistic, the rigid action of the machine, and the every-varying skill of the designer, enter into such equal and intimate partnership as in the case of the potter's wheel. A skilled workman, who has for years been in the employ of Mr. Doulton, charms all who watch his ready fingers by the magic swiftness with which the whirling clay obeys his touch, and the more than theatrical transformations caused by the toil of himself and his boy. It would not be at all unworthy of the directors of the Exhibition if a small collecting-box were placed in the neighbourhood of the potter's wheel, to enable the many visitors who would rejoice in the opportunity to throw in a obolus by way of acknowledgment of the cheerful civility and steady industry of Mr. Doulton's workman. It is hard for a man to give so much pleasure and so much information to so many people merely for his modest day's wage.

The manufacture of a short, straight, glazed obacco-pipe, by merely inclosing a bit of clay, roughly modelled into form, in an oiled mould that closes with a hinge, pushing down a thumb-shaped plug of steel that hollows the bowl, and pushing forward a horizontal needle that pierces the stem, is another process that excites a strange fascination over visitors. The readiness, nay, eagerness, of the English public, to educate themselves by the eye as to manufacturing procedures, is amply illustrated at this part of the galleries.

The visitor to the Exhibition, having passed the ugly passage (temporary, we trust), which is not the more agreeable for being called "The Fernery," enters a sort of vestibule, which may be said to be devoted to mourning the absence of French contributions, and the obituary, for the present moment, at all events, of that part of the map of Europe of which the title,—Kingdom, Republic, Empire, Kingdom, Republic, Empire, and so on *ad caput*, has been undergoing a cycle of eighty years of change. A very graceful piece of sculpture,—a half-draped, seated girl, contemplating a cameo, might be taken to represent the mourning genius of French art. There is a yet more pregnant satire in the figure, admirably executed in bronze, of the *Cigale qui avait chanté tout l'été* of La Fontaine, the winter-caught wayfarer, drawn with such pathos by Gustave Doré, in his illus-

tration of the fables of the French *Æsop*. An admirable, though realistic, figure of a Savoyard boy, in the same material, stands next. Then come two busts, executed, it is true, with marvellous skill, and admirable simulation of life, but the proper locality for which is that presided over by Madame Tussaud, and not a gallery sacred to the fine arts. Having passed the spot where France is thus so conspicuous by her absence, we enter on the Eastern Arcade, filled, or rather lined, with specimens of various works in terra-cotta, at its southern end.

To fish out the items in this interesting arcade from the troubled waters of the Official Catalogue is scarcely possible. Every distinct catalogue-writer seems to have followed his own plan, or his own no-plan, of arrangement; and the articles themselves have been placed rather as furniture in a room than as exhibits in a museum. In English sculpture, for instance, while the objects are scattered widely over different galleries, the numbers which indicate them are arranged in the alphabetical order of the artists' names. But we find no such rule to hold in pottery, nor does there seem to be anything but haphazard in the order, or no order, followed. Neither are the tiles, when found, descriptive.

The first specimens of structural and decorative terra-cotta that strike the attention in the East Arcade come from the manufactory of Messrs. Doulton, of Lambeth, contributors who are numerically the first of our English potters. Moulded bricks and architectural dressings of every kind; tazas, vases, and statuettes for garden decoration; medallions for insertion in walls; ornamental chimney-pots for the service of those slovenly architects who build, as is the custom of our country, chimneys that smoke two ways, viz., into the outer air and into the rooms;—all these are furnished by Messrs. Doulton, in clay of a very agreeable colour and texture. Wall copings and cornices, air-bricks, pedestals, terminals for fountains enlivened by models of cranes, flower baskets and pots, key-stones, pier caps, balusters, ventilators, and window-heads are among the objects as to which, in our climate, the pottery of Messrs. Doulton will very advantageously replace stone. Between those products of greediness and scamping which are now euphemistically termed bricks, and burnt clay such as this, there is almost as much difference as between the amorphous and the crystalline forms of carbon, the anthracite and the diamond.

The Watcombe Terra Cotta Clay Company exhibits articles of a somewhat similar nature to those produced by Messrs. Doulton. This company possesses both a light-coloured and a full red clay; and by the combination of the two materials very good effects may be produced. It seems that the clay of the Watcombe Company is susceptible of a far more delicate and artistic treatment than their moulders generally have known how to apply. In confirmation of this view may be observed some specimens of flowers, modelled with more than Oriental patience, which contrast with the rather unfinished surface of some of the medallions. Some fine bold specimens of terra-cotta from Prussia, follow next in the arcade, but will be sought for in vain, or at least have been sought for in vain, in the catalogue. Then follow some good samples of what is called glypto terra-cotta, in which an incised pattern has apparently been produced by pressure, from the Whitwell Colliery, also a desideratum in the catalogue. The ferro-metallic clay, for architectural roofing and ridge tiles, specimens of which are exhibited by Thomas Poake, resembles cast iron in hardness and colour, and no doubt enormously exceeds it in durability, as incapable of rusting. It resembles those productions of our earlier brick-fields, of which it need to be said that they would last for ever, and mend the roads afterwards. Air bricks of a new design, vases, pedestals, and other objects, in red and white terra-cotta, are exhibited by James Stiff & Sons, as also highly vitrified chemical apparatus, pipes, chimney funnels, and a covered hospital chest in wooden case, with water lute cover. Similar objects are exhibited by W. J. Holland & Co., of a very delicate white clay. The specimens, however, have either been treated with neglect, or there is some element in the clay which spoils the purity of the work. A good collection of works in terra-cotta is exhibited by James Pulham. Among them is one, not to be found in the catalogue, which possesses great beauty, and special interest for the builder. It is a built window-setting, in moulded blocks of white terra-cotta, equal in appearance and superior in

durability to most stone used for similar purposes, and ornamented by a mask and conventionalised floral ornaments, executed with unusual taste, as well as skill, in a red clay. It should be compared with another, of numerous mouldings, returned in a round-headed arch, with a mullion pillar of terra-cotta and two small internal semi-circular heads, executed in out or moulded brick. This pretty little window is from the Farnham works.

The Patent Plumbago Crucible Company exhibits Morgan's patent crucibles for melting and refining metal, and nests of round and triangular clay crucibles for refining and gold-beaters' use. There are also melting and muffle furnaces, and flint-glass crucibles. Some gas-retorts, of ribbed fire-clay, manufactured by the Farnley works, near Leeds, are very noble specimens of the potter's art. There are some good glazed bricks from the same makers. We do not find in the catalogue, or even in the index, the name of Chance Brothers, the well-known glass-makers, who exhibit not only specimens of their retorts, but samples of the "pot earth" of which they are made. This juxtaposition of the raw material and of the manufactured article is of the utmost value, in an educational point of view, as regards the instruction of intending colonists, or persons interested in developing the resources of new districts of country. For the other articles, the excellences are so varied, and so equally balanced, that in most cases the question of carriage will determine that of supply. But we cannot doubt that the stimulus that will be given, by the concurrent opening of the graceful new building by Mr. Waterhouse, and of this fine collection of architectural objects in terra-cotta, to the employment of that material in domestic architecture, will be both immediate and permanent. Good specimens of terra-cotta are also sent from Bridgewater, from Norwich, and from Ipswich, to which the catalogue fails to give proper reference. Their use will be chiefly local, except in the case of the very excellent moulded bricks for chimney-stacks, after the fashion which prevailed in England from the reign of Elizabeth till the commencement of the last century, when the great storm overthrew so many of these structures that the comfort of our domestic architecture has ever since been seriously diminished, this important feature of a house having then apparently gone out of fashion. These bricks are from the Norwich firm.

Attention will be given to a concrete wall, known as Parr and Strong's Combination (names not in the index) in which a hexagonal brick with a circular opening in the centre, is filled with concrete, and the surface of part of the wall is rendered with one, or with two, coats of Selenitic mortar. A short description of materials and statement of cost, ought to be printed and annexed to any specimen of work that is at once so original and so deserving of notice as this. The system, our readers will remember, has been illustrated in our pages. We must recommend those who visit this arcade for the purpose of selecting terra-cotta manufactures, to use their eyes with diligence, and not only so, but to make full notes of any as to which they wish to make any further inquiry.

Among the decorative terra-cotta for architectural purposes in the arcade, is arranged a collection of can-shaped bottles, ale-bottles, jars, and similar specimens of stoneware for commercial purposes, chiefly supplied by Messrs. Bailey, of Fulham, Messrs. Doulton, and Messrs. Stiff & Son. They may all be of equal excellence, although for beauty they follow the order in which we have arranged them. The Fulham stoneware is of a particularly good tint. We suppose that it comes from clay that bears some relation to the source of the famous old Fulham china. For all liquids that can be satisfactorily kept in earthenware, these skillful manufacturers appear to have provided appropriate vessels.

Before passing to the interior of the gallery, which is chiefly devoted to domestic pottery and porcelain, we must cross, if we continue our observations of the principal features of the Exhibition illustrative of architecture, to the opposite side of the quadrangle. In the space to the west of the Western Gallery, in which are to be seen the engines that give action to the shafting within that series of apartments, is a wooden building, approached from the machinery-gallery, which is a full-sized model of a school-house, adapted for small country villages, as erected in Sweden. It was designed for this exhibition by P. J. Ekman, and manufactured at his joinery-works at Stockholm. It is admirably

suited for the purpose for which it is intended. The joiner's work has a lighter and more highly finished character than is ordinarily to be found in countries where, under a severe climate, rough timber forms the main bulk of most of the buildings. The Royal Swedish Commission has filled this species of Swiss cottage with models and examples of school-fittings and furniture. There are desks for the pupils, diagram-boards for the masters, and apparatus for teaching of every description. A careful examination will well repay the expenditure of the time it demands, to all those who take practical interest in the education of the young.

On the same side of the Gardens, but in the gallery leading to the refreshment-room, is to be found a model which possesses special interest for ourselves, and also, we trust, for our readers, as being an attempt by an Italian inventor to carry into effect an economy of that enormous force to which we some time since called attention (when the question of the exhaustion of our coal mines was under discussion), as an illimitable source of motion and of calorific power. The model is called the flux-motor. The inventor, or at least the writer of the little illustrative pamphlet, is Ferdinando Tomasi. The invention is stated to be patented in England, France, &c., &c., the countries indicated by the two et-ceteras being left to the imagination to supply. There is no doubt that we have here the nucleus of a very elegant and meritorious invention. The mode in which the tidal force is rendered available for motive power is by the compression and expansion of air. The little pamphlet which illustrates the model, and which contains a lithograph of the apparatus, although not written in Italian, can hardly be said to be written in English, and the explanation has some need of being explained.

The idea, however, is this. At any convenient spot near the sea-shore, in districts where the tide has a certain degree of rise and fall, a closed reservoir is to be constructed of iron or of adequately strong masonry, of which the bottom is at, or a little below, dead low-water mark, and connected with the sea: the top is level with the extreme high-water level of the spring tide, and a horizontal division or diaphragm is constructed half-way between the two. A vertical pipe or pipes pass through this diaphragm to near the bottom of the lower compartment. Connecting pipes are led from the upper part of each of the superimposed compartments, and connected with the working cylinder of an air-engine.

As the tide rises, the air in the lower vessel is compressed by the weight of the column of water, which rises, with the tide, through the vertical pipe, and fills the upper part of the reservoir. The compressed air is allowed to pass through the lower connecting-pipe, and thus drives the air-engine, the power being proportionate to the pressure. When the tide has reached its height, and begins to fall, the connecting-pipe is closed with a stop-cock, and the pipe connecting the upper chamber with the working-cylinder is opened. The water descends, by gravity, together with the external tide, thus leaving a partial vacuum in the upper chamber. The pressure of the atmospheric air to fill this vacuum gives motion to the piston of the air-engine, which thus continues to work during the fall of the tide.

The inventor, accustomed, we conclude, to the tideless phenomena of the Mediterranean, does not speak with the air of a practical man. Indeed, so little was he able to calculate the pressure on his model, constructed, he says, on the scale of 2 1/4 in. to the foot, that the glass flow of the mimic tide was unable to resist the pressure, and the metal reservoir has been bent out of shape by the same agency. The little engine works merrily enough. The height of water, which is turned on from the mains, is indicated by gauges. Much consideration has to be given to the subject before it can be regarded as a working method. But that consideration will be rewarded. The use of air as an intermediary, in transmitting the force of oceanic tidal gravity to machinery, is indisputably possible. And where the attainable power is unlimited, and the cost is that of machinery alone, the motor being a natural force, it is evident that such an amount of power may be obtained as to make the comparatively low pressure per inch adequate to the performance of any required amount of duty. We recommend the invention of Signor Tomasi to the attention of English mechanics, and, more especially, those of our great seaboard towns.

THE VALUE OF LAND IN LONDON.

At the ordinary general meeting of the Institution of Surveyors, May 22nd, Mr. Edward T'Anson read a paper on "London: its Commercial Centres, and their Influence on the Value of Land." We must confine ourselves to a portion relating to the latter part of the subject.

I might easily extend these observations as to the markets and manufacturing districts of London; but what I wish more particularly to point out is the influence which these great centres have upon the value of property. To be in a market is, we all know, of great importance; it is something to be in London, itself one vast emporium and mart, but it is more still to be in the great market itself. For this reason, the land in the great market of London,—the money market,—is the most valuable land in London, and perhaps the most valuable land in the world. What do we observe in the hoarding round the new building now erecting at the corner of Queen Victoria-street and the Poultry?—little boxes, where sellers are established in the vast line of traffic which passes this locality. What rent they pay I do not know; but I do not doubt it is something considerable for mere standing room in the midst of commercial London.

Something like 40l. per superficial foot for the freehold is, I believe, the highest price obtained for land in this great centre; but this is an exceptional case, and probably about 30l. may be stated as the average maximum value which ground has yet reached in the very heart of England's metropolis. This large value, however, extends over a very limited area. It comprises a part of Cornhill, but hardly extends beyond Finch-lane, to the eastward, or westward beyond the Liverpool, and London, and Globe Insurance Offices, at the corner of Lombard-street and Cornhill.

The highest quoted value of land in my experience was in Lombard-street; but, as before stated, I consider this quite exceptional. Lombard-street itself, in its best part, would not exceed two-thirds of the value of the land in Cornhill; whilst, at the eastern end of Cornhill, the land does not reach a value exceeding one-third of its maximum value opposite the Royal Exchange.

Taking, as I do, the Royal Exchange as the centre of the commerce of London, it is in this immediate neighbourhood that land reaches its maximum value. If we go either eastward or westward of the Royal Exchange the value of land rapidly declines; eastward, at the end of Cornhill, it is already only worth about one-half (10s.) per foot what it is worth at the Royal Exchange. If we cross over Bishopsgate-street the value decreases to about one-fourth of the maximum (5s.) and when we get as far east as the Minories the land there has almost reached its minimum value in the City of London.

In Bishopsgate-street Within, where are to be found the great commercial houses of Baring Brothers, Antony, Gibbs, & Co., and one or two more large mercantile firms, the value of land is about intermediate between its value at the eastern end of Cornhill and the western end of Leadenhall-street.

Proceeding in another direction, along the line of Lombard-street, the land here retains its value more nearly through its entire length than it does in Cornhill and elsewhere. Lombard-street is in the line of thoroughfare to the great commercial centres of colonial trade, and, with Fenchurch-street, may be taken at about one-third, or somewhat less, of the maximum value, falling to about one-fourth, or even one-fifth, as it approaches Mark-lane; beyond that point it passes the commercial centres, and rapidly falls in value.

There are now two great lines of thoroughfare tending westward, one leading along Cheapside and Ludgate-hill to the Strand, and the other along New Queen Victoria-street to the Thames Embankment. On the former thoroughfare, about as far west as Bucklersbury, the traffic is the densest in London, as computed by Mr. William Haywood, the engineer to the City Commissioners of Sewers, and referred to in a masterly pamphlet drawn up by him, urging the necessity of opening up new thoroughfares in the City.

As far west as Bucklersbury, the land in the Poultry, especially on the south side of the street, attains very nearly its maximum value. A very recent letting, at the corner of New Queen Victoria-street, will attest this assertion. Beyond Bucklersbury, the price gradually falls.

I have hardly any data precise enough to give an exact proportion, but I am, probably, safe in saying, that along the western part of Cheapside, and (as far as the western end goes) of Ludgate-hill, the land hardly realises more than one-fourth of its maximum value. Along the Strand, as far as Charing-cross, about one-sixth is probably the per-centage, although, perhaps, this is rather low for corner situations.

If we take the new line of Queen Victoria-street, from the Mansion House to Blackfriars, there have already been sufficient dealings in the land bordering on the street, to prove that the value rapidly declines in proportion as we leave the great centres of value and commerce. The extreme eastern portion of the street fully maintains the maximum value; but it falls to about one-half a very short distance westward, and from one-fourth to one-fifth at the western end of the street.

If we follow the line of Cheapside in the direction of Holborn, the value of land still decreases as we go westward, until—notwithstanding the impetus given by the magnificent viaduct, which now blots out what was for long that great disgrace to London, the Holborn valley—the land hardly realises one-fourth of the maximum value; although in one instance (a corner plot) it reaches about one-third. Southward of the Royal Exchange, in the narrow lanes which, until they were cut in two by the opening of King William-street in 1851, were very unimportant thoroughfares, the land reaches about one-third of its maximum price, until at the southern end of those lanes, next the river's bank, its value does not much exceed one-tenth of the maximum, and that only in the portions nearest to London Bridge on the west.

Northward of the Royal Exchange, except immediately adjoining the Bank,—that is to say, in Bartholomew-lane, Throgmorton-street, Lothbury, and Tokenhouse-yard, which are in close proximity to the money market,—the land does not exceed about one-half of the highest value, and beyond that it rapidly falls, until, in Finsbury, it realises not more than from one-fifteenth to one-twentieth of the full value.

In Bishopsgate-street Without the value falls rapidly, and in the small streets running westward out of Bishopsgate-street, such as Smith-street and Skinner-street, houses and shops were, until quite recently, when their value had been somewhat improved by the passage of the North London Railway, letting at rents almost as low as the most distant parts of London.

There has always been, and still exists, at almost unreasoning difference in the value of land on the south side of the river and that upon the north side. In the best thoroughfares land on the south side of the Thames scarcely realises one-fifteenth or one-sixteenth of the maximum value of City land; and when at only a moderate distance from the river, and, indeed, when close upon it, it hardly goes beyond one fortieth of the maximum, viz., about 6d. a foot. Immediately adjoining, however, the south end of London Bridge, the land changed ownership by the acre at something over the highest proportionate rate I have just referred to, and in the line of New Southwark-street, in one favourable corner plot, it reached six-twentieths of the full value.

These statements of value, most of which are founded upon my own personal experience, however, only offer to you as approximate. They must always be exceptional conditions, such as corner sites, aspect, light, convenience of access, suitability for special buildings, non-liability to interference by adjoining owners, and so on, as well as the pressing necessities and prodigality of some of the great houses of business requiring extension of accommodation, which considerably influence the value of property in certain localities.

Besides the great lines of thoroughfare I have referred to, converging towards the centre point of importance and value, there are also, I have endeavoured to point out, other centres of foci of value, which are scarcely less valuable than those I have already enumerated. For example, I have recently heard of land, in the centre of the Manchester trade or market, being valued as high as the land in the close vicinity of the Royal Exchange.

It is curious to observe, however, within a short distance the value of land varies. For instance, in Friday-street the maximum value land is asked and obtained; but within a stone-throw of that spot—in Monkwell-street, for instance,—its value falls to one-eighth of the maximum. And in the old City lanes intersect-

by King William-street there is a very notable difference between the value of land on the north and on the south side of that thoroughfare.

The difference between the highest and the lowest value of land in the City may be stated as about 1 to 20; for I take 20s. a foot to be now about the maximum value, and 1s. a foot as about, although not quite, the minimum. I think I am right in saying that land let for residential purposes, in the most fashionable districts of Western London, does not reach more than from one-sixth to one-eighth of the maximum value of land in the City proper.

We are all familiar with the vast differences in the value of property which have occurred in the course of the last half-century. It would not, I think, be at all excessive to say that, in the localities comprised within the before-named markets, the value of land has at least doubled during the last fifty years, and that in the more important trade-centres within the city of London it has been fully quadrupled.

I have purposely refrained from alluding, by name, to any case; but one special instance occurs to me in illustration of my remarks. The Innes-street town had, from a very early period, a wharf in Upper Thames-street, near London Bridge, called the Steel Yard. Here, shut in within their own walls, they had their own mercantile centre and depot for goods, just as, I believe, is still the custom in Chinese cities. The piece of ground covered just 60,000 feet superficial. The Hamburgers, to whom the Steel Yard belonged, sold this ground, through their engineer, Mr. Lindley (who has done much to raise the town of Hamburg from the ruin in which it was plunged by the disastrous fire of 1842), for exactly 11s. a foot, or just what now take to be the minimum value of land in the City. This was not more than some twenty years ago, and a few years since it was sold for, believe, 3s. a foot. The site of the Steel Yard is now covered by Hawke's City terminus of the South-Eastern Railway.

I have no sufficient data with reference to the value of land in other great cities to which I can refer, so as to quote figures, but I have a general impression that land in London has arrived at an excessive value as compared with such other localities, and that it is a value which, so long as we remain a commercial country, will be maintained, and even increased.

I can quote some instances of the value of land in Paris. The land in the new street from the Place de l'Opéra to the Rue de Rivoli was sold, in 1869, at from 68l. to 72l. per square metre for corner plots, or from 6l. 6s. to 7l. per plot, taking 10 ft. superficial to equal a metre. In the Boulevards the land, however, only fetched at the same time 5l. per foot; but these prices are, by no means, I believe, the highest prices for land which have been obtained in Paris.

In the centre of the city (*viz.*, round the Louvre), and upon the inner Boulevards, land sells, if I recollect rightly, quite as much as in any more than, land in London.

THE ARCHITECTURAL DRAWINGS AT THE CONFERENCE.

The invitation to architects to send geometrical drawings for exhibition at the Institute some during the Conference week did not result in anything very extraordinary in the way of an exhibition of this nature, though the whole illustration was interesting, if only as illustrating the various ideas of different architects as to the best method of getting up working drawings; and there were isolated drawings of considerable interest on other grounds. Perhaps what would not strike any observer whose recollection of such things went back a good way, would be the total disappearance of the old style of fine drawing, with hair-like lines, and finished with delicate correctness in every part, but without the slightest attempt at an effective appearance. The contrary extreme, which may be called "blotting-paper" style, and which for a few years was patronised chiefly by some young architects who thought the come of perfection in drawing lay in an appearance of utter carelessness and roughness, has also disappeared; and on the whole an inspection of the drawings hung last week at Conduit-street, leads to the conclusion that geometrical drawing among architects at present is, in the main, in a bad manner, clear and sensible, and very much what it ought to be, presenting a neat and intelligible delineation of what is required,

without waste of time in unnecessary or absurd elaboration. All English architects who visited the gallery would be especially interested in the two or three sheets of details by M. Baudet, for the *Eglise de Bambouillet*, hung on one of the screens, as specimens of the manner of working adopted by French architects in constructive detail drawings. Whether these fairly represent average French architectural drawing we cannot feel sure, but certainly they are admirable specimens, in clearness and precision, of drawing of this class; and we would call attention to the system of giving perspective drawings of some of the points of the construction, or perspective combined with section, which, in some cases, might very usefully be adopted to facilitate the comprehension of the architect's intention by the workman, as well as to enable the architect himself to realise better what he was about. Another sort of interest attached to the beautiful little sketches in Indian ink, of M. Viollet-le-Duc, hung on another screen, and consisting of small representations of foliated capitals, of various designs, made at the works of St. Denis, for the direction of the carvers. These were equally admirable as artistic designs and for the freedom, ease, and rapidity with which the effect had evidently been obtained; the whole design and relief and shadow of the artificial foliage being indicated, in some cases, by a few strokes of the brush. Mr. Porter's small elevations and plan of a very big design for Museum at Kensington, &c., was an instance of what had been urged at one or two of the meetings as to the inability of geometrical drawings to represent a design; as the composition in question, rather pleasing with its centre dome and smaller cupolas, could, from no possible point of view, appear as drawn. A hotel front in French Renaissance style by the same hand, and Messrs. Banks & Barry's elevation of the Piccadilly front of Burlington House, might be classed together as neat drawings of the kind (the latter in line only) like a good many others in the same style. Mr. O. Barry's large drawing, in section and what may be called perspective elevation, of a portion of the front wall of Dulwich College, was a capital specimen of pen-and-ink etching on a large scale. Two or three working drawings for the spires of different modern churches were exhibited, which furnished a good example of what we have before recommended, the union of drawing and specification in one document; these drawings consisting of sufficiently well and clearly drawn illustrations of the external design and internal timber construction of the spires in question, written over with notes and directions, sufficient, as far as our observation was able to go, to abrogate entirely the necessity of any separate specification. Mr. E. C. Robins's plan of the Denmark Theatre in Leicester-square showed a winter garden with fountains and flowers encircling the auditorium; otherwise the plan did not differ materially from other theatre plans, save in an arrangement of having a prompter's box on each side behind the wings of the proscenium; a better arrangement than the usual intrusion of the feature in the centre of the front stage, if only the management are going to undertake to provide two prompters instead of one. The same architect's full-sized details of capitals, &c., for St. Stephen's Church at South Kensington, were good specimens of this style of working drawing, and among the most purpose-like things in the room. Mr. Snell exhibited drawings of Kensington district schools and workhouse, the latter a very sensible plain Elizabethan design in brick, with a modern touch here and there; and Mr. Tarver, in his elevations of Coombe Farmhouse, showed how picturesque a little house might be made out of very simple materials, by a judicious use of wall-tiles and treatment of roof-outline and windows. Mr. Schmidt's proposed "accommodation for the learned societies" showed clever utilisation of an awkward angle in the plan, by shouldering the auditorium of the lecture-theatre into it; and Messrs. Banks & Barry, in their drawing of Holy Trinity Church, Barking-road, exhibited some originality in the treatment of the springing of the timber spire. Mr. White's design for a private country-house would scarcely be passed over by any one with an eye for the picturesque of domestic design; and the plan was worth study too, as a specimen of that irregular Gothic plan which lends itself so well to the domestic arrangements of English houses, combining convenience with opportunities for architectural effect of a quiet, homelike, picturesque order. Mr. Rolfe also exhibited some neat and picturesque drawings for schools, with

chapel attached, where, for the sake of his own conscience, at least, we trust there is an altar just 8 ft. 5 in. long.

We should have wished to see a little more of ornamental and colour detail than was shown on this occasion; what little there was could not be said to be of much interest. The elaborate line-drawing of a design for the decoration of a library, with detail of a Classic type, is one of those things the value of which is almost nil unless the colour design be shown as well as the form. Mr. Aitchison's three chimney-piece designs for various rooms in a mansion were distinctive enough in character, and pretty in the general effect of the (apparently) inlaid floral ornament; but what may be called the architectural portion of the designs was somewhat weak. Mr. T'Anson's sketches of furniture details for the house of the British and Foreign Bible Society (the plans and elevations of which were also hung), were too small and sketchy to be of much interest as matters of study, though suggestive in parts. We entirely approve, however, on such an occasion, of architects sending the actual drawings from which their work has been executed, not touched up or revised, and should be always glad to see specimens of drawing which unite clearness with apparent rapidity and ease of execution. Rapidity without clearness, however, as in a sketch exhibited of a proposed market at Madrid, which was a mere unfinished pencil scrawl, is not what we care to see encouraged either by example or precept. One or two drawings there were, too, which might serve to encourage provincial visitors by showing to what kind of productions the letters F.R.I.B.A. may sometimes be found attached; but enough of that. The idea of an exhibition of geometrical and working drawings was a good one, and perhaps more may be made of it next year, and our provincial friends may be moved to contribute something of interest: we do not remember noticing anything from the provinces among the drawings that were hung; this, however, may have been partly the result of want of accommodation. It would add much also to the interest of the exhibition on another occasion if drawings of the same class, detail and working drawings especially, could be obtained from architects of other countries, besides France; Italy, Germany, or America, for instance. We have, mostly, little practical knowledge of the method of working adopted by our professional confrères of other nations.

THE ROYAL ACADEMY EXHIBITION.*

SECOND in importance, and hardly second in promise and in interest, to the class of paintings that deals with ancient historic subjects and the incidents of Oriental or classic life, must be regarded the group of pictures devoted to English genre. The school which contains such names as those of Hogarth and of Gainsborough appeals with unusual force to the sympathies of the English character. In the mixture of humour with pathos, or in the contrast of incidents of a comic aspect with aspects of grandeur, of pity, or of terror, we have an unrivalled master in our great native dramatist. In the description of the Battle of Agincourt, in the play of King Henry V., the contrast between those conflicting emotions is brought out with the most perfect mastery. In the satiric paintings of Hogarth may be traced the expression of a wit of the same temper, however inferior in rank. The conceptions of Hogarth are usually of a higher order than his execution. In Gainsborough we have the representation of simple, natural incidents, or the portrayal of individual character, effected by a magic touch which evinces true dramatic power. Domestic life, when raised by passion or by pathos above its ordinary level, is especially the subject for treatment by artists who have more guides among English writers than among English painters.

Mr. F. Walker, A., has given, in his "Prisoner at the Bar" (1,168), a dramatic work of a very high order. It is not in the technical excellence of the painting, that the charm of this striking picture lies, but in the depth and terror of the sentiment. The outline and expression of the principal figure linger on the memory like a ghost. In a gloomy, subdued light, which might well be that of an English court of law, in November, a meagre, terrified, guilty woman bonds the glance of her large dark eyes on the face of the accuser,—witness, counsel, or

* See p. 370, ante.

judge,—unseen by the spectator, who is on the trace of her crime. Her poor thin hands nervously twitch and tear the leaves of the rue branches that lie beneath them on the bar, behind which she stands. Figure, face, pose are all full of the same terrible meaning. The indifferent, heedless features of the gaoler, or officer of the court, case-hardened to the sufferings of criminals, heightening by force of contrast the expression of the intense nervous lip of the prisoner. Pleading the picture is not, but instinct with the energy of genius.

On a smaller scale than the last picture, which is nearly life-size, is No. 87, "School Dismissing," by Sir G. Harvey, P.R.S.A., which our northern friends will pardon us for calling a very fine example of English genre—as the term British genre is hardly admissible. It is not, we believe, a new painting. An old schoolmaster, in the costume of a century more picturesque as regards male costume than the present, stands in his schoolroom, deliberately examining the task of an impatient boy beside him. The rout of scholars rushes, with shout and struggle, to the door. Slant sunbeams light up portions of the scene, and glorify the texture of one of the boys' caps, waved in triumph in the air. Two or three culprits are awaiting, with varied expressions of fear or of stolidity, their several meeds of justice. The weak point of the picture is the face of the child on a form to the right of the spectator, which is far from good. The boiling impatience of the boy under inspection is an admirable pathognomic study, and contrasts admirably with the deliberation of the Dominie. Evidence of long study of the Flemish masters, as well as of the influence of Wilkie, is to be found in the subdued browns and greys, and in the limpid finish, of the scene. The picture cannot fail to become popular.

It is not desirable, in a notice limited as to length, to single out objects for unfavourable criticism. Still, the very marked want of knowledge, or heed of the simplest rules of composition, which spoils so many pictures, otherwise of merit, and reduces others to the level of wall papers, can hardly be too strongly insisted on. No one appears more pertinaciously to have listened to evil, rather than to good, counsellors, in this respect, than Mr. Orchardson. The acres of 2½-in. flooring which he gives are rather features for a surveyor's bill of quantities than for any form of pictorial representation. In "St. Mark's, Venice," the cardinal is very truthful and characteristic, but he travels over a great distance of country. But in "A Hundred Years Ago" (196) the artist seems to have experimented, with considerable success, as to how bad a picture his name would admit to the walls of the Academy. In "The Death of Buckingham" Mr. D. W. Wynfield has given the interior of a hall and the elevation of a staircase. Two small female figures are hurried, *par accident*, on the latter, and on a table in the former is stretched out a very inconvenient figure, suggested apparently by a recently-exhibited work of Velasquez. The description, by Mr. John Forster, of the scene represented has, at all events, movement and alarm, but the picture gives, in addition to the furniture, only that which is disagreeable, and that, moreover, as if by mere casual incident.

It is melancholy to find, year after year, the same stock scenes from English history reproduced, like the modified forms of a book of fashions. Mary, Queen of Scots, and Anne Boleyn suffer and die annually on the walls of the Academy. Such trifles as "Wisdom and Garrulity" an admirably-drawn owl, with a scarcely inferior jay, by Mr. W. J. Webb (110), contrast most favourably with such ambitious but ill-considered failures. The birds are all they pretend to be. Mr. Mac Whirter's donkey (404) by the sea-side is another of those admirable nothing. Under the unpretending title of "The Three Magpies" (646), on the contrary, we have a well-treated incident of rustic life, in the good old time when the bride rode from the church on a pillion. If the sky and the water had been better rendered we should have had a charming picture here. The girl's face is delightful. The casket of the good old days of hound and horn lingers in Mr. J. B. Burgess's "Visit to the Nursery." The old squire, who is hospitably and solemnly offered a cup of Doll's tea, is a very characteristic figure, and the mamma is perfectly charming. Mr. E. Nicol has given us rather an aged girl, in "How it was she was Delayed" (18). As matter of years, the delay is not explained; as matter of minutes, or of hours, the half-confident, half-shy face of the wooer is very admirable, and accounts for the

want of punctuality. So is the puzzle of the boy at "The Fisher's Knot" (426). Mr. Faed has hardly given more time to "A wee bit fractions" (150) than is demanded for a sketch. It is difficult to express, in properly conventional terms, the amount of negative success attained by Mr. Armitage, A. Mr. Cope's "Night Alarm," taken from, or else miraculously like, a German engraving in "Reinette Fuchs," however, runs the former artist hard. The very happy rendering of the portraits in "The New Picture" (93), by Mr. Calderon, makes us regret the very awkward composition. On "On the Way to the Throne" this artist has bestowed more careful work than on his exhibits of former years. The motive of the picture is not to our mind. As satire, it is feeble; as incident, impossible. For example, the royal lady, by the eagle jewel by her side, should be either the Empress Queen of Hungary or her martyr-daughter. In either case, the liveries are quite out of truth. The intrusion of the barber at the last moment is altogether unlikely, and unimportant if true. But while the idea is trivial, the execution of the picture is very pleasing, and shows that decided progress which cannot but attend conscientious labour in such a painter as Mr. Calderon.

It is impossible to deny that the element of power is manifest in Mr. Elmore's "Lenore" (164). The sea nymphs are far too substantial,—they should have been mere forms of spray, to consist with the verity of the spectral bridegroom. Lenore's face is good, in itself, but hardly conscious of the extreme peculiarity of her position. But the picture has fine points, and seems to grow on study. There is a good bit of colour in this artist's "After the Siega" (526); his "Judith" (1,120) seems looking round for applause, while earning, or pretending to earn, the galleys.

Mr. Frith's "Salon d'Or" (158) is, judging by the crowd which surrounds it, the most popular picture in the Exhibition. Viewed as art, these crowded canvasses, which rather resemble screens adorned with scraps than true pictures, are scarcely to be praised. The force and finish, the execution of the detail, and the skill with which figure is linked to figure by the by-play of expression (when time is given to minute examination), are such, in Mr. Frith's pictures, as to counterbalance this main evil. In the "Salon d'Or" there is the great advantage of the one ruling interest and passion harmonizing all discordant details; but the finish is not equal to that of the "Derby Day." By what strange chance the name of Mr. Herbert, R.A., has been affixed to the deplorable "All that's Bright must fade" (206) is unexplained. There is much humour and dramatic power in Mr. Horsley's "Reckoning" (234). The creditor looks not too hard to reckon the debtor has not the wit to do. The little pair of aspidochelons, "Monsieur as chauffe" and "Madame as chauffe" (526, 527), would sparkle in a sitting-room. Mr. Mason's "Milkmaid" (553) will charm many. Mr. Marks's "Bookworm," which ought to be called by some name indicating a more general *virtuoso*, is a very creditable work of the new Associate. The expression of the countenance is very truthful, and the colouring harmonious. As to composition,—we will not complete the sentence. There is something fairy-like and antique in Mr. Poole's sketchy scene from "Cymbeline" (312). Mr. Pettie's "Serenader," in the love song, is so faithful to the self-admiration of an Italian *innamorato*, as to lead one to long to kick the hungry fellow in red. But as to the scene in the Temple Gardens (501), horrid feelings arise with reference to the artist himself. We would send this picture after the "thousand souls" referred to by Warwick. Mr. Sant's charming diploma work, "The Schoolmaster's Daughter" (331), is, as it should be, the best of his seven contributions. A good group of children are the "Volunteers at Artillery Practice" (138), called into the field by Mr. Webster, who also has an evident sympathy with his "Robbers dividing the Plunder" (257). Mr. Ward introduces us, with effect, to a phase in the career of Goldsmith as a physician (260), and Mr. J. Ritchie to a very bygone ideal of London and a grave London merchant, sadly amusing himself with angling in the Thames,—rather for barbel than for "Salmon" (261).

Among the portraits are a very happy one of H. R. H. the Princess Louise (286), by the Hon. H. Graves; a lovely group of the little Princesses Louise and Victoria of Wales (243), by C. Bauerle; and two very faithful and happy, though roughly-finished portraits,—J. E. Mil-

lais, R.A. (172), and F. Leighton, R.A. (177), by G. F. Watts, R.A. The beauty of face, delicacy of complexion, and taper-gage of fingers given to each of Mr. Bookner's portraits are unquestionable. But what is the cause of the strong likeness, as though it were a family likeness, between those three lovely women? We cannot omit to notice the three caricatured contrasting portraits of Père Hyacinthe, marked by composed, but not ignoble, fanaticism; Pope Pius IX., a vulgar picture of a mischievous prelate whom it is the fashion in this country to speak of with an entirely undeserved respect; and Mr. Binney, with his air of profound and thankful self-satisfaction. To these should be added a fourth, in the same room, the curiously Medieval portrait of Mr. Clabbar, looking more like a saint than either of the three theological difficulties. To a few pleasing landscapes we have no room to refer. Mr. Vicat Cole has thrown a golden and glorious light over his larger scene, "Autumn Gold" (52), which is hung vis-à-vis to Chill October. The unpicturesque timber-yard selected as a subject by Mr. MacWhirter is placed over the latter landscape. Mr. Danby has lighted up the sea, in "The Day after the Gale" (317), with a magic lustre cast over wave and cliff. Mount Chimborazo (368), by the late L. R. Mignot, has a clear foreground and a fine misty distance. There is motion in the sea, freshness in the gale, and the dance of nature's spray of Mr. Hayes's "Freshening Gale," fishing-boats returning to Scarborough. "Funs from the heights of Taormina" (545) is a fine effective scene by Mr. Brett. The moonlight view of the Pretorium at Neufchatel, by H. W. B. Davis, is a romantic and suggestive landscape.

We have to express admiration of the noble figure of "Odin, the Northern God of War," by Mr. V. C. Prinsep. The hands of the figure have the rare fault (almost merit) of being too small, especially as compared with the feet, but the stride with which the heroic form presses over the snow, the bold and massive draping of the head, and the weird companionship of the ravens, impress Odin very clearly on the memory. With this embodiment of Norse poetry let us compare that of the faith of Southern Europe of the day, in the reverent glance cast upwards towards the mighty dome of St. Peter's by the peasant and his wife, in "Ondanie" (359), by K. Halswelle, A.R.S.A. The weak part of the picture, the clumsy marble Cupid, is true to the spot, although rather too much of it is shown. The peasants are admirable. Mark the Roman beauty of the girl on the ground.

NEW CORRIDOR, MERCHANT TAYLORS' HALL.

THE Merchant Taylors' Company is one of the twelve great livery companies, and is of considerable antiquity. It was incorporated by Edward IV. by letters patent in the year 1466, but was in existence some time previously. The Company's hall is in Threadneedle-street, and was formerly to be seen from the street, but is now hidden by a range of offices erected about twenty years ago by the late Mr. Hardwick, upon the site of some small buildings occupied chiefly by the subordinate officers of the company. This hall is a handsome room, about 80 ft. long by about 43 ft. wide, with tracered windows, and is placed with its longest side nearly parallel with Threadneedle-street, from which it is approached by two corridors, one at each end of the hall.

The original hall was destroyed by the Great Fire, and was rebuilt in 1669-70, the company having sold their plate for the purpose of providing the necessary funds. It is not improbable that some portions of the old hall was spared by the fire, or at least that sufficient of the building was left to enable it to be restored to something resembling its former condition, as the Gothic is very superior to what passed by that name at the time the hall was rebuilt. The design is attributed to Wren who built the chapel and almshouses called Bohun's, or Boone's, at Lee, in Kent, for the company; but this is an error, the hall having been rebuilt by Jarman, the City architect.

The only communication between the western part and the eastern part of the company buildings was through the hall, or by a covert way on the north side of the company's garden. To remedy this inconvenience, it was resolved, in order to give access to the divided portions of the premises, and prevent the hall being used as passage-way, a short time since, to build a corrid-

on the south side of the hall, with lavatories and other conveniences opening out of the corridor. The works have been recently completed by Messrs. Rider & Son, of Southwark, from the designs and under the superintendence of Mr. Edward Janson, surveyor to the company, at a cost of about 2,800*l*.

The new corridor is 7 ft. 6 in. wide, about 12 ft. long, and 10 ft. high, running the whole length of the hall from west to east, and is divided into five bays by piers, with segmental arches carrying the buttresses on the south side of the hall, which it was necessary to remove in order to form the corridor. The two easternmost bays have a range of narrow traceried windows looking into the garden belonging to the company. Adjoining the two middle bays is a projection containing lavatory, dressing-rooms, and other conveniences, and the westernmost bay and the projection adjoining is used as an entrance-lobby to the hall. The building externally is of Portland stone, and the dressings internally of Bath stone. The walls are lined to a height of 3 ft. 6 in. from the floor with panelled veneer set with a moulded capping. The beams and lining of the ceiling are of deal, stained and varnished. The floor is laid with encaustic tiles with emblematical devices, supplied by Mr. McColla. A continuous corbel or cornice runs through the corridor, upon which is inscribed in raised letters the circumstances of the building of the corridor, and the names of the several officers of the company, in which record the name of the architect is very properly inserted; an honour too rarely conferred. The carving was done by Mr. Earp.

The whole of the windows, twenty-five in number, have been filled in with stained glass by Messrs. Heaton, Butler, & Bayne, the cartoons for the figure subjects having been made by Mr. E. M. Allen, and those for the heraldic work by Mr. Metcalfe. The window in the easternmost bay, which is a single light in consequence of a doorway being placed there communicating with the garden, has a portrait of Sir Thomas White, Lord Mayor of London in 1553, founder of St. John's College, Oxford, and a munificent benefactor of the Company's school.

The windows in the central bay on each side of the doorway leading to the lavatory are divided horizontally, and filled in with personifications of the Virtues,—the window in the right containing figures of Valour, Patience, Fortitude, and Wisdom; and that on the left figures of Mercy, Justice, Truth, and Love, surrounded by a narrow border, and covered by canopies. These figures are to a rather larger scale than the rest of the glass, and do not harmonise with the other subjects, either as regards size or treatment. The drawing is weak, and the colouring cold and insipid. The head of the figure representing Fortitude is boldly drawn, and better coloured than the rest; but the others, especially Love and Wisdom, are extremely *jeune*, and are deficient in expression. Apart from the disparity in the scale of the figures, the difference in the style of the handling is very noticeable. The rest of the glass is treated in a thoroughly Medieval spirit; but these figures are conceived in a manner approaching classicism, and resemble Munich glass in style and drawing.

The other three windows illustrate an incident in the early history of the company,—viz., the Contention between the Merchant Taylors' Company and the Skinners' Company, which was determined by reference to the Court of Queen's Bench, which Court referred the case, in the year 1483, to the decision of the Lord Mayor, Sir Robert Belesdon and the aldermen. They decided that the two companies should take precedence of each other alternately, unless the Lord Mayor elect were of the company, when the company to which he belonged should have precedence. They further decreed that each company should dine at the other's hall twice a year,—viz., the Merchant Taylors on the vigil of Corpus Christi with the Skinners, and the Skinners with the Merchant Taylors on the feast of St. John the Baptist, or Midsummer-day. This latter injunction is still carried out, and appears to have induced harmonious relations between the two companies.

The window in the ante-room, at the west end of the corridor, represents a civic procession (probably on Lord Mayor's day), and the contest for precedence by the two companies is indicated by a struggle which is going on between two men bearing their respective ensigns, who are assisted by partisans on both sides.

The adjoining window on the east shows the

Lord Mayor and aldermen adjudicating upon the dispute, and in the third window the very English mode of reconciliation by a dinner is illustrated, the master of one company being shown as about to drink to his brother master in a loving cup.

The heads of the windows above these subjects are filled in with canopies, which are rather too French in character, to harmonise with the rest of the design. The tracery above is filled with the arms of the Masters and Wardens of the company, very brightly and skilfully composed.

These windows are very agreeable in colour, and the drawing is clear and decisive. It is, however, to be regretted that the glass is so near the eye, as the leading is unduly conspicuous, and much of the effect is lost. No attempt seems to have been made to clothe the members of the two companies in their proper liveries, which might easily have been ascertained by reference to their records. What the dress of the Merchant Taylors may have been in the fifteenth century is not generally known, but it appears from an extract in Herbert's "History of the twelve Livery Companies" that in 1568, the colour of their hoods was stipulated to be "only scarlet and puke" (puce). The colour of their gowns is not specified, but in 1624 it appears to have been red, or as it was then called, *murrey*, and the use of other colours was forbidden.

In an illuminated initial to the charter of the Leathersellers' Company, A.D. 1444, representing the king (Henry VI.), delivering the charter to the company, the livery wear a dress of two colours, *murrey* and *plunket*, the former a deep red, as already explained, and the latter blue, "parted" into equal halves (hence particularly coloured), and trimmed with fur. The figures have their hair cropped, and wear scarlet pantaloons, with peaked toes. The style of dress is no doubt here correctly given, and it is very likely that the only difference between the various companies consisted in the colour adopted for their garments, and not in the cut or arrangement of the dress.

THE COAL-OWNERS' LONDON RAILWAY BILL.

THIS Bill, which has caused what will probably prove the most costly contest of the present Parliamentary session, has been rejected by the committee over which Sir Hedworth Williamson presides. The case was closed on Friday by the speeches of counsel, in which the voluminous evidence given, and a great deal more, was passed under review. The committee reserved their decision until Tuesday last, when the chairman gave judgment that the preamble had not been proved to the satisfaction of the committee. The decision has caused considerable surprise, as the Bill was, by almost every one, considered a genuine, honest Bill, promoted by independent men for a legitimate purpose, to unite the east of London,—the great manufacturing and coal-consuming district,—with the coalfields of South Yorkshire. The rejection of the Bill is a heavy blow and sore discouragement to its promoters, and is not a decision over which the inhabitants of London have occasion to rejoice; it involves practically the exclusion of a legitimate competitor from a share in the coal supply of the metropolis; no reduction of coal rates; no relief to the overcrowded lines upon which coal, goods, and passenger traffic are conducted; and involves, probably, more frightful railway accidents. The Bill has been defeated mainly by those powerful confederations, the Great Northern and the Midland Railway Companies, which the new line would probably have relieved of part of their coal traffic.

ROYAL ALBERT BRIDGE.

ANOTHER Bill has been in progress during the week in one of the House of Commons Committees on private Bills,—Mr. Hurst, chairman,—that is promoted by the Royal Albert Bridge Company, and opposed by the proprietors of the Battersea Bridge and the Thames conservators. The company got their first Act in 1864, and a second in 1869. They need a third to revive or extend their powers. Mr. Hurst's committee has declared the preamble of the Bill proved, but is taking security that the powers given in the Bill will lapse unless the Board of Trade certifies, at the end of six months, that 10,000*l*.

have been expended in works connected with the bridge. About 12,000*l*. have already been expended upon land and works. After laying aside the design of Mr. E. M. Ordish, the original engineer, and taking up the design of Captain Julius Roberts, and even a third design, the company has fallen back upon Mr. Ordish, and a fresh contract has been signed for the construction of the bridge upon that gentleman's first design,—on the rigid suspension principle. The additional capital required to complete is 38,000*l*., to which the company, through Mr. Mayhew, their solicitor, say that they can see their way. The bridge will be 710 ft. long between the abutments, with a 400-ft. span in the middle, and two side spans, each 155 ft. wide. The width of the road will be 40 ft., including the trottoirs: water headway 21 ft. at high water. The river piers will be cast-iron cylinders of 15 ft. diameter, filled with concrete and brickwork. The girders of the bridge will be of wrought iron, and it is expected that the structure will be completed in eighteen months. If the company can raise the money speedily, they will have little difficulty in expending it upon works within the time specified. It is much to be desired that the public should enjoy, without further delay, the sight and the use of a means of communication between the two banks of the river in that locality, that will be more sightly, useful, and convenient than the hideous and dangerous timber structure known as Battersea Bridge.

FROM VENICE.

THERE is a wonderful bit of railway being made from Mestre to behind the island of the Giudecca, to a point nearly even with the Dogana. It is a private enterprise of several merchants to convey the merchandise from the East and elsewhere direct to Mestre (the main land), to forward it to the interior of Italy without the labour of unloading and taking it in barks to the present station. The railroad is being constructed on piles across the Lagoon. The work shows the desire of the Venetians to avail themselves of the opening of Eastern communication by Suez to increase their importation.

Salviati is preparing some beautiful mosaic pavement to replace the worn out ancient floor of the Church of St. Mark. It is to be exactly like the old pavement as to design, and figures of the four evangelists will be added. The old materials will be used whenever they can be applied; but in most cases the stone of formerly 2 in. thick has been worn down to $\frac{1}{4}$ in. The wavy appearance of the floor will be remembered.

The three pillars of the arches at the south-west corner of the Ducal Palace, called Adam and Eve Corner (from the figures of those worthies there, with a very demonstrative figure arrangement), are considered becoming decidedly unsafe, and an ugly scaffolding is looming in the distance. So that they prepare and finish the reparation,—well; but St. Mark's is still disfigured inside and out with hideous scaffolding. Careful photographs and drawings are being made of every part of the three pillars and arches that they may be truthfully restored.

In St. Giovanni e Paolo, as well as in the grand old church at Murano, there is a dead standstill in the forward work of reparation from want of means.

SOUTH-EASTERN PASSENGER TRAFFIC.

IN a clever brochure, by Mr. Alfred M. Watkin, of the locomotive department of the South-Eastern Railway, some interesting statements are made concerning the traffic. From the pamphlet and other sources we learn that it is computed that the three millions of travellers who use the Charing-cross line locally between that station and Cannon-street, save, on a moderate calculation, 40,000*l*. per annum, reckoning their time at a shilling per hour, or fifty hours of working time in the year. On Easter Monday over 200,000 passengers were carried in and out at London Bridge Station, and over 900 trains were signalled. Between Dover and Cannon-street there are 75 signals, or an average of about one per mile. Between Charing-cross, Cannon-street, and Spa-road, there are distance of three miles and a half, there are 31 signals. The Cannon-street signal-station is worked by five men and three youths, in relays, at a cost, for wages alone, of about 600*l*. per annum. The signalling on the Charing-cross section costs, for working alone, 2,400*l*.

per annum. The passengers in and out at Cannon-street Station average from 35,000 to 40,000 daily, according to the season. There are 652 trains in and out daily at the station, between six in the morning and twelve at night. From eight till eleven in the morning, and from four till seven in the afternoon, the trains average, out and in, 44 in the hour, or 264 trains in the six hours. In the past three years, on the South-Eastern Railway, 60,000,000 passengers have been carried. No train-passenger has been killed. Last year there was no accident to report to the Board of Trade; and Captain Tyler, R.E., Inspector of the Board, felt justified in referring to it as at the head of the "no-accident" lines of the United Kingdom. It should be mentioned that, of the large number of points and signal-men that work the line between Charing-cross and Woolwich, not one is, on any day in the year, or under any circumstances, called upon, or permitted, to take more than eight hours' continuous duty as his day's work.

A PEOPLE'S GARDEN.

A PEOPLE'S GARDEN has been opened on Old Oak Common, near Willesden Junction. It is promoted by the People's Garden Company (Limited). The visitors had to reach the gardens by half a mile of road, which, for neglected mud and enormous pits and ruts, could scarcely be equalled. There are promised, in the future, railway communication, a large concert, meeting, and dancing hall, 200 ft. in diameter; a dining-hall, capable of accommodating from 600 to 800 persons; a theatre, museum, fountains, lake, temple, &c. There are fifty acres of elevated land, commanding extensive views, some flower-beds, a series of little refreshment-boxes on the northern side, an out-door dancing platform, and provisions for croquet, archery, cricket, and gymnastics.

OPENING OF MACCLESFIELD NEW COUNTY ASYLUM.

THIS extensive congeries of buildings has been opened for patients. The site is in the suburbs of Macclesfield, about a mile from the town, from some parts of which the towers of the building are now a feature in the landscape. The buildings stand in the centre of about eighty acres of land. At present, although accommodating about 250 inmates, the asylum is by no means finished, and the recreation-ground and details of the building and its immediate surroundings will not be fully carried out for some time to come. The buildings cover an area of nine acres and a half, and up to the present time probably 120,000 ft. have been expended upon them by the county. The asylum is calculated to hold about 700 patients. The style of architecture is Italian, the materials used being red brick, with white and blue brick dressings, and stone enrichments for the clock tower, and the principal entrance underneath it.

The estimate of accommodation afforded by the different parts of the building is as follows: Block No. 1 (female), 86 patients, 20 ditto in single rooms, total 106. Block No. 2 (female), 86 patients, 20 ditto in single rooms, total 106. Block No. 3 (male), 86 patients, 20 ditto in single rooms, total 106. Block No. 4 (male), 80 patients, 20 ditto in single rooms, total 100. Infirmary (female), 56 patients, ditto (male) 56 patients; excited class (female), 54; ditto (male), 54.

There is about a mile of corridors. There are about 1,000 windows, in addition to skylights plentifully strewed along the passages. The ventilation from all single rooms, passages, and day-rooms is obtained by means of single extraction flues, and cold-air gratings in the external walls. The inner shutters of all the single rooms, as well as the spaces above the doorways, are also fitted with zinc perforations. All the lantern windows in the building, which serve the double purpose of light and ventilation, are worked by iron rods and cranks under charge of the attendants.

The architect for the entire building is Mr. Griffiths, of Stafford.

The contractor, who has had charge of the execution of the whole of the work, is Mr. Henry Lovatt, of Wolverhampton. The clerk of the works is Mr. Laidlaw. The joiner's work throughout is of pitch pine. The floors of all the blocks are boarded, and the walls covered with cement. The staircases are of Kerridge stone. The lavatories, baths, and water-closets are fitted up on approved principles. Of the

latter those in use in the Administration Department are Lambert and Jennings's patents; the baths and lavatories are by Messrs. Finch. The engineering works have been executed by Messrs. Conpe, of Wigan, for the sewage works; Mr. Mellard, of Rugeley, for the hot-water apparatus; Messrs. W. Mellor, of Rainow, for water-pumping engine; and Messrs. Beuhm, of London, for the cooking apparatus. The other sub-contractors are Mr. Mellor, of Macclesfield, for the plastering; and Mr. Westwood, of Dudley, for the slating.

The building is fitted with gas throughout, supplied from the Macclesfield Corporation Works, through a 500-light meter in the building. The fittings were supplied by Messrs. Messenger & Co., of Birmingham.

Provision against fire is made by one of Messrs. Merryweather & Son's hand-engines and hose in each block.

The church has been erected at the western boundary of the ground, in which divine service will be celebrated for the inmates by the appointed chaplain. The external walls are of Tegemose stone, with Hollington dressings, the interior walls being of Bath stone with Hollington dressings and arches for the windows. The building is in the Early English style, with nave and transepts, chancel, organ chamber, and vestry, with entrance for the males into the nave, and females into the transepts. The roof is open timbered, with a double principal arch meeting in the centre of the transepts. The chancel and aisles are fitted with Minton's encaustic tiles, and the sittings (which are of the ordinary description), are constructed of pine, and are capable of accommodating about 400.

CONSTRUCTING-RINGS ON WATER-PIPES.

THE practice of using "constricting-rings" on water-pipes is a very serious matter for the inhabitants of London, and ought to be brought in a distinct manner to their attention. A water-pipe supplying a house may be 1 in. in clear diameter along its entire length, excepting in one place; and at that place a constricting-ring may be put, so as to reduce the pipe's diameter there to one-eighth of the size, the effect being that the flow at the tap is very small indeed. The same reduction of flow may be accomplished by placing inside the pipe a disc, with a very small hole bored through it, or by flattening the pipe. These arrangements make the pipe give no more water than a clear pipe would which had the tap only a very little turned on,—a mere dribble. Mr. Greaves, the engineer of the East London Water Company, said, in his evidence before the Royal Commission on Water-Supply, that a *maximum* supply-pipe, with a disc inside, would yield to the consumer a pint of water a minute. It is to be hoped that the water company with which this gentleman is connected have no discs in the supply-pipes of the 32,000 houses which they serve on the constant system. AQUARIUS.

TOMB OF GERARDUS III. IN THE MINSTER CHURCH AT ROERMOND, HOLLAND.

ON a previous occasion we have spoken of the remains of ancient domestic architecture at Roermond, in Limburg, and we have mentioned the fact that this town contains two remarkable churches, of which by far the more interesting is that of "Our Lady," generally called the Minster Church.

The Minster Church at Roermond is certainly the most perfect and finest example of pure thirteenth-century style existing in Holland. It bears so strong a resemblance to the church of St. Quirinus at Neuss, on the Rhine, and to the Church of the Apostles at Cologne, that one would be inclined at first sight to set them down as works of the same architect; but we are of opinion that a more close inspection of the three buildings in question will convince the experienced antiquary that the church at Roermond is later in date than either of the other examples. The plan of this singular and beautiful building consists of a nave of two quadripartite bays (each subdivided into two), western transepts, and a kind of fore-nave of two bays to the west of the western transepts. In the angles formed by this portion of the building are two square bays, the angle piers of which are very solid, showing evidently that they were intended

to form the lower portions of towers; and Mr. Cuyper, under whose judicious superintendence this church is being restored, has designed towers which are to be at once carried up. East of the nave are short apsidal transepts, and a very short chancel, consisting simply of an apse and one bay. Three smaller apsidal projections open into this greater apse. Over the intersection is a lofty octagonal lantern crowned with a dome, and there are two tall square towers capped with spires at the angles of the chancel and transepts. So that externally the church (when the present restoration is completed) will present a beautiful group of four spires and a dome. Mr. Cuyper has been found great fault with by some of the native antiquaries for retaining this domical roof to the lantern; but his defence is, that although the present dome dates only from the sixteenth century, in his opinion it retains the form of the original one; and M. Viollet le Duc, who was consulted in the matter, strongly corroborated this opinion. Certainly the form of the dome, which is not octagonal, but slightly star-shaped, is so thoroughly different from any sixteenth-century work that we know of, that we cannot conceive it to be an original work of that date; in addition to which, this dome is so very similar in form to those found on the old German reliquaries of the twelfth and thirteenth centuries, that we have little doubt Mr. Cuyper is correct in the view he takes of the subject.

Internally the church is very striking: its most remarkable features are the large triforium of the nave, the use of pendants in the vaulting, and the entire absence of a ritualistically-arranged choir.

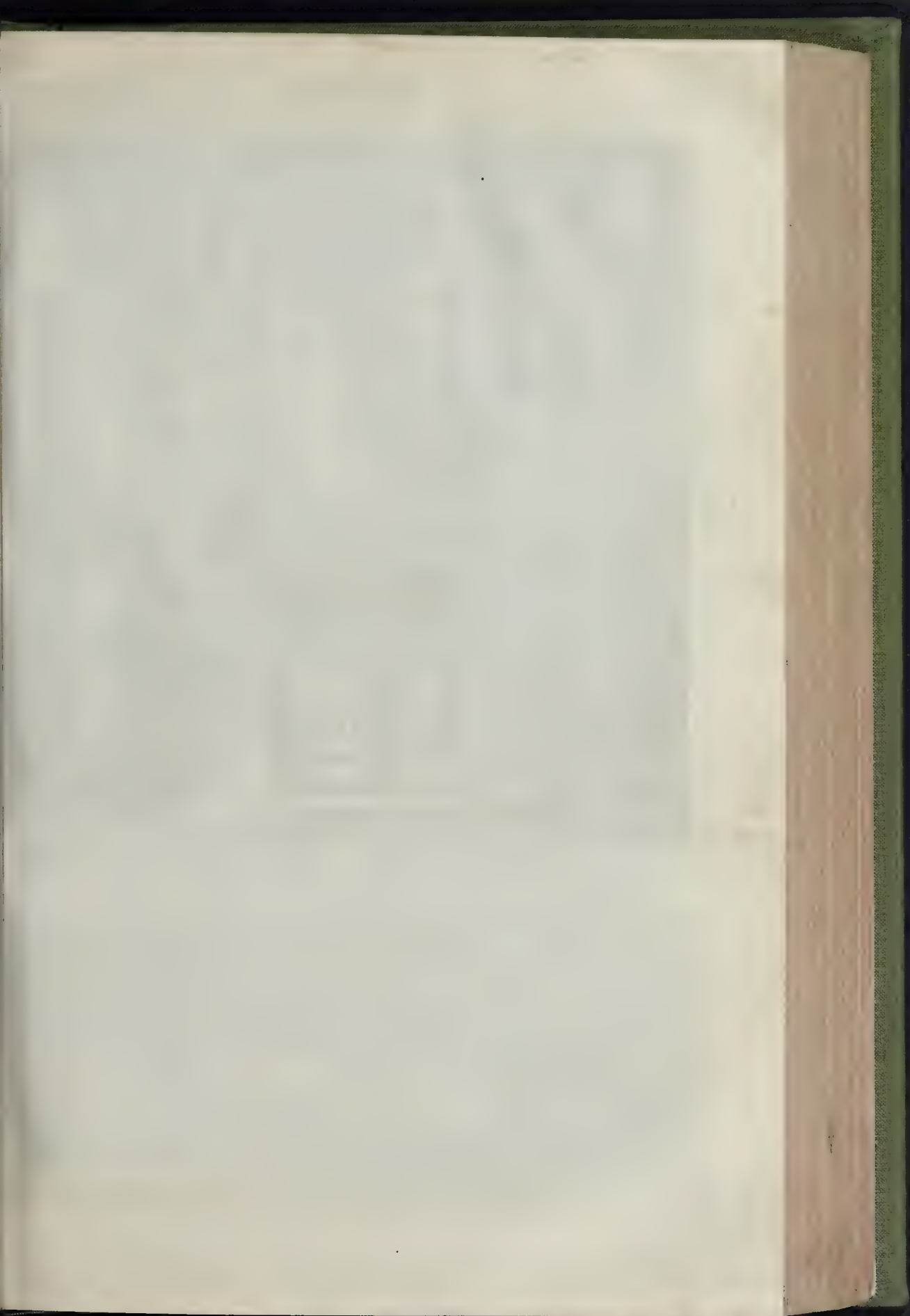
The great peculiarity of the triforium of the nave is that it was designed to serve the purposes of a choir for the nuns by whom this church was originally possessed; and where the triforium ends against the walls of the transepts two small apses are bracketed out, each of which is pierced with small windows (originally glazed), and containing a stone altar. One of these apses is shown in the engraving.

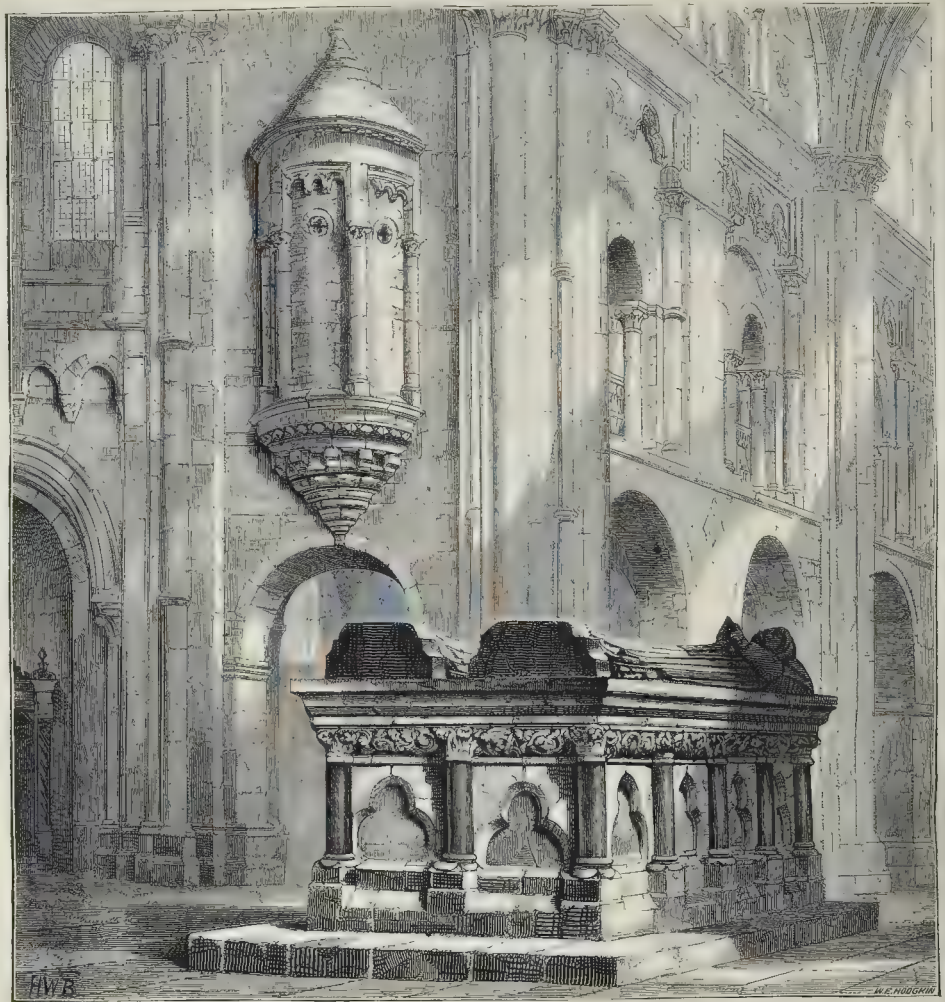
The pendants of the roof are very singular. The vaulting-ribs are brought down some 4 ft. and where they meet is a pierced circle. Through this piercing a wooden post is inserted, the end of which is carved in imitation of a flower, forming a kind of suspended boss. We are assured by Mr. Cuyper that this arrangement is original. It is quite evident that there never was a ritualistically-arranged choir here; and what is still more singular, the original high altar, which still exists, is not in the *great apse*, but in the semicircular niche which projects from its eastmost side. A modern high altar is placed in the great apse, but Mr. Cuyper proposes to remove it, and restore the ancient high altar to its original purposes. There are two other ancient altars in the triforia under the eastern towers, and a magnificent early sixteenth-century triptych reredos of carved wood, in the south transept, the doors of which are painted by an artist of the Cologne school.

Under the contre lantern is the tomb of Gerardus, the third Duke of Guelders, and his wife, founders of the church. It is an interesting example of an altar-tomb of the earlier half of the thirteenth century, composed of black, white, and grey marble. The figures are painted in "proper" colours. This tomb was until a few years ago surrounded by an iron grille, which, we are told, is now to be seen in the Tower of London. Can any of our readers give us any information on this subject? In the triforia of the nave are some good encaustic tiles; and in the greater western gallery, which is original, is a fine old picture, of the school of Lucas van Leyden, representing scenes from the Passion of our Lord, in fifteen different compartments. Below the western gallery is a large fifteenth-century representation of the Entombment, with figures the size of life.

Funds have been subscribed for the entire restoration of the *exterior* of this fine church, which is being excellently carried out; and it is to be hoped that the entire restoration of the interior, which is sadly disfigured with plaster and whitewash, will follow in a short time, and under the same architect.

Albert Medal.—The Albert gold medal "for distinguished merit in promoting Arts, Manufactures, or Commerce," has this session been awarded by the council of the Society of Arts to Mr. Henry Cole, C.B.





TOMB OF GERARDUS III, ROERMOND, HOLLAND.—Thirteenth Century.

THE BALUSTER COLUMNS, ST. ALBAN'S ABBEY CHURCH.

SPEAKING of the baluster columns in the triforium of the transept, Mr. Scott says in his Report:—

"A question arises: Are these columns, though Saxon, as early as the time of King Offa, and did they form parts of the church which he erected or restored at the suggestion of Charlemagne?"

It is my good fortune to be able, as I think, to throw some light upon this question. I was engaged some years back in repairing the Saxon Church on the Castle Cliff at Dover,—said to have been built by Eadwald, son of Ethelbert, the first Christian English king,—when we found, used up for later purposes, balusters just of the same kind. Again, I was repairing the Saxon Church of Jarrow-on-the-Tyne, the very church in which Venerable Bede ministered, and erected just before by Benedict Biscop. Here, in removing some modern walls, we found, bedded in them as mere material, no less than twenty of these curious columns. Shortly afterwards, in the Sister Church at Monk Wearmouth, erected also by Benedict Biscop, and described by Bede, a doorway, long walled up, was opened

out by the local antiquarian society, when four such balusters were found in their proper position, forming portions of its jambs.

If, then, we find in three churches, all of the seventh century, baluster columns of the same kind with those at St. Alban's, why need we doubt that the latter formed portions of King Offa's Church, which was erected (either wholly or in part) in the succeeding century? We may, then, fairly assume that we have in the present structure features which belonged to that which immediately succeeded, or even formed a part of the church built on the scene of martyrdom, and within about ten years from the death of the Proto-Martyr."

GRANARY ON THE WELSH BACK, BRISTOL.

THE illustration which we give in our present Number represents a granary erected from the designs of Messrs. Ponton & Gough, of Bristol, for Messrs. Wait & James. The ground being defective for so heavy a structure, a layer, 6 ft. thick, of ground brown lime concrete was spread over the whole site, and upon this plat-

form the external walls were erected, to the great height of 100 ft. The building is 96 ft. long, 40 ft. wide, and contains ten stories. The lowest story is used as one large bonded cellar; a portion of the ground story for the offices, a small portion of the top story for an engine-room, and all the rest of the building for storing grain, and will contain 12,000 quarters of wheat. There are only nine internal supports for the granary floors, and this leaves the large floor space unusually free of pillars. The external walls are faced with the hard Catlybrook bricks, and advantage has been taken of the necessity of obtaining a large surface for the introduction of air into the granary, of ornamenting the lower portion of the window openings with open patterns in brickwork. The great difficulty experienced in designing the usual external lifts and external doors on each floor, for the introduction and delivery of grain, has been avoided by arranging the lifts in niches at the angles of the building, and by delivering the sacks of grain into carts upon movable skids, sliding out of the round holes under the first-floor string-course.

The contractor was Mr. Thorn, of Bristol, who erected the building in nine months; and the cost was 6,000l.



GRANARY ON THE WELSH BACK, BRISTOL. — MESSRS. PONTON & GOUGH, ARCHITECTS.

CONVERTIBLE CARRIAGES.

Sir,—In your paper on the "Coal Supply of the Metropolis," you state that the new coal and goods line would save 1s. per ton, or 300,000l. a year to London.

Permit me to remark that the use of convertible carriages would save 2s. more per ton, or make a saving of 900,000l. a year in the whole.

Convertible carriages run both on rail and road, the wheels being changed when the truck is loaded by a single porter with a screw-jack. They have been described in General Hill's "Railway Problems, 1870," and other publications.

Why are they not used? Because railway engineers pretend they would be liable to accident on passenger lines by breaking down, and therefore forbid their certificate; their real objection being, that they refuse to assist the invention of "outsiders." On the coal-line this objection could not prevail; and once introduced upon it, they would soon find their way to other lines, for there is nothing in the objection.

The advantages of the convertible truck are, that all cost of loading and unloading is saved. The coal would come direct from the pit's mouth to the cellar of the consumer, without being tipped and watered by the coal merchant. If necessary, it might come in loaded vans, so that no pilfering could take place.

The only thing to be attended to is to make the truck within the capacity of an ordinary team of horses to draw through the streets. Six or seven tons could be easily drawn, but beyond this the trucks are needlessly large.

Bricks, slates, manure, everything, in short, which goes in one large load to the same destination, could be carried at much less cost by these trucks than by the double system of railway-vans and road-carts at present in vogue.

When we shall have lost for some years some millions a year by the refusal to adopt convertible carriages, their merits will at last be recognised.

CONVERTIBLE.

CHARGES FOR PROFESSIONAL SERVICES.

Sir,—The President of the R.I.B.A., in his opening address, published by you, at the first meeting of the Congress, alluded to the diversity of charges by professional men, and spoke of it feelingly; for within the last three months he had five cases of disputed accounts between architect and employer referred to him for arbitration, as president. This argues well for the employers, that they should have consented that an architect should act as umpire in settlement of architects' accounts. In courts of law such decisions by the judges are recorded, and are not useful, as deciding the law or practice upon special points. It would be invaluable if the President were pleased to allow a copy of the charges, and his decision and opinion thereon, to be deposited among the records of the Institute in reference by the members, to guide them in doubtful points. It may be a mere A B case, efficient for the purpose, and not compromising any parties. I fear there are many of our brethren who consider themselves entitled to their interpretation of the rules of the Institute, to make the 5 per cent. a mere starting-point, and, by cumulation to make their charges rise up to 7½ per cent., or even 10 per cent., on considerable works. A record of judgments so high an authority would go far to rectify this, and I think it may be useful even as a check to another umpire, whoever he may be.

SENEX.

ARCHITECTS FOR THE LONDON SCHOOL BOARD.

At the last ordinary weekly meeting Mr. C. Atter, M.P., brought up a report of the Committee of Works and General Purposes (29th May, 71), which said:—

1. The Committee recommend the Board to advertise as they may be required, promising a commission to any surveyor, valuer, or agent who can furnish such a report as may be approved by the Board. 2. With reference to the appointment of a consulting architect and surveyor, considering the probability that each of the proposals to be taken over must be reported upon separately, that there will be many questions of site, plans, drainage, ventilation, alterations, and the like, the Committee recommend that an officer should be appointed as one of the staff of the Board, whose duty it will be to be at his whole time during office hours to the work of the Board—such officer to be a practical architect and surveyor, who has considerable experience in designing school-buildings. The committee also recommend that an officer should be appointed, at a salary of 500l.

per annum from Midsummer next, with an intimation that, should the work increase, and the Board be satisfied, the salary would probably be augmented. 3. As to the selection of an architect for the erection of schools, the committee recommend that, looking at the great importance of the work, the Board should make their selection at present by a competition, to be limited to such names as may be approved after the inspection of schools in various places. The Committee suggest that in such competition a small honorarium be given to each designer; that no perspective, or merely show drawings, be sent in; that uniformity of scale be observed; and that the successful architect be employed on the proposed building, provided that the Board are satisfied that his design can be executed within a reasonable margin of the cost he states in his estimate. All designs to be the property of the Board.

Mr. Reed, as chairman of the committee, moved that the report be adopted, and be referred back to the committee to be carried out; and that, with reference to the choice of a consulting architect and surveyor, the committee be authorised to select six names from whom the Board may make the definite appointment.

After some discussion as to the advisability of appointing a consulting architect, in addition to the architect engaged to superintend the erection of buildings,

Mr. Green moved the omission of that part of the report which referred to a consulting architect; and after some little discussion,

The Chairman recommended that the word "consulting" be omitted, and "architects" substituted for "architect."

This was agreed to; and, after farther debate, the preamble was agreed to, with some verbal changes.

The second recommendation was agreed to.

The question of salary was divided upon, whether it should be 400l. or 500l., the latter being carried by 28 votes against 4.

The third recommendation was postponed; and the motion that the report be so far adopted, and referred back to the committee to be carried out, was affirmed.

PATENTS AND PATENTEES, RETROSPECTIVE AND PROSPECTIVE.*

In the United States, Mr. Macfie says, there is a strong movement going on in favour of the abolition of patents; Holland has got quit of the incumbrance of patents in the belief that they are injurious to her, but nothing was said of the action of Belgium in the matter.

It is often said that in the United States every second man you meet is either a patentee or a bankrupt, or about to become one or the other in the briefest possible time. There can be no doubt that mechanical activity is great in the States; our free and enlightened cousin across the Atlantic will patent anything,—from wooden nutmegs to petroleum champagne,—by which he can grip the almighty dollar, and keep it to himself. He is great and ingenious in useful matters,—always practical. Has he not revolutionised our shops and introduced new and profitable trades? Is he not a great boon to housewives? Has he not patented no end of sewing-machines, washing-machines, mangling and wringing machines, boot and shoe-making machines,—pegs, screws, and glued,—knife-cleaning machines, bottle-washing machines, to say nothing of whisking-machines, and a dapper little machine to peel potatoes, apples, and oranges, besides no end of machines to boil eggs, and freeze water for mint juleps and sherry cobbler?

Is he not renowned for all kinds of agricultural machines? Look at the trade created by one American firm alone. In the year 1867 they made and sold 12,000 reaping-machines; in 1868 the numbers rose to 17,000; and in 1869 the extraordinary number of 23,500 mowing and reaping machines had been reached.

What kind of incumbrance our Dutch friends found, the honourable member did not state; but as they are not renowned for change, or mechanical inventions, one need not be surprised that as a people they have attached little importance to patents or patentees: their ways are old-fashioned ways, and, like the Chinese, they stick to them with undying love.

Mr. Mundella said it was true that Switzerland had refused to establish a patent law; but why? There was not a ton of coal in Switzerland, and she could not construct a machine there. Under this circumstance it was not to be wondered at that she should be willing to steal from France, Germany, and Italy whatever she could to aggrandise her own manufacturing districts. Whenever a committee should be constituted, he

would bring before it *hundreds of poor men* who had risen to fortune through having a property given to them in their inventions. Good, so far, Mr. Mundella. If true, this latter statement is more than satisfactory,—it is positively refreshing to learn that "hundreds" of poor men have risen to affluence through patents. Let us hope it is true, and can be proved. But, with all due respect and deference to Mr. Mundella, it is to be feared that the task he so gallantly proposes to perform will be difficult to accomplish in the face of known facts. That some have made fortunes—yes; but it is much to be feared that the greater number of patentees are known to keep only a Flemish account at their banker's, and are too frequently on the shady side of the hedge to get much profitable sun. It remains only to add, for the information of those whom it may concern, that the cost of a patent to an American inventor, which is granted to him for seventeen years, is only 35 dollars; whilst the cost of a patent to an English inventor is 875 dollars, and that for fourteen years only.

Such, then, are a few of the *pros and cons* bearing on the question of patents, as briefly enunciated by honourable members not unknown to fame in the engineering world, as well as in the House of Commons. No doubt, the entire question will have to be more closely investigated before any very extensive changes are made in the patent laws. To those who advocate their entire abolition the important question will always turn up and face them full-batt in front. How is a man to be secured in the beneficial possession of his own invention,—a true property created by the expenditure of his own time, money, and mental labour? The problem is not a very easy one to solve, and will puzzle more heads than one before it can be finally and satisfactorily settled.

For good or evil, the number of patents granted in any one year is, at least, a promising sign of mental progress and mechanical enterprise. As already stated, in the year 1800 there were only 98 patents granted; but last year they had sprung up to 2,491. Is this rapid advance to be attributed to an exalted idea of imaginary profits, derivable from successful patents, or merely to a restless activity of mind, regardless of loss of time and labour? There are many causes at work, direct and indirect. It may be attributed to better education among the masses, a greater spread of general knowledge, more active co-partnership and association, and to the great reduction in the rate of patent-fees already effected by recent legislation; to the growth of capital, and a more ready access to capitalists. All these, or a combination of them, have, no doubt, led to the great extension of patents in this country, to which must be, undoubtedly, joined the effect of the great international exhibitions, and the many local exhibitions, constantly attracting public attention, to which may be added the restless competition of our manufacturers, always on the look-out for novelty or improvement,—a salutary emulation, which ought not to be discouraged for light or trifling reasons.

It is a frequent complaint that patents are often granted for things that can scarcely be called inventions, or for almost invisible improvements in already existing patents; that the slightest alteration in one man's device becomes good ground for another patent; and this, again, by a little addition, gives rise to a third, or, indeed, according to the present system, to any number of patents, for what is practically the same thing, in which the differences are so minute as to be almost imperceptible.

All this may be true. How many patents are there for electric telegraphs? They all, more or less, differ in minute particulars, the general principle being pretty much the same for each class of instrument. Yet there are between two and three hundred patents in existence for these useful implements. The electric telegraph invented by Ronalds, of Hammersmith, early in the century, is the Adam of the race. It was a true telegraph. It had the needle, the alarm-signal, wires above and underground. He was before the times, and did no good. The Government of that day told him "that, the war being over, it had no use for telegraphs;" and so the ancient semaphore at the Admiralty maintained its place. What would the ministers of that day say now, if they could rise from the grave?

In the year 1826, or thereabouts, in the humble manse of Carmyle, in Forfarshire, the Rev. Patrick Bell worked out the first reaping-machine. In all essentials it is the honoured father of a long progeny of children,—all of

* See p. 369, ante.

strong family likeness. Yet how many patents have been derived from this rough but useful implement. Here, again, "the child is father of the man." As to agricultural implements in general, it may be said that each manufacturer of any note has a muniment-room full of patents, and as much was in the form of great seals as would stock the shop of a chandler. The same general observations will apply more or less to sewing-machines. Their name is legion, yet nearly all are based on the original one, the distinctions in many cases are so minute that it is not an easy thing to define the difference existing between the several improvements.

Not long since, when in the armoury of the Tower of London, a garrulous warder pointed out to me a rusty old revolver under one of the windows, from which Colonel Colt took the idea of his world-renowned arm. This he told the warder himself, therefore the story is most likely to be true. Are not our famous breech-loaders a return to the old "chambers" of our venerable ancestors; and our built-up ordnance but an extension of the "hoop" strengthening of olden time?

That foolish patents are sometimes granted is true. A few years ago one was granted for making "timber out of sawdust;" and not long since a patent was passed for making "sword-scoabards out of ox-tails;" and, what is more to the point, a flaming prospectus was issued, with the usual list of directors, auditors, and secretary, and put upon the market,—with what success "apocryphal" knoweth not.

It would be hopeless within the limit of this short sketch to attempt any kind of analysis or illustration of this part of the matter, though interesting enough in an engineering point of view. Nor can any attempt be made to trace the progressive advance and improvement of the most useful and well-known of our best tools and machines, and principles of mechanism developed in their construction. The self-acting slide-rest alone would require a volume, for it is the true right hand of modern engineers.

The calamities of inventors would make a book as deeply interesting as the elder D'Israeli's "Calamities of Authors;" quite as melancholy and full of disappointed hopes, labour lost, and reward too late to be enjoyed. Inventors have been occasionally the recipients of Government bounty,—always inadequate. This kind of reward is not only precarious, but apparently doled out on no fixed principle as to the merits of the case or the amount to be granted.

Henry Cort, whose great invention for the manufacture of iron is a well-known case, it is true, received the sum of 20,000*l.*, but too late in life for him to reap any enjoyment from it. It has been estimated by competent authority that the application of his discovery has created wealth to the amount of between 600,000,000*l.* and 700,000,000*l.*, not a long way removed from equalling the National Debt, and gives at the present time employment to upwards of 600,000 workpeople. Perhaps one of the most unfortunate inventors was Henry Fourdrinier, who, after the labour of a long life, the ruin of his prospects, and the expenditure of 60,000*l.*, brought to perfection his machine for making paper,—one of the most useful machines ever invented for aiding in the spread of knowledge, after the printing-press itself. So great was the improvement effected by this beautiful machine that the paper duty was soon increased by upwards of 600,000*l.* per annum, and effected a saving to the country of 8,000,000*l.* From the great improvement of the paper, it assisted powerfully in the progress of lithography and engraving. Even where least expected, it brought improvement in its train, for the fine tissue paper manufactured by it had a marked effect in improving the printing of patterns and devices on pottery, which was felt and freely admitted in Staffordshire. When in extreme old age, after many weary years of application, he received the small and utterly inadequate Government grant of 7,000*l.*, after his claims had been carefully investigated by a Parliamentary committee. He lived to see the triumph of his machines, and died at the patriarchal age of eighty-nine.

Could this noble old man have stood by my side but a few weeks ago, how his eyes would have glistened with pleasure, to look upon some fine brass wire of 28,000 meshes to the square inch, and a copper wire 3,000 yards long drawn from a single penny-piece,—one of Boulton & Watt's old contract pieces, long since withdrawn from circulation. What painful trouble,

labour, and anxiety, these fine specimens of wire-weaving would have saved to Henry Fourdrinier, could he but have had the like when he began his experiments at his once prosperous paper-mills,—the Two Waters,—at the junction of the little river Gade and Bulbourne brook, in pleasant Hertfordshire?

Accidentally looking over an old-fashioned description of Derbyshire, "adorned with copper cuts," I stumbled upon a quaint account of Sir Thomas Lombe's once renowned silk-twisting mill, built on the banks of the pretty Derwent at Derby.

The somewhat mystified history of this piece of machinery is well known,—how Lombe went to Italy, got introduced to a famous silk-mill there as a workman, studied the details, copied out all its parts, then fled for dear life to England, where he put up his mill,—the first in the kingdom,—for making Argazine or thrown silk. So began the silk twist trade. We are treated to a little detail, and told how,—“This engine has 26,588 wheels and 97,746 movements, which are all worked by one water-wheel turned by the Derwent three times round a minute. By every turn of the water-wheel the machine twists 73,726 yards of silk; so that in twenty-four hours it will twist 318,496,320 yards. And it gives employment to between 300 and 400 work-people. This machine was considered so much importance by the Legislature that, on the expiration of the patent, the Parliament granted him 14,000*l.* as a further recompense for the great hazard he ran;” for he is said to have been dogged by Italian assassins.

The condition of recompense was that a perfect model of the machine should be sent to the Record Office in the Tower of London, there to be kept to perpetuate the invention. The sole existing fragment of this machine is now preserved in a small glass-case in the Patent Museum, Brompton; it is of wood, and seems to have been well made, as far as one can judge from so small a fragment.

Harrison, the famous chronometer-maker, and inventor of many useful appliances in horology, received a Government grant of 20,000*l.* for improvements effected by him in chronometers and other time-keepers: he well deserved it, for he was a great friend to astronomers and navigators. A curious old-fashioned eight-day clock, with wooden wheels, the production of his hands, is preserved in the Patent Museum, Brompton; it still "goes tic-tac," and is well worth inspection.

In conclusion, this naturally brings my freely-wandering observations to the remarks offered to inventors by the existing and recent Governments. It seems from a return recently published that during the ten years ending 1869 the Director-General of Ordnance has spent in experiments no less than 233,327*l.* for Ordnance and 8,124*l.* for small-arm experiments. These amounts do not contain the costly experiments of the Whitworth and Armstrong contests, which, in fact, exceed all preconceived notions on the subject. For converting muzzle-loaders into breech-loaders Mr. Snider, Colonel Roden, and Mr. Wilson, divided amongst them 16,000*l.* for the plan only, and not for the actual work. Major Palliser, one of the fortunate few who deal with Government, for his mode of chilling projectiles gets 15,000*l.*, and for the conversion of our old cast-iron guns he gets 7,500*l.* Considering that chilled iron has been frequently used before, can this be called an invention? It may be claimed as a novel application to gunnery. Years ago the trunnions of the transit instruments, both at Greenwich and Cape Town Observatories, were made of chilled iron; but the novelty is, of course, in chilled shots, to give a warm reception to our friends the enemy when they choose to pay us a visit. Captain Moncrieff, for his new scheme for mounting big guns, got 10,000*l.*, with the addition of 1,000*l.* as salary, and the pleasant prospect of a further bonus of 5,000*l.* when he has completed his invention,—for it is not yet complete. Mr. W. Hale, for his stickless rockets, gets 8,000*l.* Mr. Frazer, of Woolwich, is rewarded with 5,000*l.* for the construction of guns which are to supersede the Armstrongs in active service. For breech-loading carbines Mr. Westley Richards gets 2,375*l.*; Colonel Baderley, for patent screw bands for rifles, 1,500*l.*; Mr. Pittman, for concussion fuzes, 1,200*l.*; Mr. Lancaster, for rifling guns, 4,000*l.*; Mr. Clarkson, for cartridges, 1,000*l.*; and Mr. Henry, for his breech-loading rifle, the modest sum of 500*l.*

Military men and others who employ their faculties in the invention of things to maim and

destroy their fellow creatures, cannot complain of lack of due reward and encouragement to complete their amiable intentions.

The fortunate Palliser gets 15,000*l.* for vamping up old guns—the same amount given to the illustrious Doctor Jenner for stamping out the small-pox. Sir Humphrey Davy and George Stephenson got 1,000*l.* each for their safety-lamps—the miner's friends. Hence it appears to be more profitable to invent machines to destroy than to save life. Most of these well-rewarded gentlemen are protected by letters patent, and we may therefore expect that they at least will oppose those who may wish the abrogation of all patents. A Parliamentary committee is about to sit: it is expected to go fully into all matters relating to patents and patent laws. Let us hope that it will be attended with beneficial results, and that future legislation may remove many of the difficulties which now embarrass the subject, and give real inventors a sure property in their inventions. J. L.

ST. MARY'S HOME, RUSHOLME.

THE foundation stone of the new building for St. Mary's Home, in Dickenson-road, Rusholme, has been laid by the Bishop of Manchester. The plan of the building is an oblong, and its broadside will face Dickenson-road. The front portion of the building will be set apart for the persons managing the home, and the back part will be used by the inmates. The work-room and dining-room for the inmates are each 16 ft. 6 in. by 16 ft., and the ceilings throughout are 11 ft. high. The wash-house, which is 19 ft. by 15 ft., and the laundry, which is 24 ft. by 15 ft., project at right angles to the back portion of the building, while beyond are various other out-buildings. A covered way forms a means of communication between these outbuildings and the main building. A corridor runs from end to end of the main building, forming a means of ventilation. The staircase and entrance-hall are nearly in the centre of the front part of the building, having the committee-room and waiting room on one side, and the ladies' dining and sitting rooms on the other. The superintending ladies' rooms are to the front of the building, on the chamber floor, while at the back are dormitories for the inmates, 49 ft. 6 in. by 21 ft. 3 in., and 28 ft. 4 in. by 21 ft. 3 in. respectively. The dormitories are separately arranged. The building is provided with bath-rooms and other conveniences, and attention has been paid to ventilation. The elevations are plain, and are executed in selected common bricks, with white headers, relieved by bands and arches of stoop bricks. The entrance and staircase hall form the principal feature in the front, and the door and windows have stone dressings. The chapel projects from the east end of the building, and is lighted by windows on both sides and by a triplet at the east end. The building is being erected from the designs of Mr. John Lowe, Manchester, architect, by Mr. George Napier, a Holme, builder. The contract for the building (exclusive of boundary walls) is about 2,400*l.*

TREATMENT OF TOWN SEWAGE.

INSTITUTION OF CIVIL ENGINEERS.

ON May 16, the paper read was "On the Treatment of Town Sewage," by Mr. ARTHUR JACOB. The agricultural mode of dealing with sewage, namely, by irrigation, was advocated, at once effectual, consistent with sanitary requirements, and economical. In situations where land could be procured at a reasonable cost irrigation might be employed; it effectually removed the dangerous impurities in sewage and discharged the effluent water, in a practically pure, into the watercourses of the country, and this could be accomplished without prejudice to the public health and without inconvenience to the senses. The process of irrigation was to a great extent independent of the state of the weather, being but little arrested either by continuance of wet or cold weather, and produced to the agriculturist such results as no ordinary management could accomplish. The farms at Horsham, Barking, Orpington, and elsewhere, had furnished evidence of the large returns that irrigation, when judiciously managed, was capable of producing.

The difficulties of procuring suitable land were sometimes considerable. Land should be selected with regard to the special circumstances of each case, rather than with reference to

ample requirements of engineering expediency. He points specially considered were, the distance from urban districts, the proximity of the river to a suitable market for the produce, and a relative position with regard to the direction of the prevailing winds.

The objections raised to irrigation, as a means of propagating entozoa disease, did not appear to be supported by facts; but, being admitted, they could be met by the employment of the acids, which experiments had proved to be absolutely destructive to animal life in the form of objects pre-supposed it to exist. If sewage irrigation was attended with the dangers apprehended, the same objection would hold the employment of all ordinary kinds of manure.

The determination of the area of land requisite for the treatment of the sewage of a standard number of people depended on so many circumstances, that it could only be arrived at by experiment and experience. In each existing example there were varieties of circumstances at work influencing the conclusion to be arrived at, sewage being sometimes strong, at others weak, and the soil free or compact in every possible variety, the determination of the requisite area would necessarily be varied accordingly; and so far as the determination of the question had been carried, the balance of opinion inclined to a proportion of about 100 people of all ages to 1 acre of average agricultural land. Much, however, depended on whether irrigation was employed merely as a mode of abating nuisance or as a source of pecuniary profit. Irrigation was practised on the large scale in five different ways,—by catchwork, when the surface of the ground afforded sufficient inclination for the sewage to flow off; by the pane and gutter, when the surface inclination was but slight; and by ridge and furrow, or the bed system, when there was not sufficient surface-slope to admit of the employment of the other methods. The latter was the most refined mode of applying sewage to land; and, although usually attended with more expense, there was no reason to recommend it. Narrow beds were to be preferred to those of large size, as being more economical to form, and calculated to turn the sewage to the best account.

BRISTOL CORPORATION BUILDINGS COMPETITION.

SIR,—The twenty-nine authors of the designs delivered pursuant to advertisement three months ago may prepare themselves to submit to all the trappings of trifling and trickery which may be expected from "Bruggagem." The Estates Committee six weeks ago arrived at a decision how the premiums should be awarded; but some corporation friends of local disappointed candidates have been moving by various means to prevent the Town Council ratifying the award. This body, at a meeting on the 24th of May, postponed to the 13th of June the special meeting to dispose of the business. This was enough in the face of the joint recommendation of Mr. Waterhouse and the Estates Committee; but I now hear that the manuscript of the resolution has somehow or other got altered, and the meeting to vote the prizes is thus indefinitely postponed. Is there no law that might be usefully set in motion to discomfort intriguers?

FAIRPLAY.

THE FINE ARTS, CAMBRIDGE.

THE Slade Professor of Fine Arts resumed his lectures at the Fitzwilliam Museum on Monday, the 22nd ult., when the subject was on "Stained Glass." Sir Digby Wyatt explained the whole process, from the plain sheet of glass to the perfect window, illustrating the details by diagrams. He afterwards pointed out the various modes of colouring the glass, and then treated his subject historically.

On Tuesday, the subject of the lecture was "Enamel," in which art the technical principles were more complex than those in stained glass. The lecturer took the opportunity to apologise to the apparently too technical nature of the lectures. He could not but think that in the present day we did not pay sufficient attention to the technical nature of our arts. However, he ublime the manifestation of the art, you could not apply the general principles of criticism unless you understood how the artist was limited in that particular speciality. The art of naming was really the application of glass

to metal. The lecturer described the process of facing the metal with enamel, which was held by means of cavities in the metal. He then proceeded to distinguish between the different varieties of enamel, and to show the antiquity of the art, which was spoken of by Ezekiel. Turning to modern usage, mention was made of the application of enamel to iron for industrial purposes. The process was as yet only in its infancy. It began in humble application to pots and kettles, but now it has been found useful on a larger scale, and promises great industrial occupation. By means of the newly-invented gas oven, enamel could be produced 13 ft. by 3 ft.; whereas a century ago, a piece the size of a sheet of foolscap was the extent thought of. This new process of applying enamel to iron for other than ornamental purposes appeared to supply a desideratum very long wanted.

SCHOOL AND VICARAGE-HOUSE, SOUTHEIGH.

THE new school and vicarage-house erected in this village are now completed. The school was the first work commenced, and the educating of some fifty children is now going on. The building may be described as having brick walls, the window openings, doorways, gables, &c., being formed chiefly of Box stone. The school-room is light and airy, with open-timbered roof, stained and plastered between the rafters. The building is of Gothic character, and may serve as a model to those who wish to build a good and pretty yet cheap school.

The house contains upwards of twenty-two living and sleeping rooms, besides useful accessories. There are two good staircases, one of which is in the tower; this tower is upwards of 60 ft. high. The chief doorway is rich with columns, moldings, carved capitals (by Mr. Knowles, of Oxford), and other work. In the recess is a handsome fireplace, fitted with encaustic tiles of new design, and specially made by Mr. R. Minton Taylor, of Stoke-upon-Trent. The style of architecture set forth in the house is a development of the ancient Romanesque. Both the school and house have been built by Mr. C. Selby, of Oxford, from the designs and under the superintendence of Mr. John Gibbs, architect.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—The strike of the engineers of Newcastle and Gateshead for the reduction of the hours of labour to nine per day commenced on Saturday, when about 9,000 men turned out, in accordance with the notice given. Policemen were stationed at one factory as the men left, but no disturbance took place. At the other factories the men cheered. The works are now locked up. The remainder of the men who have signified their intention of coming out will do so as their notices expire. Numbers of the workmen are under contracts to their masters, and the Nine-Hour League recommends them to fulfil them, if legally bound to do so. Messrs. Stephenson & Co., the great locomotive makers, have declined to accede to the demand for a reduction of the hours of labour to nine per day. Mr. Stephenson bases his refusal on the ground that foreign and home competition will not permit the reduction, and that serious loss would accrue from keeping valuable machinery idle. The firm employ 1,500 hands, and it is expected all will turn out. It is feared that the struggle will be long and severe. A communication has been made, however, to Messrs. Stephenson's workmen, to the effect that if they considered the system now in operation on the Clyde more favourable than that adopted on Tyne-side, the firm would adopt the same number of hours. This proposed compromise was at once considered at a meeting of the men, and it was decided to take a vote as to whether the Clyde system of 57 hours is generally acceptable, or whether the men will strike for 54 hours. If the men turn out, it will increase the number on strike to nearly 12,000. The joiners who turned out some weeks since are still on strike, and there are strikes or agitations in nearly all the trades of Newcastle and Gateshead. A largely-attended meeting of the Newcastle master joiners and house carpenters have resolved to continue to send away for more men. The masters appear more than ever determined not to give in to the nine-hours movement.

Hartlepool.—The carpenters at the extensive shipbuilding yards of Messrs. Denton, Gray, &

Co., of West Hartlepool, and Messrs. Withey, Alexander, & Co., of Hartlepool (Middleton), have come out on strike, their demand for a concession of the nine-hours movement not having been conceded by their employers. Their total number is, we are told, little short of a hundred.

Leeds.—The Leeds carpenters and joiners are agitating for a reduction of hours to nine per day, and an increase of wages. It is believed the masons, bricklayers, and plasterers will follow.

Sheffield.—At a meeting of the committee of the Painters' Union, the resolution passed at a meeting of the master painters, held a few days before, was taken into consideration. The masters had agreed to give 6d. per hour to the better workmen, and 6d. per hour to others. The committee in accepting, on the part of the men, 6d. per hour as the standard wages of the town, also passed the following resolution:—"That we, the operative painters, tender our sincere thanks to the honourable master painters of Sheffield who, with the true spirit of liberalism, treated with their men as a body, in a manner most satisfactory to all parties concerned." The men, we understand, now regard the dispute as practically at an end.

APPLICATION OF COLLODION.

SIR,—I read an article in your paper, titled a "Novel Application of Colloidion," by M. Kieffel, of Berlin. I beg to claim the right, by priority, of that invention, practised by me, and patented the 25th of June, 1869, applied to the decoration of ceilings, compositions, &c., for architectural and other purposes, and have a most comprehensive system for that and kindred purposes, as chromographs and other decorations.

EDWIN ROBBINS.

NEW BUILDING ACT AND FIRE-ESCAPES.

SIR,—A few words as to the controversy upon fire-escapes to houses. Your correspondents have evidently not seen the proposed new Building Act that the Metropolitan Board of Works have tried several years to make law. True, there is a clause that means of escape from houses are to be provided, but then the new method of measuring the heights of walls and houses impedes the escape clause. All walls are to be measured from the base up to the top of the wall (not topmost ceiling, as in present Act); in which case, to save extra thickness, walls will generally be carried up to the roof only, and there will be no parapets. So that, unless flats are formed on top of roofs, and the front and back stacks of chimneys separated, there will not be much opportunity of having fire-escapes in the upper part of houses. Iron balconies may be formed between the top windows of adjoining houses. However, it is not too late for the Board to alter their clauses as to height of walls, and no doubt many other clauses will have to be modified before they become passable.

Y.

THE MULLINGAR EPISCOPAL RESIDENCE COMPETITION.

SIR,—On receipt of the circulars, on the 18th ult., from the secretary of the Building Committee, rejecting all the plans, I sent for mine to be returned, but they are still retained. I can only say that there has been plenty of time to smuggle ideas from one and all of the designs with impunity.

A COMPETITOR.

DECAYING STONEWORK.

SIR,—Can you help me to find a remedy for decaying stonework in a building of brick and stone, the stone of which is decaying fast. I shall feel greatly obliged for any information derived through your valuable columns suggestive of remedy for yours.

A DILAPIDATED STONE WALL.

. Evidence as to the real value of any of the systems at present before the public is still wanting.

WHERE IS THE PIMLICO CLUB?

SIR,—It was stated in your columns, a few weeks ago, that we have now two associations for promoting working men's clubs. Will you allow me to ask, through the same medium, what has been done with the gift of the late Marquis of Westminster, two years ago, of 1,000l., and a site, to build a club and institute in Pimlico? Various reports are in circulation, and about twelve months ago there was handed about the neighbourhood a set of drawings, by an eminent architect, for a building that would cost 10,000l. As it has not been carried out, we suppose it was abandoned; but somebody would have to be paid, and what we fear is that the money will be frittered away in this manner, and the trustees in thus "grasping at a shadow," will lose (for us) the substance.

A PIMLICO WORKMAN.

CLEARING GULLIES VERSUS CLEANSING SEWERS.

SIR,—As your paper is the leader in all sanitary improvements, permit me to point out an evil, and to suggest a remedy. It has occurred to me that there is much wanting under the above heads. Most people will admit that the present disgusting, injurious, expensive, and inefficient mode of clearing gullies is a disgrace to an age

that prides itself on its sanitary engineering. First, we smell, then we see, a carload or more of putrid matter lying in all our streets for hours, at all seasons, poisoning the air, and shocking the sight; its day-work stroke of removal being a most tedious process. The appearance of the black filth leads to the question, how long has it been accumulating? From my experience in country and in town, I feel little hesitation in asserting that there are no such things as cesspits, *in effect*, that is to say, the detritus, &c., is allowed to consolidate *level* with the outlet to the sewer; then follows, as a natural consequence, the second, costly, tedious, and injurious necessity of cleansing sewers. I may be told there is this and that patent gully. I flatter myself I have seen all; and, admitting there are improved means of emptying gullies, yet the great desideratum appears to me to be an indicator of the amount of detritus, &c., in the cesspits. The emptying should follow; and, instead of smelling and seeing what we do, I believe a great sanitary and economical reform would ensue.

T. G.

WATER! MORE WATER!

In these thirty days, when—"Water! more water!" is the London cry, you would probably confer a boon upon the city, by giving place to the following proposals for a new source of supply:—I have lately returned from a prolonged tour in Italy, and have specially marked the care with which rain-water is utilised. In Venice every drop of rain-water is made potable, and in almost every castle and monastery throughout Italy there is a well capable, under ordinary circumstances, of supplying the inmates. The means of attaining this object are both simple and inexpensive, *viz.*—two twin-wells, a foot or two apart, with one or more thin partitions filled with porous slabs that act the part of filters. The rain-water is made to run into well A, and to pass through the filters into well B, which should be deeper than the other in proportion to the demands on it.

Every area and courtyard of London might have such a supply of the best potable water, for the filters would effectively exclude the usual impurities of the house-tops, and such porous tiles could be made in every pottery about town.

Where the London clay is the superficial formation, very little masonry would be required. Where gravel prevails, of course a water-proof lining of cement would be necessary. In such reservoirs water would remain pure and unchanged for any time.

AQUARIUS.

SCHEME OF THE ROYAL SANITARY COMMISSION.

AN important document, embodying in considerable detail the views of the Royal Sanitary Commission as to the best machinery by which "constant and universal supervision of the essentials of public health,"—*viz.*, the food, the water, and the air of the people,—by competent persons, can be efficiently and economically secured throughout the country, has just been made public. The document, entitled "Memorandum on Medical Officers of Public Health," reiterates, in the first place, the unanimous opinion of the commission that "every question affecting public health should be brought into relation with one central office presided over by a minister," and goes on to point out that every district in respect of its health should be,—

"As closely connected with the said department of health as is every part of the country with the Home Office through the police and the magistrates, and as are the destitute with the Poor Law Board through the guardians, &c.," and that every person should "benefit forward be entitled in respect of his health to such reasonable public protection as he is in respect of his liberty and his property."

The Commissioners believe that there should be six permanent departments under the Minister for matters connected with the law of local government, engineering questions, registration and statistics, the relief of the poor, the medical care of the public health and the poor, and legislation bearing on the profession of medicine. The Commissioners affirm that the plan would work well and economically, inasmuch as the action of the several departments would be mutually related and complete. A recommendation to establish laboratories for public analysis in such towns as Oxford, Cambridge, Leeds, Newcastle, Bristol, &c., to be supported by public grants, is also made, as also to bring the naval and military medical services in direct relation to the Central Health Office, which, lastly, would be able by accumulating accurate data to diffuse early, valuable, and trustworthy information touching the cause and the prevention of disease.

MONUMENTAL.

THE full-length bronze figure of the late General Outram has been hoisted on to the pedestal erected for it in the ornamental garden on the Thames Embankment, near the Charing-cross Bridge, and it will shortly be uncovered. The height of the monument is about 20 ft. The pedestal is of polished granite, and its four corners are ornamented with trophies of arms, shields, and warriors' head-coverings, executed in bronze, typical of the races the gallant officer was opposed to in his campaigns.

Alderman Rawcliffe has applied for the permission of the Preston Corporation to place a statue to the memory of the late Lord Derby in one of the Preston parks. He said that a short time ago a working-men's penny testimonial was originated, and they had now 300*l.* in hand. The proposed statue would cost between 800*l.* and 1,000*l.*, and it was the wish of the executive committee that the statue should be placed in one of the parks of Preston. Alderman Goodiar referred to a second statue which was either to be erected in the Shire-hall, Lancaster, or the Town-hall, Preston. Mr. Alderman Rawcliffe said that for the statue Mr. Goodiar had spoken of, the sum of 1,200*l.* was already in hand. The sculptor was at present unwell, but on his recovery he would visit the two buildings named, and decide in which the statue would be best placed. The application was unanimously granted.

The author of "Local Sketches," writes:—"On paying a recent visit to the grave of Charles Lamb, in Edmonton Churchyard, I found it certainly not in the state an admirer of 'Elia' would wish to see it. The mound beneath which he and his loving and beloved Bridget lie is half-trodden down and broken, and what is left of it is anything but the bank, where daisies grow, as Moron wrote. To remove the giant nettles and to order new turf was my first object; but something more requires to be done. In a year or two, unless the letters are recast, the words of the inscription will have passed away."

CHURCH-BUILDING NEWS.

Ellsborough.—The church here, after restoration and enlargement, has been reopened by the Bishop of Winchester. The building, which is finely situated on the spur of one of the chalk hills, between Aylesbury and Wendover, and consisted of nave, south aisle, and porch, chancel, and of a tower at the south-west corner, has been enlarged only by the addition of an organ-chamber and vestry, on the south side of the chancel. With the exception, however, of the north and west walls of the nave and arcade, the church has been entirely rebuilt,—the tower at the cost of about 1,500*l.*, by the late Lady Frankland Russell; the chancel and chancel-aisle, at a cost of about 1,200*l.*, by Mrs. Astley, of Chequers-court; and the south aisle, porch, and portions of the nave, at a cost of about 1,800*l.*, by subscriptions from the last-named lady and friends, and from the parishioners, largely aided by the rector, the Rev. J. H. R. Sumner. The church is dedicated to St. Peter and St. Paul, and is chiefly of the Perpendicular period, with many local features. All the walls, till lately covered with a coating of cement, have been refaced, as originally, with flint, with Bath-stone dressings, in place of the chalk, which was much decayed and defaced. The walls are generally lined with Bath stone and with chalk. The chancel-roof, of the original steep pitch, is of oak, covered with green slates, as are also the chancel-aisle and porch-roofs. The nave and aisle roofs are almost a reproduction of the ancient flat roofs, covered with lead. Mr. Bromfield, of London, has executed the carving throughout the church, including figures of the twelve Apostles, St. Peter and St. Paul, our Lord, &c. The body of the church is fitted with open benches, of pitch pine, varnished; the chancel, with oak throughout; and accommodation is provided for 234 persons. The passage-spaces are laid with Godwin's tiles and old inscription-slabs. The restoration of a monument in the south aisle has been executed by Messrs. Burke, of London. One of the north windows of the nave has been filled with stained glass, designed and painted by the architect, and another, in the south wall of the chancel, by Messrs. Barlow and Grylls. An organ is in course of building, by Messrs. Bryceson. The five bells have been re-hung in the tower, by Mr. White, of Besselesleigh, and a new bell added to complete the peal of six. The church is now

heated with hot water, by Mr. Vincent Skinner, Stokes Croft, Bristol; and Mr. Leaver, of Maidenhead, has executed the ornamental wrought-iron work of the doors. Mr. Giles Holland, of Thames, carried out the several building contracts, under the direction of Mr. Preedy, of London, architect.

Filton.—The ancient church here has been reopened for divine service. The edifice, which ranges from the Norman to the Tudor style, has for some time past been undergoing a restoration, at a cost of 2,300*l.* The entire roof has been taken off and repaired, and about half of the roof of the aisle is new. The roofs are of carved oak; the new piece is a counterpart of the original. A stained-glass window has been presented by Mr. E. Clerk, of Westholme House, and several other stained windows have been put up in various parts of the church, from the manufacture of Messrs. Horwood, of Frome. A new pulpit and font, carved by Mr. Herley, of Wells, have also been erected. Messrs. Hart & Pears, of London, have supplied a lectern, and a new altar, carved, has been presented by the Rev. T. P. Nunn, vicar of West Pennard. The galleries have been taken away, and new open benches of polished pine have been placed all through the church. The arch at the south entrance has been restored to the Norman style and the Early English doorway on the northern side with the Early English arcade has been similarly treated. The architect of the restoration, except the chancel, was Mr. A. E. Gough, of London. The chancel was undertaken by the Ecclesiastical Commissioners, and carried out under their architect, Mr. E. W. Christlan.

Dorking.—We understand that Mr. Woodyer, architect, has had an interview with the committee for the rebuilding of St. Martin's Church, Dorking, and has been instructed to prepare plans for the same forthwith. The estimated cost is about 12,000*l.*

Waterbeach.—Six months ago the old stone church at Waterbeach, dedicated to St. John the Evangelist, was closed for the purpose of being restored. The contract was undertaken by Mr. E. Tooley, of Bury St. Edmunds, who has carried out the plans of Mr. W. M. Fawcett, of Cambridge, architect, and the work is so far completed as to enable the edifice to be re-opened for divine service. The present restoration is only partial, but has cost something like 900*l.* To complete the work will require a further outlay of 600*l.* to restore and enlarge the north aisle, at present untouched. The exterior of the leaden roof has been renovated, and the walls of the south aisle and nave have been newly faced with rustic work, having stone facings. The mullions of the windows on this side have likewise been replaced in several instances, and new buttresses erected. Coming to the interior of the building, the roof of the south aisle was renewed. The old roof in the nave has been varnished. The church has been re-seated with square-top oak pews, having tracery panelled ends, and in the chancel there are some choir-stalls. The walls have been re-stuccoed, and the church columns and arches in the nave renovated where requisite. The flooring consists of red and black Staffordshire tiles in the nave and aisles, and Minton tiles in the chancel. At the eastern end of the south aisle is a stained glass window. The glass is said to have come from the clerestory windows. In the renovated chancel, on the south side, stands a new organ, built by Messrs. Gray & Davison, of London. The work of this partial restoration has been under the superintendence of Messrs. Doo & Ayton, of Bury.

PROVINCIAL NEWS.

Cliffe, near Rochester.—The tender of Mr. J. G. Naylor, of Rochester, has been accepted to restore and enlarge the present Rectory House for 2,000*l.* The architect is Mr. J. P. St. Aubyn.

Hazel Grove.—The new Mechanics' Institution at Hazel Grove has been opened according to the *Macclesfield Courier*. Mr. Wm. Adhead, the honorary secretary, stated that for the erection of the institution Mr. W. J. Leigh, M.P., had given land and buildings worth 150*l.*, and the amount raised up to the present time, exclusive of that gift, was 831*l.* Of that sum the village of Hazel Grove and its immediate neighbourhood had contributed 524*l.*, the number of contributors being about 200. The contract for the erection of the building amounted to 1,040*l.*, and that for the fittings to 160*l.*, which made a total

stability of 1,200l., leaving a debt on the institution of 368l.

Petersfield.—New schools have been opened at Blackmoor by Sir R. Palmer, M.P. The architect was Mr. A. Waterhouse. He has rounded all the several buildings of church, vicarage, schools, and cottages, so that a pleasing effect might be produced. The external walls of all these buildings are built of stone quarried on the estate, with Bath dressings. Mr. Hors Kemp executed the mason's work of the schools, Mr. George Finch, the carpenter's work, Mr. Haunsom the staining and painting, Mr. Odell the glazing, and Mr. J. Finch superintended the works. The large schoolroom measures 60 ft. by 25 ft. and 5 ft. high; the large class-room 17 ft. by 14 ft., and the infant school 24 ft. by 17 ft., with schoolmaster's residence, large playground and exercising yards, and the necessary offices. Every room has been taken by the architect for perfect ventilation and heating. Mr. Ginger supplied one of Gill's stoves for the large school, and Mr. Boyd one of his own for the small school.

Bristol.—A new banquetting-hall is now nearly completed in the rear of, and in connexion with, the White Lion Hotel, Broad-street. The room will hold 300 people. The apartment measures 30 ft. in length by 40 ft. in width, and 35 ft. in height. It will be elaborately decorated. The room will be lighted by coloured glass windows all the day and powerful sunlights at night.

Hatfield Heath.—The foundation-stone of a new mansion to be erected on the site where Crown Hall has long existed has been laid in the presence of Sir Henry and Lady Selwin Ibbetson, Mr. Cookerell, the architect, and others. The stone was laid by Lady Selwin Ibbetson, who handled the trowel as if she were accustomed to the work, but, to the amusement of the audience, her ladyship received several injunctions to strike the stone with greater force.

Books Received.

The Haydn Series: a Dictionary of Science. Edited by G. F. Rodwell, F.R.A.S., F.C.S. London: Moxon & Co. 1871.

WE state that besides the editor, who conducts an able Introductory Essay, the article Heat, and miscellaneous articles; Mr. Proctor, F.R.A.S., is the author of those on Astronomy, Meteorology, and various others; Mr. Crookes, F.R.S., wrote those on Light and Chemistry; and, enough is said to secure confidence in the work as a Dictionary of Science, so far as its limits of nearly 600 pages, in close but distinct type, extend. The scope of the work is general, regarding the physical sciences, but does not include the abstract sciences of algebra, geometry, &c., and the classificatory sciences of botany, zoology, &c. Mr. Tomlinson and Mr. Bottomley contribute various articles relating to molecular physics and theoretical chemistry, and there is one on Musical Intervals by two competent authors.

Miscellaneous.

Oxford Architectural Society.—The second excursion this term has been made to Chester, Middleton, and Chesterton. The members were received at Bioster by the Rev. J. M. Watts, the vicar, who conducted them over the church, and drew attention to the chief points of interest. The vicar conducted the party to view the remains of the priory. They then proceeded to Middleton, where they were received by the vicar, the Rev. C. F. J. Bourke. The church was described by Mr. Bruton. The inspection of the paintings in Middleton House had been offered to the members by the Earl of Weymouth, and though time was limited, and an additional mile was thereby added to a very long walk, and notwithstanding that many of the party were ladies, it was unanimously determined that the liberal offer of the Earl should be accepted, and the entire party proceeded to view the pictures. They regretted, however, that it was impossible, with the limited time at their disposal, to do justice to it. Passing through the park, the party made their way to Chesterton, where the vicar, the Rev. W. F. Fritzsche, had prepared refreshments. The church was then visited. It was intended to visit the Roman camp at Alchester, but they did not permit.

Salary of Architect and Surveyor to Sheffield School Board.—For the services a salary of 100l. per annum was proposed at the last meeting; and for preparing designs of new schools and superintending their erection, a commission of 5 per cent. to be further paid on the expenditure. On the minutes of the building committee coming up for confirmation, Mr. Eadon objected to the salary: 20l. a year would be amply sufficient. Mr. Moore said, when they had erected the schools required, the salary might be reduced, but for the first three or four years the salary ought to be much more than 100l. a year. Mr. Wardlaw considered the proposed salary was excessive, and that there was no architect in the town who would not undertake to do all the work required without any salary, provided he received a commission of 5 per cent. upon new buildings and alterations. An amendment, making the salary 50l., was lost, four voting for it and eight against. It was then resolved that an architect and surveyor be appointed under the conditions set forth in the committee's recommendation; and it was further resolved that an advertisement to this effect be inserted in the local papers. Personal canvass will disqualify any of the candidates.

Report on Water Supply for Birmingham.—Mr. Robert Rawlinson, C.E., has reported, at the request of the local authorities, on the best mode of improving the water supply of Birmingham, and the report has been printed and circulated. Mr. Rawlinson recommends a totally new source of supply, from the rivers Elan and Claerwen in Cardigan and Radnor, Mid-Wales, with reservoirs and conduit, for supply by gravitation to certain towns on the way, as well as to Birmingham; and that the waterworks should be in the hands of the corporation. The length of conduit would be about eighty miles, made up of forty-one miles of masonry aqueduct, twelve miles of tunnel, and twenty-seven miles of iron pipes in valley crossings. The works could supply 40,000,000 gallons daily, at an estimated cost of 2,765,380l., but 20,000,000 gallons could be supplied through the same masonry conduit at an estimated cost of 1,784,720l. To supply the same quantity from the Teme by gravitation, and other improvements of the present supply, Mr. Rawlinson estimates at 1,368,000l. The net present value of the present company's works has been taken at 600,000l. in preparing the estimates.

Handel Festival: Crystal Palace.—The result of recent rehearsals, if we are informed aright, tends to the belief that the commemoration of 1871 will produce no mere mechanical rendering of the great composer's works, but an absolutely perfect and intellectual exposition, by a highly-trained, experienced, and accomplished body of artists, produced with the assistance of extraordinary resources never on any former occasion brought into such perfect and gigantic combination. The directors have reason to be in the highest degree satisfied with the improved acoustical qualities of the centre transept, which will tend very materially to enhance the general effect of the solos not less than that of the choruses. No one who has heard the opera concerts of the present summer can fail to have been struck with a very perceptible improvement in the clearness of the tone. Messrs. Gray & Davison's organ, in view of the approaching event, has been proportionately enlarged,—in fact, for the first time completed according to the scale of the original design,—so that its accompaniment may be in every respect worthy of the occasion.

The Tenders for the Brighton Town-hall Alterations.—At a special meeting of the Town Council, the committee reported that the tender to perform the work for 2,617l. was accepted on the 3rd ult., but on the 16th, when the contract was submitted for signature, Mr. Nightingale refused to sign unless certain alterations were made in the specifications. The committee, therefore, proposed to cancel the agreement, and accept the tender of Mr. G. R. Lookyer, of Brighton, which was the next lowest. Resolutions rescinding the agreement with Mr. Nightingale and accepting the tender of Mr. Lookyer were carried unanimously.

Gutter Children.—We are glad to hear that at the last meeting of the School Board two beades were appointed, for the purpose of taking children who are liable to be sent to industrial schools, before magistrates, with a view to their being so sent.

Chester Archaeological and Architectural Society.—A meeting of this society has been held at the Old Episcopal Palace, Abbey-square, when Mr. Thomas Hughes read a paper on "Chester in its Early Youth: being a Glance at the Colony of Deva, as seen by the Light of the Roman Remains discovered there in Past and Present Times." The entire Roman collection in the society's museum was exhibited at this meeting; and, through the kindness of the Marquis of Westminster, the two fine Roman altars, the inscribed pig of lead, and the celebrated gold torque, from Eaton, were submitted to the society's notice for the first time. The collections of Mr. Frederick Potts, and the Water Tower also contributed specimens in illustration of the paper. There was a large attendance, including the Rev. Canon Kingsley, Professor Max Müller, Mr. H. C. Raikes, M.P., &c. The Rev. Canon Kingsley, on the motion of Mr. Wynne Ffoulkes, took the chair. After the reading of Mr. Hughes's paper, Mr. Wynne Ffoulkes read one on "Torques."

The Destructive Doings in Paris.—Now that the fiendish work of the Communists in Paris is at an end, perhaps the dominant feeling is thankfulness that wretches capable of such purely malicious doings have not done their destructive work still more thoroughly; and that the Sainte Chapelle, the Louvre and its art-treasures, Notre Dame (it is to be hoped), the Pantheon, the Foreign Office, the Ministries of Marine and of the Interior, the Bank of France, and other public buildings have not also been all destroyed. As it is, the catalogue of losses is a heavy one, including, as it does, the Tuileries, the Hôtel de Ville, the Ministry of Finance, the Prefecture of Police, the Cour des Comptes, the Palace of the Legion of Honour, and the Mont de Pitié, besides so many streets and houses almost ruined. The loss of the Louvre library, too, is one to be regretted. The chief streets built during the Empire were too solidly constructed, with stone and iron, to have been easily burnt, even with the devilish help of petroleum.

Liverpool River Approaches.—The subjoined statement, with plans and coloured drawings of the various schemes for improved approaches to the river, has been exhibited in the Exchange Newsroom at Liverpool:—Dock Engineer's plan E 1, as per Bill No. 2, now being promoted in the House of Commons; expenditure to be incurred by Dock Board as per Mr. Lyster's estimate, 143,500l.; expenditure required by Liverpool corporation, namely, removal of a portion of St. Nicholas's churchyard, the adjoining buildings, and the Goree warehouses, so as to widen the dock road sufficiently to take the traffic, see Mr. Lyster's plan of 1866, 260,000l.; total cost of plan E 1, 403,500l. Mr. C. G. Mot's plan—Value of land to be sold for offices and other buildings, 408,000l.; less cost of works as per engineer's estimates, including the new George's Dock, 240,000l.; value of land over cost of works, 168,000l.; total saving to Liverpool if Mr. C. G. Mot's plan is adopted in place of plan E 1, 671,500l.

Coincidence in Names.—Two names, which at this moment are attracting much attention, and occupying much space in the daily journals, apparently very unlike, are identical in origin and meaning, Tichborne and Kidbrooke. Tich, or Titch, being from *ticen*, a kid; and borne, with its varieties of spelling,—bourne, bourn, born, burn,—being a common retention of an old word for brook or rivulet. Tich is not a common prefix, but it occurs in *Titchhurst*, Sussex; in *Titchmarsh*, Northamptonshire; in *Tichborne* and *Titchfield*, Hampshire; and in *Titchwell*, Norfolk. It is said that 22,000 persons visited Kidbrooke-lane on Whit-Monday. We can only lament the misuse of a fine holiday.—A. J.

Whitechapel District Surveyorship.—Mr. S. W. Iron and Mr. Arthur Harston have announced themselves as candidates for the office of Surveyor to the Whitechapel District Board of Works, vacant by the death of Mr. Fricker. Mr. Iron, who is a vestryman of Mile-end Old Town, and, till Easter last, was churchwarden of St. Philip's district church, was for several years assistant-surveyor in Mr. Fricker's office. Mr. Harston is a member of the Limehouse Board, and was for eight years in the office of Mr. Dunch, surveyor to the Limehouse district. There is also some mention made of Mr. Hudson as a probable candidate.—East London Observer.

Wells Cathedral.—A meeting of the General Committee for restoring the west front of this cathedral was held on the 23rd ult., at the residence of the Earl of Cork, in Grafton-street. The architect, Mr. Ferrey, was in attendance, and having reported that the works were steadily progressing, and that the central portion would be finished in August next, the committee instructed him to obtain a tender from the contractor for the execution of the second or south-east section of the works. The attention of the committee having been called to the dilapidated state of some of the statues of the west front, Mr. Ferrey was directed to prepare a detailed report on the condition of the whole of them.

Wednesbury New Town-hall.—"J. G." wishes to draw attention to the condition of this building, now in progress. He says,—"When the work was commenced the builders could not find a proper foundation for one side of the building; so an additional sum was asked by the architect, which was granted. The building progressed, and is now ready for the roof. But what is really the state of the building? The fact is, two sides have given way, and the building is cracked and otherwise damaged. There is a fear, when the roof is on that the whole building will give way. I think the attention of the members of the Board should be directed to the state of the building."

The Sewage of Exeter.—A lease of this sewage has been granted to a public company for twenty-five years, who propose to utilise it according to the plans of Mr. Proctor Sherwin, C.E., upon the irrigation principle. The sewage will be conveyed by means of a conduit under the River Exe, and will then be pumped by two 40-horse power beam engines, so as to irrigate some 600 acres of land, which have been secured for that purpose. Mr. W. Hope will lay out the land for the company. The entire cost of the irrigation work (exclusive of the land) will not exceed 25,000l., for which sum Mr. S. Hassel has undertaken their execution.

Epping Forest and the City Authorities. It seems that the City Corporation are anxious to have the honour of securing all that remains of Epping Forest, 3,500 acres, for the benefit of the people. The Court of Common Council, on the motion of Mr. J. T. Bedford, have referred the subject to the Coal, Corn, and Finance Committee to wait upon or communicate with her Majesty's ministers as to the terms and conditions upon which the forest can be preserved from further spoliation.

Oxford-street to Charing-cross.—At the last meeting of the Metropolitan Board of Works it was resolved to apply to Parliament for power to pay 200,000l. towards the cost of the proposed new road, to be constructed by the London and North-Western Railway Company, from Tottenham-court-road to Charing-cross. The total cost of the new road is estimated at 540,000l.

Society of Engineers.—At the next ordinary meeting of this society to be held on Monday evening, 5th June, a paper will be read on "The Timbering of Trenches and Tunnels, applicable to Sewerage or Railway Works," by Mr. Charles Turner, to whom the premium offered by the President has been awarded by the Council.

Proposed Opera House for Copenhagen. A design is to be chosen in competition, and some English architects appear to be about to send drawings. We conclude, from a paragraph in a daily paper, that the names of competitors are not to be withheld from the judges.

TENDERS

For rebuilding two houses and shops, in Edgeware-road, for Messrs. Pocock, Brothers. Mr. Wm. Berriman, architect. Quantities supplied:—

Perkins	21,355 0 0
Green	1,250 0 0
Tarrant	1,240 0 0
Fisher	1,197 0 0
Maryland	1,180 0 0
Sharp	1,154 0 0
Ingram	1,140 0 0
Eldon	1,089 0 0
Cooke	1,077 0 0
Gibbs & Son	839 0 0

For reinstatement after fire, at the oil-mills, Hammer-smith. Mr. G. H. Simmonds, architect:—

Williams, Bros.	21,480 0 0
Chamberlain, Bros.	1,269 0 0
Grover	1,193 0 0
Wicks & Bangs	1,095 0 0
Jacobs	1,070 0 0
Adams	1,060 0 0
Mortar	847 0 0

For alterations and additions to Mr. White's house, Cuckfield, Sussex. Mr. T. Case, architect:—

Jeffery	2245 0 0
Anson	240 0 0
Desson	230 0 0

For building villa residence, on the Crystal Palace Park Estate, Sydenham, for Mr. J. Kendry. Mr. J. Norton, architect. Quantities by Mr. S. J. Thorne:—

Pesket & Taylor	23,430 0 0
Nightingale	2,314 0 0
Dover, Dowel, & Co.	2,301 0 0
Cooke	2,189 0 0
Pollard	2,235 0 0
Smith	2,198 0 0
Heath, jun.	2,189 0 0
Cooke & Green	2,178 0 0
Taylor	2,126 0 0
Capps & Ritao	2,110 0 0
Gooding	2,084 0 0
Watson, Brothers	1,930 0 0
Hugheson	1,930 0 0
Whiting	1,915 0 0
Crosley	1,898 0 0
Waterson & Co.	1,890 0 0
Crook & Wall	1,845 0 0
Moore & Grainger	1,705 0 0

Accepted, for the erection of a paragon-house at Holmesfield, for the Rev. T. Hirst. Mr. S. Rollinson, architect:—

Excavator's, Mason's, Bricklayer's, Slater's, Plasterer's, Smith's, and Founder's Work.

Wright & Boies.....£870 0 0

Carpenter's, Joiner's, Plumber's, Glazier's, Painter's, and Stainer's Work.

Elliott.....£403 0 0

For the erection of pulpit, police-station, museum, and other buildings, at Winchester. Messrs. Jeffery & Skiller, architects. Quantities by Mr. Thos. Ladds:—

Blackburn	13,350 0 0
Dowel & Co.	12,121 0 0
Smith	12,995 11 8
Brinton & Bone	12,350 0 0
Haggon	12,214 0 0
Harrison & Son	11,800 0 0
Mackin	11,689 0 0
Carter	11,283 0 0
Sollett	10,750 0 0
Dunay	10,870 0 0
Quick	10,874 0 0
Finch	10,625 0 0
Dallimore	10,590 0 0
Bull & Sons	10,196 0 0
Newman & Son	10,475 0 0
Sibley	10,327 0 0
Barnes & Moody	10,313 0 0

For masters' residences and boys' schools for St. Barnabas, Fimlico. Mr. F. W. Hunt, architect:—

Schools.	House.
Richardson	£2,151 18 0
Jackson & Shaw	2,107 14 8
Haylock & Son	1,692 0 0
	1,480 0 0

* Accepted.

For rebuilding the Holborn Branch Bank, for the London and County Banking Company. Mr. C. Jocelyn Parnell, architect. Quantities supplied by Mr. James Schofield:—

Sturgeson	£8,687 0 0
Corder	6,675 0 0
Hill & Sons	6,573 0 0
Perry & Co. (accepted)	6,601 0 0

For repairs to the water-towers, Crystal Palace, Sydenham. Mr. C. H. Driver, architect. Quantities supplied by Mr. T. Nixon:—

Long	£3,850 0 0
Chappell	3,500 0 0
Dowds	3,499 0 0
Bruce	3,179 0 0
Nixon & Son	3,398 0 0
Jackson & Shaw (accepted)	3,193 0 0

For alterations and new buildings for a new brewery, at Lower Tooting, exclusive of founder's work, engines, boilers, &c., for Messrs. Atlee. Mr. Arthur Kinder, architect. Quantities supplied:—

Rudkin	£2,325 0 0
Late	2,203 0 0
Williams	2,177 0 0
Deacon	2,080 0 0
Fors & Blackshaw	1,899 0 0
Norris	1,868 0 0
Kelly, Bros.	1,863 0 0
Moultrie	1,840 0 0

For Edmonton main drainage, Middlesex. Mr. G. Eades, Engineer. Quantities supplied by Mr. Driver:—

Waller	£47,982 0 0
Webster	44,000 0 0
Stiff	41,000 0 0
Parrell	40,809 0 0
Kryen & Co.	39,918 0 0
Walker	36,821 0 0
Hill, Keddell, & Waldram	36,686 0 0
Anderson & Danvers	35,240 0 0
Bloomfield & Morris	35,975 0 0
Ratson	34,750 0 0
Wainwright & Wilson	33,880 0 0
Marshall	33,880 0 0
Riley	33,503 0 0
Pearson	33,333 0 0
J. & J. Haynes	33,000 0 0
Moore	31,720 0 0
Brown	32,000 0 0
Neave	31,531 0 0
Chappell	29,350 0 0
Sibley (accepted)	28,124 0 0
Wignmore	27,700 0 0

* Exclusive of work under the New River.

For drainage and road-making, for the Enfield Burial Board. Mr. T. J. Hall, architect:—

Porter	£3,500 0 0
Pizzey	3,200 0 0
Patman, Bros.	2,548 0 0
Shurmer	2,490 0 0
Bayes & Co.	1,882 0 0
Bagird	1,555 0 0

For villa residence, at Dartford, for Mr. J. C. Hayward. Plans, specifications, and quantities by Messrs. Habershon & Pite:—

Reedall	£2,331 0 0
Cobham	1,850 0 0
Goddard	1,913 0 0
Jeffreys	1,871 0 0
Harrison	1,835 0 0
Tongue	1,807 0 0
Naylor	1,790 0 0
Gambrell	1,766 0 0
Rooney, Bros.	1,750 0 0
Dover, Dowel, & Co.	1,727 0 0
Perry	1,690 0 0
Groom & Davis	1,690 0 0
Blake	1,672 0 0
Blackmor	1,673 0 0
Perrigor	1,630 0 0
Hugheson	1,626 0 0
Low	1,618 0 0
Blackburn	1,591 0 0
Watson, Bros.	1,580 0 0
Estlin & Chapman	1,570 0 0
Gooding	1,560 0 0
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The Builder.

VOL. XXIX.—No. 1479.

Concrete Buildings at West Brompton.



R. FOWLER, the engineer in chief of the Metropolitan and the Metropolitan District Railways, and his former colleague, Mr. T. M. Johnson, and present assistant, Mr. B. Baker, have made use of concrete very largely in the works of that line. A good example of their use of concrete is to be seen at present at the Cannon-street Station of the District line, now fast approaching completion. The backing of the retaining walls, and of the covered ways of the inner circuit throughout the greater part of the route, is of concrete, which has well served

its purpose. The engineer, enamoured apparently with the material, thought it applicable to more extensive uses, and with this view probably a crucial test of its tenacity and bearing powers was applied in the construction of a bridge, near West Brompton, about two years ago, described in our pages at the time. The single arch was of 75 ft. span, with a rise of only 7 ft. 6 in. It was originally only a narrow rib, 12 ft. wide, afterwards widened to 40 ft. The depth of concrete at the crown was 3 ft. 6 in., at the haunches 8 ft. 6½ in. The narrow rib stood a strain of wagons loaded with sand and iron equal on the crown to 15 tons per superficial foot. The load was left on all night, and for some time into the next day, without the detection of the slightest symptom of failure. This trial bridge has since been removed, to make room for an extra line of rails, but was strong enough in the test it bore to fully justify the much more extensive use of concrete now in course of execution by the Metropolitan District Company. We regret to have to notice a serious misadventure that has occurred in relation to the more extended use to which we refer.

It may be known to our readers that the Metropolitan and the Metropolitan District Railway Companies, although apparently "one concern," have really, for some time past, lived together a "cat and dog life." The whole of the inner circuit, as yet opened, has been hitherto worked by the Metropolitan Company, under an agreement, which expires at the end of this month. From the 1st of July next it is intended that the Metropolitan District Company shall work its own part of the system by its own rolling stock. This, of course, means the provision of engines, carriages, and wagons, and premises for their housing, repair, and manufacture if the company think fit. These premises are being provided in a very spacious area that the District Company has purchased to the west of the double junction of the District line with the West London at West Brompton.

These works, in so far as walls are concerned,

it has been determined to construct of concrete. These great concrete works embrace, first of all, a boundary wall of great length. It is a fair piece of work as far as executed, and is compounded of blue lias lime from Warwickshire. The foundation, laid upon solid stuff, is about 2 ft. wide by 2 ft. deep, of concrete; the wall from the ground level is 7 ft. high, and batters 6 in. on the outer side,—that is, from a thickness of 15 in. at the bottom to 9 in. at the top. It is strengthened by piers on the outside, at about 60 ft. apart. The method of construction in this wall is the same as is followed in the larger works to be hereafter referred to. Strong standards, at suitable distances, are fixed and bolted at top and bottom, and strengthened with stays at the feet. On one side batten-boards of about 6 in. by 1½ in., are nailed all the height. These are machine-dressed on the inside, and finished flush and fairly jointed. The foundation having been laid, a batten-board is let in within the standards on the operating side, and the concrete is put in, and the sides are worked with the shovel so as to drive in the stones from the surface and leave a clean finish of plaster, so to speak, next the boards. So, upwards the work is proceeded with; being taken in lengths, bond is obtained by "toothings," in the same manner as in brick-work. This boundary wall, of blue lias and gravel in the proportions of 1 to 5, shows good surfaces on both sides, and is finished by a little scraping and pointing.

Larger erections in the same material are in progress on the ground. These consist of a running shed, 165 ft. long by 54 ft. wide, and near it, connected by a traverser, a repairing-shop, 103 ft. long by 60 ft. wide. Again, adjoining these, are to be carriage-sheds and a smithy, each of the buildings above 80 ft. long by 60 ft. wide. There will also be carriage-shops 265 ft. long by 75 ft. wide, and a carriage-shed, 260 ft. long by 51 ft. wide. The engine-shed will have four lines of rail, and the carriage-shed five lines.

All the large buildings, to which reference has been made, are to have their foundations and walls entirely of concrete, and a beginning had been made with one of them, which has come, if not to a bad ending, to at least a very ugly interruption. The end wall, and about 70 ft. of a side wall connected with it, had been got up, the one to a height of about 30 ft., and the other to a height of 20 ft., when the timber supports were removed; this had not been long done before the two walls fell, breaking as flag-stones might have done, and in such a manner as to show that the greater part of the material employed was well fitted for its intended use.

We first saw the structure about three weeks ago, and learned,—the information causing a misgiving at the time,—that the lower portion of these concrete walls was to be of blue lias and gravel up to the ground-line, and the main portion of the wall to be of Portland cement and gravel; proportion, seven to one. The foundations were a mass of about 3 ft. wide by 3 ft. thick of the blue lias concrete. Above the foundations the wall is carried for 4 ft. in a thickness of 2 ft. 1 in., to a height of within 1 ft. below the proposed rail level. Above that, the wall is of Portland cement concrete, 18 in. thick.

As is well known, Portland cement concrete sets very rapidly, whereas concrete of blue lias goes on hardening for years; the first is often harder in a few hours than the other becomes in as many months. The project of lias concrete foundations and footings would have served the purpose, doubtless, if they had been in the ground or well packed on both sides; but through some strange inadvertence this seems to have been forgotten, and the lias concrete wall, which rises above the present ground level, was not protected up to the height to which it is to be banked with made ground, and not being so supported, or well set, it succumbed

to the superincumbent weight of the consolidated Portland concrete wall above it. Experience will doubtless teach the builders as to the conduct of their future operations.

The walls, as already stated, of these shops and sheds will be 18 in. thick. They will be strengthened by piers 3 ft. by 2 ft., from 12 ft. to 14 ft. apart. The greater number of the erections will have cross roofs, with double queen-post principals, set at about 15 ft. apart, supported on columns. The roofs will be about a third of glass, the remainder of slates, the purlins being, of course, horizontal. Where side lights are introduced, they will be by cast-iron windows with semicircular heads, and cast with lugs to let into the concrete.

We hope to be able to report favourably in future numbers upon the progress and successful completion of these interesting works in concrete; and in order that this may be the case, we advise a revision of the system which is being pursued. The timber mould, so to speak, in which the concrete is placed is, itself, a very costly and bungling contrivance.

AMONG THE INTERNATIONAL PICTURES.*

A QUESTION which naturally suggests itself on passing from the East to the West galleries at the Exhibition is, "What are the distinctive characteristics of the English school of painting, as contrasted with any or all of the Continental schools? What has it in particular which they have not, and what failings are there peculiarly its own?" Such a query would probably have been much more easy to answer twenty-five years ago than it is in this year of grace 1871. We are certainly becoming less insular than we were, in art as in other things. The hard-and-fast line of demarcation between English and Continental art is so far being broken through that, although something in the general look and tone of the pictures tells us that we are in the English Gallery, there are isolated paintings here which we might almost as naturally expect to find taking place in the French or Belgian galleries, just as there are in those galleries (in the latter particularly) paintings not easily distinguishable in style and manner from the works of some of the best known English artists of the present generation. Then, too, we have naturalised among ourselves some able and distinguished artists of foreign lineage, such as Mr. Alma Tadema, whose works are not only becoming like familiar faces on our Exhibition walls, but are influencing the style and manner of some of our own artists. What there is peculiar to the English school, therefore, cannot be so well generalised as noted more in detail; though it is impossible not to recognise in a large proportion of our paintings a comparative lowness of scale in colour, and a lack of intensity and of definite point and aim in dealing with the subject treated. What, for instance, is it which causes so carefully and correctly painted a picture as A. Johnston's "Flight of Mary of Modena" (145) to fail so completely in arousing any interest in us? There is no definite fault to charge against the work; but it is simply mediocrity and totally unimpassioned: there is no evidence that the painter has felt his subject strongly, and he naturally cannot make the spectator feel it. We wish very much the same remark were not so applicable as it unfortunately is to a very large number of what are called "historical paintings" by English artists: so it is, however; and rarely indeed do we see a picture of this class which in any degree intensifies our conception of or interest in the subject it illustrates. So with "Helen of Kiroonnell" (26), another picture from last year's Academy, with which there is no special fault to find, save that it simply vulgarises the deep and stern pathos of the old ballad which it professes to illustrate. That dire sin called "common-place" is, we fear, the standing defection of too many English painters. Among works which are nowise open to such a charge many will recognise with pleasure Mr. Poynter's masterly and original little picture, "Andromeda" (43), where the cold blue drapery, flying wildly in the wind, intensifies the expression of forlorn terror in the beautiful figure, showing how an artist of genius can create a new interest

* See p. 379, ante.

in an apparently hackneyed subject. This picture will be better done justice to in its present position than in the corner where it was hidden away in the Academy last year, where many visitors entirely missed it. We welcome as an old friend, too, Leighton's "Mermaid" (36; so entitled in the catalogue, but really an illustration of Goethe's well-known ballad, "The Water rushed, the Water swelled"), one of the earlier works in which the painter indulged his peculiar fondness for perhaps over-wrought contrasts of flesh tint. Halswelle's "Pilgrims of the Santa Scala" (84), with less than usual of the artist's mannerism, is perhaps the best in point of composition that he has exhibited; the contrast between the soft beauty of the kneeling woman and the rugged sternness of the bandit (?) is happily conceived. Prinsep's "Death of Cleopatra" scarcely improves on acquaintance; style there is, but little energy or genuine feeling; the same artist's "Venice, 1560" (349), with less of his characteristic manner, is more interesting and tells its tale better. Of an older artist, also with a strong idiosyncrasy of style, we have perhaps the best specimen he has ever painted, as illustrating his own peculiar powers, for with such a scene as the "Song of Philomena by the beautiful Lake," from the Deceameron (61), the peculiar mystical tone and scale of colour, which give a too unreal aspect to some of Poole's works, are completely in keeping; the soft dreamy light which falls on the wooded lake, the group of musing figures in the foreground, all breathe the very air of romance, tempting us to linger—

— "till we do forget
That golden time again."

In contrast to this we may notice, a few paces off, F. Walker's "The Plough" (73), farther explained in last year's Academy catalogue by the sentence, "Man goeth forth unto his work and his labour until the evening;" one of those pictures belonging peculiarly to modern feeling, which seek to connect the outward aspects of nature with some of the sadder problems of earnest work-day life, and lose none of their poetry and interest on that account; a work in feeling and execution alike honourable to the school which has produced it. Among other paintings where figures are the predominant source of interest, but which come mainly under the head of *genre*, we note the same artist's admirable study of the nude, not in its most classical developments, under the title of "The Bathers" (389), deformed only by that somewhat sickly yellowish-green tone in the landscape which this artist is now happily getting quit of. Mr. H. S. Marks's heterogeneous-looking band of musicians are still on their way to "the Minstrel's Gallery" (10), but the painter himself has been in other regions, and appeals to our philanthropy with his significant question, "What are the shepherds doing that the lambs go astray?" (the "lamb" showing a round cropped head, devoid enough of malice, over the rail of the "dock at a court of quarter sessions" (374); a pendant to the kindly satire expressed in the sketch, "Before the Bench in the State School of Compulsory Education" (191). As to Mr. Tidy's "Union" and "Repeal of the Union" (137 and 143), we have little faith in any such "repels," and fully expect the "parties" to make it up again; but in point of tone and style we prefer E. Barclay's "Whittling" (442), especially with so comely a rustic belle to look on at the operation; to be sure there is a mannerism in the flat treatment and low tone of the figures, but it is a mannerism pleasant and characteristic enough, reminding us by the way of the manner of that other painter of rustic figures, Mr. Mason, unfortunately conspicuous by absence, whose thinly-painted, expressive figures gave us the poetry of country life, removed one degree, literally and figuratively, from the hard reality of nature. Of the said reality there is enough and to spare in Erekine Nicol's representation of the "Renewal of the Leasse Refused" (85), one of the best and most refined (or, may we say, least unrefined?) specimens of this artist's portrayal of Irish humour. Our sympathies are bespoken for other than home scenes by J. Stirling, in his admirably-painted little picture of the "Water-seller of Morocco" (360), equally good in the finish, the colour, and the grouping and attitude of the two thirsty children who wait for the welcome supply out of the skin of water. "Bagun at Tangiers, 1898; finished in Paris, 1870," is the short sketch given of its history. "The Toilet of a Lady of Ancient Rome" (379), by C. W. Nicholls, looks a little too like an intentional yet not completely successful imitation of the hard, precise style

and finish of certain French painters: the subject wants interest in itself, despite the compassion inevitably excited for the luckless handmaid who has broken a bottle dedicated to "the cosmetic powers," and at whose feet the lion's head, forming part of the foot-rest, grins with a ludicrous repetition of the scowl of the lady. To return to modern life: it is perhaps significant, in a way, that paintings of every-day life of the upper classes run with us so much into open-air scenes, while the French artists keep us continually in the boudoir. As to the comparative interest of the two we fear there can be little doubt: the place of Carand and Goupil is supplied, in English galleries, by the painters of water parties and tea-garden réunions, such as Field's "Henley-on-Thames" (104) and Archer's "Tea on the Grass" (114), whereof it may be said verily that they "smell of bread-and-butter." Among pictures, too, which would be painted nowhere but in England may be noted those "Meets of Sir Blank Blank's Hounds," and other such "sporting" subjects, which must not a little puzzle the foreign connoisseur intent to define their motive or value. We will compound, rather than these, for Ford's cottage-scenes, not ill-represented in this gallery, albeit opining that such subjects have been "done to death," and that the taste which sees pathos and humour only in representations of what is called "humble life" is as one-sided, as much based on cant and fashion, as any other prejudice. Humour of a different type from this is exemplified in Slocombe's "The King's Pictures, 1645" (131), examined with a mixture of curiosity and contempt by the virtuous eyes of certain steeple-hatted Puritans, who affect not to find the subjects at all to their taste. J. D. Watson's "Student" (192), reclining on an antique chest, and studying his mistress's face, rather than any less interesting book, is a picture of more refinement and feeling than we meet with every day; nor must we pass over Wallis's "His Highness and his Excellency the Ambassador of the Florentine Republic" (473), two figures in the costume of the great period of that Republic, sitting in *déshabillé* unofficial attitudes on a marble seat, in animated discourse,—an interesting and suggestive work. Among that interesting class of pictures depending for their expression on the pose, costume, or feeling of a single figure, are two very French in feeling.—Mrs. Charrett's "What shall my Song be to-night?" (153) and M. Claxton's "Nature and Art" (451) the latter a very thinly-draped female figure drawing a curtain to contemplate a picture of undressed nature, the subject and manner reminding us of some of Coomans's paintings, but with far less finish. Taylor's "Unfortunate Shareholder" (302), a full-sized half-length, reading the unwelcome news of the depressed state of the market, has a kind of rueful pathos in the anxious lines of the face; and for intense feeling, of another description, perhaps there are few pictures in the gallery which one would be less likely to pass without turning to look at than the solitary figure on the seashore, with hands clasped over the head, by Cave Thomas, called "The Reverie" (288), a fine imaginative conception. Some other notable and well-known works have been before alluded to as present. In portrait our reputation is saved by G. F. Watts, whose masterly heads of Lord Lawrence, Carlyle, and others, above all his noble half-length of Herr Joachim, violin in hand, are on the high road to become "old masters" if they last out the right and requisite time to ripen such distinction. In his "Evan" (385), and his portrait of "Miss Prinsep" (165), a sitting figure in a blue dress before a piano, the same artist gives example of his versatility of manner. Mr. Watts's portraits rise to the dignity of high art.

As to landscape, we are not altogether well represented, not in oil at least; though there is a fair collection, sufficient to mark clearly enough the characteristic tone and feeling of English landscape-painting; its realism, its want of definite aim and purpose, its facility (some time ago recognised as a characteristic by a French critic), in the representation of cornfields, Lucas's "Evening" (35), a view over a golden sunlit field of corn, is, perhaps, a picture which as to subject, finish, and colour would scarcely be found among the productions of any other nation; the feeling for this particular aspect of nature being a peculiarly English one, as evidenced in our literature also. Knight's "Crawley Rocks, Oxwich Bay" (19), is a well-painted coast scene; in which class of subjects also we have some of the well-known pictures ("The Acre by the

Sea," 361, being about the best) of J. C. Hook, who, however, certainly exaggerates the green of the rocks and lead-blue of the sea, just as J. S. Nash in turn exaggerates Hook. Still, these are paintings with a marked style, and at least free from that distressingly "painty" look which oppresses us in some other sea-pieces. Among other pictures bearing a manner of their own in the artist's view of nature may be named Hunt's "A Welsh Stream in November" (130), Hall's "A Breeze up Channel" (135), a really fine study of green watery sea; and H. W. Oakes's "Autumn" (160), the subject merely a brown stream and some thin trees, but full of distinctive character. Gosling's "English Harvest Field" (183) is one of the best and least-mannered specimens we have seen of the national subject, very well and carefully composed, and very atmospheric. One Creswick (291) is a very good example of this peculiarly English landscape-painter of the old school; and R. Edwards's "Winter Evening at Twickenham Marsh" (338) is a small landscape with much solemnity of feeling about it. One of the best things in the galleries, combining freedom of touch with accuracy of effect, is Ingholt's "Venice—Pinzetta and Ducal Palace" (359) a picture very peculiar and original in tone and execution. H. W. B. Davis's "Ambleuse Bay" and "On the French Coast" (416 and 420) should not be passed over; and there are others, new and old, worth attention, including one or two of the best of Graham and McWhirter, which need only be alluded to; but, as a general rule, we cannot fail to note in the English landscapes a large proportion of more accurate painting, a deficiency of predominating motive and feeling, as contrasted with the French, though counter-balanced by a great and conscientious attention to nature. Among paintings of architectural subjects, which are not numerous, we may perhaps safely challenge any other nation to show architectural pictures of such artistic excellence in tone, composition, and colour, combined with such accuracy of drawing as in the sketches (for some of them are scarcely more) of the late D. Roberts, of "St. Paul's from the Thames," and other adjuncts of the metropolis. W. W. Dunn's "Corridor of a Genoese Palace" (202) is worth notice,—rather, however, as an architectural view than a picture, in the usual sense of the word. An Englishman may look with some pride on the water-colour gallery, not only as we are the only nation possessing a water-colour school at all, but in view also of the very high degree of excellence characterising a large proportion both of the landscapes and figure pictures in this department. The recent tendency to the use of body-colour (which, unless very sparingly employed, is no true water-colour, but only a means to make water-colour do what oil can do better), is less apparent in this collection than in some of the smaller exhibitions of one at least of our water-colour societies. Among figure-subjects we meet our old friends "Marguerite and Faust," by J. D. Linton (158), and can only wonder again that the artist who could give so tender and original a rendering of the immortal love-story should have failed so completely in his attempt to portray Mephistopheles; and we are surprised, however, to find this work still apparently, on the artist's hands. This, and Tidy's two large and elaborate drawings, "The Night of the Betrayal," and "Christ Blessing Little Children" (1723 and 1732) are satisfactory proofs of what may be done with figure subjects of no inconsiderable size and importance in pure water-colour. An admirable specimen, too, of fine composition as to light and colour effect, and broad handling, is Madame Bischoff's (*née* Kate Swift) "Consolation of Age," (1603), a girl reading to an old lady. Miss Lucy Madoc Brown's "Après le Bal" (1721), is a drawing not to be passed over, and with a "moral" too; and C. Haag's "Sheik Michael el Musrah" (1756) will escape the notice of none who have an eye for rich and glowing colour. Absolon's "Sir Roger de Coverley" and other previously-known drawings by J. D. Watson and others, will be welcomed again; and a small drawing, by C. Green, "A Reverie" (1763), a single small female figure musing over a tambour-framed, is very suggestive and full of feeling. S. Pope's "Honra de Leisura" (1797) is a scene of placid enjoyment, almost enough to make one lazy in sympathy with the well-fed old monk with the flute to his lips. Pinwell's two drawings of "The Pied Piper of Hamelin" (1724 and 1736), were probably intended to tally with the grotesque humour of Browning's famous "child's story," but it is easier to embody

is kind of humour with pen than with pencil; the drawings are somewhat too grotesque, and not pleasant in colour. Among landscapes, that branch of natural representation to which water colour, with its soft aerial tints and tints, lends itself so happily, we need hardly say that A. P. Newton gives us a sight of one of those mighty hills in which he delights, where the mountains, though represented on an actually small scale, increase in size and scale as we study the drawing, and get imbued with the artist's meaning and feeling.

W. Hunt's "Child of Roland" (1,571), and W. Williams's "Sunny Showers, Isle of France" (1,654), are each in its way fine examples of what water-colour can accomplish in intended and aerial effects: the sunset skies of Mather and Mogford have not lost their glow; perhaps we could dispense with the constant repetition of the same effect in the drawings of the latter; Hargitt still finds Highland cattle valuable as a foreground high-light for his dark landscapes; and A. MacCallum shows us no means the least laboured and successful of his tree studies, in "The Oaks of Cranbourne Chase, Early Morning," a beautiful translation of trees and of morning effect; and, truth to say, we like this artist better on this scale than in those great fields of canvas displaying masses of the trunks of forest trees, whereby he is known to frequenters of the Academy, and which always strike us as larger than the subject-matter demands, or is worth. One small drawing, by Miss Frances Keys, is worth particular mention for its originality of idea and treatment; "Lost on the Mountains" (1,667), a dark twilight scene, the sky nearly filled up by the outline of a bleak mountain, the foreground even more desolate with morass and reeds, among which is distinguishable the form of a solitary stray lamb, the one spot of light in the composition; nothing could better intensify the loneliness and vastness of such a scene than the figure of this hapless little wanderer, a mere point amid the darkening landscape: it is a poem worthy of Wordsworth.

And so we take leave for the present of the international pictures, not finding perhaps so much of novelty, or so marked an illustration of the peculiar strength and weakness of various schools, as we had hoped for: comparative deficiencies, which are perhaps to be accounted for partly by the disturbed state of the Continent of late, partly by the prevalence of a feeling that the present Exhibition was experimental merely, and a consequent doubt as to importance as a medium for the making known of new works. The general success of the experiment, so far, will probably arouse greater interest on the part of artists when it is repeated, which repetition, however, we hope will be only at such intervals as will afford time for marked progress between each, and for the adequate development of works of art of sufficient importance to justify such a comparative exhibition of the progress of various nations. This (as we before hinted) will not be the case if the Exhibition be made an annual one; there will not in that case be matter to fill up satisfactorily, and it will degenerate only into an ordinary assemblage of pictures, wheat and chaff together. We should say that intervals of three years would be the shortest at which to hold international exhibitions of high art, if the art is to be really worthy of the occasion.

FURNITURE AT THE INTERNATIONAL EXHIBITION.

What is it that we look for in furniture such as may be worthy of the dwellings of civilised and cultivated people? We may commence with the simplest desideratum, and say that, in the first place, it must, before all other qualities, be characterised by solidity and durable appearance and construction. Nothing more completely and immediately debases the aspect of an apartment than flimsy and rickety-looking furniture, in which material has been "saved" in every direction, and which appears as if starved and ready to fall to pieces under any but the most cautious usage. This quality of strength and solidity it is which forms one of the most striking distinctions between old furniture and that which is turned out by a certain sort of cabinet-makers in the present day. Many an old sideboard or elbow-chair, the design of which would never well be defended on the best artistic principles, derives a kind of patriarchal dignity, nevertheless, from its massive and durable aspect, so radically distinct from the cheap and

showy type of the present day, which gives us but few specimens of domestic furniture that seem likely to fulfil what Cobbett thought the great end to be looked to in the fabrication of the poor man's table, that it should be an heirloom for future generations. We must not, on the other hand, be cumbered by needless and ostentatious weight or clumsiness, especially in objects which have to be shifted about occasionally. We want the general form to be graceful or picturesque, without displaying either weakness or a tortuous straining after effect; we want the construction and design to be such as may be naturally suggested by the material; and we want ornament judiciously applied,—that is, not jumbled indiscriminately over the whole thing (as if a rich effect would come of itself if you only laid on the gilding thick enough), but applied with an obvious motive, and in positions where it may be seen and admired without interfering with, or being interfered with by, the practical use and purpose of the particular article of furniture of which it forms the decoration. These do not seem, stated broadly, very unreasonable or unattainable stipulations, yet they are not often thoroughly fulfilled in any one article of modern furniture.

Before passing a few remarks on the specimens of furniture design in the Exhibition, we may take note of three specimens of carved white marble chimney-pieces placed together in the gallery adjoining the north-east staircase. Chimney-pieces, though not in one sense looked on as furniture, may, in point of design, be classed under that head, and afford some of the best opportunities for the display of decorative treatment of a refined and ornate type. Considering how expensive and beautiful are some of the materials used for this class of work, it is variations to find them so constantly thrown away on designs of the most commonplace quality. In the present case we must repeat the same regret over the chimney-pieces by Messrs. Mignot-Delaunoy and Tainsy (2,738-9, both from Belgium), which are in the usual style of Louis Quinze and Louis Quatorze work respectively, without a single new idea either as to design or treatment of the material, the carving of which is very tame and spiritless, though elaborated to such an extent as to render the works costly, however inartistic. The third specimen, by A. Beernaert (2,726), though not in a very good style either, is far superior in point of treatment, the ornament being well and somewhat thoughtfully conventionalised, and treated with the hard, precise lines and delicate contour to which marble so admirably lends itself. In most English "show-rooms," this would certainly pass as one of the best chimney-pieces, regarded as an architectural design. To go round, however, to the furniture proper in the saloons between the main picture-galleries of the western side: we are conscious, on looking through this somewhat random collection, that, at all events, the old elegancies of weak and what were supposed to be "graceful" curves, in the arms and backs of chairs, &c., twisting and turning in any but the natural way of using the wood, have mostly departed, among our own manufacturers especially. In the Buhl furniture, exhibited by L. Mignonne (console and cabinet tables, &c., Nos. 3,074-5-6) we do see some specimens of that style of gorgeous, over-wrought fancy article, all a-blaze with nymphs, griffins and gilding, in lavish profusion, which the author of "Lothair" would probably consider the *us plus ultra* of furniture for a "habitable" mansion, and of which, when you have called them "very handsome" (a phrase which we heard two or three times applied to these specimens, while looking at them), you have said all that can be said, and perhaps all that the maker wished to hear said, in their praise. But these are not English, and, on the whole, are exceptional in the Exhibition, though we fear they have plenty of counterparts in our shops and in the residences of the upper ten thousand amongst us; and if a republican Yankee did wish to make a sermon against "effete aristocracies," a suitable text might be afforded by this kind of wriggling emasculated type of furniture design, bedizened with gold flummery, and standing as the representation of what we should call bastard art. As a contrast to these, we may look at the cottage cabinet exhibited by Gillow & Co., placed between the more pretentious articles just named, and showing how in matters of design the "cottage" may at times have the better of the palace. This, though simple and perhaps a little too square and severe in outline (which may be in keeping, however), is one of the best furniture

designs exhibited. The main portion consists of oak carved and moulded with no great elaboration, the principal ornaments consisting of small panels of box-wood let in, and carved with flower and bird subjects, &c., in low relief, the proverb "Better is a dinner of herbs where love is," &c., appearing (in Latin) on a scroll along the back. A defect we have to find in this, as in a good many other works of the class, is a want of solidity or of gracefulness, or both, in the treatment and outlining of the supports, and often of the general form. This is uncomfortably the case in the cabinets designed by A. F. Brophy for Messrs. Trollope & Sons (3,084-5-6), and decorated by the xilotechnographic process. The contrast of brown and red tones in the woodwork is so rich and pleasing as colour, and the ornamental design in some points so good, that it is a great pity to find the constructive design so weak and lame-looking, with the thin supports and angle pieces, conveying the idea that the artist had entirely overlooked form in elaborating his colour or inlay design. Adjoining Messrs. Gillow's cottage cabinet are two very pleasing and sensible-looking chairs, with ornamental stamped leather seats, from the same firm; and in another part of the gallery is a very elaborate cabinet in carved ebony in the Renaissance style, also exhibited by Messrs. Gillow (3,058), but here we are vouchsafed the artist's name also (R. Jefferson), which should always be given in such cases; we do not recognise "firm;" as artistic designers. This is a fine work very well executed in a style to which the material, which requires plenty of variety in surface carving to give it high lights, lends itself very well; but, without necessarily gainsaying the choice of this style for cabinet work, we cannot help being struck with the remarkable contrast presented by this article to the cottage cabinet just described, in style, mode, and material, and regretting that so few (apparently) of our large manufacturers should be capable of defining for themselves a systematic style of furniture treatment to be consistently worked out, instead of turning out, through the medium of different artists or assistants, a succession of things in every variety of style, and looking as if they came from opposite ends of the earth. "The root of all evil," it is to be feared, is at the bottom of this also. Another larger ebony cabinet of quasi-classic design, from the same firm, stands in this gallery, with some originality in the ornamental detail, which may be said to be of Greek type, and is treated in a very square, conventional manner; the small carved panels, in a light-toned wood, in the centre of each door, have a very bright effect on the other material. Another cabinet in the same material (ebony seems to be in favour), by Messrs. Collinson & Lock (3,053), has much the same kind of merit as the last: the ornamental detail is refined, though not very effective; in this material it is difficult to hit the golden mean. In small panels are figures painted in white on a red ground, making a pleasing effect of colour; in general outline, however, this object is among the least graceful in the gallery. The best and most artistic of the ebony productions is, perhaps, that exhibited by Trollope & Sons, designed or executed (or both), by R. Bearis and M. Rogers (3,083). This is in Renaissance style, with some originality and refinement of detail, and (unlike much of the furniture), carried on legs sufficiently massive without being clumsy in appearance. It is decorated with heads painted in grisaille, in a light grey tone, which goes very well with the ebony; altogether this is a pleasing and tolerably artistic work. We cannot say so much for the walnut-wood sideboard, by M. Rogers, for the same firm (3,090); there is a great deal of labour in this, but it is simply a large mass of carving, in doubtful taste, and is admirable merely as a piece of execution. Certain specimens of tables, scattered up and down in the picture galleries, are worth notice, as beautiful specimens of execution in inlay and marqueterie; those by A. Lorimer (3,069), and T. Jacob (3,070), rewarded by the Society of Arts, show ornamental designs on the surface of the table, very suitable to the situation and material, and very happy in the contrast of tone of the various woods. Another splendidly executed specimen in the same gallery falls through excess of ornament on the surface; figures are out of place on a table, and such a superabundance of ornament applied without consideration and without any plain surface, by way of relief, is rather barbaric than artistic; the style of the ornament, moreover, is of the most gaudy Louis Quatorze. Among two or three pianos exhibited, the cabinet

instrument by Brinsmead & Sons, in walnut and marqueterie, can only be called "neat;" it shows no artistic feeling, and has the ordinary vulgarity of griffin legs, &c. A carved piano-case (3,050), by H. H. Stannus, for Mr. Collmann, is much better, showing considerable delicacy and variety of treatment in the Renaissance style, and is noticeable also for having what is usually considered the "back" of a cabinet piano treated so ornamentally as the front. In general, either the pernicious habit of planting a piano close against the wall of a room has led the makers to think it of no use to ornament that portion, or the fact of it not being ornamented has led to the habit of cornering the instrument so as to hide this portion; either way, the habit is objectionable and bad for the effect of the instrument, and we are glad to see any hint of its possible discontinuance. A grand piano (3,049) shows a design for what is described as "cheap decoration" (perish the word!), designed by J. Gamble, and executed by Messrs. Wornum in painting: this consists of flat painting, in dark colours on a lighter ground, of conventional ornament, with figures on the lid. This is one of the few pieces of furniture in which something novel has been attempted, and the result is by no means unsatisfactory, but care should be taken in such decoration to guard against any appearance of imitating the effect of inlaid work, which this is not quite free from; and the comparatively large figures on the lid look rather out of place and too ambitious in aim for the situation. Among the smaller articles to be found heterogeneously piled under glass cases in this department are a good many things which might come under the head of "furniture," but which we cannot here undertake to pick out and classify; only calling attention in one of these cases to a small box and a pair of small cabinet doors (3,110), carved in seal-wood by a Mysore artist; showing design of Gothic richness, and more than Gothic delicacy of line, on a very small scale, and finished with a minuteness that would almost stand the test of a magnifying glass. The large Gothic doors carved by S. Copping (3,095) are very good specimens of the class of work, but must yield to this little bit of Indian execution. Among other articles scattered about, a looking-glass in a pierced metal-gilt frame (2,792), by W. J. Bastard, shows a right feeling for the use of metal in ornament, the design being kept flat and free from the knobs and wreaths which seem generally proper to gilded metal ornament of every kind; the effect is bright and glittering without being gaudy.

Nearly all the work we have alluded to is English; what little foreign work there is besides is not of a nature to call forth much remark. In the Austrian Gallery (in the East block), we notice a heavy carved sideboard, or rather two sideboards, of Venetian workmanship, very well executed, but of which the design is of the most vicious type of what we should call the "fann and monkey" style; it is really time we got rid of these fanns, and grotesques, and nymphs ending in scrolls, which have nothing in common with modern feeling in any way. A Belgian carved bedstead, in another part of the building (we cannot undertake to describe the whereabouts, for, indeed, everything is everywhere), is an example of the same union of excellent execution with most commonplace design; in this case it is Cupids instead of satyrs, which, *ceteris paribus*, are perhaps preferable, but not more novel. In the neighbourhood of this last piece of furniture stand in a corner some forlorn-looking chairs without names, we presume also Belgian work, which are pleasing as specimens of very simple and unpretending carved work in an ordinary material, apparently a white pine: these are neat, and appropriate to their purpose; and as we cannot all have "gold and silver, and ivory and apes" in our dwellings, it is as well to note what can be done in plainer materials. Are stoves "furniture"? We are shown some terra-cotta chimney-pieces and stoves; a chimney-piece by Messrs. Virebent, of Toulouse, and one or two stoves by Austrian and Swedish manufacturers. The same objection applies to all these, that the ornament (whether good or not *per se* we will not stop to inquire) shows not the slightest attempt to adapt it to the material; it is just an imitation of the treatment of carved work, with of course all the bluntness of finish and uncertainty of line inseparable from the material. If terra-cotta is to be largely used in art-work, it has yet to have its characteristic treatment and design invented; so long as it attempts the imitation of carved work it will never be satisfactory.

We can hardly institute any comparison between our own and Continental artists and designers in furniture from the results of this Exhibition, because the latter are so meagrely represented, and we have no means of knowing whether we possess any of their best specimens or not. In regard to our own furniture designs, we recognise a great deal of admirable execution in various styles, a decided aim, in many cases, at truthfulness and suitability in the treatment of the material, and an occasional effort after something new either in design or effect. What we note as the most important deficiency is a want of attention to form in what otherwise would be the best work. Decidedly the best designs in form and outline are among those of a standing type (generally Renaissance), where the main forms are made ready to hand, and are merely adapted, combined, and executed by the artist with more or less of ability and *tour de force*. The comparatively small number of furniture designers who are seeking for new effects and new treatment, and who are striving to show what can be done with simple solid materials, without seeking after gold, ivory, and other expensive adjuncts, appear to have given their attention much more to solidity of construction, and truthfulness and piquancy of ornamental detail, than to general form and outline. In nearly all the designs of what may be called the new type, we find this defect of stiffness and squareness of form; a kind of natural rebound from the weak flimsy curvature designs which were so long the vogue. If some of the best and most original of our younger furniture designers would set themselves to improve this, and to combine the really good and sterling qualities of some of their designs with a greater attention to gracefulness (which is not necessarily weakness) of form, we should probably see something more entirely satisfactory in some future art exhibition than we have found in this, interesting as it nevertheless is.

THE ROYAL ALBERT HALL AND BUILDINGS FOR MUSIC.

If we were to seek for the very shortest way to a more rational architecture, and a truer fine art than at present exists, or to which there seems any probability of reaching for a generation or two to come, it would be in the endeavour to realise, as perfectly as may be, in a building, a preconceived idea, without reference to "precedent," perhaps created originally for a different purpose. This to some, at first sight, may seem a very simple proposition, but it is in reality one of immense difficulty, for it is a hard thing not to refer to some already well-known and established form. It saves trouble and thought, and the more easily passes muster when finally done. Take an ordinary church, for instance: we all know how a church is designed and put together; the material idea is old enough, but the intellectual, moral, and mental idea from which the new building should spring, is more or less new, and of the time, and the consequence is, that not a few absolute inconveniences and inconsistencies are endured, and cheerfully put up with, after the revived antique idea is fully carried out, and the diverse elements, so to speak, mixed together. This way of doing things architectural is not confined to churches; it more or less finds its way into all building matters, and there is one special one to which we would call the attention of the reader. It is a curious one, and is not a little important just at the present moment. We refer to concert or music halls, rooms, or spaces specially contrived, or supposed to be contrived, for the express purpose of providing for the performance and hearing of musical compositions, singing, organ-playing, pianoforte-playing, and concerted music.

We have been led more particularly to this subject from the doubts that have been expressed as to the fitness of the new Albert Hall for musical performances, and for which it was more expressly built, and for the purpose of offering or rather hinting at a few thoughts on the subject, not only as respects that special hall, but of others in London, and to point out one or two things which would seem to have escaped those who have had these music-halls to design and superintend. Nothing would seem to be more vague than the original conception in the minds of most architects of a music-hall. A large open room is built up, according to the capabilities of the site; it is more or less ornamented or "decorated," has an orchestra and audience-seats, and

an organ commonly at one end, and that is all; for in all other respects the room might do for any purpose whatever. We may adduce St. James's Hall, Exeter Hall, St. Martin's Hall before it became a theatre, and many others scattered about London. We say nothing of the glass-covered Crystal Palace, or the glass Floral Hall, Covent Garden, nor of the many theatres, as in all of these musical performance is only secondary to the main purposes for which they were constructed. Neither is the "architecture" of the exterior or even interior much to our present purpose; we are dealing almost solely with the structural element in such buildings as regards music and sound. Of course it will be understood that the materials of which such a place, and for such a purpose, is built are no slight things in it, and that by no system of construction and ingenuity of plan can the original mistake of choosing wrong and unsuitable materials be obviated. Let us, by way of illustration and to make the matter as clear as possible to those to whom it is new, begin with a few very simple propositions. Now, for the sake of the utmost simplicity, instance the effect of a musical instrument, such as a trumpet, or even a number of them, in the open air, as in a military band. Of course there is no roof, or floor, or walls, to confine the sound, and, moreover, the sound is, by the action of the passing wind, sent hither and thither in a way not a little pleasing and capricious sometimes; but there is no material building either to increase or to diminish the pure effect of the instrument or instruments. Building, or sound - chest, as we may call it, there is none, - the air above does not reflect the sound, nor does the grass or gravel underfoot. This is important to bear in mind; for if we go into such a structure as the Crystal Palace, where the walls and roof are of thin glass, the effect is pretty nearly, if not quite, the same, for the place is too large, and the walls too thin, to resist and send back the air-vibrations produced by the instruments. In a canvas marquee or tent the effect is nearly the same, for the flexible and movable walls do little or nothing in the way of resistance, or rather reflection. It has even been supposed that a tent of indiarubber web would entirely absorb the sound, as a black surface absorbs light. Whether this be so or not is but a curious problem, worth testing perhaps, but only important at present as tending to show how important material is in the composition of a room or space for musical purposes, and that some kinds of materials are better than others for the purpose, and that not only is the kind of material to be carefully taken into account, but quantity, or thickness, of material as well. Nothing, indeed, would seem to be worse for the purpose of a sound keeping or developing (if we may use the word) space, or chest, than thin glass, or canvas, or cloth. It must not be forgotten, too, that all the bounding surfaces of a building would seem to be equally important, - viz., the floor, the walls, and the roof, one and all. It would seem a fatal mistake to suppose that stont and good walling, of however fit a material, is enough, and capable of doing the work, if only covered in with roof of unfit materials, such as glass or canvas. In the new Albert Hall whatever of suitable materials the walls may be, the glass roof does not seem to have answered; for has been found necessary to suspend beneath it a flexible and loose canvas, thus to do away with what is termed echo in the building. But this cannot be quite what is wanted, when the sound produced in a building has afterwards to be absorbed by the hanging and flexible canvas beneath its roof. But let us go a little further. It is not a little singular to note how very subtle nature is in many of her ways of work; for it seems to be impossible to tell, after even a lengthened and careful examination, why one particular room or space does better than another as a sound room or chest. Some places add not a little to the power of sound, while others seem but to deaden and detract from it. Why is it? Take St. Paul's. It would seem to be absolutely impossible to contrive a building better fitted for the purpose of sound and music, but why is it so? Take Westminster Abbey next. It is strange to say, it is nearly or quite purely negative; it does not either injure or add to the power of the organ or musical instrument in it. Why is this? The walls, roofing, floors, of these two buildings are pretty much the same. They are both full of church furniture, monuments, matting on the floors (a thorough destroyer of sound effects, by the way),

nd large glass-filled windows. No two build-
ings could be more worthy of curious study as
usual rooms. Before we go further,—for it is
little painstaking and troublesome thinking
out, and difficult observation,—it is well to
mark on the strangely fine and beautiful effects
be found accidentally in places never built
or tended for music. Many must have noticed in
empty rooms, passages, railway arches, and other
out-of-the-way places, how such spaces would
seem to have been contrived for the purposes
of fine and clear sound effects, and how
well fitted they seem for musical purposes.
It is in vain you ask why it is, there is
nothing in them to lead to the idea that
they are so fitted for this special purpose, and
it is only by accident perhaps that it is discovered
[all]. It is difficult to single out places in
any of our proposition, for they are hard to get
at, and still more difficult to test when found.
We have instanced St. Paul's as being super-
bly excellent, and Westminster Abbey as being
entirely negative, to which we may add St.
Nicholas's,—we repeat negatively, but not
intrinsically harmful; but when we come to such
buildings as Exeter Hall and St. James's Hall,
and find pretty nearly all the elements against
it.

It would be difficult, perhaps, to discover
building less fitted for the purposes of a large
and of instrumentalists and singers, and a great
and besides, than is Exeter Hall, and it is not
little surprising to find the music-loving public
used to go on year after year listening to the
performance of all sorts of things, little and
great, in such a place. Everything is against
work to be done,—floor, roof, walls, and last,
but not least, the enormous size of the band and
the immense number of singers in so comparatively
confined a place; and it is really only by going
into the room itself, and standing in one of
the passages, that the music can be properly
heard at all. The whole room then becomes, so
to speak, a sound-producing chest, like a nearly
empty organ-case. When in it, you are in pre-
cisely the same position as if standing in the
middle of a monster organ in full play. It is
just deafening and music-destroying. In St.
James's Hall it is but little better; a little better
is, because the building is longer, so that
there is more room for the sound to travel, but
these well-known and fashionable rooms
but little suited for musical purposes. The
rooms are filled with seats and covered with thick
non-absorbing matting, the walls of thin
plaster and plaster, covered with thick
layers of paint, and the roofs of thin lat
plaster, all tending to render them little
better than confined chests, lined with sound-
absorbing media, utterly destructive of pure
musical music, and clear and perfect sound;
what can be the object of producing
full and full note if you must need deaden it
overwards? In an ordinary room filled to
overflowing with furniture of all kinds, carpet,
tapestries, large window-openings, papered walls,
thin plaster ceiling, of course everything is
just musical performance and musical instru-
ments; and sound, however pure and clear, even
in the best of instruments, is all absorbed in
the upholstery of the place. Take everything
that can be called furniture out of a large
empty room, as the pianoforte-makers are
able enough to do; strip the paper from the
walls of it, and clean the thick wash from the
ceiling; and put a good pianoforte in it on the
floor, and the difference is soon perceived,
power and tone of the instrument being not
vastly increased, but it becomes different in
quality, and the power and sweetness of the sound
appreciable by the ear even of the most care-
less listener. Nature will always be found to
require some sacrifice, something must be given
up to attain any great and superlative end.

In connexion with this most important sub-
ject, we would suggest to the authorities at
South Kensington the usefulness of a little prac-
tical experimenting. The matter at present is
but a little obscure, and there is a great need of
data to go by. It is really useless to go
into a building room after room sometimes at such
great cost without having some few clear notions
as to the guide us in the providing for this daily in-
creasing want of good and fit rooms for musical
performances. A small, well-built, solid-walled
room might be selected, and different kinds of
wall lining tried, first in all cases testing the
effect of the natural material, as wood. It is a
question how far brick is inferior to stone,
and can be at present merely guess at it. Then,
again, what kind and description of wall hanging

most effectually absorbs all sound? Then there is
the form of the roof to be carefully considered,—
whether flat or gabled, like an open church roof,
or round arched, and as to whether stone vault-
ing or wood is the better material. It is to be
hoped that some practical experimenting, how-
ever roughly it may be done, will be undertaken.

WORKS SELECTED BY PRIZEHOLDERS IN THE ART-UNION OF LONDON.

From the Royal Academy have already been selected:—
Dr. Johnson at Rehearsal, D. T. White, 200l.; War
News—Hostilities have commenced, G. Pope, 100l.; Town
and Castle of Ambrosia on the Loire, G. C. Stanfield, 100l.;
A Runaway, W. M. McTaggart, R.S.A., 45l.; A Salmon
Trap, J. Adam, 45l.; Too Late, A. D. Cooper, 30l.; The
Homestead, A. J. Stark, 25l.
From the Society of British Artists.—St. Michael's
Mount, from Marazion, George Cole, 60l.; The Cliff,
T. R. Roberts, 50l.; A Summer Afternoon on the Mole,
Surrey, W. H. Foster, 45l.; Cattle on Hampstead Heath—
looking West, H. E. Harp, 40l.; On the South Coast,
E. Holmes, 40l.; Portland Island, E. F. D. Pritchard,
40l.; Little Goody Two Shoes, Mrs. Charlotte, 31l. 10s.;
A Modern Imogene at the Cave, A. E. Patten, 31l. 10s.;
On the Scheldt, E. Hayes, 30l.; The Lesson, E. C. Green,
30l.; Winter, C. Thom, 20l. 6s.; Loch Katrine and Ben-
venue, Perthshire, C. Pearson, 25l.; The Pet Bird,
R. Physick, 25l.; A Quiet Spot, C. Smith, 25l.; Pat pre-
paring for the Fair, A. Gunn, 21l.; A Berkshire Water-
mill, Miss R. S. Warren, 21l.; Fishing Town on the French
Coast, J. J. Wilson, 20l. 10s.; Fruit and Still Life, C. T.
Baile, 20l.; Low Tide, Seabrook Beach, E. Hayes, 20l.;
Mill near Hampton, Devon, W. Dent, 20l.; Morning,
near Great Marlow, on the Thames, J. C. Salmon, 20l.;
Mouth of the Thames—Blowing Fresh, C. Taylor, 20l.;
Among the Heather, T. F. Waterwright, 20l.; A Venetian
Canal and the Rialto, J. E. B. 15s.; Old Bridge at
Owling, South Wales, J. Peel, 25l.
From the New British Institution.—"There, on this spot
by treacherous hands," &c., C. Calhoun, 65l.; Stepping-
stones on the Ouse, W. H. Yarwood, 45l.; Le Déjeuner,
Haynes Williams, 45l.; Treasure Trove, C. M. Webb, 40l.;
The Black Pool, J. Finnie, 30l.; The Miller's Waggon,
J. Peel, 30l.; In the Marches, Rainham, W. Laker, 25l.;
Under the Elm, Hyde Park, J. Thorpe, 21l.
From the Society of Painters in Water-Colours.—On the
Road between Cladish and Dalmally, Loch Awe, Argyll-
shire, T. M. Richardson, 45l.; A distant Gleam of Sun-
shine over the Sea, S. F. Jackson, 40l.; Distant View of
Conway from the West, David Cox, jun., 35l.
From the Institute of Painters in Water-Colours.—
Vessels off Tyne-mouth Bar, Edwin Hayes, 54l.; The
Bridge and Campanile of St. Croce, D. H. McKewen, 42l.
From the General Exhibition of Water-Colour Draw-
ings.—Glacier Stream, Zermatt, A. Croft, 40l.; Near
Harlow, North Wales, H. Moore, 30l.
From the Royal Scottish Academy.—Glen Croe, J. L.
Wingate, 25l.

THE GREAT PAINTERS OF NORTH ITALY.*

AFTER Mantegna's rupture with his adopted
father, Squarcione, he received an invitation
from the Marquis of Mantua to take up his
abode in that city, which, after finishing
work that he had already commenced, he
accepted. From this period he came in con-
tact with a new influence, that of the Venetian
painters employed by the Marquis and others.
Settled in Mantua, his archaeological tastes
bring him pleasant acquaintances. One of the
Marquis's sons was a collector of antiquities, and
he begged his father to allow Mantegna to come
to Bologna to see his cameos, bronzes, and
antiques. Expeditions were made, too, to dis-
cover antiquities, and the sentiments they awoke,
and the lessons the "finds" gave, are to be de-
tected in several pictures that his critics mention.
The treatment of a martyrdom of St. Sebastian
in the Belvedere of Vienna they ascribe to this
influence; for it has a cold silver grey tone, and
the name is written perpendicularly in Greek
letters on the pillar of a round arch rising from
a parti-coloured floor strewn with fragments
of sculpture. But his studies with their Greek
simplicity and severities did not keep his mind
in the state of cool and calm repose that we
should have imagined they would have done, for
his biographers refer to various letters, showing
him to have been a vain, irritable, restless
being, frequently at daggers drawn (to use an
idiom that is probably of Italian extraction)
with his neighbours, prosecuting them for
trespasses, accusing them of robbing him of fruit,
and of ill-using him in other respects. But, as
we are looking at his work in the old Mantuan
Castello, we forget all this. The winged angels,
the Cupids, children, gods and goddesses, gar-
lands, lunettes full of fables on gold grounds,
medallions of emperors, interwoven with por-
traits of his patron with his family, chargers,
hounds, and servants, and wrought into one
bright fancy filled up with architecture and
landscape, are not the thoughts of every-day
mortals, and we forgive him. Finally, his
biographers record the visit of Lorenzo di

Medici to the painter's atelier, his subsequent
employment of him, Mantegna's invitation to
Rome, and two years' occupation upon the Pope's
private chapel in the Vatican, the building and
decoration of his villa, his pecuniary difficulties,
the artistic assistance of his two sons, the scheme
and archaeological perfection of the Triumphs of
Julius Cæsar we preserve at Hampton, his last
works, and his death. Of the Triumphs, which
they conclude were intended for the decoration
of the theatre in the Castle of Mantua, and
which we know were sold with the property of
King Charles II, after his death, and repurchased
by Charles II, they say, admirably,—

In countless articles of common use in ancient times,
in the statues, shields, helmets and breastplates forming
the peculiar feature of these pictures, we think we see
Mantegna copying the treasures of that rich collection
which Lorenzo de' Medici and Francesco Gonzaga admired
and envied, and exhausting the catalogue of antiquities
discovered throughout Italy. His horses, kine, and
elephants are natural; his costumes accurate to a sur-
prising degree. He was the only artist of this period, not
excepting the Florentines, who was pure and accurate in
the attempt to reproduce the semblances of a bygone
time; surpassing alike Botticelli and Piero della Fran-
cesca, and reducing the Sienese to pigmies. With stern
realism which was his virtue, he multiplied illustrations of
the Classic age, in a severe and chastened style, balancing
his composition with the known economy of the Greek
relief, preserving the dignity of sculptural movement and
gait, and the grave masks of the Classic statues;
modifying them, though but slightly, with the newer
accent of Donatello. . . . He no longer drew with
a black and incisive line, nor modelled with airy shadow;
his contour is tenuous and fine, and remarkable for a
graceful and easy flow; his clear lights shadings with grey,
are blended with extraordinary delicacy; his colours are
bright and variegated, yet thin and soft, and of such
gauzy substance that they show the wall throughout."

In this outline of Mantegna's career, we have
given a fair specimen of the completeness with
which these now veteran biographers have
treated the lives of the principal artists. Of
minor workers, and here we learn incidentally
that if we wish to be remembered we must
work, the four centuries that have slowly
passed on in a continuity of days have effaced so
much, that there are but two or three pictures
to describe, and two or three conjectures to
hazard; but all that could be done with the
faint traces of their existence has been done.

Francesco Francia, the Ferrarese, enjoys a
good place in the work. It was this artist's
Madonnas, it will be remembered that Raffaele
declared to be the most beautifully devout in
his acquaintance. "In technical treatment,"
our biographers aver, "Francia is a perfect
master of the method of oil, using much colour,
tempered with abundance of vehicle, laying on
the parts full, retouching them afterwards with
semi-transparents, and finishing them with
glazes." His picture of the "Nativity," in the
gallery of Bologna, is chosen as an illustration
of his style. The scene is laid in the foreground
of two lofty semi-circular arches, whereof one is
in ruins, through which a distant landscape of
hills and sky fills up the background. Between
the spectator and the arcade are eight figures,
some standing, others kneeling in different
positions, indicative of adoration, love, and
light, arranged as nearly as may be in a semi-
circle around the infant, who is cooing upon a
mat in the very centre of the foreground. All
eyes are bent upon the babe, and rapture is
expressed in every face. In the illustration we
do not see the short-coming of "nun-like or
monkish coldness," and "rawness in his argen-
tine tints," that the authors find in the original,
which, in deference to their analytical capabil-
ities, we must consequently take for granted.
This Francia became very Portuguese in his
manner after a visit to Florence. A Saviour
lying in the lap of the Virgin, with St. John at
the head, and the Magdalen at the feet, now in
the Parma Gallery, painted after this journey,
exhibits much of the Umbrian softness, com-
bined with Florentine vigour, that Perugino
affected in his best days. The authors detect
an intense expression in the affliction than
Frances would have given if his eye had not
been enlightened by the sight of this master's
manner; less frigidity than is his wont; and
more facility in the grouping. And when Francia
set himself to another "Nativity" now at Forlì,
originally painted for Paolo Zambeccano, all raw-
ness had vanished, the movements and expres-
sions of his figures were "attuned in the
greatest perfection to the height of religious
composure," a clear bright light prevailed, and
treatment, tone, and finish alike attested an
extraordinary care. This last improvement
required a fresh explanation; and accordingly
Messrs. Crowe & Cavalcaselle ascertain that at
this time he came in personal acquaintance with
Raffaele, and attribute to this acquaintance the
increase of harmony and skill, and the power of

* See p. 277, ante. Notice of Messrs. Crowe & Caval-
caselle's book.

conveying a sense of atmosphere he ever afterwards manifested. They thus pictorially describe one of his frescoes in the oratory of St. Cecilia, Bologna:—

"In the one, St. Cecilia seems to sleep as she lies outstretched in the winding-sheet; her form regular and softly yielding, her youthful and pleasing head crowned with roses, and her hands and feet beautifully formed, she seems to have gone to a sweet rest unhurt by the boiling oil in which she perished; four youths hold her suspended over the opening of the vault, two of them nearest the spectator stretching the sheet between them with muscular exertion of limb; to the left a cardinal, a youth with a torch glancing upwards in the true Umbrian style, a pope, a female, and an aged man looking down at the saint's face; to the right, two women and a young torch-bearer; in the air an angel carrying the martyred saint to heaven and floating lightly over a quiet landscape. Tenderness and affected grace are carried almost to excess, even in the figures most strongly engaged in the action, and some necessary coldness arises from that cause; the left hand group is skilfully arranged, and composed of personages individually interesting, whilst that to the right is ill-balanced, and throws the composition out of focus, but the feeling evinced in every part is of a very select kind, and a wonderful resignation and melancholy are infused into the slender actors in the scene."

Giorgione, with his large following, occupies a prominent share of the biographers' attention, just as his pictures, with their radiant colours, beautiful faces, and rich dresses, have ever occupied a prominent place in all collections. It was under his influence that Venice cast aside her old taste for religious paintings, and began to brighten the walls of her palaces with cabinet pictures of landscapes, of *fresco* fests, groups of figures engaged with music and song in palaces, and other varieties of conversational pieces. Messrs. Crowe & Cavalcaselle have weighed the effect of the popularity of this introduction.—"Certain it is that in the course of time the combined enticements of high-born person, pompous dress, and luscious colour became irrevocably connected with the man who first brought them into fashion; a host of imitators thronged to occupy a field which seemed so easy of access; and towards the middle of the century numerous productions inspired in part from Giorgione, in part from Titian and Palma, were thrown upon the market." People collected these pictures with avidity, and re-christened those they already possessed, till the confusion created was too great for the simple connoisseur to find his way through. Under the influence of this new demand, Pordenone's colossal *impersonations*, the semi-sensual figures of Pellegrino, those of Del Piombo and Tordito, the rural scenes of Cariani, the bright fables of Paris Bordone, the gay liveries of Tobo, the smart but homely compositions of Bonifazio, the sprightly and sometimes lascivious incidents of Schiavone, or the coarse but not un clever deceptions of Rocco Marcone, Pietro della Vecchia, and the later Friulians,—we are quoting Messrs. Crowe & Cavalcaselle in the application of these terms,—were all besprikled with the greatness of the name of Giorgione. Just as Mr. Gilbert explored Cadore and the rest of Titian's country for a key to much that was in his pictures, so the new biographers of Giorgione have visited Castelfranco, the scene of his birth and childhood, apparently for the same purpose. They are not word-painters, though clever at describing pictures: consequently, they do not show us such veritable landscapes as Mr. Gilbert points out from the various resting-places on his way to the dolomite country. But they make out that before the forest was cleared and the fortress ruined, the place must have been picturesque enough to stir the heart of the young artist; and to the influences of its elms and cypresses, vines and mulberries, hazels, poplars, yales, farm-buildings and battlements, must be attributed much of the success with which he subsequently delineated park-like scenery. And then they show us this son of a country-girl a welcome guest in the houses of the great, painting the portraits of the doges Agostino Barbarigo and Leonardo Loredano, and Queen Cornara, admired by all and adored by the fairer sex. They attribute much of the happiness of his style to the luck of his tuition in Venice, just as Gentile and Giovanni Bellini were at the height of their powers, and Antonioello's hand was in the wane of its cunning, and his clever combination of their two styles into a new one. At first, they ascertain, he laboured in the old field, like the rest; but he soon abandoned Scriptural subjects, and, as they put it, learnt the charms of *genre*. Nevertheless, most of the pieces described in the work before us are of a religious order. Here is a "Nativity," now in the collection of Mr. Beaumont, by this gorgeous Giorgione:—

"Under a grotto to the right, overgrown with ivy, and overhung with grasses, the Virgin kneels, adoring the babe,

attended by St. Joseph, grey bearded, self-communing, at rest behind a portion of rock and a remnant of hurdle. To the left, two shepherds, who, in another part of the ground, are seen receiving the message of the angel behind them, a distance in which the turkeys, the trees, and hills, peculiar to the neighbourhood of Castelfranco are seen. With the general character which distinguishes the ordal of Moses, or the Judgment of Solomon, this landscape has more atmosphere, more intricacies, and more masses of colour. A tall tree to the left of the bank, another to the left in the picture, vary the scene. At the foot of the latter a cabin shelters a peasant; there are rocks, too, of a soft, worn, vague, texture, with greyish greenery made out and delicately finished cropping from the fissures. Reeds, pebbles of transparent colour, are minutely made out. In the distance the bare hill-side is yellow-lighted in the setting sun by the glow of coming evening. The square tower commands the houses all around steeped in vague atmosphere. A charming contrast is produced by setting the despondent shepherds in front of the warm straw-coloured fields, whilst the Virgin and St. Joseph are thrown forward upon the gloomy shadow of the grotto."

The marvel of this piece is its intense brilliancy, notwithstanding that it is a picture of humble life, and the clothing of the shepherds is in tatters, and their toes are peeping out of their worn-out shoes.

Some artists have acquired their reputation from the excellence with which they imitated those of established note. Cariani was one of these. His works have been assigned to Giovanni Bellini, Giorgione, Palma Vecchio, and Pordenone. This confusion of identity is, however, evidence of considerable ability; but it has the drawback of creating suspicions in every direction, and some of them rebound upon himself. If we may accept the two portraits at the Louvre which pass for portraits of the two Bellini by one of themselves as the work of Cariani, remark our authors dubiously, we shall discern the earliest form in which a Bernarquesque of the Palmesque type began to imitate the Bellinesque: to such a scrutinising pass has their inexorable criticism arrived. If he uses a golden tinge, it is because Lotto did so; if a fiery glow, it is because he is copying Bernardino Licinio; if a twilight, he is robbing Palma of one of his particular effects. His flesh-tints are those of somebody else; his draperies are also thefts; in a word, he has lost all credit for originality in good work. On the other hand, a Madonna with seven saints, in the Carrara Gallery, "confused in setting, dry and small in its figures," is unquestionably handed over to him. A certain touch called *di macchina* is also unhesitatingly accorded to him. "In this phase Cariani rings the changes chiefly on grey, pink, and purple tertiaries, and with the help of dirty rubbing gets an uncertain haze or mist over his surfaces which proves effective at a certain distance;" and then follows a list of works of this kind, headed by a female in long frizzled hair, red bodice, and green sleeves, in the hospital at Bergamo, all of which are allotted to him without grudging.

In the account of Antonella da Messina, we are led into some of the Neapolitan churches where Mr. Perkins, in his "History of Italian Sculpture," pointed out to us the admirable monuments; and we are impressed with the kindred value of the works of the respective authors. By their aid we have mention, now, of much in these churches, both of sculpture and paintings, that has been hitherto in the knowledge only of a few connoisseurs. Mr. Murray, we may assume, and we thank him, is about to do for art what he has done for our countries, our cathedrals, and the leading Continental routes; and if he should continue as he has begun, our thanks will be echoed by a wide circle. In Messrs. Crowe & Cavalcaselle's instalment of his scheme, we do not know which section to admire most. At first, we own the almost Oriental splendour of the gold backgrounds and gilded stucco ornaments of the Early Venetian pictures of which they write; yet we are allured by the increased freedom, symmetry, power, and grace of the later Venetians; we think, too, of the Muranesque blending of the two; then of the Paduan garlands and graces of Mantegna, and his strong feeling for architecture; the Veronese palaces rise up, too, invitingly; the Milanese, with their receptive minds that first reflected Mantegna's teaching, and then that of the Umbrian and Florentine schools attracts us; we feel the claims, too, of the early painters of Prini, with their traditions and their oscillations between German and Italian feeling, and ultimate decision in favour of Venetian models; the Parmese artists, too, have our sympathy; in a word, the authors have so managed their subject as to give interest to all of it. Their work is like a chamber in which every panel has been painted by a different artist: every page has its fascination to those who can enjoy descriptions of subtle applications of colour to forms; and though the

absolute contents of each may vary in quality we may admire them all. The first volume is enriched with twenty-nine illustrations, chiefly of paintings in the academy of Venice. The second volume has four only: the Crucifixion, by Antonella da Messina in the Antwerp Museum; the Entombment, assigned to Giorgione, in the Museo di Fieschi, at Treviso; a perspective of the Church of Sant' Antonio, at San Daniele in Friuli; and a Glory of St. Lorenzo Guistiniani, by Pordenone, in the Academy of Venice. It is difficult to forget the wonderful fore-shortening of figures, either nude or in almost transparent draperies on panelled and coffered ceilings, or the white clouds, blue heavens, round brocade cherubs, angels, gods, goddesses, satyrs, garlands, and other accessories which usually accompanied them; or the panelled rooms in the old Italian castles, bright with stories told in almost miraculous colours; or the tall altar-pieces of every grade of devotional feeling in the countless churches; or the chapels painted with scriptural subjects from basement to summit, that the authors have shown us. Long after the violet covers are closed, we think of portraits such as that of the Grand Duke of Oldenbourg in his red velvet cap and furred pelisse, or the Violante of Palma Vecchio in her yellow brocade sleeves and blue bodice, or the Sultan Mehmet of Gentile Bellini, or of the Marquis of Mantua who was Mantegna's patron, as of pleasant acquaintances whom we have recently seen.

THE SELECTION AND USE OF STONE FOR ENGINEERING AND ARCHITECTURAL PURPOSES.*

HAVING found the quarry which produces stone of the quality you require, the next step is to specify the particular bed or beds which you desire to use. There is a great deal of looseness on this point in the practice of engineers and architects. Too often a stone of a particular district is specified, without regard to the fact that in the district named, stone of many different qualities are raised, some of which cost much more to work than others. This of course leads but to one result: the most profitable stone for the quarryman and mason is used instead of the most durable. Another great evil is the outcry for large blocks, and the insisting that columns, figures, &c., should be cut out of one piece of stone. Many a good bed and quarry has been closed or rejected because it did not produce large blocks: witness the case of the Mansfield Woodhouse Quarries, where the stone was only used to a very small extent in the Houses of Parliament, because at that time blocks could not be got out large enough; but where it was used it has stood exceptionally well, in contrast to the stone from Anston, which appears to have been selected principally because large blocks could be obtained.

In specifying the qualities and sorts of stone to be used in a structure, it should be remembered that in this climate decomposition sets in generally on the parts facing the south, south-west, and west, arising from the fact that the most prevalent storms of wind and rain are from those quarters. Lichens, which are a great protection to stone, unfortunately will not grow on structures in large towns, but they form an excellent shield to the stone in the country. A great deal has yet to be learned as to the proper use of the various and beautiful colours of different kinds of stone; and it is of more importance to have variation of colour in a large town, because the fronts exposed to the wind and rain will always exhibit more or less the natural colour of the stone, not being hidden by lichens, as in the country. Some stone stands very well as ashlar or for plain mouldings, but if used for cornices, pilasters, or in any part where damp or where the wet stands, so surely will it decay; it is, therefore, very necessary to specify one kind for the ordinary face-work, and a stone of superior durability for the portions exposed to wet and frost.

However durable the stone may be, a good drip or weathering should be given to cornices or heavy projecting strings, as it enables the rain not only to run off, but, at the same time, to carry with it any dirt or dust that may have lodged on it, which if left grows moss and weeds both very injurious to the durability of the stone. These of metal cramps,—iron particularly,—is very objectionable; they nearly always burst the stone after a time. Slate dowels are the best.

* By Mr. A. Pain. See p. 402, ante.

the stone parapet walls on the Thames Embankment are all built with slate dowels: some of the masonry in the lower portion of Sir Christopher Wren's towers at Westminster Abbey are specimens of the evils of metal cramps. Bedding one properly is a most important thing; it is a cautious plan to make the bed of columns or other masonry hollow instead of true and square with the face: it invariably causes the stone to spall the outside of the joint, as in the case of the oblong Viaduct, besides causing the weight very often to be thrown on parts not intended to carry it, and a host of other evils, not to mention the unsightliness of walls and columns cracked in all directions. In masonry the joints could never, as a rule, be mitred, as is sometimes done, or in lintels.

There is one exception to this rule,—namely, the case of a pointed arch, which should be centred in the centre, not with a key-stone, as a segmental arch. When the stratum is thin, and the structure is exposed to heavy driving rains, the outer courses of stone are often bedded in a slight angle outwards and downwards, and the mortar is kept back about an inch or so on the face. This is done to keep the interior dry, by preventing the rain from driving through the joints. In designing rubble walls for buildings, they should not be shown too thick; for if they are, the masons are apt to fill it with two faces, and to fill up the centre with loose rubble, often with little or no mortar. It is exposed to vibration of any kind, they are very liable to burst. I have seen a great number of instances of this. One in particular,—a chancel, in the lake district, which was cracked on top to bottom, and all round,—in fact, resting under the vibration caused by ringing bells, and the superincumbent weight of the roof.

In walling, masons always like to put the best of a stone outwards; and the result is, you have large spaces, which are filled up with mortar and spalls. Few workmen can resist the temptation to put on a long stone parallel with the face of the work, instead of endways. The want of bond-stones is the great defect of walling generally. A good plan, where the stone is small, is to build three or more courses of brickwork right through, at certain levels, and act as a tie. With stone, from most geological formations, it is of great importance that it be placed bedwise, or as it lay in the quarry: this is not properly attended to; it leads generally to rapid decay. There are various methods of finding the beds of stone; for instance, veins always run from top to bottom, or with a downward direction. Shells, or fragments of shells, as flat as they would on the seashore. In most sandstones the streaks or layers exhibit the bed very plainly. In conglomerates, the pebbles, or the shells, are generally lying on the flat bed. Added to all these it is generally usual in the quarries, before sending the blocks away, to mark on them which is the bed. The bed is, therefore, not so hard to find as some try to say, and a little careful examination of the peculiarities of the particular stone you are working will enable you to detect at once if the stone is on its bed or not. After a structure is erected, or, as in the Scotch method, during construction, it is usual, if the work is of any moment, to clean it down. Too much attention cannot be paid to seeing that all the mortar and flush are thoroughly washed off; for if not, the frost and rain will bring them off, and they either on the projections and under the mouldings, causing them to decay. It is a common practice, when a stone gets dirty or discoloured, to decay it, to cut or drag off the surface of the stone. This should never be done; for, if the stone is dirty, it can be rubbed and washed and get it clean. Stone thrown out, as it were, hard skin for its protection when first exposed, and if that skin be taken away, the protection is gone, and it is very liable to decay. The stone is really decaying, any number of new faces will not stop it. In the construction of works where much stone is used, it is very important to have clerks of works and inspectors who have served as masons. In the greater number of cases it will be found that in early days most of the clerks of works, inspectors, and foremen have been carpenters or joiners. Too often you find masons knowing nothing beyond their trade, while carpenters and joiners are a better informed and superior class of workmen. A great deal of the inferior stone that is used, and the bad bedding that is permitted, are due, I think, to the fact that the workmen know that their masters are not masons. I am not finding

fault with the men who by their industry have raised themselves from journeyman to positions of trust. Far from it, it is most creditable to them; but, on the other hand, it is equally discreditable to the masons that they allow the journeyman from another trade to take posts of trust which they might fill with greater advantage, where stone is much used, if they were steady and educated themselves for it.

Although I must now come to a close, do not think the subject is exhausted: I could say a great deal more on this important material; but as I hope there will be a valuable discussion afterwards from the members and gentlemen present, some of whom are connected with quarries, I shall defer any further observations to a future time.

In some parts of my paper I have made extracts from Sir Charles Lyell's and Sir H. De la Beche's works, from Blue Books, and other publications which I have consulted. To those familiar with works treating on stone, I am sorry to say very limited in number, these extracts will be at once apparent.

In conclusion, if engineers and architects really desire durability, they must be prepared to pay a reasonable price both for the raw material and the workmanship on it, and they will, I think, find they will be heartily seconded in their endeavours, both by the quarryman and mason, in the selection of the best stone; and in the long run it will prove not only one of the best of building materials, but the cheapest.

At the conclusion of the paper,

Mr. Clarkson said that practical experience was very necessary in the proper selection of stone, as well as theory. Witness the failure of the stone for the Houses of Parliament. He considered limestones better than sandstones. He thought the Craigleith an exception to the rule, for it was a most excellent stone.

Mr. Cross considered it immaterial which way the stone was bedded, provided it was not face-bedded. The quality of a stone was very difficult to discover; he did not think the test referred to by Mr. Pain,—viz., "the examination of stone by a magnifying glass,"—a good one; he considered that good stone had a powdery fracture; but granite that broke with a soapy fracture would not stand, because the fine parts cementing the other portions decayed quickly. With respect to Portland stone, he thought the "best bed" the most durable, and that the "brown bed" decayed fastest; the "best bed" was cream-coloured, but that Portland stone must not be selected by the colour. Granite, although it was not generally considered to have a bed, had one; for masons could split it very much better in some directions than in others. In many quarries the bed was as plain to see as in York stone or griststone. He believed that those stones which had most bed, such as paving stone, were the strongest by about 20 per cent.

Mr. Butler said he had been brought up as a quarryman and mason: he quite agreed with Mr. Pain that architects were very loose in their specifications with respect to stone, and that it led to a great deal of bad stone being used. He also remarked that clerks of works were generally joiners by trade, and that they very often rejected the most durable stones. In Bath, Box-ground stone was mostly used, because after the lists or clay-bands were cut out it was better than either of the other five descriptions of Bath stone. Combe Down stone stands very well in Bath. Box-ground stone decays in London and by the seaside. He should like very much to know what was the cause of Portland stone throwing out a sort of white powder after it was put up in London. He suggested it might be by the seawater seeping into it on its way up by ship. He did not agree with Mr. Cross that brown Portland would not stand; he considered it the best stone. Independently of stone standing better on its bed, he thought it looked so bad in the building, with the grain of the stone all kinds of ways. Mr. Cooper thought that sandstones had a great advantage in being comparatively soft when quarried, but became very hard on exposure to the atmosphere. The power of stone to absorb a large quantity of water did not prove that it would not stand the frost. He considered that scientific investigation into the properties of stone was of great use. It was absurd to specify "best stone," as if it was "best iron," because there were many qualities superior to the trade term of "best."

Mr. Whitaker instanced the want of proper selection in many structures, for durable stone is found side by side with bad. He considered

that what Mr. Cross thought was the bed of granite was the veins. Granite was not a stratified rock, therefore could not have beds in the geological sense of the word, but it had a peculiar grain, which made it easier to split some ways than others.

Mr. Morrison said that stone varied very much in every quarry, and this accounted for the fact of the museum in Jernyn-street standing so much better than the Houses of Parliament. He said engineers having work abroad were at a great disadvantage, because they must use the stone of the district, which had perhaps never been used before. But a knowledge of the different qualities of stone obtained at home was most valuable. He drew attention to the absurd notion that all granites were durable; it was a very great mistake, for there was bad granite as well as good.

Mr. Haughton believed granite had a bed. Geologists were now engaged in the question whether granite should be classed as metamorphic, and not as a Plutonic rock. He considered that the cause of stone decaying was, in a great measure, owing to the rate at which structures were put up. It gave no time for good stone to be selected, if indeed the quarry could supply it. Another cause was, everything was cut down so low in price.

Mr. Hunter said a good mode of testing sandstones was with a knife; it was easy to see if the stone was of equal quality. Another was to crush a small quantity, and put it into a glass, when it would be found that the stone which discoloured the water least was the best.

Mr. Wilkinson thought that granite had a bed; most quarrymen considered it had.

Mr. Clarkson, in explanation, said that "the bed" of a stone meant the original plane of deposition of stratified rocks.

Mr. Large agreed with some of the previous speakers that granite had a bed. He considered that a good stone had a clean fracture and a bell-like ring. Strongly advocated the use of dowels instead of metal cramps. He considered Mr. Pain was quite right to condemn the practice of blasting stone to be used as masonry; in his practice he had always avoided it.

Mr. Arthur Pain, in reply, said notwithstanding Mr. Cross differed from him, he still held that, taking the two beds, the most durable stone was found in the top or "brown bed" at Portland, and in that opinion he was supported by many competent authorities. With respect to the question, had granite a bed or not, it had been very ably answered by some of the previous speakers, that, looking at the strict meaning of the term "bed," granite had not a bed the same as stratified rocks. Mr. Butler had suggested that the white powder on Portland stone after erection was due to salt; he did not think so, for other stones that did not come by sea were troubled with it; he considered it was caused by the lime in mortar, or the chalk in cement, working through the stone. Mr. Haugh on thought that stone could not be supplied from a quarry of durable quality quickly enough for large buildings such as the New Law Courts. But in answer to that he would suggest that at no time were quarries better able than in the present day, by the use of machinery, to supply large quantities at a short space of time; besides, the best course would be to use stone from all the best qualities, from various formations: by that means an agreeable diversity of colour could be had as well as durability.

FROM HYDE PARK CORNER TO OXFORD-STREET.

MR. WALTER L. GRANVILLE recently submitted to Mr. Ayrton, First Commissioner of her Majesty's Works, a project for constructing a new public thoroughfare near the eastern boundary of Hyde Park, to accommodate the large traffic which now passes obliquely through Park-lane, and which was intended to obviate the necessity of any change either in Hamilton-place or Park-lane. Mr. Granville proposed to construct a road or "boulevard" nearly a mile long, near to the eastern boundary of Hyde Park, commencing from the present entrance next Apsley House, at Hyde Park Corner, Piccadilly, and terminating at the Marble Arch, Oxford-street. The road was to be a straight line between these two points, and to be nearly 200 ft. wide, with suitable avenues of trees for pedestrians, and flower gardens next to Park-lane. Mr. Ayrton, in returning the plans with thanks, said,—"A project, with the same intention, but

on a smaller scale, had been already rejected, and it would therefore not be possible for him to entertain the present proposal, involving, as it does, a much more considerable interference with the Park."

The scheme exhibits several features of much interest, and had it been proposed at an earlier time would have called for more consideration than could be hoped for it now.

MR. PEEK'S PRIZES.

THE following are the special prizes placed at the disposal of the Council of the Institute of Architects by Mr. H. W. Peek, M.P., Hon. Fellow, for competition by any members of the profession whose age does not exceed twenty-five years, on condition that the drawings for which prizes are awarded shall become the property of Mr. Peek:—

EASTBURY MANOR HOUSE.

The sum of 42l. for the best, and 20l. for the second best set of measured drawings, illustrating the restoration of Eastbury Manor House, near Barking, Essex, viz.:—

A plan of the ground-floor (including the walled-in garden upon the eastern side) drawn to a scale of $\frac{1}{4}$ in. to a foot, with the names of the various rooms, &c., marked thereon, according to their supposed former appropriation.

A sheet of details, drawn to a scale of $\frac{1}{4}$ in. to a foot, viz.:—

A plan of one of the octagonal tower staircases, with a section of one revolution.

A plan and section of the closet or garde-robe on the upper floor.

An elevation and section of part of the garden wall, showing the small recesses therein.

A plan and elevation of one of the ornamental chimney-stacks.

Elevations (drawn to a scale of $\frac{1}{4}$ in. to a foot) of the north, east, and west fronts, in outline only.

A perspective view (about 18 ft. by 13 ft. 6 in. size) tinted in sepia only, showing three sides of the quadrangle.

A short history and description of the building in manuscript.

THE CONVENT GATEWAY.

The sum of 10l. for the best set of drawings illustrating the restoration of the Convent Gateway, Barking, viz.:—

A plan (drawn to a scale of $\frac{1}{4}$ in. to a foot) of the ground and upper floors.

An elevation and longitudinal section to the same scale.

A perspective vignette view, tinted in sepia only, about 7 ft. by 6 ft. in size.

A short history of the conventual building in manuscript.

TRADE ARBITRATION.

THE Council of the Social Science Association are about to present a memorial to the Secretary of State for the Home Department, urging that it is desirable to provide a cheap and ample legal means of carrying out a system of trade arbitration. They are of opinion that it would be expedient to allow legal powers to be given in aid of arbitration in cases of dispute between masters and men, and that it would be desirable to allow both parties entering into an arbitration to bind themselves beforehand to abide by the decision of the arbitrators. They do not suggest that it would be well to compel the parties entering on such arbitration to bind themselves, but simply that they shall have the option of so doing.

TRADE BOOKS.

Handyside & Co.'s Vases and Fountains.—The illustrated Catalogue of Vases and Fountains, just now issued by the well-known founders, A. Handyside & Co., of the Britannia Ironworks, contains a number of very good specimens, and, as the prices are given, will be found useful to many persons. The designs are proceeded by some serviceable suggestions as to the formation of fountains. Messrs. Handyside & Co. have constructed some of our best iron conservatories, notably the well-known one in the gardens of the Royal Horticultural Society, South Kensington.

The Emporium, Euston-road.—John Bird & Co.'s Price List contains a number of carefully-engraved designs for chimney-pieces. We do not discover any great amount of novelty in the collection, but it includes many good handsome designs, with the prices at which they can be produced in various materials.

E. Stevens's Illustrated Catalogue of Patent Domestic Inventions sets forth a number of particularly useful utensils and machines, such as for roasting, baking, toasting, or broiling; improvements in kettles and cans; and, above all, inventions to improve the making of bread,—a subject to which the most serious attention of all heads of families should be given. This catalogue, though a trade book, is something more.

ST. ALBAN'S ABBEY.

THE arrangements for the public meeting, to be held on the 22nd, to promote the reparation of St. Alban's Abbey, are going on satisfactorily, and will, we hope, produce a good result. It is not generally remembered that this abbey, of royal foundation, has at intervals since the Reformation received the considerate care of various sovereigns. In A.D. 1612, for example, from James I., by brief,—“That monarch took a personal view of the structure as he made his progress into the North, ‘and out of his princely zeal and pious inclination to preserve so ancient a monument and memorable witness of the first conversion of this kingdom from Paganism to Christianity, granted a brief for collections to be made throughout England and Wales for the speedy repair of the same.’” (Old MS.)

1681. Charles II., by brief.

1689. William and Mary, by grant out of certain ecclesiastical funds.

1721. George I., by brief.

1764. George III., by brief.

1832. William IV., by voluntary contributions, raised under his auspices.

The example thus set will, we dare say, not be lost sight of on the present occasion.

GOOD NEWS FOR TOWN SURVEYORS.

WE have the privilege of announcing that the Glastonbury Local Board of Health—it has just been instituted—has advertised for a surveyor. The heading of the advertisement, however, is,—

“To Surveyors and Others.”

We should have preferred,—

“To Surveyors and Such.”

From what we have said of the place it is certain they want a man of experience, or at any rate of ability, and the Board is evidently of that opinion, and want to begin their duties at the right end, for they offer 10l. a year as salary, with remuneration for extra work. The amount of remuneration is not stated, but we have no doubt it will be something grand. Ten pounds a year going—actually going a begging.

Application must be made immediately to the Town Clerk, Chilkwell street, Glastonbury.

This advertisement we insert free of charge.

THE BRICKYARD CHILDREN.

IN a pamphlet, entitled, “The Cry of the Children from the Brickyards of England,” Mr. George Smith, of Coalville, Leicester, speaking from an experience in the matter of thirty years, again urges the cause of these poor children, to whose hard and sorrowful case we have occasionally devoted space in the *Builder*, as Mr. Smith honourably acknowledges. He says, in reference to his proposal to bring the brickyard children under the Factory Act:—

“I will now briefly submit a few reasons why all the children employed in brick and tile yards should be brought under the Act:—1st. It will only be dealing with fairness to those masters who employ fifty hands and upwards, and are thereby under it, for all yards, irrespective of the numbers, to be under the Act. The excessive toil and fatigue the children have to suffer is another reason. I will mention a case that came under my own observation, only a few weeks ago. One child, out of many others similar in size and age, and doing the same amount and kind of work, I had the curiosity to have weighed, and found (he was barely nine years old) that he weighed only 63 lb. Well! this little creature was engaged in carrying, on an average, 44 lb. weight of clay on his head, for a distance of fourteen miles per day, and working seventy-two hours per week.

The ignorance, vice, and immorality that prevail amongst persons employed in brickyards, is another reason why something should be done to better their condition.”

I am strongly opposed to girls being employed in brickyards, on any account, as being contrary to all sense of decency. This demands the attention of the Government in the next extension of the Factory Act. Girls are forbidden to work at collieries, and most certainly they ought also to be forbidden at brickyards, the work being totally unfit for them. If potters, printers, bookbinders, agricultural gangs, iron and tin workers, and others are brought under the Act, I say that all children employed in the brick and tile yards ought to share in those benefits which would elevate themselves, their families, and their country, morally, socially, and intellectually.”

The Government, or some Member of Parliament, ought at once to bring a brief Bill into Parliament, amending the Factory Act, so far as to place these children under its protection. The subject has already been well enough ventilated, and needs no more exposition beyond what has already been done. The evil is notorious.

* Sumpkin, Marshall, & Co.

THE CANYNGE SOCIETY, BRISTOL.

CHURCH OF ST. MARY REDCLIFF.

THE anniversary of the Canynge Society, which was established in 1848, to promote the restoration of St. Mary Redcliff Church, was celebrated on Thursday in last week. The tower of the venerable pile was gaily decorated with flags, and the bells, as usual, rang merrily at intervals during the day. At half-past twelve o'clock divine service was held in the church, and the Rev. Dr. Alfred Barry (son of the late Sir Charles Barry) preached an admirable and philosophic sermon from Matthew xiii. 52,—“Every scribe which is instructed unto the kingdom of Heaven is like unto a man which is a householder, which bringeth forth out of his treasures things both new and old.”

A public luncheon was afterwards held at the Royal Hotel, College-green; the mayor, who is a Canning, presided, and was supported by the bishop of the diocese and many others. The report, read by Mr. J. S. Clarke, included the following letter from the architect, which we print as serving to show the progress with small means made at the church:—

Brompton, May 22nd, 1871.
My dear Sir,—I have received your note that I would inform the committee briefly of what has been done at the church of St. Mary Redcliff since the last meeting of the society, and I hasten to reply to it.

In my lecture on this occasion the desirability of properly paving the chancel was mentioned. This has since been effected with encaustic and other tiles, marble bands, and marble steps. It was executed quite to my satisfaction by Messrs. Simpson & Sons. The side screens in the chancel have also been completed, and a reredos has been erected. The latter is of Caen stone, with some slight dressings of marble and mosaic work, and includes a considerable amount of carving. The sculptured groups, representing the miracle of the five loaves, were done by Mr. Forsyth. With this exception, the whole was executed by Mr. Rice and those engaged under him, and the workmanship is, I think, very creditable to those concerned.

In the lower part of the tower great weakness was evident, and, but for precautions taken, a great catastrophe might have occurred. Since the last meeting it has been very materially strengthened and rendered more capable of bearing a spire. Very little more has been done to the tower itself externally; but the existing portion of the spire has been partly repaired and partly reinstated, and a certain amount of new work has been prepared, ready for hoisting, with a view to carrying up the spire towards completion. This will very shortly be proceeded with.

The erection of a fine stained-glass window in the north transept, in memory of Edward Colston, and of a memorial window, set up by Mr. Arthur Baker, at the eastern end of the north aisle of the chancel, also call for notice.—I am, my dear Mr. Charles Clarke, faithfully yours,

GEORGE GODWIN, Architect.

Some interesting speeches were made, and a subscription to the amount of about 760l. was announced.

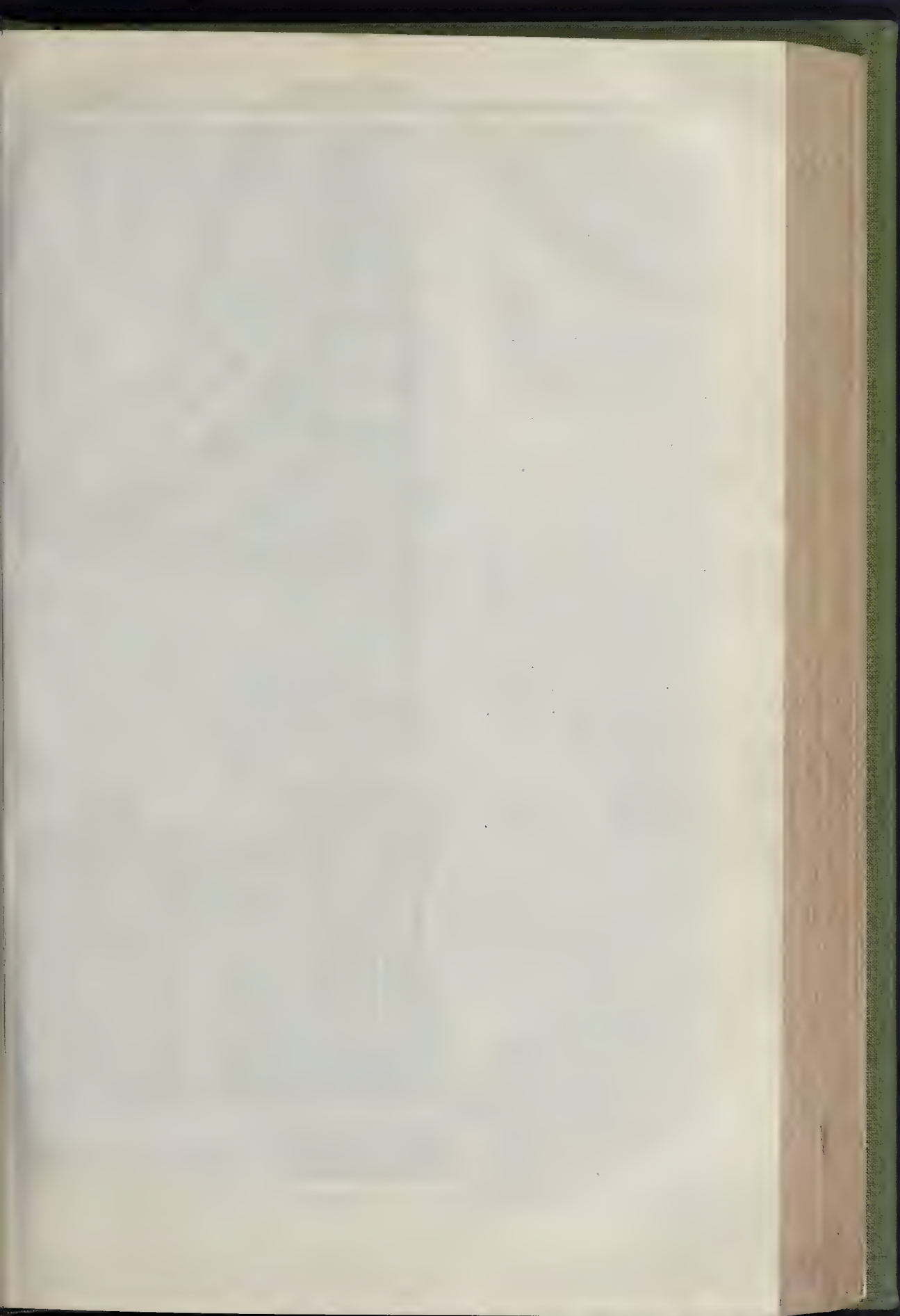
HOUSE OF COMMONS.

Parliament Houses.—Mr. W. H. Smith wanted to know when it was intended, under the powers of the Act 30 & 31 Vict., c. 40, authorising the Commissioners of Works “to acquire lands and to construct an embankment for the security of the Houses of Parliament, and for the improvement of the approaches thereto,” to proceed with the removal of the houses which had been purchased, and with the construction of the embankment. In reply, Mr. Ayrton said he was not aware that the Government had arrived at any determination on the subject, and no new works could be undertaken until an estimate for them had been laid on the table, and the money had been voted.

Park-lane.—In answer to Lord Bary, Mr. Ayrton stated that from the information supplied to him by the Board of Works, he had no reason to doubt that the new street between Park-lane and Piccadilly, through Hamilton-place, would be available for public traffic on or before the 19th inst.

Bethnal Green Science and Art Museum.—In reply to Mr. C. Reed, Mr. Ayrton was understood to say that he had received a letter from Colonel Scott, fixing the completion of the exterior for the last of October next. A great part of the building was, however, now ready to be occupied. Under ordinary circumstances, the building would be handed over to the Department of Science and Art, when the president could decide on the proper course to be taken as regarded the opening. We gave a view and plan of the Museum some time ago.

Archaeological Discoveries at Finkley. Dr. J. Stevens, of St. Mary Bourne, Huntingdon, member of the Newbury Field Club, has just discovered a Roman villa at Finkley, St. Mary's, Huntingdonshire. It is situated about 400 yards west of the Portway. There are, he says, at least three others close by.

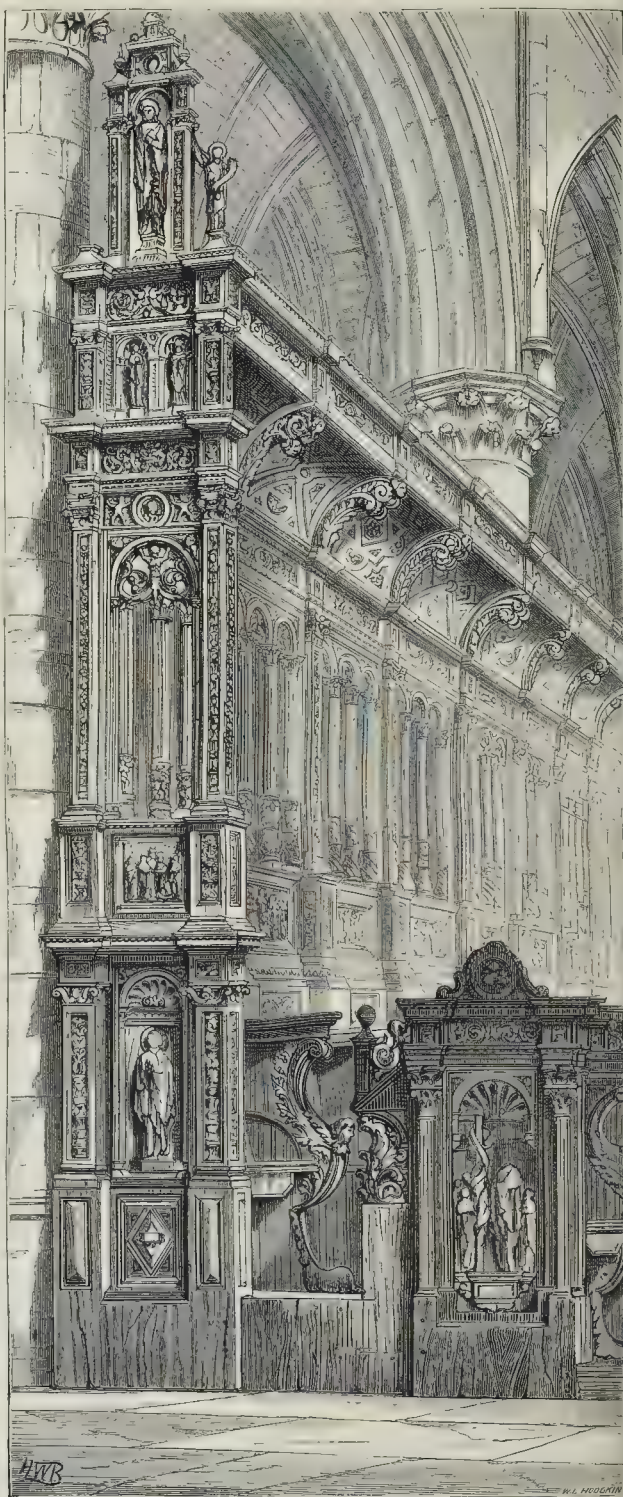


STALLS AT DORTRECHT.

It is not to be supposed that the churches in Holland are by any means rich in furniture, as the Reformation in that country took such a thoroughly iconoclastic form that the destruction of altars, pulpits, stalls, and so on, which were nearly always adorned with figures of saints or with armorial bearings, equally distasteful to the Dutch Reformers, was general. In Limburg and portions of North Brabant, where the Roman Catholic religion stood its ground, of course the remains of ecclesiastical furniture are more frequently to be met with than in the other portions of the kingdom; but even there the frequent wars between the two parties during the sixteenth and seventeenth centuries spared little, and left that little in an impaired condition. Notwithstanding, however, the sweeping destruction of works of ecclesiastical art during the period of the Reformation in Holland, a few fine examples have been handed down to our time, and of one of these, the stalls in the great church at Dortrecht, or Dort, we give an illustration.

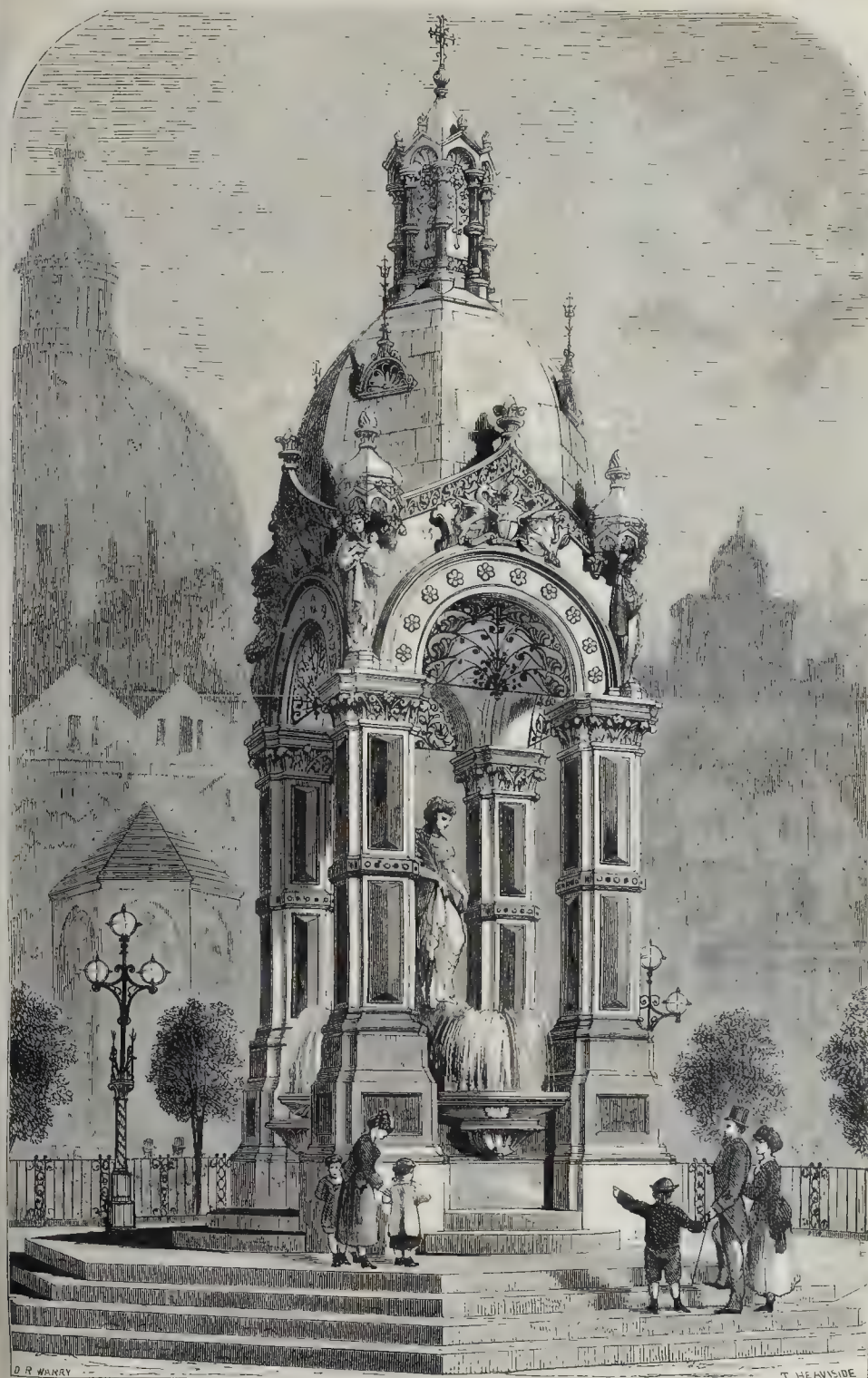
As will be seen, these stalls are of the early Renaissance period, and the dates which are inscribed upon different portions of them vary from 1543 to 1547, and those which are situated in the two west bays of the choir are probably several years later, as they are plainer, more Italian in character, and far less beautiful in design. No portion of them, however, can be attributed to the time after the Reformation. We may remind our readers that the change of religion took place in Holland about forty years later than it did in England, and the Protestant religion was not fully established in Holland till the year 1580. During the years 1578 and 1579 the greatest destruction of ecclesiastical monuments took place, and it was probably in one or the other of these years that the stalls at Dortrecht were mutilated, and many of the figures with which they are adorned deprived of their heads and arms, and some of them were wholly destroyed. How these stalls escaped entire destruction is a mystery, as all other furniture, stained glass, &c., were swept away. One extraordinary feature about these stalls is their extent; they fill four bays of the choir, and are in a double range on either side, comprising altogether about 160 different "sedilia." The misericordes consist of heads of cherubim, cleverly carved. What is a far from common occurrence, the eastern portion of these stalls is more elaborate than the western. This may probably be accounted for by the fact that they were never returned at the west end of the choir, as is the most general practice, and all the authorities upon ancient ritual agree, that when the stalls were only lateral the highest dignitaries of the church were placed at the east end, and diminished in rank westward; whereas, when the stalls were returned at the back of the chancel-screen (as is usual in English cathedrals and churches), the highest dignitaries always sat on either side of the entrance to the choir, and declined in rank towards the east. The latter of these arrangements is nearly universal in northern countries; but the former has been the general practice in Rome and in Spain. The stalls at Dortrecht afford the only example of the Roman treatment we have met with so far north.

These stalls are carved in very fine oak, which has never been varnished or stained, and is consequently of a most exquisite grey colour. The church in which they stand is a very noble fifteenth-century building, consisting of a spacious apsidal choir, surrounded with radiating chapels, deep transepts, and a nave with double aisles. The nave alone is now used; but we are glad to be able to say that the choir and transepts are well kept, and the stalls, of which we give an illustration, are now carefully preserved. The roof of the choir and side chapels is decorated with arabesques, of the early part of the sixteenth century; but all the rest of the interior is covered with a thick coat of whitewash. The modern fittings in the nave, though vile in design, are more costly and respectable than are generally to be seen in the Dutch churches. For instance, the pulpit is of white marble, and the screen which cuts off the choir and transepts is of copper and brass.



STALLS AT DORTRECHT, HOLLAND.

Middle of the Sixteenth Century.



THE PROPOSED DRINKING-FOUNTAIN, SMITHFIELD; LONDON.—MR. FRANCIS BUTLER, ARCHITECT.

THE NEW DRINKING-FOUNTAIN,
SMITHFIELD.

THE origin of this fountain is somewhat interesting. It appears that Sir Martin Bowes, citizen and goldsmith (who was also Lord Mayor in the year 1546), left a sum of money for the repair of the conduits; but these gradually fell into disuse, water being brought into the City through other well-known channels. The sum bequeathed by the worthy citizen lay by and accumulated, and it now amounts to over £2,000.

It was proposed to expend this sum in the erection of a drinking-fountain, and the Markets Improvement Committee, having obtained the sanction of the Charity Commissioners, resolved to place the work in the centre of the circular space formed by the roadway down to the Great Western Railway depot, in front of St. Bartholomew's Hospital.

In response to an invitation from the committee, about forty designs were submitted in competition, and to these we referred at the time. The design selected bore the motto, "Peace," and was found to have been submitted by Mr. Francis Butler. It is now being carried into execution.

Referring to the illustration, it will be seen that the principal feature in the composition is a bronze statue of "Peace" crowned with a wheaten garland, bearing in her left hand the olive branch, while the right is raised, expressive of the blessings of Peace.

Around the statue are grouped four polished granite fountain basins, and below these are six drinking-bowls of white marble. Four angle piers (the shafts of which are enriched with panels of polished Boes of Mull granite) support a canopy, the four arches of which are filled in with wrought ironwork of varied patterns. The arms of the City are shown in tympans, which rise above these arches. An appropriate position will also be selected for the urns of Sir Martin Bowes. Four statues, representing respectively Temperance, Faith, Hope, and Charity, occupy the positions indicated in the engraving. These statues will be placed under small canopies.

Above the tympans before mentioned the erection takes the form of an octagonal dome, upon the summit of which is placed a small temple, surmounted by an orb and cross. The whole structure, which will be in Portland stone, is placed upon a flight of steps.

Mr. E. Saunders, of Maldon, has undertaken the erection of the structure generally. The central bronze statue is in the hands of Mr. J. Birnie Philip. Messrs. Farmer & Brindley will execute the carving; while Messrs. G. & J. Jennings, of London and Glasgow, have the marble work in hand. The wrought ironwork will be furnished by Mr. Leaver, of Maidenhead. The principal dimensions of the fountain are as follow:—The diameter of the flight of steps is 10 ft.; the width across shafts of piers is 10 ft.; and the extreme height of the whole structure, 6 ft. The total cost will be under £1,500.

It is understood that in designing this fountain the author endeavoured to produce a work which should be both appropriate to the locality generally and in harmony with the important buildings and works recently erected in the immediate neighbourhood; viz., the Meat Markets, the Holborn Viaduct, and other buildings adjacent.

HEATING CHURCHES.

SIR,—Having read the letter in the *Builder* as to this subject, I beg to forward one or two replies to the question therein raised on the important matter of church heating.

1st. If the quantity of pipe distributed about the church is insufficient, then, as the architect advises, the congregation will, no doubt, suffer from draughts, and one remedy would certainly be to take pipes into the roof itself; but the proper method would be to increase the power of the apparatus below.

2nd. Unless the quantity of hot-water pipe is very considerable, no church with a large cubic content can be heated comfortably by lighting the fire for one day only; if it be a small church, with ample heating surface, the mistake is often made of lighting the fire on the Saturday night instead of in the morning of that day, the church being generally rendered more comfortable on Monday than on the Sunday.

3rd. If a church only requires heating one day the week, an air-apparatus properly constructed,

so that the air can at no time be superheated, and of such dimensions that a constant interchange of air is secured, is the best and most economical. Constructed upon a proper principle, the temperature can be no greater at the same elevation in any part of the church.

In severe winter weather a hot-water apparatus is apt to sustain damage by frost unless the fire is kept constantly at work.

For large buildings having a number of separate rooms, of course, hot water is more conveniently applied; but even in that case ventilation should be combined with the warming.

In churches where a hot-water apparatus would be kept constantly at work through the winter, I have a system for ventilation by bringing warm fresh air into the church over the wall-plates, and extracting the vitiated into the tower.

The method suggested cannot be adopted or carried out except by the architect making some special provision in his plans. No pipes are seen in the church, nor are any gratings required further than for purposes of extraction.

H. GIELGUD.

THE ENGLISH STAGE.

"The want of a national theatre not wholly controlled by the predominant taste of the public," urged by Mr. Godwin on the occasion of Dr. Dora's recent lecture on Shakspeare, and afterwards reiterated with weighty argument by Mr. Planché in our pages,* is taken up by Mr. Tom Taylor in the *Echo* of the 7th instant, the editor of which journal adds a leading article with the same tendency. Mr. Tom Taylor speaks forcibly and well on the present condition of the majority of the London theatres, and promises to pursue the subject in a future letter. Mr. Theodore Martin and other men of position are understood to have a strong feeling in favour of the movement, and it is not impossible that an endeavour may be made to carry the idea into action.

ROYAL ITALIAN OPERA, COVENT
GARDEN.

A WELL-FILLED house, including Royalty, demonstrated its well-earned approval of the performance of Meyerbeer's "Huguenots" last week; and how could it do otherwise, with the excellent singing of M^{me}. Carvalho, M^{me}. Pauline Lucca, M^{me}. Mongini, and others? The only objection that could be taken would be to the acting, which in some cases weakened the impression intended to be conveyed by the composer.

I hope the management will take the following words in the spirit in which they are written. The draughts in the house are so violent that the attention of the greater part of the audience is diverted from the opera with thoughts of having a cold on the morrow. Something should be done. Why could not the doors leading into the stalls, for example, take the form of ordinary turntables, forming three doors instead of four, acting upon upper and lower pivots, so that when a visitor opens and enters one door would close another behind? They could be fastened by bolts to projecting arms at top, and at bottom in an iron ring working round with the door, let in slightly below the level of the floor, which, being unbolted, and the doors thrown back at the end of the performance, they would not impede the exit of the audience. This would prevent the unpleasant sight of the ladies' ribbons fluttering about in the breeze, and the necessity of covering their shoulders with various shawls, destroying the look of the house.

Y.

BIRMINGHAM ASSIZE-COURTS
COMPETITION.

SIR,—Your correspondent "Fair Play" does not state his case at all fairly as to the present position of the above matter. Let me endeavour to place it before you as clearly as may be. In the first report made by Mr. Waterhouse to the committee he selected five designs, and placed them as follows:—1st, No. 9 (no motto); 2nd, "Perseverantia"; 3rd, "Forum"; 4th, "In Uno"; and 5th, "Desideratum." Now it was found upon looking at the instructions given to architects that "No. 9" had so far disregarded them, that whatever might be the merits of the design,—and no one, not even the "local intriguers,"

has attempted to deny that it has great merits,—it was fairly out of court. It seems only natural, therefore, that "No. 9" being displaced, the other four selected by Mr. Waterhouse should move a step forward. Now what is the real state of the case. On Mr. Waterhouse being again appealed to, he takes a design from what may fairly be called the outsiders,—for it was not among the five first selected by him,—and places it first, in the place of "No. 9," deposed. This state of things, it seems to me, requires explanation. If the merits of the design now put into the place of honour were so great, why was it not one of the five selected by Mr. Waterhouse, or is it possible that he overlooked it? Can you wonder, after this, that some of the competitors are inclined to murmur; but, however, a special meeting of the Council is called for Tuesday, the 13th of June, when no doubt the matter will be fairly settled. In the meantime, let me give "Fair Play" one small piece of advice. Never let him call people hard names, nor stigmatise as "local intriguers" men as high-minded and honest as himself. I merely wish to add that I am not a competitor.

C. W. C.

PRESERVATION OF IRON.

ON Friday evening last, at the rooms of the Society of Engineers, 5, Victoria-street, Westminster, kindly granted by Messrs. Pain and Reid, treasurer and honorary secretary, a practical and valuable paper was read by Mr. G. C. Dawson, of the London and North-Western Railway, on "Iron Structures, and their Preservation," to the members of the Civil and Mechanical Engineers' Society. The paper was well worth reproduction *in extenso*, but we can only touch a few of the salient points. One of these was that all exposed ironwork should be under constant examination; and wherever exposed to oxidation, either from abrasion or from the action of the atmosphere, that such portions should be covered up, at once, by some preservative. By this constant supervision, the conclusion had been arrived at that the Britannia Tubular Bridge and the Conway Bridge were practically everlasting (?). He attached also great importance to the mode in which cast-iron girders were cast. If the metal was deposited from the side, light particles of the iron would naturally rise to the edges of the bearing and other plates; whereas, if cast from the top, the denser particles of the metal would be deposited at the base of the girder, where strength was mainly required. He also insisted strongly upon the desirability of having cast and wrought iron work for outside exposure designed upon the simplest plan, with a minimum of projections and recesses.

"WHERE IS THE PIMLICO CLUB?"

SIR,—In reply to the above question, put by "A Pimlico Workman," in your last issue, I have to state that the gift of the late Marquis of Westminster was conditional upon a further sum being raised which should be adequate to the erection of a club-house of superior style and character. The estimated cost is £4,000, not £10,000, as supposed by your correspondent; and the Working Men's Club and Institute Union, with the efficient aid of their friends Mr. Herbert B. Praed and the Hon. Philip Stanhope, have spared no efforts to obtain the required amount. Having at last obtained promises amounting to about £1,800, the plans are now being prepared, and measures taken to commence the work.

It has been no easy matter to raise the money, for nine persons out of ten to whom application for aid is made in such cases feel doubtful as to the interest of the working-classes in the object, seeing that they themselves do not raise the requisite amount by means of shares. This fact was represented to the local committee formed for the purpose of obtaining the co-operation of the workmen in the project; but the opinion of the members was that it would be impossible to raise the amount in that manner. It was said that these institutions have not yet been conducted in a manner to warrant the expectation that they would be a profitable investment; and that, very few of the workmen residing for any length of time in one locality, they would be unwilling to invest their savings in any undertaking of this kind.

No other course, therefore, was open to us but the slow, laborious, and disagreeable process of "begging." We all hope that when erected the institution will be a model one of its kind, and

* See p. 329, ante.

thereby make such institutions more generally acceptable to the working-classes, and, above all, show practically that such institutions may be made self-supporting. The success of the club and institute movement has been retarded by the inadequate scale on which these institutions have generally been started at the outset, for want of capital.

HODGSON PRATT, one of the Trustees.

KENSINGTON GARDENS AND POWDER MAGAZINE.

MANY recent explosions of gunpowder stores have caused an anxiety about the deposit of such combustibles in large quantity within the precincts of a populous city. In Paris a wide ruin was caused by the explosion of one store, whether accidental or by design is not yet ascertained; but at Liverpool, at Hounslow, and other places in England fearful damage and loss of property have been caused by the purely accidental ignition of ammunition stores and factories. For the distance of a mile houses have been damaged or demolished. It therefore appears unreasonable that the beautiful and valuable districts of South Kensington, Bayswater, and even Park-lane (the *chateaux* of the Park) should be exposed to so dreadful a contingency.—Albert Hall and the Albert Monument being sure of annihilation.

It perhaps may appear to many an unreasonable intrusion upon the freedom of our now splendid Park that a military quarter should occupy the most central and picturesque position, although it be only a captain's company, or even a sergeant's guard; that a store yard, with a ranger's villa, insulating ten acres, and two other domiciles (one built within ten years) should be obtruded upon this invaluable Park, which in other respects is duly cared for and ornamented. These are questions which time and an increasing population may hereafter bring to a solution; but the storage of ammunition in quantity within such an area is as unnecessary as it is dangerous.

There is, however, another disadvantage arising from the inclosure of an acre around this magazine,—it stops the course of the carriage-way across the Serpentine Bridge between Bayswater and the Kensington-road, which might be in a direct line, but now curves round the inclosure by a descent of 10 ft., and a similar ascent. Seeing the pains that have been taken to embellish the Park borders and long walk with shrubs and flowers, it might be expected that this unhappily-placed repository would be transferred to other Governmental stores, whence our unemployed wagon-train might easily supply the metropolitan garrison. The whole structure and its accompaniments are a blot upon the fair woodland scene. T. H. H.

KING'S CROSS, LONDON.

SIR,—Your correspondents appearing ignorant of the origin of the name of King's Cross, which is so intimately connected with the building trade, I beg leave to ask your permission to enlighten the younger readers of your valuable journal, and to transfer from "Notes and Queries" (second series, xii. 67) and Pinks and Woods' "History of Clerkenwell," pp. 501, 710, such information contributed by me to those publications, illustrative of the history of this interesting London district:—

"King George IV. had just ascended the throne, when my grandfather, Mr. William Forester Bray," with the assistance of Mr. Dunston, late governor of St. Luke's, Old-street; Mr. Robinson, solicitor, 32, Charterhouse-square; and Mr. Flanders, a retired tradesman, commenced building on some pieces of freehold ground at a notorious place for thieves and murderers, known as Battle Bridge. It was a speculation of £6,000, and soon my grandfather had the satisfaction of seeing sixty-three houses erected, some of which were situated in the thoroughfares afterwards named by him Liverpool-street, Derby-street, Hamilton-place, and Chichester-place, Gray's-inn-road. More houses were afterwards erected; but in consequence of the notorious popularity of the name of Battle Bridge, the new houses would not let. The result of this was, that my grandfather had an interview with the other freeholders, to enable them to change the name to a better one. One wanted the new-built locality to be called 'St. George's Cross,' another wanted its name to be 'Roadside's Cross,' in memory of that great battle from whence it derived its name; but neither of these names being agreed on, and my grandfather being the largest builder there, he proposed that, in honour of George IV., who had just assumed the crown, it should be called *King's Cross*. This was at once agreed to. All

leases were granted under that name, and from that period the locality has made great progress in civilisation and improvement."

The estate comprised from seventeen to twenty acres. Of this, my grandfather took sixteen small dilapidated houses and the dust and cinder heap, which it was said had been existing on the spot since the Great Fire of London. He gave about £200 for the lot, although the parties wanted 200*l*. Bricks were then very scarce, so he very soon realised a good sum for the old buildings; while Russia, bearing in some way of this enormous dust-heap, purchased it for purposes in rebuilding Moscow. The site of the mountain of dust is now covered by the houses of Derby-street; and I may add, the names of the thoroughfares erected on this estate were derived from the popular ministers of the Government of that day. The estate derived from this property by my grandfather exceeded 1,000*l*. a year. Upon part of his estate he erected large auction-rooms, in Liverpool-street; but being obliged to go to Brighton, he left the building to a Mr. Lanza, manager to an amateur singing society, who, in conjunction with Mr. Geary (one of the early proposers, with Grandfather, for bridging Bobrow's Valley), turned the place into a 'Cabinet Theatre.' It was some time ere my relative could stop the proceedings, and it cost him much trouble to do so. He, however, had from the first retained the cellar under the building, which, he informs me, are of a very extensive character."

To those interested in the early history of this remarkable district, a reference to the "History of Clerkenwell," already mentioned, will afford ample information. It may be worthy of note, however, that the entire building, with the statue of King George, erected by Mr. Geary, was removed in 1845, and a lamp placed on the site.

The wonderful dust-heap alluded to was known far and wide, and obtained more notoriety through the popular old song, "Adam Bell, the Literary Dustman":—

"You recollect the cinder-heap,
Yot stood in Gray's-inn-lane, sir!"

As for the unlikingly-looking statue of George IV., which has only been eclipsed in late years by the more disgraceful one of another King George, in that ruinous-looking district, Leicester-square, it was included in the song thus:—

"Great sculptors all conwars wi' me,
And call my taste divine, sir;
King George's statue, at King's-cross,
Yos built from my design, sir."

Finally, although my grandfather took so prominent a place in the "glorious revolution" and improvement of the district, it must not be supposed he had any influence in the erection of this statue, which, from the first, was to him an eyesore. T. C. NOBLE.

MULLINGAR.—THE EPISCOPAL RESIDENCE COMPETITION.

SIR,—I dare affirm, without fear of contradiction, that the expressed opinion of "A Competitor" on the above competition will not gain notoriety for its singularity. The query naturally arises, is the term "boast" sufficiently explicit, or condemnatory?

The wording of the return mischievous (grammatical as it is) proves that the Liberator's fellow-lodger, no twigs, cost and accommodation,—some of the feedings (anything but downy birds, though) alighting on twig one, others on twig two; the right rev. obtaining a very comfortable nest at a moderate rate (as per conditions required") by the transaction. From advices received (to my cost), the money-twigs intercepted me, although I barely gave the required accommodation, without any attempt at architectural display (as per conditions).

I am not an *admirer* of the legal bearings of the case, but, as the committee did not avail themselves of the customary soporific or reservation of the judges, and as the designs submitted,—they may be amenable to the grinding action of the strong legal arm.

Personally, I cannot advocate, nor do I intend to participate in the insane recreation of throwing up sovereigns for insatiable lawyers to catch, always bearing in mind the little story of the lawyer and the oyster, and its intimate relationship to shelling out. S.

AN AGRICULTURAL AND INDUSTRIAL TRAINING COLLEGE.

SIR,—Mr. Craig (p. 410, ante) draws such a tempting picture of his proposed college that one would like to see how it could work successfully, and how it can be useful or necessary even if commercially successful. Knowing nothing of the establishments at Holford, Ealing, and Balabine, quoted as instances of the success of the scheme, I should have thought that the degree of prosperity which attends the agriculturists of this country, with all their advantages of traditional and modern information, close personal supervision, and the labour of the farmer and his family, was not such as to leave much chance for competitors less practical and less interested in the work; and certainly that no society, with its committee, secretary, manager, overlookers, and people to look after them (and over them) could hope to live out of the work.

But if such a scheme has already been found successful, why spend half a million of charity money in repeating the experiment? The country is full of capital, which only wants such an opening, and all the more if more and intellectual training were combined with profitable investment. Indeed, I do not know that one could do much better than go into the scheme in person as well as in purse.

But your correspondent is careful to stipulate that the youths who are to be benefited should be selected for health, strength, and average capabilities. Surely these are the last persons to need charity in any form. There is already a good market for them everywhere. One would rather select them on account of the lack of advantages

of nature and of early training, so that they might be encouraged, strengthened, and reformed. Then, how are they to acquire business experience and experience in industry,—to form acquaintances outside the institution, to see something of family life? What is to become of them when turned out at twenty-one? Are they to become farm labourers or farmers? And if the latter, on what farms and with what capital? Perhaps they would emigrate, and if so, it would seem more judicious to establish the institution in one of the colonies, so that the youths might grow up as nearly as possible in the actual condition of their future mode of life.

I am sure we should all be very much shocked at the mildest hint of socialism or communism, but it strikes me that there is a strong tendency to "keep" human beings just as boys keep rabbits. An institution is a hutch on a large scale. You carefully select your young stock, feed them on artificial food, subject them to artificial trials and temptations, get immensely interested in them, and then when, from social considerations, the experiment must come to an end, you turn them out into a world which is strange to them and they to it, where so one feels any particular want of them, and where every one whose place they try to fill will hold it against them with all the advantage of possession. Like Rascals, they will turn back towards their happy yard; and as they clamour for assistance, you must pitch on a few of the most promising of them—those who can go through the routine with the greatest constance—and make them professors. What should Mr. Wonnacott, Mr. Marx, or any of the profession wish to see my statement practically illustrated, an opportunity presents itself daily at the front of my works, facing Lawson-street, Great Dover-street, where I am now erecting a block of industrial dwellings, 27 ft. by 48 ft. and 60 ft. high, and one of the wings now being 58 ft. high, or within 2 ft. of the roof. In this wing I have walls of various thicknesses, some partition-walls being only 4 in. thick, and the whole height. I shall be happy at any time to show the work in progress, from the material being brought in (in its rough state), crushed, conveyed through the mill, packed as possible, and I find, in consequence, that the cost of thick walls is much less, in proportion, than that of the thinner ones.

My walls of factory are 20 ft. long, 20 ft. high, and 1 ft. 6 in. thick, without pier, and the cost of these was a trifle over 4*l*. per rod; and I may here mention that the labourers constructing these walls earn a 7*d*. per hour piecework. This rate of wages should be compared with country wages.

Mr. Wonnacott speaks of the apparatus probably adding considerable percentage to the cost of the apparatus. Then, again, the plan, and it is a question which is really the most expensive, my patent building machine or a builder's plant. As an illustration, what would be the cost of erecting a wall 100 ft. by 48 ft. by 60 ft. high, for the erection of my buildings (now in course of erection), 60 ft. high. I estimate that the builder's appliances would be 50 per cent. more than my apparatus. Then, again, the durability, my apparatus has been in use six years, with scarcely any perceptible wear. I am aware there have been one or two attempts to construct buildings in concrete with imitations of my patent apparatus, and which in each case have proved failures, both as regards durability and the working of them.

Mr. Wonnacott does not give a reason (for his statement) why concrete could scarcely be recommended for localities much exposed to frost. I myself cannot see, and have not found) any disadvantage in this respect, although throughout the last severe winter I was erecting buildings (some of them in most exposed situations within a mile of my works), and yet up to the present time there does not appear to be the slightest defect throughout the work.

JOSPH TALL.

THE COST OF CONCRETE BUILDING.

SIR,—In your last week's notice of the "Architectural Committee," quoting a paper by Mr. Wonnacott, on "The Use of Concrete as a Substitute for Stone in Walling," I see this gentleman states that substantial concrete walls cannot be constructed at a less cost than 1*l*s. or 20*d*. per cubic yard; but, by building them thinner, it might be possible to construct them at 12*d*. per cubic yard.

These high prices must be an exception,—they are certainly not the rule (i.e., speaking from my own experience in building in this material, which is now very considerable). I will, however, admit that the cost varies, according to local material and labour, having myself erected concrete walls (with windows) from 6*d*. to 12*d*. per cubic yard, in different parts of the country; noting also, at the same time, that the cost of building in brick or stone varied in the same degree.

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JOSPH TALL.

CHURCHES STRUCK BY LIGHTNING.

Helthorsett.—The church tower during a recent thunderstorm was struck by lightning. From the point of the vane the lightning made a way through the roof of the tower into the bell-chamber, and without injuring the bells caused considerable damage to the walls, especially the east. The damage within the church was confined to the stone tracery of the windows, the glass not being at all injured. The church has been insured for about ten years in the Norwich Union, and the cost of repairing the damage, it is understood, will fall chiefly on that office.

What has occurred may suggest to clergy and churchwardens that they should insure the fabric by means of proper lightning conductors.

Bury St. Edmunds.—St. John's spire was struck by lightning, but sustained no great damage. The spire is 160 ft. high, of Suffolk brick. The lightning-rod had been displaced at the top, and about two-fifths of the way down

* Some time proprietor of the *Brighton Herald*. The late Mr. Biggs, the originator of that popular periodical, the *Family Herald*, was at that period my grandfather's apprentice.

the spire it was completely severed. In the neighbourhood of this severance some shoo! had been given to the brickwork and the beaded stone quoins at the angles, some of the joints of which appear to be opened not less than an inch. No injury has as yet been discovered in the tower. It is thought by some that the spire has been thrown out of the perpendicular. It will now be necessary to erect a scaffold for the purpose of putting up a new lightning-rod,—the old one never was properly insulated,—and the opportunity will be taken to examine carefully the condition of the whole of the spire and tower.

THE TRADES MOVEMENT.

Rotherham.—The notice given by the men in the painting trade at Rotherham for an advance of wages has expired. At a meeting of the masters it was agreed to allow an advance of 1d. per hour, making the wages of the men 5½d. per hour. The men agreed that, inasmuch as no masters had given way to a certain extent, no men would also give way, and instead of demanding 6d. per hour, would be satisfied with 5½d. The masters were informed of this decision, and the men received a letter stating that the masters could not afford to give the price asked by their employers. A meeting of the operatives, a reply was transmitted to the letter from the masters, in which the workmen stated their resolution not to work at a lower rate than 5½d. per hour. No answer had been received to this communication.

Newcastle.—The great strike of engineers in Newcastle and Gateshead looks worse. Mr. Stephenson, who has declared against the nine-hours movement, says competition in the engineering trade has become so great, both from the Continent and Scotland, that, if the Tyne-side masters were to agree to the present demand, the workmen themselves would shortly be the sufferers. He has lately accepted unremunerative contracts for the sake of keeping the machinery and men employed. A large number of cabinetmakers in Newcastle have turned out on strike, demanding an advance of 10 per cent. on piecework prices.

Hartlepool.—The "strikers" in Messrs. Denton, Gray, & Co.'s iron shipyard, at West Hartlepool, have struck work on account of the refusal of that firm to comply with their application for an increase of wages from 18s. to 20s. per week. They are in no way identified with the nine-hours movement.

Consett.—An arrangement has been arrived at between the puddlers and managers at Consett ironworks. The plate and rail mills would have been at a stand-still in a day or two for want of iron, but for this arrangement. The chief cause of the rupture was the inferior "fettling" material.

Manchester.—An outrage of a serious character has been perpetrated on the premises of Mr. Parkinson, brickmaker, near the Broughton Grove Paper Works. Mr. Parkinson has set up a brickmaking machine. About the time he commenced to make machine bricks one or two men waited upon him and asked him if he was determined to make bricks by machine. On his replying in the affirmative, they said he had better not do so. Subsequently, he was again waited upon, and he was led to engage a private policeman. Notwithstanding this, on Saturday night some six or seven ruffianly men were seen enter Mr. Parkinson's croft, and to commence smashing down the bricks that were walled, and so to trample upon the newly-laid ones. An examination showed that about 60,000 bricks are destroyed, besides other mischief. The men engaged in this outrage were armed with iron bars, which they were heard to say they would use in case they were molested.

EXCURSIONS OF ARCHITECTURAL SOCIETIES.

The Oxford Architectural Society.—At the last excursion of this Society this term the members and their friends, numbering altogether about sixty, assembled in Christ Church Hall, and shortly afterwards embarked on one of Salter's large barges for Sandford. After passing through Illey Lock, a general meeting of the society, was held on the top of the barge, while gliding down the stream. Professor Westwood occupied the chair, several new members were elected, and several others proposed. Mr. James Parker then gave

a brief account of the archaeology of the Thames, observing, in the course of his remarks, that he believed the upper portion to be properly called the *Lis*, the word Thames arising from the Thames, which flows into the river at Dorchester, and the word *Eso*, which is analogous to Eke, Uke, and other similar streams in the kingdom. He added that the Thames in Saxon times formed the great boundary between the kingdoms of Mercia and the West Saxons.

The party on landing at Sandford proceeded to the church, the early history of which was given by Mr. Parker, and a fine specimen of stone carving, dug up when the church was restored, was explained by Professor Westwood. This relic represents a full length figure of the Virgin, surrounded by angels, and at her foot is a reliquary, supported by two angels. The stone is now fixed in the south wall of the church. Afterwards the party proceeded to Temple Farm, and the remains of an establishment of Knight Templars, formerly existing there, were inspected. The party then proceeded northwards, skirting the Thames railway, and visited the remains of the "Mynchery," a religious establishment, now also forming a portion of a farm, and its history was explained by Mr. Parker. The party then visited Littlemore Church, the history of which was explained by the Rev. G. W. Huntingford, vicar. The party then proceeded to Kennington Island, where they re-embarked to the Long Bridges and the College boat-races. The next excursion was to be to Bioceter, Middleton Stoney, Chesterton, and Alcester; the third excursion to Stanton Harcourt; and the last to Kenilworth.

Lincoln Diocesan Architectural Society.—On Thursday, June 22nd, in the parish church, a description of the fabric will be given by the Archdeacon of Stow. The society's members and friends will then start from the market-place, visiting Newark, Kelham Hall, Kelham Church, Averham, Upton, Hockerton, Caunton, Norwell, Sutton-on-Trent, Carlton, Cromwell, North Muskham, Holme, South Muskham. Each church will be described by the Archdeacon of Stow. In the evening, among other proceedings, a paper on "Painted Glass," by the Rev. H. Usher, will be read. On the following day the company will proceed to the Castle, which will be described by Archdeacon Trollope. The following places will then be visited:—Newark Castle, Haxton Church, Balderton, Claypole, Stabton, Fenton, Broughton, Beckingham Church, Beckingham Manor, Barnby, Coddington. In the evening a paper will be read on "Easter Sepulchres," by Mr. H. H. Bloxham.

THE SANITARY CONDITION OF GLASGOW.

In the "Annual Report of the Health of the City of Glasgow, 1870," Dr. Gairdner, Medical Officer of Health, informs the local Board of Health how far, after a year's experience of the new and enlarged organization of the Sanitary Department, which took effect in April, 1870, the working of the new machinery promises improved results in the removal of the causes of disease and death. In this able report he says:—

"The true permanent sources of epidemic disease, and of all its associated evils,—filth, overcrowding, physical degeneracy, and moral deterioration of every kind,—are to be found, not so much in the mere existence of certain external nuisances, as in the growth and multiplication indefinitely of a population prone to begot and to tolerate nuisances; a population educated through successive generations into habits of squalor and indecency, by the mere fact of defective house-accommodation."

This is a fact which holds good in more places than Glasgow. As we put it, many years since, in the *Builder*, and in separate publications,—*"As the houses are, so are the people;"* and the truth and significance, as well as importance, of this axiom have long been fully established. In Glasgow, as elsewhere, by far the largest part of the mortality is due to pulmonary disease; and Dr. Gairdner shows the close relationship of this dread evil to the state of the homes of the lower classes.

Archæological Institute of Great Britain.

The preliminary arrangements have been made for the congress of this society, to be held this year, towards the latter end of July, at Cardiff. The Marquis of Bute will be president; the Duke of Bedford, Lord Tredegar, the Earl of Cadwor, Mr. C. R. Mansel Talbot, M.P., and the Bishop of Llandaff, the local patrons.

CHURCH-BUILDING NEWS.

Liverpool.—Christ Church has been consecrated by the Bishop of Chester. The building was commenced in May, 1868, at the expense of Mr. George Henry Horsfall, of Larkfield, Aigburth. It is situated on the west side of Linnet-lane, to which the east front of the church faces, and the site extends to the New-road, in Albert Park, in which is the west front. The north and south sides are bounded by land upon which detached villa residences are being erected. The church is inclosed from the roads by stone and wrought-iron palisading, and has gate-piers and ornamental wrought-iron entrance-gates. It has been constructed, externally and internally, of Stourton stone, in two tints, with a slight intermixture of redsims, in bands and shafts. Although it is somewhat out of the way, its lofty gables, tower, and spire are seen from the neighbouring parks. The style of the architecture adopted is Gothic, of the Early Decorated period. The design is simply and freely treated. The plan consists of nave, north and south aisles, chancel, vestry, and tower, with east, north, and south-west porches. The chancel, or east front, has been made the most important feature of the design, the tower and spire being placed on its north side, instead of, as is usual, at the west end. The tower is 175 ft. high, and differs in many respects from the usual models. Instead of being divided into stages, by windows or sham clock-openings, it rises without interruption to the belfry-windows, which have been so arranged as not to form a distinct stage. By means of gablets and sets-off, these windows merge into the branch of the spire, which rises by a marked curve from the square of the tower to the octagonal sides of the spire, and these run down upon it, thus forming a connecting link with the belfry-window gablets and the first gableted spire lights. Two bands of a darker-tinted stone divide the spire, and the apex is finished with a wrought-iron cross and terminal. The chancel, which juts out nearer the road than the tower, has a buttressed centre, in which, some distance from the ground, is the east window, of three lights, divided by shafted mullions, the arched heads being filled with tracery. Above this is a gable, having a carved stone cross. The corners of the chancel are splayed, in which are single-light windows, with traceried heads. It has a high-pitched roof, with ornamental oak slateshipped, and terminating in a wrought-iron finial and ridge-cresting. Above this is the high gable of the nave roof, with stone cross. On the north side of the base of the tower is an outer open and inner closed porch, having arched entrances and gables. The inner roofs are groined in wood, and the floors laid with ornamental tiles. To the south of the chancel is the vestry, with its high-pitched roof and wrought-iron cresting. The north and south sides are divided by buttresses, between which are the windows, of three lights, with traceried heads, a small gable being placed above. The west front is a five-light window, 15 ft. wide by 30 ft. high, divided by mullions, transom and tracery. On each side are porches, set on the angles. The roofs are groined in wood, and the floors laid with ornamental tiles. In the interior, the nave is 32 ft. 3 in. wide by 105 ft. 8 in. long, divided from the aisles by six arches and clearstory supported upon five moulded York stone shafts, with moulded bases and carved capitals. The roof is of pitch pine, and consists of hammer and collar beams, principals, with carved and moulded ribs between them, and also from under the hammer-beam to the top of carved caps of detached red stone shafts, the bases of which are supported upon stone corbels, having sculptured angels underneath. Above the collar-beams, the ceiling, 55 ft. from the aisle floor, is formed of diagonal boarding in sunk panels, the sides being pierced with quatrefoil piercings, which provide the means of ventilation to the space above the ceiling. From thence to the exterior the sloping sides show the rafters and diagonal boarding. The nave is lighted by large west and clearstory windows. The aisles are 11 ft. 5 in. wide by 90 ft. 8 in. long, and lighted by large three-light windows, with traceried heads. The roofs have half-principals resting upon carved stone corbels, and formed to suit the gables over each window. The chancel is 30 ft. long by 28 ft. wide, separated from the nave by a moulded arch, springing from stone and sculptured corbels. The sittings are of pitch pine, with carved bench-ends, and are so arranged as to form a centre and side aisles. They will seat 809 persons, one-third of

the sittings being free. The font is placed at the west end of the centre aisle, and is a design in Caen stone, having a moulded base and shaft, and four sculptured angels supporting the basin. These were specially designed by Mr. Sumners, and executed by Mr. Alfred Norbury, who also executed the whole of the internal and external carving. The church is warmed by hot-water pipes running under ornamental gratings in the aisles. It will be lighted by gas from large ornamental brass standards, having fifteen lights in each. These, and the brass standards for communion-rail, and the wrought-iron gates and railing, were supplied by Mr. T. W. Davey, of Manchester. The contract was taken by Mr. William Thornton, stonemason, for 13,000l. Messrs. Haigh & Co. did the woodwork; Messrs. Hales & Johnson the slating; Mr. David Radcliffe the plumbing, glazing, and painting; Mr. B. G. Powell the tiling. The bells are to be supplied by Messrs. Warner & Sons, of London. The architects were Messrs. Culeshaw & Sumners, of Liverpool.

Rochdale.—The Church of St. Peter, Newbold, the foundation-stone of which was laid by Bishop Lee, on the 7th of August, 1869, has now been consecrated. This is the second of the new Rochdale churches—All Saints', Hamer, being the first. Three others, at Balderstone, Facit, and Falinge, are in progress. The new church is situated a quarter of a mile or more to the S.E. of the Rochdale railway station, between the Oldham-road and the Lancashire and Yorkshire Railway, and is well seen from both, as the site is elevated. The style of the architecture is Pointed Gothic, treated to suit the rough random rubble stone and red brick, of which materials the church is mainly built. The walls are of rubble, and stock brick is introduced in the coigles, bands, strings, buttresses, and arches, in the ornamental panels, moldings, and cornices, and in many other places where dressed stone is more usually employed. In this case dressed ashlar stone is used externally for all sills, and for the coping and tracery of about thirty of the windows. The tower is at present carried only a little above the level of the aisle walls. Projecting from the centre of the western side is the semi-octagonal staircase turret to the belfry stage. The tower will have at the top four two-lighted windows, and be surmounted by an octagonal broach spire. There are two small lancet windows lighting the tower porch. The spire will be carried to a height of about 135 ft. and at its summit is to be placed the cock, as a well-known symbol of St. Peter. Next in order on the west elevation is the west porch or narthex, with its three arches. The two side ones are doors, to be used for exit only. The central arch contains a small quatrefoil window, and the spandrels are filled with ornamental brickwork. The roof of the porch slopes up to the bottom of the large west window, which has four lights below, and a rose-window above. The central pier of the four lights is carried up projecting, so as to form the stem of a cross, in conjunction with the tracery bars in the circular window above. The west gable is again connected with the narthex by a flying buttress and buck-pinnacle, and on its summit is a cross. At the north-west angle of the church is the baptistery, with a buttress and pinnacles, separate pyramidal roof, and floriated metal cross. The long lines of the north and south aisles are broken by the buttresses which divide the pairs of aisle windows. The roofs are slated in two colours, arranged in patterns, and are finished with red-tile ridge-cresting, of a rather more elaborate design over the chancel than over the nave. The main entrance is by the south lower door. The ground plan of the church comprises nave, north aisle, ending, towards the east, in the minister's and choristers' vestries; south aisle, ending in the organ-chamber; a chancel, and its semi-hexagonal apse. The east end of the church is lighted by the three two-light apse windows. The church will seat 670 adults, all the seats being alike. The several contracts amount to about 3,750l., and there are extras beyond the amounts of the several contracts. The foundations were put in, first of all, by Messrs. Stopford & Cordingley; then the shell of the church was built by Messrs. Rogers & Booth, of London. The fittings and finishing have been carried out by Messrs. J. Robinson & Son, of Hyde. The pulpit and font, and six busts of saints, with scrolls in medallions to the spandrels of the nave arches, and all the other figure-work, were executed by Messrs. T. B. & Evan Williams, of Manchester. The carved capitals and altar-

cross were done by Messrs. Earp & Hobbs; the gasfitting by Messrs. Thomason. The bell, which is intended ultimately to be hung in the school belfry, was cast by Messrs. Mears & Co. The architects, from whose designs the whole of the works have been carried out, were Messrs. Medland & Henry Taylor, of Manchester.

Books Received.

The current number of *Fraser's Magazine* contains an interesting and readable article on "Architecture and its Relation to Modern Life." We give an extract to show the tone of the paper:—

"As a nation we are (at present) good engineers and bad architects, and our engineers who have carried out, with equal energy and ability, some of the most important practical work of the present day, have taken like the (Romans) to borrowing stereotyped architectural features, and applying these to their structures in the vain idea of thereby making the latter 'ornamental.' We will mention one instance, familiar to most of our metropolitan readers, as it forms a singularly apt illustration of what we mean by the misapplication of an architectural feature; we allude to the new bridge over the Thames at Blackfriars. Standing on the Embankment and looking along this bridge, we see that the outer face of each pier consists of a huge cylindrical granite pillar, of very thick and squat proportions, carrying a Brobdingnagian spreading capital. Now, the evident expression of such a feature, of such proportions and material, is that of power to sustain an immense vertical pressure. What does it really sustain in this case? A light balcony thrown out from the foot path over each pier, for the convenience of loungers on the bridge. Let the most unarchitectural spectator once look at the feature in this light, and he must see its absurdity. Observe, the mass of material forming the column may be a necessary addition to give greater stability to the pier, but it has been added in the wrong form and with the wrong expression; it should have taken the form of a buttress or shoulder leaning towards the pier, and adding to its apparent stability, not that of a ponderous vertical pillar sustaining next to nothing. This is only one out of many instances of the total and absolute ignorance of architectural design displayed in some of the largest and most expensive engineering works which are being carried out in this country, and which will remain as phenomena for the criticism of a better-educated generation."

Miscellaneous.

Insanity of "Self-Interest."—The dust generated in the grinding of needles is productive of serious consequences to the health of the workpeople; and, as far back as the year 1811, the Society of Arts bestirred itself to find a preventive. The large gold medal of the Society was given, in 1822, to Mr. J. H. Abraham, of Sheffield, for his magnetic guard, intended to protect persons employed in pointing needles and other branches of dry grinding. The stone rotated through a slot, in a canvas or wood screen, so that the jet of dust, after having been carried beyond the screen by the force of the grindstone, was prevented from returning. As an additional preventive, magnets were suspended over the stone, and the grinder was furnished with a gauze muzzle fitted with magnets, which collected the fine metallic dust from the atmosphere. The editor of the *Society's Journal*, commenting on this, says,—"The Society's efforts were not only not appreciated, but actually opposed, by the very persons they were intended to benefit. A commission was sent to Sheffield to introduce a respirator intended to prevent the inhalation of the dust raised by needle-grinding, which was exceedingly hurtful to the workmen. The members of the commission were threatened with personal violence if they persisted in their labours, on the ground that the general use of such a respirator would lengthen the life of the workmen, and so tend to diminish the wages paid!"

Opening of New Refreshment-room, Grand Hotel, Scarborough.—The refreshment-rooms, which were opened to the public on Whit-Monday, consist of a suite of rooms, the principal of which is 100 ft. long, with an oak and marble counter 80 ft. in length, on which are set out every kind of popular domesticables and refreshments. A smaller room will be devoted to the use of those who do not object to a slightly increased tariff, with a selection of superior wines and liquors. Another large room, similar in size, will be set apart exclusively for the use of the working-class parties. Between the two large rooms there are parlours-offices, men's lavatories, and ladies' cloak-rooms. The new building was designed by Mr. W. B. Stewart, architect, and has been erected by Mr. W. Peacock, of Scarborough, builder.

A Public Park for Congleton.—The opening of a new park has been an event at Congleton. The park, including the Town's Wood, covers an area of about twenty-three acres,—nine of which have been purchased by the Corporation at a cost of 1,800l., and about three are virtually the gift of Sir C. W. Shakerley, bart. It is pleasantly situated on the north side of the town, on the right bank of the river Dane. The wood, which is well timbered, rises to a considerable height, and from it a view is obtained of the town and the country beyond. The ground has been partially laid out according to plans submitted by Mr. Kemp, of Birkenhead, and by the borough surveyor, Mr. Blackshaw. The ornamental portions of the plan are as yet untouched upon, consequently with the exception of a terrace walk at its foot, the Town Wood still retains its natural aspect. The size of the wood is about eleven acres. On the higher part the Russian gun, which was some time ago removed from the High-street, is mounted on a stone battery, erected for the purpose. Farther on is a timber bridge, thrown across a ravine in the western part of the wood. The principal entrance to the park is by the Meadows, over a bridge designed and executed by Mr. E. Soragg, of Baglawton, mechanical engineer. At the foot of the hill, and on the terrace walk, are placed two drinking-fountains. Fronting the terrace walk is the park or recreation-ground,—eleven acres in extent,—for the public, upon which cricket and other sports can be engaged in. Close to the river is the bowling-green, which cost about 80l., measuring 65 yards long by 45 yards wide, and 2½ ft. below the level of the surrounding ground, on account of the usual and necessary slopes for the bowling-green edges.

The Burlington Fine Arts Club.—Of the various ways and means by which this association seeks to advance the cause of the fine arts within its more immediate circle of professionals, amateurs, or connoisseurs, and to cultivate a taste for those arts in the wider circle of uninitiated society, not the least important is the holding of periodical exhibitions and conversations within the rooms of the club. The club has been putting forth fresh efforts in that direction since its removal from Piccadilly to its new quarters, 17, Savile-row. In these rooms there is now on view a highly-interesting collection of drawings illustrative of the early stages and ultimate development of the art of water-colour painting, as practised in this country. The exhibition was inaugurated by a conversation on Saturday evening, the 3rd. The collection of pictures consists of more than 300 drawings in water colours, representing from fifty to sixty different artists. The exhibition is confined to the works of artists born before the close of the last century, and not now living; and in making their selections the committee have drawn mainly on those artists whose works are known to have influenced more or less the development of the art of painting in water colours, not rejecting, however, any good drawings by less known artists.

Electro-Plating Inside of Lead Pipes.—By the invention of Mr. H. E. Towle, of New York, in order to coat or line a long length of lead pipe with silver, the pipe is first made straight, or nearly so, and placed on a table inclined at an angle of about 20° or more. An anode of peculiar construction is next inserted within the pipes at the lower end; the negative pole of a galvanic battery is attached to the pipe, and the positive pole to the interior anode of silver. The pipe is next filled with a solution of cyanide of potassium, for example) at the lower end, so that it will not quite reach to the upper end of the anode; the anode is then slowly drawn forward, and the lead pipe is occasionally jarred or rolled over to bring its sides alternately uppermost. The time required to complete the coating will depend upon the thickness desired, the electrical force of the battery, and the character of the solution employed.

The Light of the Legislature.—The Chief Commissioner of Works has it in contemplation, says the *Morning Post*, to add another attractive feature to the metropolis, by displaying the lime light on the great clock tower at the New Palace of Westminster so long as the House of Commons is sitting. When it is extinguished it will be known far and near that the labours of the Legislature are suspended. The arrangements for displaying the light will be under the direction of Dr. Percy and Professor Tyndall.

Improvement of Dwellings in Liverpool.—Lord Derby presided recently at a meeting held in Liverpool, for the purpose of forming a Society for the Erection of Labourers' Dwellings, near to the great centres of labour, on a self-supporting and not a charitable basis. In opening the proceedings, his lordship said that the excessive disease and mortality of Liverpool are chiefly due to the overcrowding which so sorely prevailed, it being estimated that no less than one-third of the population lived, in average families of six, in only one room. He thought that the evils of drunkenness would be obviated much more effectually by the erection of better houses for the labouring population than by the total lecturing; for the discomfort experienced by men and women from overcrowding is generally the incentive to drunkenness. The most satisfactory feature of the society was that the tenants would pay a fair rent, and thus their self-respect would not be lessened by any consciousness of living in almshouses. From his experience of such societies in London, Lord Derby anticipated very favourable results to the new society. The rector of Liverpool proposed as the first of a series of appropriate resolutions, which was,—"That this meeting is of opinion that a company for carrying out the objects set forth in the preliminary prospectus, and to be called 'The Liverpool Labourers' Dwellings Company, Limited,' should at once be formed." The resolution was carried unanimously. At the close, the chairman, alluding to some remarks by Mr. Shaw Brown, said he differed from them in one point. Mr. Brown had said that a labourer earning 15s. a week could not get 3s. 6d. a week for his rent; but all that he (Lord Derby) could say was, that labourers did in London.

Cost of Blackfriars Bridge.—A large sum has recently been made against the Corporation in respect of the erection of a new bridge at Blackfriars. It seems tenacious having been invited for the necessary works, the committee accepted the lowest, namely, that of Messrs. Thorn Brothers, for the sum of 269,045l., the contract containing the usual stipulations as to extras and omissions. The bridge was completed at the end of 1869, and by that time the contractors had received from the Corporation, on the certificates of Mr. Pitt, the engineer, the sum, in all, of 309,695l. The difference between that and the tendered sum was owing to the completion of extras. There is now owing to Messrs. Thorn a balance, after allowing for extras and omissions, of 7,895l. odd. The contractors, however, have brought an action against the Corporation to recover upwards of 100,000l. over and above sum paid, and the committee, who denied liability, had paid into court the sum of 35l. The action had been sent for trial, but the contractors have suggested that the whole dispute should be referred to an arbitrator. The court have referred the matter to the House Committee, with power to take steps they might think desirable.

Decoration of the Bradford Exchange.—The space between the rafters has been painted a cream colour. The roof has been treated throughout in the manner in which the timbers of the Middle Ages were decorated. The ends of the timbers, including the cross-beams and hammer-beams of the ambulatory, have been painted and varnished, and the chamfers picked out in colour. The principals sustaining the roof are picked out also in colour. Immediately over the wall-plate of the roof, and between the rafters, are bands of colour, and scroll ornaments over the centre of each dormer-light. The gable portion of the upper part of the roof has been simply divided by lines of quiet green and a cream-coloured ground, and extending to the eaves the roof. In the ambulatory cross-beams have stencil ornaments at their intersections carried all round. The work has been executed by Mr. Henry Briggs, under the direction of the architects, Messrs. Lockwood & Son.

Railroad across the Straits of Dover.—

Hutchins sends us a scheme for joining England and France by a submerged floating way, the tube being divided into four watertight longitudinal compartments. We do not think it necessary to print the communication, because we are not quite sure that we wish the Straits to be bridged; and secondly, because we are quite sure that this is not the way to

Statues of Statesmen.—It has been proposed to erect at Westminster, by means of funds subscribed, statues of the late Sir Robert Peel, Viscount Palmerston, and the Earl of Derby; and in consequence of communications made to the Government, the Treasury recently requested Mr. Barry and Mr. Weekes, together with Mr. Fergusson, to report upon the subject. These gentlemen state in their report, dated the 8th of May, that the two gardens in Parliament-square, opposite the gateways of New Palace-yard, are the only open-air spaces at present available for the statues of statesmen in the neighbourhood of the Houses of Parliament; and that if the central avenue between these gardens were widened to 28 ft., ten statues could be accommodated, five on each side of it, so as to form a pleasing and appropriate approach to the Houses of Parliament. The four truncated angles of the square would afford suitable positions for eight more statues, and suggestions are made to prevent any incongruity or unpleasant effect while the number may be incomplete. After the eighteen statues have been erected, which can be placed in Parliament-square-gardens, other sites may be available, in consequence of the proposed clearances in Old Palace-yard and Abingdon-street.

The West of England Sanatorium.—The foundation-stone of the new building for the West of England Sanatorium, Weston-super-Mare, has been laid, according to ancient Masonic custom, by Earl Carnarvon, K.G. The institution is not purely local in its charitable aims. The building will be in the Collegiate style, forming a quadrangle facing the sea, with a private chapel, and glass houses for recreation. The whole, when completed and furnished, with the purchase of the land, will not exceed 120l. a bed, whilst every comfort is provided. The building will be erected in sections, as funds are collected; and at present the committee are in possession of about one-fifth of the required sum. The building will be of stone, with free-stone dressings, lined with brick. The estimated cost of the whole, including the land, is 11,000l. The first of the three sections will cost about 4,000l. and it will be devoted to children and women's wings. It will accommodate about thirty patients, and the entire building, when completed, will contain accommodation for 100 persons. The streets of the town were crowded with excursionists, and the residents turned out *en masse* to see the procession.

The New Mint.—The new Mint, it is said, will not be on the Victoria Embankment. The site chosen is bounded on the north by Temple-street, on the south by the Embankment, on the west by the southern portion of King's Bench-walk, and on the east by the gigantic gasworks, about the removal of which, however, there is some talk. In the event of their removal, there might be a line of handsome buildings (including the new Mint), extending from Blackfriars Bridge to the Middle Temple Library on the west, without in any way interfering with the Embankment or its approaches. A Bill has been introduced into the House of Commons, to enable the Commissioners of Public Works and Buildings to acquire property west of Blackfriars Bridge, for the erection of a New Royal Mint, and to dispose of the site of the existing Mint on Tower-hill, and for other purposes. It has been referred to the examiners of petitions on private Bills for consideration and report.

Congregational Memorial Hall and Library.—The committee of this hall and library have just purchased a freehold site in Farringdon-street, being part of the ground on which the old Fleet Prison stood, and which commended itself as being at once central and convenient of access from all parts of London. Here a spacious hall is to be erected with the 50,000l. already collected and remaining of the fund of 250,000l. for chapels, schools, &c., in commemoration of the extradition of 2,000 clergymen from the Church of England by the Ritual Act. The site of the hall is nearly opposite to the new street from Farringdon-street to Holborn.

New Wesleyan Schools at Callington.—The foundation-stone of new Wesleyan schools at Callington has been laid. It was discovered next morning that the foundation-stone had been removed from its place, and, apparently, a search made for the bottle containing articles deposited. The thieves, however, failed to find the bottle, which was laid in a piece of masonry underneath the corner-stone.

Fall of a Quay-Wall at Swansea.—A serious casualty occurred last week on the Swansea river, near the Pottery Bridge, by the slipping of a portion of the quay-wall, by which damage to the extent of, at least, 20,000l. was done. Orders were given on Thursday by the Harbour Trustees to let the water out of the north dock, and consequently out of the river above, for purposes of repair in connexion with the dock-gates. This was done; and while the bed of the river, when the water is out, is many feet below the new canal-basin, no effort was made to discharge the water from the canal, and the result was the weight of the water in the canal caused a breach in the quay-wall, and resulted in the damage that has been sustained. Wharfs, sheds, tramways, barges laden with coal, and other vessels, cranes, steam-engine, and all the appliances for shipping coal on the bank above, got huddled together in an incongruous mass, the wall having given way for a distance of at least 350 ft.

Science and Art Schools for Gloucester. On Saturday, 3rd inst., the foundation-stone of a building, which is to cost 5,000l., and will answer the purposes of schools of Science and Art, and a museum, was laid in Gloucester. A School of Art has long existed in the city, and, under the guidance of Mr. Gambier Parry, has proved very successful. A museum also has been conducted in rooms lent for the purpose, by Mr. Sydney Dobell. But the building used for the School of Art is utterly inadequate, and it has long been desired that there shall be within one space worthy means for general instruction. The ceremony was to have been performed by the Duke of Beaufort, K.G., Lord High Steward of the city, but he telegraphed at the last moment that an attack of gout prevented his attending, and the stone was laid by the High Sheriff of the county. We shall give a view and plan of the intended building in our next.

Water for London.—A new Bill for improving the supply of water to the metropolis has been printed. It bears the names of Mr. Bruce and Mr. Winterbotham, and provides for a constant water supply by the metropolitan companies when required to do so in any district by the Metropolitan Board of Works, who are to act on their own motion or when required to do so by the local authority in any district. In case of the metropolitan authority refusing or delaying to act, or in case of the health of a district being likely to suffer from an insufficient water supply, the Home Secretary is to have power to require the water companies to provide a constant supply. The companies are liable to a penalty not exceeding 200l. for breaches of the Act, and a further penalty not exceeding 100l. per month for continued neglect. An analyst is to be appointed by Government to test daily the quality of water supplied by each company, and penalties are to be imposed for impurity.

Drainage of Dublin.—The *Irish Builder*, writing on this subject, says:—

"Our professional contemporary in London seems pretty well posted up on all matters of importance relating to the Irish capital. The Corporation of this city are pretty often reminded of their duties, and their repeated failings in the performance of them. However strong the censure of our contemporary may appear, there are some among us who do not think they are deserved, while there are many more who are of opinion that they are not half strong enough. We must say for ourselves that we cannot take any great exception to the remarks of the *Builder*, for they are based upon incontrovertible facts. The main drainage scheme of Dublin, if properly carried out, would confer incalculable advantages upon the city, but we have no guarantee that the work will be a profitable one, though no one can gainsay its desirability. Nor can we be convinced by any show of reasoning that the proposed scheme for the disposal of the sewage, by letting it into the mouth of the harbour, is anything more than a most unwise and fruitless proceeding. The utilisation of town and city sewage for irrigation and agricultural purposes is much too important a matter at the present hour to be overlooked or treated lightly."

Two Men Crushed to Death in Piccadilly.—Mr. Bedford has held an inquest at St. George's Hospital touching the death of Henry Dawley, aged 43, who was killed, with another man, in Piccadilly. The deceased was engaged, with several men, at 8, Stratton-street, Piccadilly, pulling down the side walls of the house. A scaffold was erected for the men to walk upon, when suddenly one of the walls fell, and the deceased, with another workman, was buried under the debris. Deceased was got out alive, but the other man, when extricated, was fearfully injured, and shortly afterwards expired. Deceased was taken to the hospital, where he died. Verdict, "Accidental death."

The Westminster Memorial.—Lady Theodora Grosvenor has laid the foundation stone of a cottage hospital at Shaftesbury, which the inhabitants of the town and neighbourhood have decided shall be erected in memory of her father, the late Marquis of Westminster. The building will be plain. It will afford accommodation for eight patients, nurses, &c., and it can be readily enlarged without destroying the proportions of the structure. The institution will be built of local stone, with dressings of Bath stone, on an eligible site given by the Dowager Marchioness of Westminster, situated near the church and schools. The building contract was obtained by Mr. Miles, his tender of 1,430*l.* being the lowest. The architect is Mr. J. B. Corby, of Stamford, Lincolnshire. The cost of erection is already covered by the amount of subscriptions received, but more funds are earnestly solicited for the endowment of the institution. Towards the latter object Lady Westminster has contributed 2,000*l.*, and the annual subscribers of from three to five guineas number about thirty.

The Result of a Strike.—Twelve Flemish joiners arrived in Newcastle on Monday from Antwerp. The arrival was expected by the Newcastle operative joiners out on strike as well as the master joiners, and there was a considerable number of both masters and men. The masters had taken measures to defeat any efforts of the strike hands to hold conversation with the Flemings, and consequently the batch of foreign workmen were carried off by their future employers in security. For some weeks past the master joiners have had agents in Belgium with the view of obtaining a sufficiency of work men to fill the vacancies in the Newcastle work-shops caused by the strike in the building trade.

Saturday Afternoon Lectures.—A series of lectures in aid of the Working Men's Club and Institute Union, will be delivered in the Theatre of the Royal School of Mines, Jermy street, on Saturday afternoons.—June 10th, Mr. Thomas Hughes, M.P., "A Visit to the United States"; June 17th, Mr. Robert Coningsby, "Paris under Insurrection"; June 24th, Miss Emily Faithfull, "The Best Society"; July 1st, the Dean of Westminster, "The Early Christians"; July 8th, Mr. Rupert Kettle, "Masters and Men"; and July 15th, Mrs. H. Fawcett, "Women and the Franchise." The charge for admission is small.

Opening of the New Cheshire Lunatic Asylum.—The new county asylum at Maclefield has just been opened, but without ceremony of any kind. The asylum is an immense place, covering 9½ acres, and its cost to the country is about 120,000*l.* It is calculated to accommodate about 700 patients. The building is in the Italian style of architecture, and consists of twelve complete blocks, broken up by recreation-grounds, airing-spaces, and yards, and connected with each other by corridors and single rooms. The whole of the building is of red brick, with blue and white bricks for the ornamental part of the work.

Opening of Reigate Cottage Hospital.—The new building erected for the Reigate Cottage Hospital has been formally opened by the Bishop of Winchester. The building in its present form will give room for fourteen beds, and when fully completed, as contemplated, there will be ample space for about forty beds. The cost up to the present time has been 1,473*l.* 5*s.* After providing for other wards, and the requirements of the hospital, a sum of over 500*l.* is required. The hospital has been erected from designs by Mr. John Lees, of Reigate, architect, and the work has been carried out by Mr. William Carruthers, builder and contractor, Reigate.

A Movable Chapel.—The *Rock* mentions that the managers of West Laurel Hill Cemetery, Philadelphia, have caused to be constructed a movable chapel, to protect those attending funerals from inclement weather during the services at the grave. It covers an area sufficient to allow standing room for seventy-five persons, who can then stand under shelter, and on dry ground. The idea might well be adopted in England. The churchyard has killed many.

Conference of Architects.—We are asked to say that the name of Mr. E. Kirby, of Liverpool, should have been included in the list of country members present at the recent conference. We did not profess to give the names of all who attended. The very unwise arrangements as to the press, indeed, pointed to the supposition that we should give none.

The Liverpool Borough Engineer.—The Health Committee of the local Council propose the appointment of Mr. C. Davies as acting engineer and deputy borough engineer, at an increased salary of 600*l.* per annum, instead of 450*l.*; and, in consequence of the state of the health of Mr. Newland, the borough engineer, it is proposed to appoint him as consulting and borough engineer, at a salary of 800*l.*, instead of 1,450*l.*

Equestrian Statue of the Prince Consort. Mr. Bacon, of Sloane-street, is engaged upon an equestrian statue of the Prince Consort, which it is intended to erect in the circus at the western end of the Holborn Viaduct, near Hatton Garden. The model is now completed. The group is a little over life-size, and is the gift to the City of a gentleman who desires to maintain a strict incognito.

The Northern Architectural Students' Society.—The second annual meeting of this society was held on Wednesday night at the Literary and Philosophical Society's Rooms, Newcastle. This brought the winter session to a close. The President (Mr. W. L. Newcombe) delivered an address. Some routine business was afterwards transacted, and officers were appointed.

A Heavy Belle.—A poetic lover, who recently lost the mistress of his soul, has, in memory of her, given a bell to his parish church, with this simple and pathetic inscription upon it,—"Minnie." A London sight-seer thus read on (introducing the bell maker's memorandum of the weight which was beneath the name),—"Minnie, 920 lb."

Value of City Property.—Messrs. Roshworth, Abbott, & Co. sold by auction, on Friday last, at the Auction Mart, a freehold house in Bishopgate-street, adjoining the National Provincial Bank of England, producing rental of 300*l.* a year for fifteen years to come, for the sum of 8,800*l.*, being at the rate of about 10*l.* 10*s.* per square foot.

The Population of London in 1871.—A leading journal says,—"On an average there are 2,669 persons to a square mile." Really, there are 26,654 persons to a square mile. This error has been copied into several newspapers, and will, of course, be frequently quoted as a correct list of statistics.—A. J.

House for Scientific Societies.—A deputation from several of the scientific societies of London, headed by Mr. W. Newmarch, F.R.S., have had an interview with the Chancellor of the Exchequer in Downing-street, for the purpose of submitting a proposal for erecting a building on or near to the Thames Embankment.

Steam Omnibus.—On Friday, the 2nd inst., Mr. T. S. Johnston's steam omnibus "Pioneer" commenced to run between Edinburgh and Portobello for the conveyance of passengers. It starts and goes at the speed of an ordinary coach from the foot of Waterloo-place, in Edinburgh, and from John-street, Portobello.

Fountain on the Thames Embankment. We are informed that it is not likely that the Metropolitan Board of Works will carry out either of the designs for a fountain to which they awarded premiums.

Chatham.—It is announced that the first portion of the Dockyard Extension at Chatham will be opened for use on the 17th instant. The public ceremony to mark the event has been abandoned.

TENDERS

For house at Borrowash, Derbyshire, for Mr. H. N. Towle. Mr. John Collyer, architect:—

Curtis (accepted).....22,298 0 0

For pair of villas, Chestnut-grove, Nottingham, for Mr. W. H. Farmer. Mr. John Collyer, architect:—

Bel & Son.....690 10 0
Wool & Slight.....987 0 0
Lynam.....979 0 0
Vickers.....1,010 0 0
Curtis.....945 0 0
Jelley (accepted).....980 0 0

For house, Mapperley-road, Nottingham, for Mr. A. Brownhouse. Mr. John Collyer, architect:—

Curtis.....21,646 0 0
Slip.....1,023 0 0
Shepperson.....1,020 0 0
Vickers.....1,010 0 0
Lynam.....1,006 0 0
Jelley (accepted).....993 0 0

For alterations and additions to Gunpowder House, Manor-road, Bucks, for Mr. Henry Rose. Mr. Arthur Vernon, architect:—

Looseley.....£930 0 0
Corby.....810 0 0
Seaton.....774 0 0
Child.....799 0 0
Reavell.....750 0 0
Mason.....850 0 0
Woodbridge.....649 0 0
Cooper.....628 0 0
Banghurst (accepted).....553 0 0

For two houses and shops in the Fulham-road, for Mr. P. Jackson. Mr. J. T. Pidditch, architect. Quantities supplied by Mr. T. R. Parker:—

P. & T. Bradley.....£3,900 0 0
Potter.....3,760 0 0
Morgan.....3,710 0 0
Laidlaw.....3,835 0 0
Thorn & Co.....3,680 0 0
Thurst & Co.....3,967 0 0
Mills & Son.....3,924 0 0
Higgs.....3,900 0 0
Sprake.....3,855 0 0

For new farmhouse, Tibbs Court, Brenchley, for Mr. Moulton Lambard. Mr. John Jeffkins, architect. Bricks provided:—

Guest.....473 13 0
Grover.....703 18 0
Marsden.....93 18 0
Chantler.....522 0 0
Vinal (accepted).....440 0 0

For the erection of a new house at Neauddreith, near Newtown, Montgomeryshire, for Mr. Edward Elwell. Mr. E. P. Jackson, architect:—

E. & G. Williams.....21,730 0 0
Davies.....1,685 0 0
Birrell.....1,365 0 0
Trow & Sons (late).....1,325 0 0

For villa residence, Brantford-road, for Mr. W. C. Smith. Mr. Alfred C. Bean, architect:—

Wigmore.....21,697 10 0
Gilding.....1,985 0 0
March.....1,450 0 0
Rose (accepted).....1,392 0 0

For rebuilding Nos. 63 and 70, Ludgate-hill, for Mr. Robert Pettit. Mr. J. R. Meakin, architect. Quantities by Mr. Matthews:—

Robertson & Sons.....23,305 0 0
Foster.....3,296 0 0
Dove, Bros.....3,170 0 0
Calle & Sons.....2,876 0 0
Browne & Robinson.....2,976 0 0
Conder.....2,935 0 0
Capps & Hissel.....2,720 0 0
Elkington.....2,669 0 0

For alterations to No. 168, Fleet-street, for Mr. George Kenning. Mr. J. G. Marsh, architect. Quantities supplied:—

Sevell & Son.....2,338 0 0
Yardley.....324 0 0
King & Son (accepted).....298 0 0

Elmston Sewage Works.—We are asked to mention that Mr. Wigmore's tender was not accepted because it was sent in too late.

TO CORRESPONDENTS.

W. P. F. D. J. T. H. G. J. C. W. H. C. E. R. T. G. R. S. E. D. W. C. C. H. E. J. F. W. W. W. T. H. W. J. C. T. B. J. O. C. L. R. C. M. L. Y. N. N. (cancelled), having accepted elsewhere.—H. A. must look back to him or to Mr. A. (not worth) T. B. (not worth).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

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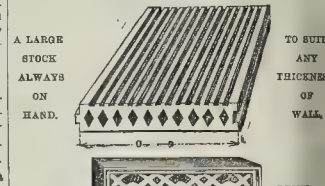
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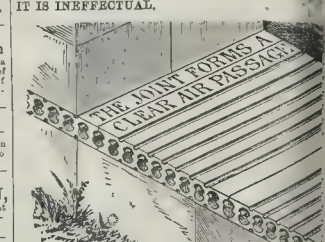
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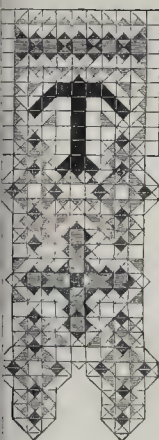


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The Builder.

VOL. XXIX.—No. 1480.



(On the Proposed Works
at Christ Church
Cathedral, Dublin.

THE small number of the larger class of ancient buildings possessed by Ireland renders the restoration of Christ Church Cathedral, Dublin, now about to be undertaken, a work of greater importance than it would be did this building belong to a country rich in ancient and historic buildings, though at the same time the fine proportions and the delicate details of the thirteenth-century portion of this church would, even were it

located in England or France, despite its smallness, entitle it to a high place among the mediæval buildings of these countries.

The funds for effecting this restoration have been given with great (though not in Dublin untampered) liberality by Mr. Roe, a citizen of Dublin, who has selected Mr. Street as the architect to be employed in carrying it out. When so deservedly eminent an architect as Mr. Street writes, "I have entered into the whole question [of the restoration of the cathedral] with a little zeal and enthusiasm, for this church has always had special attractions for me," it is to be expected that the proposals he makes will have great merits. And great merits Mr. Street's proposals for the restoration of the cathedral certainly have; indeed, the more they are examined, the more apparent becomes their very satisfactory nature, and the more clearly is seen the great reason there is for rejoicing that this restoration will take place under Mr. Street's care.

If the works proposed to be carried out at Christ Church related solely to the restoration of the cathedral, our task might be limited to the pleasant one of recommending our readers to procure the interesting and well-illustrated reports,* in which the proposed works are set forth, but this is only a part of what is in contemplation. It is intended to erect at Christ Church Cathedral a building for the use of the representative assembly or General Synod of the Irish Church, and it is on the proposals Mr. Street makes relative to this building that we feel it desirable to remark.

Mr. Roe is supplying the funds for this building, and it is to the not unnatural tendency of the public-spirited generosity he is evincing to save the scheme it is proposed to carry out through it from criticism that we must attribute that appears to have been the unquestioned acceptance of these proposals in quarters in which it was to have been expected that their

nature would have subjected them to discussion. Mr. Street's scheme for the Synod Hall buildings is not one that we can support.

Christ Church Cathedral is near the eastern end of the ridge running parallel to and rising rapidly from the southern bank of the River Liffey. It is about 100 ft. to the north of the summit of this ridge, and the ground on which it stands is some 10 ft. lower than the top of the ridge, which is occupied by Christchurch-place, an important thoroughfare.

We would remark here that we regard this depression of the ground on which the cathedral stands below this street as the great defect of what is notwithstanding a noble site. The ground between the cathedral and Christchurch-place belongs to the cathedral chapter.

The instructions of the Duke of Leinster, which have resulted in Mr. Street's report of this year, requested the reporter to show "how, availing myself of the additional ground thus [by the taking down of the present choir] acquired, I would propose to provide the hall and other rooms required for the accommodation of the representative Synod of the Irish Church." The Duke of Leinster further informed Mr. Street "that it was understood a hall about 100 ft. in length and 40 ft. in breadth would be required, with division lobbies on either side."

Mr. Street has somewhat deviated from these instructions; for he has not availed himself of the ground between the ends of the existing and that of the proposed choir, and his reason for not adhering to them would appear to be that (in his own words) "there is no obtainable view of the choir, save that from the south and south-east, and it would therefore be a great mistake to shut the church out from view at all at this side, which would be the effect of any erection of buildings for the synod on the ground of the chapter at the south-east side of the cathedral." Every one will agree with the conclusion, though most people would, we should imagine, think it "a great mistake to shut the church out from view" on the south, even if the choir were fully visible from other points. If Mr. Street had allowed himself to be led on to what we think (despite certain other arguments of his) the natural conclusion of a portion of his reasoning, he would not have proposed (as he has done) to erect the Synod Hall on the western portion of the ground south of the cathedral, abutting against and at right angles to this building, and to complete the group of buildings for the use of the General Synod by a building abutting against the end of the southern transept and parallel to the Hall, and by another joining these two buildings together at their southern ends, and itself parallel to the axis of the cathedral.

The making of such a proposal by Mr. Street ought not, perhaps, to be a matter of surprise, for it appears in accordance with the views he has always vigorously advocated with a trenchant pen and a powerful pencil, though it must be said of him, that in making it he has shown "the courage of his opinions." But we believe that no other architect of equal eminence would have ventured on proposing the erection of such a group of buildings in the same position. Mr. Street has evidently seen that his proposals would not meet with general acceptance, for he has entered into an anticipatory defence of them, the arguments of which we believe to admit of refutation. We shall not, however, enter into an examination of these arguments, for we believe we can, by a shorter method, establish the objectionable nature of these proposals.

Had the disestablishment of the church taken place, not in Ireland, but in England, and had this event been followed by the constitution of such a representative assembly as the General Synod of the Irish Church, it would probably be necessary to erect a building in London for the

use of this body. Would any one venture to propose that this want should be met by the erection of a hall as long, wider, and nearly as high as the nave of Westminster Abbey, and abutting against, and at right angles to, the northern side of the Abbey, at its western end, and of buildings containing the necessary committee and other rooms, one parallel to this hall, and abutting against the end of the northern transept, and the other parallel to the axis of the Abbey, and joining the northern ends of the hall and of the building parallel to it, these three buildings and the nave of the Abbey enclosing a courtyard? We think no one would make such a proposal, and we are quite sure that, if made, it would be rejected with moral unanimity.* Now, the objections to what Mr. Street proposes to do at Christ Church are, at least, as strong as those against such a proposal relative to Westminster Abbey would be; and we think the proposal to erect the buildings for the General Synod on the site Mr. Street has selected should be abandoned.

We think, too, that, leaving out of question the injury to the cathedral which would result from putting the ground to the south of the cathedral to the use proposed, and regarding the matter solely in reference to the contemplated buildings for the General Synod, this site is not the one on which they ought to be erected, and that its selection has injuriously affected the designs Mr. Street has prepared for them.

The Synod Hall in Mr. Street's design is a somewhat modified reproduction of that of the Central Hall in his design for the Law Courts on the Thames Embankment site, with the walls reduced to about half the height of those in the original design. The chief differences between the (upper) part of the hall of the Law Courts and that for the Synod are the far less ornate character of the windows in the latter and the omission in it of the louvres which break what would otherwise be the monotonous sky-line of the Law Courts' hall, and of the elaborate parapet which surmounts the cornice (in the design) of this building. The omission of these features on a building the height of the roof of which is equal to that of the walls which support it, must have an unfortunate effect on its appearance, for on such a building they are more needed than on one having the height of the Law Courts' central hall. The probable reason for their omission is that the Synod Hall buildings would, when the whole group was looked at from several points of view, appear a more important building than the cathedral; and the architect, knowing this to be the case, abstained from adding anything not absolutely necessary to his designs which would increase this effect, even though they would have the best result on the building which would be his own creation, and the omitted features are of this kind. The objectionable equality between the heights of the walls and the roof of the Synod Hall might be done away with by the adoption of a roof with a less steep pitch than that in Mr. Street's design; but this would have had an injurious effect on the south (a gabled) elevation; and as this is, from the nature of the streets they respectively face, a more important elevation than the western, we think Mr. Street right in using the pitch he has. The one remaining expedient which would render the western elevation of the Synod Hall satis-

* It may, perhaps, be said that it is the way in which such a pile of buildings would interfere with the roadway formed by the Broad Sanctuary which would prevent any one from proposing its erection. We, however, hold that if the position of the Broad Sanctuary was such that the erection of such a pile could take place without interfering with the roadway, the injurious effect it would have on the Abbey would forbid its being thought of. Or we might put the matter thus:—The group of buildings proposed to be erected at Christ Church could, without interference with the Broad Sanctuary, be erected on the ground to the north of Westminster Abbey; and its erection in this position would, because this church is far larger than Christ's Church Cathedral, be much less objectionable than the placing it against the latter building. Is it possible to believe it would be permitted? We are certain it would not.

* Report to the Dean and Chapter of Christ Church Cathedral, Dublin, on the Restoration of the Cathedral Church. By George Edmund Street, A.R.A. Dublin: Hodges, Smith, & Foster, 1868.

Report on the Rebuilding of the Choir of Christ Church Cathedral, Dublin, and on the Erection of a Synod Hall for the Church of Ireland. By George Edmund Street, A.R.A. Dublin: Hodges, Smith, & Foster, 1871.

factory is the placing of the committee and other rooms under it, and thus making the building abutting against the cathedral a two-storied instead of a one-storied building; and this is even less admissible than giving the hall louvres and a parapet would be, and is so for reasons similar to those given against the use of these features.

There are besides other reasons which render the elevation of the Synod Hall on a ground-floor, if erected on this site, open to objection; but these we need not go into. We may say here, however, that we regard the placing of the committee and other rooms in a floor underneath the Synod Hall as a most convenient and desirable arrangement, and consequently that the impossibility of so placing them, if this building were erected on it, would be a strong objection to any site.

The area available in Mr. Street's design for rooms for committees, for writing, and for similar purposes, would appear to be about 1,700 square feet, and any increase of this area by either a lateral or a vertical addition to the buildings he proposes is out of the question. Now, we think the area necessary to supply accommodation of this sort required (put at the lowest possible figure) is some 1,000 square feet greater than this amount. To show the limited accommodation given in Mr. Street's design we shall state the dimensions of the refreshment-room. These are,—length, 18 ft.; breadth, 11 ft. giving 198 square feet as the area of a refreshment-room of a body consisting of 624 members, in a building to be situated too in a neighbourhood without hotels.

We think, then, that not only has the selection of this site had an injurious effect on the designs actually prepared for the Synod Hall, but also that this was inevitable; and that, to enable the architect to produce a design which will be worthy of his deserved eminence, and afford proper accommodation to the General Synod, as well as to save the cathedral from great injury, all idea of erecting the Synod Hall on this site should be given up.

The question now arises to which we may fairly be expected to give an answer,—“What, then, is the proper site for the Synod Hall?”

In an article in our professional contemporary, the *Irish Builder*, of the 1st inst., three positions are pointed to, as affording possible sites for this building. One of these is described in this article thus:—

“The first and best of these sites is that extending from the eastern end of the cathedral (as proposed to be restored) to Fishamble-street. The merits of this site need not be dwelt on at length; but it may be remarked that the erection of the Synod Hall, as designed by Mr. Street, on it, would scarcely, if at all, interfere with the views which will be obtainable of the eastern end of the restored cathedral, whilst the whole mass of the latter building, being opposed to that of the Synod Hall, would dominate it. Neither of these buildings obscuring or hiding the other, the dignity and apparent magnitude of the group they would form would be greater than would result from any other disposition of the Synod Hall, and the latter building would have the great advantage of having a southern aspect to its length.”

Now we will at once admit that we have no fear that the erection on this site of the Synod Hall, as designed by Mr. Street, would result in any injurious effect to the cathedral. We think, too, that were the Synod Hall to be erected on this site, the roof might be one of a less steep pitch than that in Mr. Street's design, and consequently have what would be its southern and most important elevation much improved. And it is possible, too, that if the Synod Hall were erected on this site, its roof might be allowed to receive louvres, and its cornice be surmounted by a parapet. It will thus be seen that we believe this site to be free from the gravest of those objections which make us advocate the abandonment of that Mr. Street has selected; and we think, were there not a better site, that the money which this site would cost would be well spent. But we cannot regard it as the “best” of the sites pointed out, for we believe the second of these to be the one which merits this appellation.

As we have already stated, we think that the Synod Hall should have a ground floor under it. It will not be questioned that every increase of height which a building receives (so long as this is not made disproportionate to its other dimensions) has a favourable effect on its elevation, and it will be allowed to be very desirable that a building such as that which is required for the General Synod should be as imposing as possible, showing superior to the trade buildings in its neighbourhood; and the more its height is made to exceed their height, the more it is likely to do this.

We thus think the principle in accordance

with which the accommodation to be given by such a building as this for the use of the general synod (at least when it is situated in the centre of a city) should be provided, is that of concentration in a horizontal direction and extension in the vertical, considerations of convenience, of course, preventing an undue following of this principle. As the rooms for committee and other purposes would be quite as conveniently situated if placed in a ground-floor under the Synod Hall as in buildings adjacent to it, we would, in accordance with this principle, so place them. The provision of division-lobbies by aisle-like appendages to the Synod Hall must result in making it closely resemble the typical Gothic church, and anything which would reduce this effect would have a desirable result on the appearance of the building. The placing of the Synod Hall on a ground floor would do so to a considerable degree, and it would therefore be specially desirable to so place it if the division-lobbies should be thus provided.

But, we think that, if erected on the site at the eastern end of the cathedral, the Synod Hall could not conveniently have a ground floor under it; but our limits will not permit us to enter on the reasons on which this opinion is based. Thus we regard this site as subject to this most serious drawback.

There is another disadvantage in this site, which it has, too, in common with that Mr. Street has selected, and, indeed, in common with any site the erection on which of the buildings for the General Synod would result in those buildings and the cathedral forming one connected mass of buildings. The building for the General Synod, if placed on such a site, would have to be built of the same stone as the exterior of the cathedral, and a worse material it would be difficult to find, the use of which in the higher class of the intramural architecture of Dublin has been quite given up. But undesirable as is the erection of the Synod Hall buildings in the stone with which Christ Church is faced, the adoption of a superior material would probably be thought out of the question should these buildings be placed in contact with the cathedral.

Must they be so placed? We think not. The action of the General Synod at its recent meeting in settling that Christ Church is to be the cathedral of the diocese of Dublin has prevented the possibility of the existence of what would be the strongest reason for so placing them, that is, the erection of Christ Church into the national cathedral or minster of the Irish Church. There does not appear now any very particular reason why these buildings should be erected so as to form one group with Christ Church Cathedral, and certainly there is none sufficiently strong to counterbalance the objections to adopting this course.

The second of the sites which have been suggested is on the western side of St. Michael's Hill. On this side of this street there is an “insula,” or area completely surrounded by streets, the greater part of which is in the hands of the Church. It has been said that the whole of the part of this area not belonging to the Irish Church would require to be purchased to allow of the erection of the buildings for the General Synod on this site. But the placing of committee and other rooms under the Synod Hall would render it unnecessary to cover the whole of this area with the buildings for the General Synod, and in reality a small addition to the ground owned by the Church would permit of the erection of these buildings on this site.*

The upper portion of this site is at the top of the ridge already alluded to, and the ground falls rapidly to the north (or along St. Michael's Hill). The main entrance to the buildings for the General Synod, erected on this site, would naturally be at the south end; and the elevation of the Synod Hall some 7 ft. above the level of the street (High-street) into which this entrance would open is not liable to objection, as requiring an inconvenient ascent to reach it. If the Synod Hall were built at this level, the floor underneath it would be perfectly well suited for the committee and other rooms required.

A building on this site might be made, too, the occasion of affording Mr. Street an opportunity of giving Dublin a tower of his creation;

* The church accommodation in the neighbourhood of Christ Church is superabundant, so that St. Michael's Church, if removed, would not be missed. The body of this church is modern, but the ancient tower still stands. There are, however, several others as old and of the same general character in Dublin.

and this, we think, is an architectural feature he is specially skilful in designing.

We would suggest, then, that the trustees charged with the restoration of Christ Church Cathedral and the erection of the building for the General Synod should obtain from Mr. Street sketches of designs of the latter building to be erected on the site to the west of St. Michael's Hill. The preparation of such sketches as would enable them to arrive at a proper judgment as to whether for a site free from injurious conditions he could not furnish a design far superior to that he has produced, would not be a great labour to Mr. Street, and considering the importance of the building, we think that the labour, be it great or small, should be undertaken. We are certain that the injurious effect which the erection on the site intended of the buildings for the General Synod would have on the cathedral renders it incumbent on those who have the power to forbid their being so.

We would always prefer to enforce a recommendation by Mr. Street than to oppose it, but a strong sense of duty compels us on the present occasion to take the latter course.

THE STORY OF THE NORTH AMERICAN FISHERIES.*

WITHOUT doubt, and beyond comparison, the fisheries of British North America are the most extensive and the most profitable in the world. The mighty lakes and noble rivers abound with almost every description of fresh-water fish; and in the Gulf of St. Lawrence, those fishes which are of the greatest importance and commercial value to man, literally swarm, not only affording nutritious and wholesome food, but leading to profitable employment. Those fisheries may be presented in the open waters of the Gulf, as within every bay, harbour, creek, cove, and inlet, in connexion with it; whether on the bleak and sterile coast of Labrador, or on the western shores of Newfoundland and Cape Breton, or along the eastern coasts of Nova Scotia and New Brunswick, or within the Bay of Chaleur or around Prince Edward's Island, Anticosti, or the Magdalen Islands, the fisherman may pursue his labours with nearly equal chances of success, and the full prospect of securing an ample reward for his toil. 75,000 men and boys, and 15,000 vessels and boats belonging to the several provinces, are annually employed, and from 10,000,000 to 12,000,000 dollars' worth of fish is taken; yet it is surprising that those fisheries are prosecuted to a greater extent, and with more profit, by the French and Americans, than by the inhabitants of the Dominion and of the colonies to whom they rightfully belong. The French exercise an almost exclusive right of fishing on the western coast of Newfoundland, while 600 to 800 American vessels annually enter the Gulf of St. Lawrence, and scattering over the whole of its wide extent, with little heed of the limits to which they are restricted by treaty, pursue their business and take away full and valuable faves, amounting in the aggregate to 8 or 10 millions of dollars' worth. Merchants from Jersey also prosecute those fisheries with great enterprise and profit, and have established permanent fishing stations in Gaspe, Labrador, Newfoundland, and New Brunswick; but they by no means confine themselves to any particular locality: they employ upwards of 100 vessels almost exclusively in carrying the rich products of the deep to various foreign markets, besides the smaller craft required upon the coast. As a matter of commerce, the inland fisheries are not of so much importance, although about 200,000 dollars' worth of fish is taken in the lakes and rivers of Ontario, which still, as of old, supply the wants of many a white and Indian fisher, and excellent sport for the disciples of Izaak Walton. Heretofore in all those waters there was an abundance of white fish,—bass, trout, pike, perch, and various other kinds; but the navigation of the lakes and the erection of mill-dams and other obstructions on the rivers and streams, together with the adoption of destructive modes of fishing, has very much reduced their numbers: still, stringent fishery laws and fish-breeding establishments on Lake Ontario, it is considered will soon make them plentiful. The most valuable fisheries of the Gulf are those for herring cod, and mackerel. The herring appears about

* The importance of this subject at the present moment will secure attention for the following paper. The information it contains has been collected for us carefully on the spot.

end of April, and the fishing continues until the middle of June, when they retire to deeper water, having deposited their spawn there. Spring herrings are very thin and poor, because they are taken in the very act of spawning in nets, or with large seines, which often require from fifteen to thirty men to manage, who take from 200 to 1,000 barrels at a single haul. When landed, these herrings diminish in size and become insipid; consequently what are required for local consumption are used fresh, and the rest piled to the land as manure, by which the most abundant crops are raised. But another herring appears on the coast about the 20th of August, and remains for a month, which is very fat, excellent for food, and profitable for exportation. The mackerel, which is found in shoals along the whole shores of the Gulf, from the lat of July until the end of September, taken in seines and large drift-nets, that hang in the water at night, when the fish, rushing against them, in the dark, pass their heads and gills through the meshes, and are held there till the nets are drawn up. The mackerel is one of the chief objects of pursuit with American vessels, who fish with a line,—a mode that is called trawling. If no fish is in sight when the vessel reaches some favourite resort, he furls all sail except the mainsail, and brings his craft to the wind, when, to attract the fish, he throws it overboard,—usually small mackerel, or salt herring, cut up very small with a machine. If he succeeds in attracting them to the surface of the water, they are easily caught in large quantities, when they are dressed and thrown into kegs of water to rid them of the blood, after which they are salted, and put into barrels. All over the Gulf of St. Lawrence the cod-fishing commences about the beginning of June, and continues until the end of November, and is chiefly prosecuted in boats built by the fishermen, with fore and aft sails and a jib. They are furnished with a small oven for cooking, a compass, oars, anchors, and hook-lines, from 30 to 40 fathoms long, which are baited with caplin, herring, or mackerel. The crew are usually two men and a boy, who go from 1 mile to 15 miles in the morning; and when far out, they seldom return until the next evening, and then run alongside a jetty, upon which the fish are thrown. The heads are then cut off, and the entrails taken out, the liver only being preserved to make oil. They are then split, and the backbone taken out, when the fish is washed and rubbed with salt, in which they remain for six or eight days, when they are again washed, and put to dry upon the beach for about three weeks, being frequently turned, to prevent them from being burnt. When properly cured, they are built to small cones, about 3 ft. high, with the tail upwards, and covered with birch-bark, where they are left to season, before being packed for exportation. For the deep-sea fisheries large schooners, of from 70 to 83 tons, are employed, which generally carry six or eight sails, and a crew of fifteen to twenty-five men. When the vessel anchors in some snug harbour, the men put out in each boat to fish, and if the day is good they bring two boat-loads a day, which are carried ashore and cured for market. At the crews of the United States vessels often take the fish on board, and dry them when they go home, and by that means make two or three trips during the season. A quintal,—112 lb. of dried fish or 252 lb. of green fish,—washed and salted, is considered a good day's fishing, and a schooner's cargo will average from 450 to 600 quintals. The French vessels on the coast of Newfoundland, which are from 150 to 300 tons burden, fish with long sea-lines, to which short lines, with hooks and baits, are attached; they are left down all night, and when taken in the morning will often contain 400 or 500 large fish. Haddock, hake, and turbot are also taken and cured in the same manner, but being of inferior quality they only sell at half the price of cod. The salmon of the Gulf, which are noted for their fine flavour, are caught in large stake-nets, staked at the mouths of rivers which enter into the bays and harbours. They are split and dried in large tubs, and afterwards packed in crates of 200 lb. each. A good deal is put up in tins, and many fish are dried and smoked, but where carriage is convenient a great deal is packed in snow or ice, and sent to the Canadian or the United States markets. Years ago this fine fish was very abundant in all the rivers leading into the gulf, but modes of fishing have destroyed the young while taking the old fish, and the obstructions of weirs and mill-dams without any provisions for the fish to pass up

them to their spawning-grounds, have diminished their numbers, and to such an extent that only for the protection lately given to them by the Government those fisheries would be completely destroyed. Various other kinds of fish besides those enumerated are also taken in the Gulf, and shell-fish, such as oysters, crabs, and lobsters, are to be found in unlimited quantities. The latter are found everywhere upon the coast, and are largely used to manure the land about the Bay of Chaleur. Carts are driven down to the beach at low-water, and are readily filled with lobsters left in the pools by the recession of the tide. Large quantities are put up in tins at several places, which need only be restricted by the demand. The people of the fishing villages take them with small hoop-nets, and sell them for about 50 cents per hundred, and at that price a fisherman can earn 11. in the twenty-four hours. Those mighty animals of the deep, which are only caught for the value of their skins and the oil extracted from their bodies, are also abundant in those British North American waters. The seals, which go on to the ice to bring forth their young, are floated down to the Gulf when it breaks up; then large herds are found together on the floating ice, which are called seal-meadows. The hunters often surprise them while sleeping, and then despatch the young with bludgeons; but the old ones, which frequently turn and make resistance, they are obliged to shoot. At Labrador they are caught with strong nets across such channels as they are in the habit of passing; but at Newfoundland, Anticosti, the Magdalen Islands, and other parts of the Gulf, large schooners, of about 80 tons, manned by about thirty men, are employed to hunt for them, which, notwithstanding its dangerous nature, the pursuit is eagerly entered into by the hardy hunters. Large quantities of oil are made from the flesh of these animals, and the skins are sold, the smaller ones for 50 cents each, and the larger ones for 80 cents. Porpoises are not so plentiful now in the St. Lawrence as they have been; still, many are caught in fisheries set for the purpose, into which they run while in pursuit of the smaller fish in-shore. Oil is extracted from the flesh, and a very useful leather is made from the skin. The hump-backed whale is also captured in the Gulf by the fishermen of Gaspe and Newfoundland, where large schooners are fitted up for whaling, the oil, bones, &c., of which constitute an important branch of commerce. Thus in every part of these British North American waters there are mines of wealth, more prolific and more valuable than in all the gold-fields of Australia and California, and resources of food that are well-nigh inexhaustible, which, if developed with enterprise and energy, will be fully equal to the wants of any population this dominion can maintain upon its surface. No doubt much of the coast is rough, uninviting, and very unfit for agriculture, more especially on the Northern Shore from the Saguenay to the Straits of Belle Isle, along the coast of French descent, very thinly scattered upon it, never attempt to till the land, but live upon the products of the fisheries, which some years bring them full and plenty that they exchange at the fishing-stations, or with schooners calling for necessary articles of food and clothing; but during seasons when the fish, for some cause or other, fail to visit that part of the coast, they are often in great distress and dependent on the Government bounty. Along the south shore of the St. Lawrence from Point Lewis, opposite to Quebec, to Gaspe, the Land's End, and around the Bay of Chaleur, the inhabitants are chiefly French; but as the land is good in many places, they combine fishing with farming, which enables many to live in comfort. From the Bay of Chaleur to Miramichi, around Prince Edward's Island, Nova Scotia, and to Halifax and St. John's, the people descended from English, Scotch, and Irish, make a good living by building ships, catching fish, and cultivating the lands of New Brunswick and Prince Edward's Island, which in some parts are fertile, and by digging coal and iron in Nova Scotia, where these are to be found in great abundance. The inhabitants of the Magdalen Islands and of Anticosti are Acadian French; but the hardy Newfoundlanders, tall and active, are mainly of Western Irish origin. Like all the fishermen of the world, except the Yankees, who make shoes and locomotives as well as catch fish, those British North Americans, although brave and adventurous, are simple-minded, and easily imposed upon by the traders on the coast. Many

families who can equip and man a schooner, or those who work on shares, reap a good reward for their labour; but the bulk of fishermen, who only own or hire a little boat and sell their catch to the schooners, or at the fishing-stations, where an infamous truck system prevails, which scarcely allows them to live, fare but badly. For a quintal of cod (300 lb.), fresh from the knife, the fishermen are allowed 10s., and for ling and haddock, 5s., the amount to be taken out in goods upon which is charged cent. per cent. profit, and if their necessities oblige them to take any goods in advance, 15 per cent. is added. But, as there are exceptions to every rule, an Irishman named Retery, who some time since opened a herring-curing establishment in the village of Carleton, County Bonaventure, pays money down for all that he requires, while at the same time, as he justly deserves, he is growing rich on the profit. Salmon is purchased for 5 cents to 7 cents a pound, and during the spring, fresh herrings, 50 cents a barrel; and salted, 1 dollar 40 cents; fall herrings, fresh, at 60 cents a barrel; and salted at 2 dollars 80 cents. A large number of the natives are employed at fair wages to assist the men who have brought home in curing those herrings, a business they appear to understand well, as what they cure will keep for years their taste and colour, and will sell in Ireland at from 6 dollars to 10 dollars per barrel. It is to be hoped that the good example set by this worthy son of the emerald isle will be widely followed, for not until money payment becomes general and the truck system is made illegal, as it is in England, can the poor fisherman expect to reap the just reward of his perilous labours.*

THOMAS CONNOLLY.

THE ASPHALTE PAVEMENTS OF THE CITY.

We have lately examined the roadways in Cheapside and Broad-street, both of which have been laid with the Val de Travers asphalt. The examination was simply an experiment with a view of testing what abrasion or "wear and tear" was taking place. A line was stretched across the roadway at several points along their entire length, keeping the ends of the line close at either side of the street to the surface, and then marking, when the line was stretched in tension, the different points of abrasion and sinkage that presented themselves. This having been done, a wet day was awaited. The object of selecting a rainy day was to prove the lodgment of the water in those places indicated by the strained line and "straight-edge."

The proof was conclusive as to the irregular surface of the asphalt in numerous places. It is not intended to be argued that the abrasion or "wear and tear" at present is of a very serious description, yet it is sufficient to create a prospective interest in corporate and City circles on the money question,—as to cost and durability.

Commencing at the Peel statue, and proceeding onwards towards the Mansion House, the result of this experiment may be set down as follows:—Opposite Old Change, some slight punctures and ruts, where a lodgment of water takes place in wet weather. This unevenness of surface may also be observed in fine weather: the term undulation may more properly express it. Opposite Foster-lane, the same; opposite Gutter-lane, more sinkage, surface uneven, pools of water when it rains; opposite Friday-street, not so remarkable as the preceding; opposite Wood-street, Milk-street, Bread-street, and at places between where they intersect Cheapside, much undulation in the roadway, and at the angles of these streets the rain settles, and remains in pools until dried up by the weather, or becomes otherwise removed. Roadway pretty even between Bread-street and Bow Church. Hence to where King and Queen Streets intersect, there are much undulation and evidence of sinkage of the upper crust to be observed, and several hollows, where the water lies when it rains. Some ugly punctures or indentations in the body of the asphalt are to be seen from the latter-named streets, onward to the corner of the Old Jewry, and lodgments of water take place in a few places between Queen-street and the angle of Bucklersbury. Between here and the Mansion House the undulatory character of the roadway can be plainly observed by the experienced eye, and a sinkage in several spots is discernible. From the glassy-like appearance

* Conclusion in our next.

of the asphalt surface, particularly when the sun is reflected on it, the ordinary observer's eye will not detect at once the up-and-down character of the roadway as it actually exists. If a line or sharp edge of timber be applied, the fact, crossways or lengthways, will be at once indisputable; or a ten minutes' rain-pour will set the matter, as to the existence of hollows on the surface, at rest. Examinations in Broad-street produced similar results along the entire length of the street, from Threadneedle-street to the Broad-street Station.

On a rainy day here the small pools of water are many, and the sinkages in the surface are shallow; but the laying of this street with asphalt is quite recent. No damaging conclusions are attempted to be drawn from this statement. The facts are clear, however, that the immense vehicular traffic on these thoroughfares is subjecting the new pavement to a most crushing and crucial test. Where no distinction can be made in London between the lightest "fly" or hansom and the heaviest locomotive, transporting "lurry" or wagon of several tons, it must be seen at once what a terrible ordeal and test asphalt, 2 in. thick, is subjected. A future examination or experiment may prove that a disintegration of the concrete basis or body below the surface is taking place by degrees, and hence this undulation, abrasion, and sinkage; for, in thoroughfares like Cheapside there must exist a continuous vibratory motion, the result of the great and rapid traffic ever going on.

A short length of roadway, which was laid by the Limmer Asphalt Company last autumn, opposite Bermondsey Church, has worn tolerably well. The appearance of "wear and tear" here is shown by a series of longitudinal ridges, quite observable. A break-up of surface has also taken place lately in one or two spots, which have been repaired. This piece of pavement has a good fall from the middle, and the water is carried into the side channels. It is very slippery in moist weather, and requires to be kept clean. Of Lombard-street pavement it is too soon to speak, as it was only laid a few days ago by the Limmer Company. The material and process of laying of the latter company is different from those of the Val de Travers. The Limmer material is laid in a melted state, one layer or coating transverse the other. The Val de Travers is laid down on its concrete bed in a powdered state, the application of hot iron being afterwards applied to fuse the material into an even surface. The foundation for each pavement is prepared much in the same manner. It is to be observed, when a break-up or hole occurs in either of the two pavements, it widens fast, and requires immediate attention.

The experimental pieces of asphalt pavement that were first laid by both companies has worn better, to all appearance, than any subsequently laid, probably because more care was bestowed in the preparation and workmanship.

Viewing asphalt pavement *per se*, and apart from all interested considerations, it possesses many and great advantages for a City thoroughfare,—as absence of noise, a saving in scavenging, and a saving in flesh and iron; or, in other words, it tends to a prolongation of animal life, harness, and mechanical plant. The disadvantages are its cost at present, and the possibility that its durability will not be commensurate with the expense and the obstruction entailed in laying it down; and this may still be found necessary in restoring it and keeping it intact and whole. All we ask for is caution.

STONE WORKING BY MACHINERY.

We mentioned some time ago the stone-working machines which have been elaborated by Sir Wm. Fothergill Cooke and Mr. George Hunter, and are to be seen in operation at Battersea. We have since had another opportunity to examine into the work done by them.

The general public are much more familiar with wood-working machinery than they are with mechanical appliances for dividing, shaping, or dressing blocks of stone. At the shows of the Royal Agricultural Society, one year after another, a number of eminent wood-working machine-makers, now in business, publicly exhibit their wonderful adaptations of mechanical power as applied to the shaping, dressing, and joining of timber; but the workers of stone by machinery, comparatively few in number, do not present themselves at such exhibitions, always excepting the constructors of the terrible engines that crush and shatter

masses of rock into little shapeless pieces. Notwithstanding the promiscuity of the class of inventors, as compared with the other, it may be doubted whether the one art, stone-working by machinery, is not older than the other, even although the material operated upon is much less hopeful, inviting, and tractable than the other. If we mistake not, the germ of the machines in operation at Battersea may be traced back through half a century, to some of the fine pavement quarries of Forfarshire, the "Arbroath pavement" of which has been in high repute on both sides of the Tweed, and in regions much more remote, for a great deal more than fifty years.

We have mentioned wood-working machinery, and revert to it here to say, that the two kinds of machines are, in various respects, not to be compared, but are in contrast. The one set of cutters makes its 7,000 revolutions per minute; the stone saw takes its work so leisurely that one has no difficulty, and runs no risk, in feeling the teeth one after another with the finger for the entire round, to try whether they are hot: it is always found, it may be added, that they are quite cool. The cutters in the one case, wood-working, are the same as the ultimate form or contour of the work to be produced, and embrace the whole surface of the piece operated upon. In the Cooke-Hunter stone-working machinery the uniform simple principle is adopted of moulding, ripping, and slabbing by steel cutters of about $\frac{1}{2}$ in. diameter. Mouldings and flat surfaces are finished by a cutting or scraping with a tool shaped exactly to the work, and ground and pitched in the machine according to the nature of the material operated upon. It is not pretended, we believe, that the machinery is equal to "tackling" granite, but we had ocular demonstration that it makes excellent work of Portland stone, both new and old.

The premises contain at present six machines, all of which we saw in operation at their ordinary work. The slabbing machine consists of two discs, of $\frac{1}{2}$ in. steel plate, 5 ft. 4 in. diameter, which work horizontally, and out to, and meet, within about an inch of each other. The teeth of the saws, so to speak, are of cast steel of about $\frac{1}{2}$ in. diameter on the face, and taper down to a stalk of about $\frac{1}{4}$ in. in diameter, which passes through the outer end of the cutter-holders, that are wedged to the discs between projecting pieces left for the purpose, V-edges keeping them in their place. The cut, about $\frac{1}{2}$ in., seems rather wide, but the saw-plates require considerable strength, and the intrinsic value of the stone displaced is not sufficient to tempt the risking of injury to the machinery. The "sawdust" is, besides, worth 6s. a load to cement-makers. We hear that a readjustment of this machine is to be made, by which the cut will be reduced to $\frac{1}{4}$ in. The slabber, when we saw it at work, was cutting "landers," $2\frac{1}{2}$ in. thick, from a block of Portland stone, 5 ft. 9 in. by 4 ft. on the face. It took off one slab in our presence in less than twenty-five minutes, or at the rate of about 1 ft. super. per minute, earning, at 31. per foot, 5s. 3d. in that time, or about 51. 15s. for the day of ten hours. The slabs are easily separated, the cleavage, from the round form of the cutters, being uniformly at the middle of the uncut portion. An eighth of an inch is left for planing, and is always found amply sufficient.

With the exception of the machine just referred to, and another that does duty as a turning-lathe as well as a moulding-machine, the cutters in the other machines act vertically. They are simply discs of cast steel, $\frac{1}{2}$ in. diameter, and about $\frac{1}{2}$ in. thick, bevelled to the back, to give a cutting edge. They are firmly held in their places by a piece of iron bolted to the bottom of a sloping recess, the ends of the bolted piece being parallel with the sides of the recess; they are thus fastened in pairs, with half of the little discs, or about $\frac{1}{4}$ in., projecting, to give the cuts. These cutters, punched out of softened steel plates, afterwards tempered, are inexpensive in production and very durable. They are capable of giving a fresh cutting edge two or three times. The planing and moulding machines are adapted to the dressing of plane surfaces and mouldings up to very large dimensions, and bases for columns, balustrades, with other circular work, are turned off with great accuracy and rapidly by the machine with the horizontal cutters. In such work there is a double rotary motion,—of the stone acted upon, and of the cutter-shaft. The chief work in hand at the time of the visit was planing the broad landers that were being taken off by the slabbing

machine, and dressing the breasts of steps for hanging stairs, including the return of the bottle moulding on the ends, in which, we noticed that the machine produces a perfect mitre. The ripping-machine, which is equal to three or four cuts of about 8 in. deep, has cutters of the same form as the slabbing-machine; that is, V-shaped steel bolts, the heads of which do the cutting.

From the spiral appearance presented by the cutters, as bolted to the collars which revolve with them, it might be expected that the result of their action would be the production of a shapeless mass, and those unacquainted with their work can only be undeceived in this by seeing the truly hewn moulding emerge from the machine, and see it finished by being passed two or three times under the final cutter, which leaves the mouldings much more true, and as clean as work polished by hand with sand and water in the ordinary manner.

There is great ingenuity displayed in the mode of arranging the cutters, and still more in the mechanical adjustments by which they are raised and depressed, and the speed regulated at pleasure, and by which the travelling tables that the blocks are fastened upon are led up to the feed, stopped, and returned for another cut. It might have been supposed that a pair of saws 5 ft. in diameter, with forty-four teeth in each, a ripping-machine, with three saws 2 ft. 6 in. in diameter, and each with eighteen teeth, with four other machines, all engaged upon heavy work simultaneously, would require a large amount of steam power. The whole of the machinery is driven by a portable engine of 8-horse power, working with 25 lb. pressure; it is driven from a 30-in. drum, making eighty revolutions in the minute.

A new machine is about to be added to the others, from which good results are expected. It will cut a block of, say 3 ft. long by 3 ft. wide and 18 in. thick, into from five to six pieces of ashlar, by one operation, in a quarter of an hour, while the same operation by hand-saws would take above half a day to perform.

POSITIVE FARMING.

We have received a copy of a paper read, and discussed with much interest, at a recent meeting of the Social Science Association, on a subject that we can hardly pass in silence, so much have we made it our own,—our own, that is to say, in the sense of earnest and honest advocacy. If it be true, as we hold it to be, that the hope of the future depends on the wise application of the true method of positive investigation to the problems of human life, there is nothing in which a more immediate return can be expected than in the case of scientific practical agriculture. What is best to do for any given agricultural locality is known, or, at least, can be definitely ascertained. How that treatment pays, is no matter of doubt to those who will take the pains to investigate. How is it, then, that year after year "positive farming" makes such halting progress?

There are two distinct subjects involved in the paper to which we refer, which is from the pen of Mr. Francis Fuller. One is the fact that the agricultural produce of the United Kingdom is very far below that which might be certainly and remuneratively obtained. The other is, that the vast amount of pauper idleness might be converted into remunerative labour by application to our untilled lands. The argument, in either case, is not that of a theorist, but of a practical farmer.

The entire area of the United Kingdom is 77,513,585 acres. Of this, in the year 1868, 45,652,545 were cultivated. Thus 31,861,040, or say in round numbers, 32,000 acres, were uncultivated three years ago. Chinese industry, or Italian industry, would rear a crop of some remunerative description from every acre of this present waste. Making every allowance for mountainous districts, for the unfavourable climate of parts of Scotland and Ireland, and for the distances of the Highland ranges of country from the centres of population and consumption, we cannot escape from the fact, that in England alone there are upwards of 10,000,000 acres uncultivated, and more than 11,000,000 of acres, or about 50 per cent. of the entire area, under grasses or permanent pasture; only 33 per cent. of the acreage of England was under corn crops in 1863, and 760,000 acres were left under bare fallow. It thus results that while nearly one-third of England is unculti-

ed, the cultivated two-thirds bring in a return of something less than 4l. an acre, or the und sum of 170,000,000l. sterling.

The average amount of annual labour expended on this cultivated area is estimated at low rate of 15s. per acre. Rent, seed, and manure living and profits, make up the balance. twenty-five years' purchase the value of the soil of the country can thus only be taken 100l. per acre. But what is the result of application to even the poorest of this land such directed labour? The cost of deep drainage, the first requisite for the cleansing of it, and for the production of luxuriant crops, from 4l. to 6l. per acre. This sum may be added as an amount added to the cost or purchase value of the land in the first instance. The cost of irrigation, over the large area to which it is applicable, may be taken as less than that of drainage. These two outlays are made for all. In annual culture, Mr. Mechi, one of our best practical authorities, expends some 3s. per acre, or rather more than three times the average. The interest on his outlay in drainage may be taken at 6s. per acre; so, on poor land, this scientific farmer exceeds 2l. 1s. an acre more than the ordinary cultivator. What is the result? The yield is less. Instead of an outlay, exclusive of rent, 5s., and a return of 4l. from ordinary land (much less from poor soil), we have an outlay of 6s., and a return of 12l. Is it not woful that, instead of anxiety to avail ourselves of this lucrative secret, we are content to endeavour to explain away a success which is based the simple law of the productiveness of industry?

An instance of the result of two years' cultivation of drained and undrained clay, deserves notice. In the first case, the first year was followed by no return. The second year gave a return of 10s. five quarters at 26s., or 6l. 10s. per acre. Mean annual return, 3l. 5s. per acre. On same soil, after drainage, the first year produced 10s. four quarters at 26s., or 6l. 10s. per acre. Mean annual return, 9l. 9s. 2d. Repeating, in two years, on the outlay of 6l. per acre, 8s. 4d. And we call ourselves a practical farmer. We are not in possession of returns of the kind now properly drained in the country. The irrigation, the ordinary plan is so wasteful and extravagant, except in cases of natural action, as by the overflow of the Severn, the Trent, and other rivers, that scientific irrigation can be said to be as yet almost unattempted. It shall therefore be under the mark in estimating that labour to the amount of 150,000,000l. could now be profitably, most profitably, applied to the soil of England alone. If we allow years for the expenditure of that sum (which would be replaced, with cent. per cent. interest, in meantime), there will remain room for the yearly annual expenditure of fifty-six millions of labour in the drained and irrigated soil, an outlay that will bring in a return of at least 10 per cent., or add 178,000,000l. to the annual base of our fields.

million sterling per week expended in labour. It is what the soil of this country requires for its utilisation. Three millions per week will do the result! That is what we are steadily doing. A regular employment for our labourers, more active than that caused by the most busy season of the period of our railway construction, within our reach. The return for this employment would be far greater than the most profuse estimates of the engineers of the time of Lord Stephenson; and while land is thus being put to hands, how many hands are idle? What of work? Let the returns of the Poor Law Board be appealed to for a reply. There were 988,257 paupers on the 1st of July, 1870; while a million of the population were thus employed in a land where there is room for the employment of at least an equal number, not of souls, but of industrious workmen, 79 emigrants left our shores in the same time. Upwards of thirteen millions and a half pounds worth of that costly product—manure—has been exported to enrich the United States, the North American, and our Australian colonies. For when we send out emigrants it is not to be borne in mind that they are, to a great extent, the pick of the working classes. The helpless, and the infirm are left to swell the great army of paupers. It is instructive also to remark that we imported farming produce, such as the cereals, in the same year, to the value of more than fourteen millions and a half million.

We paid, it may be said, in that commodity which it takes the longest time and the greatest cost to produce,—the value of that butter, and cheese, and eggs, bacon, pork, salt beef, potatoes, and clover seed, that we omitted to produce at home, because we chose to leave a third of our soil uncultivated and a million of our population unemployed!

If these things were told us of some distant Abyssinian or Australian people, how we should speak of the folly of the poor savages, and the want of the light of a sound political economy to guide their actions! We should, no doubt, send missionaries among them. We should get up an interest in their behalf. But as it is only at home,—as it is only a case which we can touch with our own hand, see with our own eyes, and amend with our own industry,—we are content with letting things take their course, with observing that it is contrary to sound economical views to attempt to interfere with the employment of capital, and with stigmatising as dreamers or enthusiasts those who are always boring us with their inconvenient sums in agricultural arithmetic! What will be the opinion of our grandchildren of the positive farming of the year 1871?

THE EDUCATION OF THE BLIND.

AMONG the many forms of suffering which in this philanthropic age are sought to be alleviated, none address themselves more strongly to our sympathies than those caused by blindness. The sufferers are very numerous, about 1 in 1,000 giving a blind population in the United Kingdom of over 30,000. The great majority of these belong to the poorer classes, to whom life is a hard struggle under any circumstances, but when over-weighted in the race by the loss of so important a sense as that of sight, they must fall unless some special provision be made to facilitate their acquisition of knowledge, and to diminish, as far as possible, the difficulties under which they labour in their attempts at self-maintenance. The true solution of the question, "How can we best assist the blind?" lies in the direction indicated; and, put into the fewest words possible, the answer is, "By placing them under the most favourable conditions to assist themselves."

The spirit of the times is entirely opposed to the idea of constantly increasing the size of blind asylums, and making larger and larger demands on the public for the means of keeping our blind in idleness; and not only is the folly of such a course now well understood by the public, but it is equally opposed to the wishes of the great majority of the blind themselves, who want education and employment, and not alms. It is, however, quite certain that very few who have become blind in adult life can ever maintain themselves fully, and many can do scarcely anything in this direction: for these there will always be ample scope for charity; but most of the young ought to receive such an education as will fit them to become useful working members of society; and as this result has not yet been obtained in England, we may reasonably suspect that there is something wrong in our way of educating and employing the blind.

The first thing that strikes an inquirer is the want of agreement in the first essential of education, namely, the form of letter best suited for the purpose of reading by touch. All blind people read by embossed characters, but these differ so entirely in their shape that books printed in one character cannot be read by those who have been educated to use another; and as each form of embossed character has its own uncompromising advocates, the same books are printed in several systems, thereby increasing the cost and diminishing the number of books legible by the blind. It is to be hoped that a check has at length been placed on this wasteful expenditure and ruinous competition. About three years ago a few blind gentlemen, practically well acquainted with the subject, agreed to work together, and the British and Foreign Blind Association, under the patronage of Her Majesty, was formed by them. This Association has just published its first report, in which the following passage occurs:—

"The members of the executive council are either totally blind or so nearly so as to make it necessary for them to use the finger, and not the eye, for the purpose of reading. Each member must be able to read at least three systems by touch, and must be unpledged to any."

They have now been at work in concert for nearly three years, constantly perfecting themselves in and practicing

every system which either has obtained wide currency or appeared to possess special merit. They have personally interrogated the more intelligent of the blind within their reach, and through their corresponding members have acquired a knowledge of the wants and wishes of the blind of other countries. The results are partly of a positive—partly of a negative character; but some of the questions that have been long under discussion may now be considered as finally settled, and to these the Council desire to draw attention.

The Roman letter in all its forms is condemned by the almost unanimous consent of the educated blind of the civilised world; but though unsuited to the every-day wants of any class of the blind, it may still with advantage continue to hold a subordinate place in their education."

The three existing line systems of Lucas, Frere, and Moon are useful, but imperfect. They have all done and are doing good service in the education of the blind, and their employment may be continued until they have been replaced by a better and more carefully-considered line system.

The only system which, in the opinion of the council, meets the requirements of those who are to use it, as perfectly as their case admits of, is the dotted system of Mr. Braille. Introduced into the Paris School in 1834, it has been steadily and surely growing in favour, till there is now probably scarcely a country in the civilised world in which it is not widely known and used; and it has attained this position in the esteem of the blind, in spite of the ignorant, though well-meant, opposition raised to its introduction in almost every institution in which it has lately been adopted. England has been almost the last country to recognise its value. Here and there a blind person has by accident learned it; but previously to the labours of the Association there was not a single institution in the United Kingdom in which it was taught, and in most it had never even been heard of. Such a statement may appear incredible, but it is nevertheless strictly true. This dotted system is far superior to any other for the purposes of writing and musical notation, and it possesses the great merit that the written is identical with the printed character, and can be read by the blind with the greatest ease. It is therefore invaluable for writing from dictation, exercises, &c. The council recommend it as the educational system for all blind children, and for the every-day wants of all well-educated blind persons whose touch has not been seriously impaired by manual labour. For the old and the dull of brain and touch, they recommend a simple line system, approaching as near to the Roman as is compatible with perfect legibility. Moon's, though not nearly all that could be desired, answers the purpose tolerably well; but in this transitional period it is not advisable to spend money in setting up any fresh books, except in the Braille type, which is the only one that possesses the qualities likely to insure permanence and universality.

The council are desirous of effecting as much immediate good as possible; hence, though they are tolerably well agreed as to the changes that ought to be made in the line character, they are devoting most attention to the education of the young, leaving the adult blind for the present to be provided for by other agencies. One main difficulty in the way of educating the young blind is the great cost of most of the appliances: this the council have endeavoured to meet by the manufacture of cheaper and more apparatus than any hitherto in use. No one who has not made the attempt can have any idea of the extreme difficulty of combining great accuracy and durability with cheapness. This has been in a great measure accomplished as regards the Braille writing-frames, which are now within the reach of every blind person who wishes to avail himself of the advantages of writing. The fact that the first gross of these frames has been already sold speaks for itself; and, as the great majority of the purchasers are poor, this quick sale is evidence not only of the cheapness of the frames but also of the wide-spread desire for self-education existing among the blind. The pocket writing-frame, with pocket alphabet and style, can now be obtained for a shilling, and this price covers the cost of manufacture.

Another obstacle to the diffusion of the knowledge of the Braille system has been the absence of printed books in English. With the view of meeting this want one of the council has perfected the process of stereotyping used in France, by which the cost of production of stereotype plates is greatly reduced; and as the blind can themselves produce these plates, a new and remunerative means of employment has been discovered. Some school-books have already been issued by the Association, and will shortly be followed by others. The work on the 'Education and Employment of the Blind,' by Dr. Armitage, has been published, under the sanction and at the expense of the Association, and will assist in the dissemination of much useful information. The closer union of the blind of different countries cannot fail to be productive of the happiest results, as the knowledge of every invention useful to the blind will now be rapidly spread throughout the world. The council consider that they have only commenced their labours. There is the same want of agreement and knowledge with regard to the appliances for teaching arithmetic and geography, as for the purposes of reading and writing. The best method of teaching must be worked out, and the best and cheapest method of manufacture has to be discovered. Many works have to be printed; elementary and other books on music must be published, and the whole plan of the musical education of the blind must be changed, so that something may be accomplished by blind musicians in England comparable to the happy results achieved in other countries."

An allusion is here made to the very important subject of music as a remunerative employment for the blind. For a full account of what has been done in this respect in France and America, the reader is referred to Dr. Armitage's recently-published work.* M. Gaudet, head of the educational department of the Paris school, says with regard to piano-tuning:—

"Whenever an art or trade is of such a nature that the blind can follow on equal terms with the seeing, or, in other words, that there is a peculiarity in it which causes a disappearance of the inequality generally existing between them, this art or trade is especially well suited to the blind."

* 'The Education and Employment of the Blind; what it has been, and ought to be.' By T. B. Armitage, M.D. Hardwicke: P. Read. The author of this interesting and ably written little volume is Hon. Sec. to the British and Foreign Blind Association.

blind, and it is our duty to teach it with as little delay as possible. Now, in pianoforte tuning, the blind are not inferior to the seeing, but, on the contrary, possess certain advantages over them; we must therefore train tuners. There is no fear of the demand ceasing; therefore we must train as many tuners as circumstances will permit."

The following occurs in the report of the Perkins Institution for the Blind, Boston, U.S.:-

"The teaching of music and playing is now the largest single field open to the blind as a means of support, and it seems to be growing larger. People are becoming more disposed to employ them, and as they go forth from the school they have more and more ground of hope that they will find opportunities to earn their living in this way."

It is found from the experience of these two institutions that, with proper education, 30 or 40 per cent. of the young blind can learn to maintain themselves fully by music. In the United Kingdom there are probably not two per cent. who accomplish this; the difference in the results being ascribable entirely to the difference in their education.

It has been proposed to establish a new institution in London where the young blind who have musical ability can receive such training as will fit them to maintain themselves by teaching, tuning, and as organists. This last branch of the musical profession does not pay nearly so well as the two others, but is worth cultivating as an auxiliary means of income. If such an institution is to be successful, the teaching must be of the highest order, and it must be conducted by men who have experience, knowledge, and faith. The cost of this kind of education will necessarily be considerable; but, with well-selected pupils, it will not be too much to expect a success of about 80 per cent. All the pupils should be paid for either by the institution sending them or by individuals. This plan avoids the very objectionable system of selection; and as the protector of each pupil will take care to see that the education given is worth the sum paid, continued efficiency must be kept up, or the number of pupils will at once fall off.

The result of the commendatory endeavour to establish a new school must be decided before next month. More than a third of the means (some 3,000*l.*, in money and fees), requisite to found and carry it on for at least a couple of years, has already been promised; and by the end of that time, it is conceived, if it can be established in the meantime, its value will have been clearly proved.

For primary education the ordinary schools for the seeing may be much more used than at present, as soon as the blind children have been taught to make use of the appliances best suited to them for reading, writing, and ciphering, and when good embossed maps are procurable at a moderate cost.

There are day-schools for the blind in London in connexion with the Indigent Blind Visiting Society, where about 200 blind of all ages are being taught to read and write. The classes are held at 5, Red Lion-square; at the Home for the Blind, Whitechapel; also at Stepney and Clerkenwell. (The times of meeting may be obtained at the office of the Society, 27, Red Lion-square.) Half an hour's visit to any of these classes will convince any one that in the Braille system of notation we have a most important means of educating the young blind; and what has been done at scarcely any cost in these classes may be taken as an example of what may be done in all departments of blind education by always adopting the methods and appliances which most exactly meet the wants of the pupils.

CHURCH OF ST. MARY-LE-STRAND.

This church, which has been closed for some time, is now again open for divine service, and is all the better for the works done during the recess. Our country readers will only need to be reminded that it was built from the designs of James Gibbs, from 1714 to 1717, to know its style and character. The south flank of the church, facing the Strand, with its range of pediments and columns on a lofty stylobate, is particularly handsome; seen by moonlight, for example, it presents a picture which would be more often admired if it were in another country. Visitors, by the way, who have not seen London moon-lit do not know it: Trafalgar-square, the clock-tower seen from Westminster Bridge, the Duke of York's Column from the Park, and a dozen other spots viewed by "the pale moon-light," pay for a journey. But this is not the subject just now. We simply wish to say that the interior of St. Mary's-in-the-Strand has been decorated and improved under the direction of Mr. R. J. Wither, at the cost of

some 1,200*l.*; Messrs. Dove have executed the general works, Mr. Pulling did the decorations, and Messrs. Hart & Co. the gas-fittings.

The ceiling of the nave, which is mightily elaborate, has been coloured in neutral tints picked out with gold, and the walls have been treated in a similar manner. Upon the fascia, which runs round the whole of the building, some texts of Scripture are inscribed, very happily and appropriately selected. The large piers below the cornice are left for the present a warm Indian red, but it is contemplated to fill them with painted figures, as well as the panels of the reredos, when sufficient funds have been collected. The west gallery is now restored to its original condition, and, supported by handsome stone columns, forms an attractive feature on leaving the church. The unsightly pews have given place to open benches, the old dark oak having been made use of. The old altar-rail and gates have been brought forward a few feet outside the chancel-arch, and serve as a dwarf screen; and the stalls having been considerably extended, afford accommodation for the clergy and a choir. The altar is approached by five steps from the nave, and the floor of the sacristy is laid with tiles. The old pulpit has been let down on to a low oak pedestal, of appropriate design. Five geometrical windows of green cathedral glass from the manufactory of Mr. W. M. Pepper, have been inserted on the south side of the nave, the gifts of parishioners and other friends; and it is to be hoped that subscriptions will be forthcoming to enable the committee to fill those on the north side in a similar manner. A 7*ft* Drum window is also contemplated for the west end, but this and many other matters must stand over for the present.

The windows of the sacristy are filled with stained glass by Messrs. Heaton, Butler, & Bayne, and the vaulting is elaborately painted,—a little overdone perhaps, like that of the nave, but time and the gas will lessen its fussiness. The church, we may add, has been heated by Messrs. Perkins.

Few probably remember that when Gibbs made his first design for this church it included a column to stand 80 ft. from the west front, 250 ft. high, and bearing a statue of Queen Anne. Stone was brought on to the ground to form the foundation, but the Queen dying, the idea was abandoned, and the present steeple was built with the church in lieu of a mere bell-turret originally intended.

VALUE OF LAND IN LONDON.*

WHEN we reflect that, whilst in the year 1811 our whole population did not exceed twenty millions, and that of London was under one million and a half, whilst at the present time the population of London probably reaches to nearly four millions and the population of the United Kingdom to something like thirty millions, whilst the amount of gold in circulation has very largely increased, especially since its discovery in Australia and California, and wherever land remains the same in quantity, a remark which strongly applies to the commercial centre of London; it is almost a natural consequence that the value of land in London, and more especially in its great commercial centres, should have increased in the proportion which it has done.

The population of London is constantly reinforced by the influx of residents from provincial districts and foreign countries. Twenty years ago, the proportion of these residents in London, twenty years of age and upwards, was as 645,000 born in London to 750,000 born in the country or abroad.

The Registrar-General in 1851 (just two decades ago), taking equal areas to obtain a fair comparison, found that the population of London had increased in the following manner, viz.:-

In the year 1811 the population was	1,138,815
" 1821 "	1,378,947
" 1831 "	1,654,924
" 1841 "	1,948,417
" 1851 "	2,382,236

that is, just one million in forty years; and it is remarkable that the population of London in 1851 is very nearly the same as the estimated population of Imperial Rome, and about double the present population of Paris.

The natural increase of the population of the United Kingdom,—that is, the excess of births as compared with the deaths, for the three months ending March 31st, 1871,—was 95,426.

* By Mr. Edward T. Anson. See p. 420, ante.

† Of foreigners in London, it is estimated that no less than six-sevenths, or upwards of 30,000, are natives of Germany or German provinces.

The Registrar-General calculated that, if the population increased in the ratio it had done between 1841-1851, it would reach six millions before the end of the present century; and if it be true, as it is asserted, that the present census will disclose that we have a total population of four millions in London alone, this calculation will probably be more than verified.

These facts have for us a very practical as well as speculative bearing. The confined area within which business is transacted in the City and the enormous increase in the population which is continually going on, must inevitably lead to the displacement of certain trade centres and a consequent variation in the values of property. Some of these changes may be already anticipated by a consideration of what has occurred in analogous cases; but it is, of course, impossible to foretell with any degree of accuracy in what direction the exodus will take place, and what may be the extent of the land which will be required to meet the wants of an ever-growing population.

Were it possible to forecast what will be the future centres of value, or to define what will become the great lines of traffic, we might, there is no doubt, make a very practical use of this knowledge. The very complex social system under which we live, the force of habit, and a complacency which makes us satisfied with things as they are, renders it extremely difficult to effect changes or improvements, and the partial manner in which nearly all alterations are carried out, makes it almost impossible to predict, with any certainty, the effect of such alterations upon the value of land within the metropolitan area.

That some important changes are inevitable may be inferred from the extraordinary development that has taken place in some branches of trade; and, on the other hand, the almost total collapse of some of the most important industries upon which we formerly relied.

As an instance of the changes which affect us, may be mentioned our trade with the colony of Australia, which has sprung up entirely during the present century, and has now assumed very remarkable proportions.

In the year 1850, the declared value of the exports to the colonies was nearly 10,000,000*l.*, and of our imports 5,500,000*l.*; while in 1868 the imports were 12,077,955*l.*, and the exports 18,066,687*l.*; and yet, with our extended commercial relations, and the great increase of our commerce, the trade centre of this enormous business remains nearly the same as in the beginning of the century. Some changes have, however, taken place, which have been important.

I may cite the removal of Smithfield Market from the middle of London, which caused considerable disturbance to business, affected the value of land to some extent, and caused, probably, some cases of individual hardship in consequence of the value of ground having declined for a time; but the erection of the New Meat Market, and the alterations which have been effected in the neighbourhood have once more raised the character of the site, and in all probability rents are now higher in Smithfield than they were before the removal of the market. The planting of the market at Islington has largely tended to the development of the property in the neighbourhood, and the preservation of a large unoccupied space is no doubt beneficial in a populous overcrowded locality.

The transfer of the Meat Market from its ancient habitat in Newgate-street to the handsome and commodious building in Smithfield which it now occupies, has also to some extent influenced the value of land in the former localities; but there can be little doubt that the area of the old market will be rapidly absorbed by other trades in the vicinity (probably by the bookelling trade), and a proper equilibrium established.

The removal of public offices from the interior of the City to the more western part of London has tended to relieve the plethora of population which at times threatens to choke the City. The transference of the Government of India from the East India Company to the Crown in 1855 by the Act 21 and 22 Vict., c. 106, rendered the East-India House in Leadenhall-street unnecessary, and its site became available for the erection of offices.

The Excise-office, in Old Broad-street, which was built on the site of Gresham College, in 1774, was in the same manner removed to Somerset House, on the incorporation of the Board of Excise with that of Stamps and Taxe

in 1849, and the old Excise-office was converted into offices, and renamed Gresham House.

The South Sea House is another example of a somewhat similar transformation, a portion of the premises being occupied by the Oriental Banking Corporation, and the remainder by the Baltic Office-house and Sale-rooms.

The Hudson's Bay Company's premises in Fenchurch-street, after having remained unlet for a considerable time, have been recently let and converted into private business offices.

It has been lately proposed to remove the Royal Mint from its present position on Tower-hill, to some more convenient locality, and the Thames Embankment has been suggested as a fitting spot. This matter, however, is for the present in abeyance.

Whatever changes have occurred, or may supervene, in other departments of commerce, it is tolerably certain that the money-market will always remain in the heart of the City; and there is, therefore, little reason to fear that the value of land in the neighbourhood of the Bank and the Royal Exchange will suffer any diminution. Cornhill, and the streets in its vicinity, must always be the centre of London and the centre of business activity; and it is not easy to imagine any alteration, short of a political cataclysm, hitherto happily unknown in this country, which could in any way deteriorate from its value. The recent removals of the capital of Italy from Turin to Florence, and thence to Rome, as well as the possible abandonment of Paris, are, no doubt, suggestive facts; but I venture to think that, so far as we can form any opinion of future events, London will always remain the centre of imperial British commerce, and the city of London the focus of commercial activity.

LAND AND LABOUR IN NEW ENGLAND.

In a lecture delivered for the benefit of the Working Men's Club and Institute Union, in the Theatre of the Royal School of Mines, Jermyn-street, on Saturday last, Mr. T. Hughes, Q.C., A.P., referred incidentally to the questions indicated above. The lecture was for the greater part descriptive of what Mr. Hughes had seen, and the impressions he had received, in "a visit to the United States." In relation to the land question, there was not in America, he stated, the sentimental regard for landed property that existed in this country; there was, however, an eager desire, even among the working-classes, to possess land, but less from an idea of hereditary or permanent possession, than from a spontaneous spirit, the value of land being often greatly increased as districts became settled, their resources developed, and their means of communication improved. The opinion, that appeared to be gaining strength among the working-classes of England, that land was national property, and that the reclamation of waste, and the increased value of other lands, should be devoted to public uses, would meet with no sympathy in America. Nothing could be more unopposed than such a policy if proposed there. In connection with the labour question, Mr. Hughes stated that he had met with a number of working men in different parts of the States, that he had known in this country, and learned from themselves that in New York, Boston, and large cities, they were little, if at all, better off than they had been here. They had higher wages, it was true, but his scarcely compensated for the more expensive living, and they complained that the "bosses," or foremen, were harder, and more exacting and insolent. In smaller towns, however, their condition was much better. At Ithaca he had seen a number of masons who had gone out to the building of Cornell University, and found that these men were very well satisfied with their condition. With average intelligence and industry, they had the power not only of earning a comfortable subsistence, but of accumulating property. Many of them were able to take small contracts, which enabled them very materially to better their condition. One man, for instance, he met with who had leased a small quarry, upon which his spare time was very profitably expended.

In commenting upon the cities of the States Mr. Hughes remarked that Philadelphia, with its buildings of red brick and white marble, and its fine lines of trees, was in colour and otherwise the most beautiful of them all; and that it was the glory of Philadelphia to have provided the best workmen's dwellings, as he believed, that were to be met with in the world.

Mr. Hughes concluded his interesting lecture by referring hopefully to the circumstance that the two great English-speaking nations were getting to understand each other better; and, unlike others who had so recently given such a terrible illustration of one mode of settling a dispute, were setting to the world the example of an appeal to reason for the settlement of their differences.

TUNNELLING MACHINES.

COL. VON SCHMIDT, of San Francisco, has invented a machine for tunnel-boring,—a machine which is intended to meet the requirements of the latest scheme extant, the Tahoe water project. According to the *Bulletin*, the machine is constructed upon the severance diamond-drill principle; but in the mode of application the machine differs materially from all others now in use. The Von Schmidt drill will consist of a circular wheel, 8 ft. in diameter. Imbedded in the rim of the wheel, each revolving on its own account, will be twenty-four diamond drills, 1 ft. apart. In the centre of the wheel, according to the model, is a single drill, and this is kept 1 ft. in advance of the other drills. The wheel is calculated to make 800 revolutions per minute, the drills revolving at a higher rate of speed. The periphery of the tunnel will be on the scale of 8 ft.; the groove out by the drills will be 2 in. wide and 3 ft. deep. It is intended to load the centre hole alone, then run the machine back on the track, and raise the lower half of the wheel on hinges. The blast is fired, and the great cheese of rock crumbles in pieces. The machine is constructed so as to admit of 3 ft. space inside the wheels, between its framework and the bed of the tunnel, thus giving facilities for removing the debris afforded by an inner car-track. The machine will be driven by compressed air.

The invention of Mr. T. F. Hanley, Pimlico, as described in the *Mining Journal*, consists of a tool-holder, or head, adapted for receiving chisels or tools suitable for cutting rock. This tool-holder is combined with an arm or shaft, the two together being called the ram-head and ram-shaft, or collectively the ram. This ram is mounted by suitable connexions on a main frame or base plate, which is fitted with wheels or skids and guide-rollers for the purpose of advancing or withdrawing the machine, as may be required. The ram is made to receive a fore-and-aft movement of percussion from any suitable motor, simultaneously with a horizontal motion to the right or left, and vice versa, by means of mechanical arrangements.

A Machine Tunnelling Company has been set agoing, with a capital of 30,000*l.*, in shares of 5*l.* each, for the purpose of acquiring and working the tunnel-driving machinery recently patented by Captain Beaumont, M.P., and Mr. C. J. Appleby, C.E. The machine has been practically tested. Mr. T. J. Bowick, C.E., of Haydon Bridge, certifies that under unfavourable circumstances they progressed at the rate of about 15 yards in a month, and that it is subject to but little wear and tear. Compared with ordinary manual labour, it is estimated that the work done was about double. The machine has the advantage that it can work several drills simultaneously, and each drill can bore an inch a minute in the hardest granite. A reliable mode of setting the diamonds in the drill-head is still to be discovered. The diamonds cost 10*s.* or 12*s.* each, and quickly work out of the setting.

BRITISH ARCHEOLOGICAL ASSOCIATION.

THE Congress for 1871 will be held at Weymouth, in the week of August 21 to 26 inclusive. Sir William C. Medleycott, bart., of Ven House, Sherborne, Dorset, has undertaken the office of President. The Mayor of Weymouth and a local committee are in concert with the Council, and there is every promise of an agreeable week in a district rich in antiquities, yet comparatively unexplored. The aid of associates is invited to make the meeting as numerous as possible, and to add to its interest by every means in their power.

The finances of this society have always been managed with remarkable care, and much is done with a comparatively small amount. The journal is itself a good return for the guinea annually subscribed. The treasurer, Mr. Gordon M. Hills, in his Report for 1871, just now issued, states that the amount received from subscribers has been less than it was last year,—less, indeed,

than the expenditure,—apparently from want of punctuality in the payments, the number of subscribers remaining nearly the same; yet so well have the resources been husbanded that he can still announce a balance at the bank of 290*l.* 11*s.* 9*d.*

Referring to some of those associates who have for years laid the results of their inquiries and rare knowledge before the society, the treasurer very rightly urges the desirability of enrolling new friends, fresh instruments of aid, and instruction yielding fresh lines of thought and research. Young ardent spirits who are seeking a platform might find it here. The death of several old supporters of the association is mentioned. Speaking of one of them, the late Dr. James Copland, a kind and learned man, the treasurer alludes to some of the contributions the Doctor made at their meetings. "I remember," he says, "that in April, 1861, he produced a Latin MS. Missal from Ely, believed to be of the end of the fourteenth century. In it was written a distich, in the fifteenth century, containing a curious evidence as to Londoners not to be expected in such a book; but showing that the citizens were then contemptuously called 'Cokenys,' and had a reputation amongst their rural compatriots for luxurious idleness."

The Weymouth Congress promises to be agreeable and valuable, and some of our readers may thank us for leading them to think that they can help to make it so; that is, if they act on their thinking.

THE SUBTROPICAL GARDEN.*

MR. ROBINSON is the author of several works on English and Parisian gardening, and has consequently arrived at much familiarity with his subject. Many people of horticultural taste, who have seen specimens of these former labours, will take it for granted that what he may have to say about any branch of gardening will be as a word to the wise, weighty, sufficient, and convincing. But, unfortunately for themselves, there are many persons to whom gardening is an unknown delight; and there are many others who, having small gardens, are content with their few dry and dusty shrubs, prickly gooseberry-bushes, and frail annuals. To the last two sets of people Mr. Robinson has now opened out a new world of enjoyment in a small volume he has entitled "The Subtropical Garden;" and to the horticultural adept, as well as to the amateur owner of palatial gardens with terraces and parterres, he has given in it many hints that will be hailed with pleasure.

The titular term subtropical is, perhaps, rather misleading. We should be disappointed if we looked for instructions how to form and fill, in our humid island, a garden that would be indistinguishable from that of an Algerine bey or that of a merchant of Madeira. All that we find in Mr. Robinson's new book is an indoctrination of the desirability of the use of plants that have handsome foliage and a graceful mode of growth as a relief to flowers, followed by a selection of those that are most suitable for the purpose and our climate. All the plants he recommends are not from subtropical climes. According to his definition, "Subtropical gardening means the culture of plants with large and graceful or remarkable foliage or habit, and the association of them with the usually low-growing and brilliant flowering plants now so common in our gardens, and which frequently eradicate every trace of beauty of form therein, making the flower-garden a thing of large masses of colour only." Tender plants reared in hot-houses have no special charm for him. Hardy plants, such as the yuccas, the arundines, the scanthuses, the Pampas grass, and some kinds of palms, have an effect quite as satisfactory as any requiring a conservatory for their winter shelter; and these, mixed with young trees and a few house plants, are the only requisite stock in trade for a model garden. "What I wish to impress upon the reader," affirms Mr. Robinson, "is, that in whatever part of these islands he may live, he need not despair of producing sufficient similar effect to vary his flower-garden or pleasure-ground beautifully by the use of hardy plants alone; and that the noble lines of a well-grown *Yucca recurva*, or the finely-chiselled, yet fernlike spray of a graceful young conifer, will aid him as much in this direction as anything that requires either tropical or subtropical temperature;" and then

* "The Subtropical Garden; or, Beauty of Form in the Flower-Garden." By W. Robinson, F.L.S. London: John Murray, 1871.

he relates how he visited the South of Ireland, on his way home from America, and found at Fota Island, the residence of Mr. Smith Barry, exactly such a garden as he advocates. It was filled with hardy plants, such as the bamboo, pampas grass, New Zealand flax, yuccas, cypresses, and pines, and presented the most charming scene, he declared, that he had ever enjoyed in a pleasure-ground in the British Isles.

For our own part, we advocate fruit-growing before floriculture; and we would always accord the gardener who produced the most fruit in the least space the same praise Dr. Johnson, and others before him, voted to the man who made two blades of grass grow where there was only one before. Mr. Roach Smith, with his urgent advocacy of the cultivation of every cottage garden, gable, railway slip, and every waste corner, with fruit, has our warmest regard, and we willingly endorse every word he has written in the furtherance of fruit-growing to such an abundance that all may partake of it as part of ordinary every-day fare. But we cannot expect the custodians of public parks and the owners of extensive grounds to devote the whole of them to fruit culture: consequently Mr. Robinson's recommendation for the production of scenes of vegetation that will give pleasure to the eye and refreshment to the jaded brain may be counted as likely to be acceptable in such quarters. In Battersea Park, he continues, the first attempts at subtropical gardening were overdone and unfortunate; and some of the formal arrangements in other London parks are likewise condemned by him. Geometrically-formed beds of masses of the same plants are especially distasteful to him. The day will come, he says, when we shall avoid all formal twirlings in our gardens as assiduously as we now court them. These vanities were excusable when the materials for a garden were few; but now that we have at least 10,000 hardy exotic and British plants to choose from, we should reject them as scornfully as a landscape artist would turn from them. The time was when Allison wrote, "In gardening, the materials of the scene are few, and those few unwieldy; and the artist must often content himself with the reflection that he has given the best disposition in his power to the scanty and intractable materials of nature;" and when

every book on gardening, from that of Gervase Markham downwards, boasted its designs for knots and plats, as geometrical beds were then called. But Mr. Robinson would have us change all this, do away with our defined daubs of colour and what he calls our pudding-like heaps of shrubs, or what other people call our colour-gardens and our leaf-gardens, and, in their place, fill our pleasure-grounds with feathery palms, the outspreading allanths, tapering conifers, tree-ferns, cannas, &c., and with them associate tall, bold flowers. Hollyhocks surrounded by a ring of cannas present a very different aspect to their accustomed melancholy when tied to a row of stakes along a prim garden-wall; and a few heads of Fortune's tiger-lily rising above a group of the same plants form one of the most brilliant pictures the eye of gardener has conceived. Combinations of dahlias with cannas and other free-growing subtropical plants are also recommended as of gorgeous effect. Isolated tufts of gladioli rising out of the sward; surfacings of *lobelia speciosa*, or almost any annual biennial, or ordinary bedding plants, as a low light covering to a bed of erythrinas; tall *apocynis pulcherrima* leaning out of masses of foliage; sandworts planted in the grass near groups of fine foliaged plants; ferns, not in ferneries, but out in the sun in the grass, either alone or grouped with acanthuses, are the kinds of effects we are instructed to admire. In a word, a revolution in flower-gardening is preached, and there is to be a reign of "verdant grace," consisting of a judicious intermingling of fine-leaved plants with brilliant flowers. Old familiar friends, such as the rhubarbs, treated in new ways, appear to have quite new faces, and when found used as ornaments for the margins of shrubberies are scarcely recognisable. Some varieties of rhubarb have been planted, regardless of the new suggestions, in masses in Hyde Park, to the discontent of our author. The castor-oil plant, too, is another familiar face of late years planted in the London parks with puzzling effect. It shoots up an unbranched stem to a height of nearly 12 ft., and is clad with leaves nearly 3 ft. wide. When, in warmer climes, it would develop side-shoots and become a small tree, autumn comes and puts an end to progress. But in this case Mr. Robinson does not grieve, because he considers this plant

handsomer in a simple-stemmed state than any other.

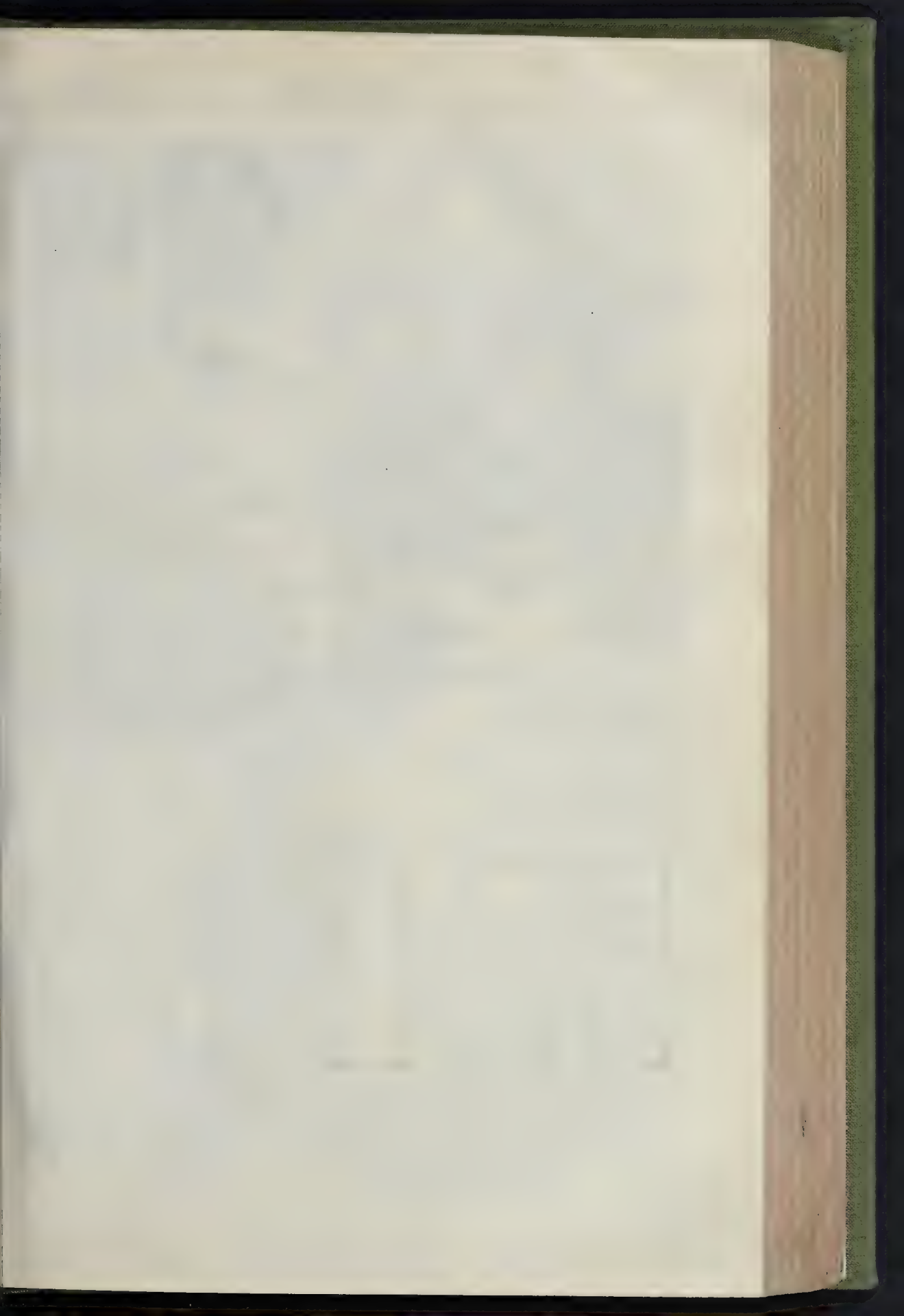
Nathaniel Hawthorne wrote of gourds, the author reminds us, in these enthusiastic words:—"A hundred gourds in my garden were worthy, in my eyes at least, of being rendered indestructible in marble. If ever Providence (but I know it never will) should assign me a superfluity of gold, part of it shall be expended for a service of plate, or most delicate porcelain, to be wrought into the shape of gourds gathered from vines which I will plant with my own hands. As dishes for containing vegetables they would be peculiarly appropriate. Gazing at them, I felt that by my agency something worth living for had been done. A new substance was born into the world. They were real and tangible existences which the mind could seize hold of and rejoice in." And though in New England the gourd family thrives better than with us, we may yet enjoy some of Hawthorne's pleasure in the contemplation of this curious tribe. They are recommended as suitable for low trellises or for training over arches, or for covering framework to form summer-houses. The singular shapes of this fruit, now a writhing snake-cucumber, now a giant pumpkin, weighing 200 lb. and more, now egg-formed and egg-sized, now club-like and casket-like, now as small as a gooseberry, now like a folded umbrella, or a ball, a vase, an urn, are truly wonderful to consider; and it is without surprise that we find Mr. Robinson has mentioned them with commendations. Of the 500 varieties that have been grown in England, however, by Mr. W. Young, only twenty-five are catalogued as desirable for a subtropical garden.

In addition to the faint contour we have given of the contents of this writer's new work we must add that it confers upon a reader new lights with which to look at horticultural efforts and effects. Those who will take the trouble to trace out the suggestions made in its pages will find themselves endowed with an access of perceptive powers in gardening matters, and thus qualified to enjoy what might have had otherwise but comparatively little interest for them.

The book includes a large number of engraved illustrations, a few of which we are enabled to give, to show their value in enforcing the object of the work.



Yucca Pendula.—Hardy Evergreen fine-foliaged Type.



BEAUTY OF FORM IN THE GARDEN.



View showing the Value of Groups of fine-leaved Trees and Plants.

*Caladium Esculentum.*—Tender Section: displaying noble Leaves during Summer in Southern Counties.*Ailanthus and Cannas.* Suggesting the Effects to be obtained from vigorous Specimens of fine-leaved Plants.

SCIENCE AND ART SCHOOLS, GLOUCESTER.



FIRST FLOOR PLAN



GROUND PLAN

SCALE OF FEET

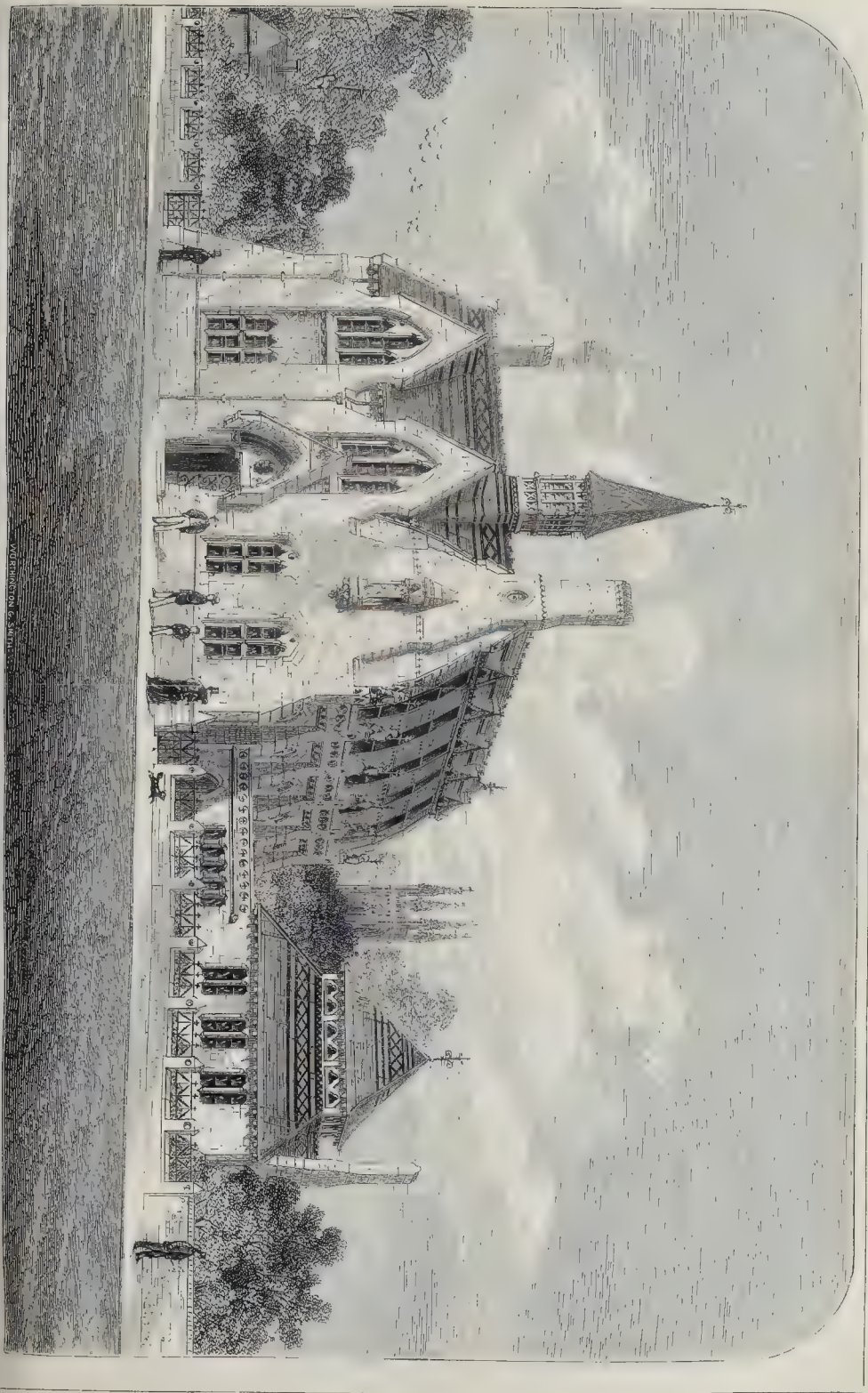
REFERENCES.

1. Museum.
2. Entrance Lobby.
3. Hall and Staircase.
4. Lecture Theatre for Science and Art Schools.
5. Master's and Preparatory Room.

6. Class-room.
7. Laboratory.
8. Stores.
9. Entrance for Science Students.
10. Painting Room.

11. Advanced Class-room.
12. Class-room.
13. Elementary Room.
14. Cook-room for Ladies.
15. Master's Room.

MUSEUM AND SCIENCE AND ART SCHOOLS. GLOUCESTER. Messrs. PARRIS, WATTS & SON, Architects.



SCHOOLS OF SCIENCE AND ART,
GLOUCESTER.

We mentioned in our last issue that the foundation-stone had been laid of buildings, in Gloucester, intended to serve as a Museum, and Schools of Science and Art; and we now give the illustrations promised. The site is on land purchased by the committee, situated between Brunswick-road and Constitution-walk, in the city of Gloucester.

The amount of the contract is nearly 3,600l. Many of the leading county men and large firms have already subscribed handsomely, and it will probably only be necessary to state the requirements for advancing so important an educational scheme to induce others to do likewise.

The block of building comprises, on the basement, rooms for the curator, store-rooms, hat and cloak rooms. On the ground floor, a museum, lecture-theatre, class and master's rooms, and laboratory for science students; this latter building being detached, to avoid nuisance from noxious fumes and gases. The first floor will be devoted entirely to the use of the students of the School of Art, and consists of an elementary class, advanced class, painting and master's rooms, with cloak-room and other conveniences.

The roof of the advanced class and painting-rooms is to be constructed of arched iron ribs, with windows so arranged as to admit light without any interruption from wall plates or gables—a great desideratum in drawing-schools. The architects are Messrs. Fulljames, Waller, & Son; and the contractors, Messrs. King & Godwin. We understand that in making the excavations the foundation of the old city wall has been exposed. It is composed of large masses of masonry very solidly joined together.

BUILDINGS FOR MUSIC.

Sir,—In the suggestive article on the above subject in the last number of the *Builder*, it appears to me that one point, with regard to the effect of different classes of materials in aiding or impairing the efficiency of a music-room, has been overlooked. Throughout the article it is apparently assumed that the one object to be kept in view in the construction of a music-room is the greatest possible resonance,—not merely confining the sound within the limits of the building, but providing against all absorption of sound by the materials composing the floor, sides, and roof, and making all these as much as possible sound-reflectors. But whether this is an advantage or not will depend very much on the size of the building. It must be remembered that for a satisfactory musical performance on a large scale we require not only volume and concentration of tone, but also clearness of definition. In a small room there is little difficulty in attaining this, so far as the effect of the room is concerned; and the employment in such a room of the most resonant materials will probably ensure the best effect, by adding an increased volume and brilliancy to the sound, as you illustrate, quite aptly, I think, in the instance of a piano placed in a perfectly bare unfurnished room. And in regard to ordinary-sized music-rooms in general, quite a different conclusion is to be drawn. The efficiency of glass (in roofs, &c.) as a means of retaining the sound. But in a very large building the case becomes less simple. It is possible there to have too much sound, or to have too much reflected, because in such a case the distance between the point from which the sound emanates, and the farthest portions of the roof and walls, is so great that the reflected sound is heard at an appreciable interval of time after the original one, thereby confusing and blurring the effect of the composition performed. Speaking with regard to St. James's Hall, you say "it is lined with sound-absorbing media, utterly destructive of pure resonant music, and clear and perfect sound; for what can be the object of producing a loud full note if you must needs deaden it afterwards?" This may be true with regard to a building of the size of St. James's Hall, though I do not consider that at all a bad music-room on the whole; the planning of the orchestra and position of the organ are bad, but that is another matter. But when you come to a building of the size of a cathedral or an Albert Hall, it does become necessary to deaden or absorb the more powerful sounds; not because you do not want the sound (for you want all you can get), but because you do not want the return

of the sound,—the reflection of it back again after it is supposed to be done with. I had not the opportunity of hearing anything in the Albert Hall until after the *velarium* had been put up; but from all I could gather from the accounts in the papers, it appeared that the defect which led to this being found necessary was, not that the glass roof did not hold in the sound sufficiently, but that its hard concave surface reflected it back into the building too much, and that the *velarium* was placed to absorb some of the sound which before was returned when it was not wanted. I believe I have in a previous letter on a similar subject referred to the case of St. George's Hall at Liverpool, where the materials are nearly all of the least absorbent nature (tiles, hard cement, marble, &c.), and where the echo most decidedly and distressingly interferes with the clearness of definition in all loud and elaborate music, and especially with the effect of the organ. In this hall everything sounds best and is best heard when the place is filled with a crowded audience, whose dress absorbs part, though not all, of the superfluous reflected sound.

From this and other experiences, I am convinced that in a very large concert-room it is absolutely necessary to prevent some, at least, of the sound from being reflected, and to use absorbent materials to some extent for that purpose. There is no doubt that such a condition greatly increases the difficulty of constructing a music-hall of large dimensions, which shall be acoustically satisfactory. An increase of power is essential for the production of any grand effect in a great interior; and, at the same time, it is necessary, in order to insure clearness, that the sound shall not be so reflected as to repeat itself to the ears of the audience. These two conditions are antagonistic, and it seems impossible to satisfy one without in some degree neglecting the other,—the moral of which is that it is not desirable to build music-rooms beyond a certain size. Buildings like the Albert Hall, orchestras like that of the Handel festivals, afford opportunities not to be despised, for the attainment of musical effects on a great scale, and for the gathering of a vast concourse of people to hear them; and the Albert Hall, as a music-room, is perhaps as successful as any interior of such extent can be made. But, after all, mere numbers and volume of sound do not make music; and in all these performances on a grand scale, clearness and precision must be more or less sacrificed. The highest class of musical compositions, which appeal to the intellect rather than merely to the ear, will probably be always most intelligibly heard and interpreted by a moderate number of performers, in rooms not large enough to introduce the disturbing element of reflected sound, or what we commonly call "echo."

H. H. S.

THE SELECTION AND USE OF STONE.

Sir,—I have read with much pleasure Mr. Pain's paper on the above subject. Until some of the suggestions advanced by Mr. Pain are adopted, the evils which now exist will not be removed.

With your permission I purpose offering a few remarks as briefly as possible.

I think it will be generally admitted by practical quarry-owners that but few architects understand the nature and quality of the different beds of stone quarried from the aqueous rocks in this country; and it cannot be otherwise until young men who are intended for the architectural profession obtain the desired knowledge by practical acquaintance with the workings of quarries, and the nature of the different beds of stone they contain. It is a lamentable fact that the want of this knowledge prevents them from knowing the "bed way" or the "growing way" of many of the best sedimentary rocks: hence how frequently do we find in our public buildings much of the stone, such as plinths, balustrades, &c., perishing in consequence of being put in the wrong way of the bed, while the other part of the building is unimpaired by time.

This unfortunate state of things arises in nine cases out of ten from sheer neglect. I could give as many instances as would fill a number of your valuable paper, and must trespass on your space by naming one which came under my notice only last week. The contractors for a respectable building delayed an order for plinth until the masons were nearly ready to fix it. The said plinth was 8 in. on the bed, varying from 18 in. to 33 in. in thickness, and "wanted immediately." Now any one practically acquainted

with stone-getting will know that it is very difficult and entails much waste; in fact, it is next to impossible to cut blocks of good stone so narrow on the bed and such a thickness. It may be said, Why not saw them? True; but this takes up time and probably a little extra expense, and as the contractors have had to "cut low," and the building is nearly at a stand, the stone is put in the wrong way of the bed, and if it is good will not be detected by the architect or any one who has not an intimate knowledge of its texture. The result will be that in the course of a few years the weather will expose the delinquency, and the truth will come out. Again, a certain stone is specified for a large public building. Tenders are sent in accordingly from a selected number of contractors; and, as your columns will show, a marvellous difference is exhibited between the highest and the lowest. The writer could give instances where some of these tendering never ascertained the cost of the stone so specified; and further can testify that others never intended to use the stone specified, but to substitute one of similar texture but of inferior and cheaper quality. Another great evil is this. It is often known for months previously to stone being required for very large contracts that the supply must come from certain quarries. Notwithstanding, the orders are frequently delayed until the masons are on the ground ready to work it. Hence the orders are then poured in, and the cry is soon raised of "standing for stone." The quarry-master is pressed, and away the blocks are hurried,—good, bad, and indifferent. A strike amongst the men for an advance of wages inevitably follows, all of which trouble might have been obviated by a little forethought and prudence.

STEPHEN SEAL.

THE COST OF CONCRETE BUILDING.

Sir,—Mr. Tall has misunderstood the statements contained in the paper on "Cement Concrete," read at the Architectural Conference.

The cost of cement concrete was stated at from 12s. to 18s., the former exclusive, the latter inclusive, of cost of patent apparatus.

It was also stated in the paper that thin walls could be built, not cheaper, but more expensively, than thick ones.

As regards the cost of the apparatus, I am unable to make any retraction from the statements made before the Conference. It is an expensive item, and cannot be regarded as "builder's plant."

The paper was reported to have said,—"Cement concrete could not be recommended in positions exposed to severe frost." The statement really was this,—"After the cement has set, frost has no influence on it; but during setting it is affected as much as mortar. It was therefore recommended that walls be covered up, and works suspended during severe weather."

To Mr. Tall is due much of the impetus lately given to cement concrete building, and his experience is very large. I am, therefore, sorry to appear to be in antagonism to him; but the facts of my experience are as stubborn as facts usually are; and as I cannot mould them, I content myself with simply stating them.

T. WONNACOTT.

THE LATE MR. GEORGE TATE, F.G.S.

On the 7th inst. expired, at Alnwick, Mr. George Tate, author of the "History of Alnwick," and the "Sculptured Rocks of Northumberland," reviewed in these pages, besides other works, chiefly of geological and philosophical interest. For the last thirty years Mr. Tate filled the office of postmaster at Alnwick, his native town. For many years he was one of the honorary secretaries of the Berwickshire Naturalist Club; and the scientific and archaeological papers he communicated to this society form a large and valuable portion of its printed proceedings. For about thirty years, too, dating from the time he was twenty-three years of age, he was the leading secretary of the Alnwick Mechanics' Institution, which post he relinquished in 1859. His house was the modest centre of the literary and scientific society of the district; and few strangers, who were themselves of note, passed through the town without paying a visit to the local historian. Owing to chronic bronchitis, Mr. Tate made a practice of confining himself to his room, every year, during the winter months; but this care did not prevent the progress of his complaint. During

the bleak winds of the late spring months his health became seriously alarming to his family, though he did not allow it to disturb his usual literary and scientific vocations until quite recently; for a few weeks ago he received, at his residence, the members of a club, of which he was president, and read to them a paper on the Basaltic Rocks of Northumberland. At the time of his death he was sixty-six years of age.

He was buried, with every mark of regard and regret, on the 9th instant, in the churchyard of St. Michael's Church, Alnwick. The local Board of Health, and a deputation from the Mechanics' Institute, numbering about eighty of his fellow townsmen, followed his remains to the grave. Those who are specially interested in the histories of British worthies and authors, may thank us for naming that the *Alnwick Mercury* of the 10th inst. gives a full and appreciating sketch of the aims, incidents, and results of his useful life.

THE GIBBS COLLECTION OF ANTIQUITIES AT SOUTH KENSINGTON MUSEUM.

SIR,—I am inclined to think the three harness-plates and hooks numbered 1,248 to 1,248b—70, in Mr. C. R. Smith's catalogue, may be described as distinctly Christian relics. Each plate is ornamented with a cross *pate* between two fish *hauriant*. On the tombs of some of the early Christians buried in the catacombs at Rome a fish is carved, which is interpreted to signify a belief in the resurrection. Bearing this in mind, redemption, boldly and unmistakably out, seem to point to a Christian rather than a Pagan Anglo-Saxon owner. As to dates, we cannot be wrong in supposing them earlier than the year 742, when Outhbert, Archbishop of Canterbury, introduced the practice of burying in churchyards, which he had seen at Rome; nor, on the other hand, could we fix a later date; for we may conclude the change would soon be made, at least in Kent. In connexion with this, I may mention a fact which is not generally known, viz., that in the year 1853 a Saxon tumbler and a frontal bone of a human cranium, of rather small size, were found in digging a grave in the churchyard at Faversham. These remains were presumably those of some one buried after the ancient cemetery in "King's Field" was disused.

GEORGE BEDO.

NEW MEMORIAL CHURCH AT SKELTON.

THE anniversary of the funeral of one of the victims of the Greek brigands a year ago, Mr. Frederick Vyner, of Newby Park, near Boroughbridge, was selected for the laying of the foundation-stone of a new church at Skelton, near Boroughbridge and Ripon, in memory of that ill-fated gentleman. A mural monument in York Minster records the painful event, and this second memento of maternal affection has just been commenced. Mr. Vyner was the son of Lady Mary Vyner, of Newby Hall, daughter of the late Earl De Grey and Ripon, and cousin and mother-in-law of the present earl. This lady provides the funds. The memorial edifice will adjoin Newby Park. The population is only 300, but the cost will be about 10,000l. The edifice will consist of a nave, with north and south aisles, and a chancel. The total length of the building inside will be 96 ft., the nave 40 ft., and the chancel 16 ft. wide. The whole of the chancel will be vaulted over with limestone, to be obtained from Earl De Grey's quarries, and marble columns will be inserted in a series of double tracery to the windows, which is peculiar. The windows will be filled with stained glass. The seats in the nave and the aisles will be of deal formed into panels, with trefoil heads to each bay. The floor will be partly of encaustic tiles and partly plain. The external facing of the church will consist of the Catraig stone, with dressings from the Morcar Quarry. There will be a tower and spire, which will rise to the height of 150 ft., at the north-east angle of the nave. About 230 persons can be accommodated. The architect of the church is in the style of about 1270. Mr. W. Burgess, of London, is the architect, and Mr. John Thompson, of Peterborough, the contractor; Mr. Sier, of London, acting as clerk of the works. It is expected the church will be completed in about eighteen months. It will be named Christ Church.

A LETTER PREPARED FOR MACAULAY'S NEW ZEALANDER.

MEMORIAL STONE-LAYING IN NOTTINGHAM.

The memorial stone of the new Wesleyan chapel, on Mansfield-road, Nottingham, has been laid by Sir F. Lytton. The chapel is situated at the junction of Woodborough-road and York-street with the Mansfield-road,—a conspicuous position in that locality. According to the plans, the new chapel will be Decorated Gothic in style, and will be built of brick and stone. The ground floor and balcony will seat about 900 persons. The ground-floor of the chapel is elevated from the street, and underneath is a school-room, lighted on all sides, and 76 ft. long, 52 ft. wide, and 14 ft. high, with ample class-rooms in the rear. The building is to cost 3,500l. The architect is Mr. Simpson; the builder, Mr. W. Slim; and the masons are Messrs. H. & T. Green, Brothers.

The laying of the memorial-stone excited a considerable amount of interest amongst the Methodists of the town and neighbourhood, and a procession took place, and crowds of people assembled.

The Rev. J. Mason read over a list of things to be deposited in the cyst underneath the stone. We slightly condense what was said as to these:—

The cyst contains the photographs of the mayors of the circuit, of several of the trustees, of the mayor and members of the sheriff and of the Woodward, of one alderman, and of one councillor. It contains the circuit plan, the General and District Wesleyan Missionary Reports, a copy of the *Nottingham Guardian*, &c. There are also deposited in it lists of the corporation and board of guardians, and a copy of the Sanitary and Highway Reports. There has been placed in it a list, with sundry specimens, of local manufactures. The cyst contains a silk stocking made for the Queen. It also contains coins of the realm, but not so many as to tempt a thief. There has been deposited a post-card, purporting to be a note from the manufacturers of Nottingham,—say, if you like, to those who shall live when the millennium of trade and commerce shall come. Some people write from posterity, but this is to posterity, and it reads as follows. The post-card bears on the address side the following:—"To Macaulay's New Zealander, or any other person it may interest, in or about A.D. 2000," and on the other the following inscription was placed in the cyst:—"Greeting: In this, A.D. 1871. We, Lace Manufacturers of Nottingham, whose productions are placed under this memorial stone, to interest the future antiquary, are paying to our workmen an average of 4s. per week each man; a new Lever's twist-machine cost us about 600l.; the price of cotton yarn ranges from 1s. 6d. (No. 50) to 20s. (No. 150) per lb.; the price of silk, prepared from 16s. to 50s. per lb. There are about 4,000 machines engaged full time,—that is, twelve to twenty hours per day,—in the production of laces and edgings of various kinds, and plain and fancy nets."

LICHFIELD.

THE chapel of the Hospital of St. John Baptist, in this city, which has been undergoing restoration, has been re-opened. Of the early history of this priory or hospital, much is involved in obscurity, though there is little doubt that it was founded in the reign of King Henry III. It was a priory of friars in 1334, and very ill conducted. During the episcopate of Bishop Smyth, the house was refounded, and its constitution altered. Within the three first years of his consecration he rebuilt the hospital, and established such rules and ordinances as were adapted to the new and extended plan of the institution. The statutes are dated 1495. The chapel, which is chiefly of the Early Decorated period, originally consisted of a nave only, 64 ft. long, by 18 ft. in width, to which the Rev. Chancellor Law (then the master of the hospital), in the year 1829, made the addition of a north aisle, with a gallery. To effect that alteration, the whole of the north wall, with the exception of a few feet at the eastern end, was taken down, and that part of this wall which was rebuilt, westward of the aisle, was of considerably reduced thickness.

In the work of restoration now accomplished, it was found necessary to strengthen the walls, north as well as south, the former being increased to its original thickness. The gallery was removed, and an arcade of stone, in three bays, carrying the wall above, and separating the aisle from the nave, has been constructed. An organ gallery at the western end was also taken down.

The south wall which possesses the only architectural features of the ancient structure, was by far the most dilapidated. Part of this wall has been entirely rebuilt; much of the remaining portion has been recoated with stone both internally and externally; massive buttresses have been added; some of the openings have been reconstructed, and others have undergone effectual repair. The west wall internally has been cased with stone.

The roof which was in so extremely dilapidated a condition as to render it dangerously insecure, has been replaced by one (of the pitch it originally had) of open timbers, wrought and stained, covered with Broseley tiles, and plastered between the rafters.

The pulpit, which is given chiefly by the ladies of the congregation through the instrumentality of Mrs. Webster, is built of Caen stones with polished marble shafts to the columns, the niches. The carving of this, as of other parts of the church, has been executed by Mr. Samuel Wood, of Lichfield, and the wood-carving by Mr. Banister. A new organ by Nicholson & Son, of Walsall, has been placed in the chapel. The work has been carried out by Messrs. Beckett & Thorneley; and Mr. W. H. Crompton of Lichfield, was the architect.

NEW PLASTIC MATERIAL.

MR. JAMES CHRISTIE, sculptor, of Broughton Ferry, by Dundee, after many experiments, has succeeded in producing a new plastic material which will facilitate and improve the production of original designs applicable to a variety of artistic purposes. A vase, an ornamented pane, a figure-piece, &c., of Mr. Christie's workmanship in this new material are to be seen in the London International Exhibition. It has been the practice among sculptors to embody their conceptions in clay, and a very good material for the purpose it is, in some respects; but it is not without its defects, and those frequently of very vexatious kind. If the model in clay is allowed to dry, it contracts out of form; and if it has "supports," it crumbles to pieces. The model must therefore be cast in plaster before it has had time to dry. This process, being laborious and disagreeable, is often entrusted to other less appreciative hands than the artist's own; and the chagrined sculptor stands aghast when he sees his work defaced and changed, owing to the unsparing use which the operator in plaster has made of his scraping tool, his sand-paper, and his Dutch ruche. In Mr. Christie's new plastic every touch consolidates as the sculptor leaves it, and the model gradually becomes hard as stone, and that without the slightest twist or contraction.

NEW SAW MILLS, LIVERPOOL.

THESE works, lately completed for the Britania Timber Company, at a cost of 40,000l. and now in working order, are of an extensive character. The site is opposite the North Carriers Dock, and is two acres in area; eight millions of bricks were used in construction; the masonry carpentry, iron work in girders, columns, roofs, and fireproof construction, are of a substantial character. Style of architecture, Italian. The general plans and working details were prepared by Mr. W. H. Stead, architect, and the contracts were carried out by Messrs. Burrows & Sons, contractors, Liverpool. The building erected comprises general offices, with a frontage of 138 ft. by 45 ft. deep, having a bold transverse stone archway and dental cornice, supported upon strong iron pillars, having as the centre "Britannia," in bas relief. The proper is 160 ft. by 63 ft., with engine-house, boiler-house and chimney, extensive warehouse, hoists, and bending department, 164 ft. by 32 ft., including workmen's dining-hall and gate lodges, and for the effectual working of these premises four lines of overhead steam travelling cranes are erected.

ARCHITECT FOR THE SHEFFIELD SCHOOL BOARD.

At a meeting of the Sheffield School Board on the 8th inst., the Board proceeded to the election of an architect and surveyor, at a salary of 100l. per annum and 5 per cent. on the works done. There were fifteen candidates.—Mr. C. J. Innocent, Mr. T. J. Flockton, Mr. D. Webster, Mr. H. D. Lomas, Mr. J. B. Mitford, Mr. G. Pocock, Mr. W. J. Marsden, Mr. J. Fawcett, Mr. Scargill, Mr. T. Hind, Mr. E. Swann, and Mr. J. Hall, all of Sheffield; Mr. Shaw, Leeds; Mr. E. M'Dougall, Rochdale; Mr. E. M. Gibbs, London. In the first vote Mr. Innocent received 7, Mr. Flockton 5, Webster 1, and Mr. Lomas 1 vote. In the second voting Mr. Innocent received 9, and Mr. Flockton 5 votes.

Mr. Allott proposed and Mr. Fairburn seconded the appointment of Mr. Innocent to the office.

A discussion arose as to the precise duties to be included in the salary offered, but eventually it was decided to make the appointment under the terms set forth in the advertisement. The motion appointing Mr. Innocent was unanimously adopted.

APPLICATION OF CONCRETE.

MR. J. W. BUTLER, Willesden, has patented a mode of "applying concrete." This consists in the application and use to structures of moulded artificial stone or concrete in the form of hollow blocks of cylindrical or other configuration, or of segments thereof. The moulding may be effected in wooden or metal moulds, the core being made in segments temporarily held together whilst the concrete is being moulded, and the core is withdrawn from the mould in separate parts or segments. When a number of moulded concrete cylinders are required to be placed one on another, as for example in cofferdams, it is proposed to secure them at their points of junction by means of fish-pieces bolted or otherwise held in position. A hollow metal shoe made in segments is to be fitted to the bottom cylinder to facilitate the sinking of the same into the ground. This reads to us like a step away from the right application of concrete.

THE ARCHITECTURAL CONFERENCE.

ONE of the gentlemen who read papers, Mr. Rolfe, is not pleased that we used the title given to his paper in the official programme, because, he says, what he was requested to write upon was, "the Bearing of the Pious Judgment on Symbolism and Art," and that before commencing the paper he mentioned the error that had been made. Omitting what we are forced to call the nonsense (for example, the assertion that we were "sneering" at "doctrinal truth" when we recorded good-naturedly that the meeting did not seem to regard the precise length of the communion-table so seriously as Mr. Rolfe did), we will let him speak on that subject for himself:—

"The line of my argument was this. By the adgment in question, an ancient faith of the Church (dating back even to Apostolic times) was contravened by an attack on its art and symbolic accessory, and that it was possible to compensate in some way for this blow on ecclesiastical art by a more symbolic treatment of other art-work which would aid in the sustentation of the ancient faith alluded to. This you must surely admit, as did our chairman, Mr. Beresford Hope, to be no digression from the subject. On this point I then remarked and illustrated by example, that in the very dimensions of an ancient altar symbolism could be traced, and advocated therefore that we architects should infuse a similar symbolic spirit into the minutest detail of all sanctuary work, even in the dimensions of the altar itself. I did recommend my brother architects in no case to carry out an altar less than 7 ft. 5 in. long (both symbolical numerals), and when possible to exceed this length to let the mystic number 5, so closely associated with altar ritual, determine in the inches the exact length of the slab. This, I say, is a somewhat different version of the matter to the statement of your correspondent. The Church has now in this nineteenth century the great need as ever of that peculiar aid which the architect alone, of all laymen, can lend her; for in all previous periods of Church history an architect in his work has been the means of bearing testimony to, or of showing his disregard for, the truths of Catholicism; and those professional men nowadays who despise and ridicule that pure symbolic spirit which actuated our forefathers in their church-work, and probably substitute for it that *à la* d. money-grubbing spirit of the age, are alike *unfit* and *unworthy* of being engaged on any modern church-work whatever."

With regard to the Conference in general, I will also add a word. It has decidedly been almost, if not quite, a failure. What is the utility of bringing a body of professional men together in this way from different parts of the kingdom, if they simply read to each other, and talk, and *literally agree to nothing important among themselves*? During the four long meetings which I had the pleasure of attending, but one formal resolution was submitted to the Con-

ference, and about that there was some demur. I see also from the accounts of the later proceedings that little else was then done beyond this reading and talking. Indeed, not one important matter was so definitely settled by vote of a majority as to sanction its being in after years alluded to as the decision of the general conference of architects in 1871. What, then, I repeat, has been the utility of this Conference? The president, at the opening meeting, gave it clearly to be understood in one of his remarks that some resolutions would be submitted to us, but as to their nature, or when they were to be brought forward, we were left quite in the dark. At the afternoon sitting on the Tuesday I rose to call the chairman's attention to this fact, and suggested that whatever resolutions were to be brought before us should be publicly announced some time before they were actually moved; and I remarked also that it would be desirable to have them posted up on the entrance-doors of the Institute, or in some other equally conspicuous place. The chairman of that sitting thereupon said that he believed the president had no idea of carrying out his intention with regard to the said resolutions, or used words to this effect. I cannot repeat his exact words. So that actually one excellent chairman was reversing, on a most important subject, the remark of the excellent chairman who preceded him. Many of the papers were only read in part. As one member remarked, a screw pressure seemed to be put upon everything read or said. In fact, things seemed to be quite muddled, and I am sure many members will entirely agree with me in this remark."

CLAPTON C. ROLFE.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne. — Nothing gives the least hope of a speedy settlement of the great strike, and the determined stand of both parties unfortunately augurs a prolonged dispute. The principal works, such as Messrs. Hawks, Crawshaw, & Company's, seem to have lost their natural activity. The pattern shop contained two boys when visited, while the two large foundries had only one man between them. The boiler yard was totally deserted, and other parts of the factory were standing idle. Mr. George Crawshaw, the head of the firm, had given instructions that no man who had allied himself with the strike should be taken on again.

West Hartlepool. — Summonses issued against a number of the carpenters in the employ of Messrs. Denton, Gray, & Co., shipbuilders, for neglecting to fulfil their several contracts, whereby the complainants allege that they have sustained damage to the extent of 20l., were made returnable at the West Hartlepool Petty Sessions, but as none of the defendants appeared warrants were issued for their apprehension.

Lincoln. — The stonemasons and bricklayers of Lincoln have turned out on strike, the masters having refused to accede to their demand for an increase of 1s. per week in the rate of wages, and the reduction by two and a half of the hours of labour on Saturday.

Rotherham. — The painters' strike is now at an end; the masters have refused to grant the further advance of 3d. per hour, but the men resume work on condition that the advance shall be granted on and after June 1st, 1872.

Merthyr. — In South Wales nearly 20,000 men have struck work. These are principally the sea-coal colliers from the Ferndale and other districts of the Rhondda, and also a considerable number from the Aberdare Valley. Large meetings are held daily. The enginemasters and firemen gave notice, and a disturbance broke out at Treanmaw, an extra police force being sent for to quell it. Sad doings; bringing injury and loss to all.

COMPETITIONS.

Charlton (Dover) Cemetery. — In answer to the advertisement inserted in our columns a short time ago, inviting designs for the erection of buildings for the proposed new cemetery for Charlton parish, forty-six sets of designs were sent in to the Board. After consideration, the Board has awarded the first premium, of 25 guineas, to Messrs. J. H. Brown & J. B. Pearce, of Norwich; and the second premium, of 10 guineas, to Messrs. Hayward & King, of London.

Proposed Covered Market for Kendal. — The corporation of this town having, a short time

ago, advertised for plans and estimates for fish and poultry markets, and three designs being sent, they have awarded first premium, of 5l. (1), to Mr. Eli Cox, second to Mr. Shaw, and third to Messrs. Brade & Smale.

Salford Union Workhouse. — The competition for the extension of the Salford Union Workhouse, by the erection of new buildings to accommodate 500 children, has resulted in the selection of the designs by Messrs. Medland & Henry Taylor, of Manchester, architects.

West Bromwich Town-hall and Library. — The first premium has been awarded to Messrs. Alexander & Henman.

Drawings for the Municipal Buildings, Leicester. — Some prospect appears of progress being made towards Leicester obtaining the much wanted, and long talked of, municipal buildings; the competitive architectural drawings being now placed in the Corn Exchange. They will be inspected by the members of the Corporation on Monday; and during the remaining days of the week the public are to be admitted to view them. An architect has been appointed to report upon the most suitable drawings for the object in view.

BUILDERS' ACTIONS.

Kimberley v. Dick and W. White. — In this case, heard in the Rolls Court, Mr. Kimberley, contractor, proceeded against Mr. Dick, for whom he had built a mansion in Wicklow, and the architect, Mr. W. White, for a very large amount of extras beyond the contract, which was made under peculiar and curious circumstances. We have reports of the proceedings before us, but as the decision had not reached us at the time of writing this, we think it better to defer comment, in justice to both sides.

NEWBURY DISTRICT FIELD CLUB.

THE antiquaries who form this club have made their first excursion this season. They drove a distance of nearly fifty miles, in order to view several spots of antiquarian interest in the district of Lambourne and White Horse-hill, starting from Speenhamland about 9 a.m., and not returning until a little past midnight. Notwithstanding the drawbacks experienced from the weather, and the fatigue produced by a cross-country ride, more than forty miles, with an occasional run up some steep hill, or a ramble over the slippery downs, all who composed the party seemed well pleased with their day's engagements. The party, including several ladies, left the Pelican yard in brakes, and they visited Lambourne, where they afterwards lunched, and then went to the Blowing Stone or Alford's Bogle, the Ridgeway, White Horse-hill, Uffington Castle, Wayland Smith's cave, &c. They dined at Ashdown Park, where a paper by Mr. Thomas Hughes, M.P., on "Berkshire in A.D. 871" was read. Alford's camp was visited, and the party then returned homewards.

BUILDERS' FOREMEN AND CLERKS OF WORKS PROVIDENT INSTITUTION.

THE annual dinner of this institution was held on Thursday evening, the 8th, at the London Tavern, under the chairmanship of Mr. E. T'Anson, vice-president of the Royal Institute of British Architects. Among those present were Messrs. J. Taylor, Cubitt, Jackson, Shaw, Fry, Hall, Trollope, C. and J. T'Anson, Townend, White, Brass, Dunnage, Fraser (treasurer), &c.

The institution has been in existence for twenty-nine years. There are seventeen pensioners upon the funds, among whom 205l. were distributed last year. A sum of 56l. was also given in temporary assistance.

The Chairman, in proposing the toast "Prosperity to the Institution," remarked that he had often observed with satisfaction the thoughtfulness of mind and carefulness of hand evinced by those engaged in the building trade, and when it was considered how much depended upon the ability of those to whom was entrusted the working out of the details of designs upon which so much depended, it must be admitted that the subject was not unimportant. He had observed with much pleasure the great increase of self-respect and refinement classes in recent years. There had been greater striving after perfection, and no doubt the new Education Act

would greatly facilitate additional progress in that direction.

Mr. George Plunkett responded, and remarked upon the fact that a unity of interests between all branches of the trade, including masters, workers, and professionals, was of the utmost importance to the carrying out of every notable commercial work; and in none was this more markedly shown than in the building operations to which such a great impetus had been given during the past few years.

The toasts of "Architects and Engineers," "The Chairman," "Builders and Contractors," "The Press," were duly proposed and responded to by Mr. Robinson, Mr. Stirling, Mr. Macey, Mr. Bovill, Mr. Graham, and others. The amount of the subscriptions was considerable.

NOTRE DAME, PARIS.

JUNE 7TH, 1871.

AGES have swept o'er thee, thou sacred fane!
And with the tide of time, a mighty wave
Of shadowy forms descending to the grave
Has fill'd these monster-crowned banks of Seine,
Many a stately, many a solemn march
Has pass'd in long procession 'neath thine arch,
While softly sweet the funeral dirges rang,
And blended voices mournful requiem sang.
But, ah! the grief, the heavy gloom, to-day,
All older griefs do mightily outweigh,
When he, who faithful to his latest sigh,
Is borne within those twin grey towers to lie;
Seeking beneath their silent shade for rest,—
A balm of memory, and a saintly guest.

M. Y. F.

BIRMINGHAM CORPORATION COMPETITION.

SIR,—“C. W. C.” informs you that the Town Council has been summoned for the 13th inst. to decide upon the plans. This is false; and to satisfy you that it is so, I have borrowed, and enclose, the summons containing the business which alone can be transacted at that meeting. The business of the plan is not mentioned.

As I said in my former note, a resolution was, on 23rd May, passed, fixing the 13th of June; but the M.S. of that resolution has been privately altered, in a handwriting not widely unfamiliar to “the local intriguer,” and the business is thus postponed.

It is now fixed for a meeting to be held on the 20th of June, after the decision on the sewage question, which is not unlikely to last a month or six weeks. FAIR PLAY.

THE DURABILITY OF WROUGHT AND CAST IRON.

SIR,—For some few years past it has become general with scientific men, such as architects, engineers, builders, and others, to use most commonly wrought-iron girders or beams to sustain weights of all magnitudes, exposed or otherwise to the changes of atmosphere,—also in damp situations. Formerly, before the process of rolling became so well known, cast iron was made use of in all cases for the above-mentioned articles. It is my opinion that in perhaps less than fifty years the major part of wrought-iron girders used to form and support bridges, or to exposure, will become deteriorated in the footings through oxidation,—reduced in size, consequently weakened. As a proof of the wasteful properties of wrought-iron, examine iron railing of long standing or the inclosure of old monuments. In most cases it will be found that the upright bars or posts are quite decayed at bottom, and some persons have said it arises from the want of paint. True, an outside coat of paint may be a preservative for a short period, but will not prevent oxidation, as paint and uncommonly comes off the iron in scales or blisters; and, even if paint adhered to iron, there is not that durability in wrought as in cast iron, because in the process of converting cast iron into the wrought, by means of puddling, squeezing, hammering, rolling, &c., the iron loses its preserving properties in the shape of dross or slag, which, if allowed to remain in the body of the metal, would act as its preservative; but by losing the properties alluded to reduces its bulk, and hence, with the expense in conversion, makes wrought iron more expensive in the bar than pig iron. By the same rule, steel fetches a much higher price than wrought iron. In melting iron ore, a flux is used for the purpose of causing the dross or slag to become fluid and more easily separated from the metal. So long as cast iron is kept in a fluid state a dross or dross continues to float on its surface, even if frequently skimmed.

Without a doubt wrought iron is commonly used for the purposes before mentioned in consequence of its making a lighter article to sustain the same weight; but for durability there is no comparison with the original or cast iron. It is well known that the main ingredients composing all paints are minerals, such as lead, ochre, &c., and the dross from iron is of the same nature. It is not generally known that cast iron and glass are two of the most elastic hard bodies in use. H.

Books Received.

The Dark Blue is taking better “form.” The June number is quite up to the average of similar publications.—*The People's Magazine* contains an *apropos* paper on “Handel Festivals and his Music.” The writer says,—

“It may not be well known that in the Middlesex Hospital there is a ward called ‘Handel's Ward.’ To this the great musician gave 1,600*l.* his usual generous aid; and although that very meritorious institution has, from the severity of the times, been compelled to close some of its wards, yet ‘Handel's Ward’ remains open, with-

standing it is, as one devoted more especially to cases of cancer, unusually expensive.” Again,—“It would also be a somewhat astounding, as well as a curious computation, if all the sums of money raised by performances of the ‘Messiah’ could be estimated in one total. If to this the amount for the sale of the oratorio, complete or in detached portions, and the various arrangements, &c., of its songs and choruses, in all forms, could be added, it would probably be found that no single work of human imagination ever drew so largely upon the purse of society.”

The current number of the “Art Journal Catalogue of the International Exhibition” includes illustrations of several of the pieces of furniture reviewed in our last issue.—In the *Leisure Hour* the editor continues his “Impressions of America and its People,” and Mr. John Tims his interesting “Autobiography.”—Mr. Hardwicke has published, as usual, his “House of Commons,” “Peerage,” “Baronetage,” and “Knights,” each for a shilling,—cheap and useful.—“Hoppos's Measurer.” Edited by William Richardson. London: Warne & Co. This is an enlarged and revised edition of the excellent old Hoppos.—“Tables for computing the Contents of Earthwork in the Cuttings and Embankments of Railways.” By William Macgregor. London: Spon. These tables seem to be simple and expeditious, and the arrangement of them convenient, so that the depths can be taken to the tenth of a foot.—“The London Saturday Half-holiday Guide: The Free Exhibitions of London.” A cheap guide, containing a good few particulars as to the British Museum, South Kensington Museum, National Gallery, Portrait Gallery, and other free museums and galleries; as well as some notes as to the International Exhibition and Albert Hall, Westminster Palace and Abbey, and St. Paul's, Crystal Palace, &c.

Miscellaneous.

Lecture on Egypt, at Stafford House.—Professor Owen has delivered a lecture on Egypt, in aid of the funds of the Ladies' Association for the Social and Religious Improvement of the Syrian Females. Stafford House had been kindly placed at the disposal of the association for the purpose by the Duke of Sutherland. The lecture was delivered in the central hall of the mansion, the learned professor standing at the top of the first flight of steps, and the audience, which was numerous, being seated in the hall, on the staircase, and in the gallery in front of the lecturer. The association maintains thirteen schools at Beyrout, four in Damascus, and six at Lebanon, which are attended by a total of 1,590 scholars, and employ the services of 41 teachers. The Ellesmere Memorial School, at Hasbaya, Mount Hermon, has just been completed. A site has been offered in the street which is called “Straight,” in Damascus, where the lease of the present school is about to expire. After the lecture the company paid a visit to the picture-gallery, and had the opportunity of examining a mummy which had lately arrived, and from which the bandages, placed round it 2,700 years since, had not yet been removed.

Northamptonshire and Leicestershire Architectural Societies' Meeting.—A general and united meeting of the Architectural Society of the Archdeaconry of Northampton and Leicestershire Architectural and Archaeological Society was held on Tuesday and Wednesday in last week at Uppingham, under the presidency of the Rev. Lord Alwyne Compton, rector of Castle Ashby. The meeting was more than ordinarily well attended, and was one of the most successful the societies had ever held. The little town of Uppingham heartily welcomed the societies, and the inhabitants showed their interest in their work by a good attendance at the Museum and the public meetings in the large school-room. The inaugural proceeding was a public meeting in the large school-room. There was a large audience, including the boys of the school. The party had excursions to Ayton, Preston, Lyddington, and Stoke Dry, after which a public meeting was held in Uppingham; and next day Seaton, Harrington, Laxton, Blatherwycke, Bulwick, Deane, Kirby Hall, and Rookingham were visited. Papers were read, and remarks made on various subjects of interest.

The Conversazione of the Institute of Architects.—The annual conversazione for 1871 will be held at the rooms of the Institute, on Thursday, the 29th of June.

Waste Lands and Surplus Labour.—The fourth of the series of meetings given under the auspices of the Labour Representation League, at the rooms of the Century Club, 6, Pall-mall-place, for the discussion by working men, members of Parliament, and other gentlemen, of important social and political questions, has been held; Mr. Thomas Brassey, M.P., in the chair. The subject for consideration was “Waste Land and Surplus Labour,” and the discussion was opened by Mr. George Howell, who was followed by Messrs. George Potter, E. M. Latham (president of the Labour Representation League), Frederick Hill, Lloyd Jones, Montague Chambers, M.P., Frederick Young, Weston, Thomas Webster, Q.C., Captain Maxse, R.N., and others. The general feeling expressed was in favour of legislative action for the purpose of employing surplus labour on the idle lands. The view taken in course of the discussion was that there are in the country upwards of 31,000,000 acres of unprofitable land, of which at least one-third might be profitably used for the growth of human food, by employing the surplus labour thereon, and the present annual cost of maintaining which, it was declared, is more than 10,000,000*l.* sterling.

Croydon Irrigation and Farming Company (Limited).—The directors report that, notwithstanding the difficulties they have had to contend with during the past year, in consequence of receiving over from the Croydon Local Board of Health the lands at Beddington in a very unsatisfactory condition, also, in consequence of the late period of the year when they were enabled to take possession and the personal management of the undertaking, the business has been satisfactory. The profits of the year being 608*l.* 6*s.* 6*d.*, out of this sum the directors recommend the declaration of a dividend at the rate of 15 per cent. per annum, free of income-tax. The directors further report that, in consequence of being about to acquire an increased area of land for their operations, and also to manufacture a portable manure, from the solid sewage, they have decided to issue the remaining shares, which will be offered in the first instance to existing shareholders, *pro rata*.

The Conversazione of the Institution of Civil Engineers.—The conversazione given by the president of the Institution, Mr. C. B. Vignoles, F.R.S., on Tuesday, in last week, was attended by more than 800 engineers and scientific men. The visitors were received by Mr. Vignoles and the council of the Institution in the library, which was converted into a picture-gallery. On the present occasion, selection was made of such paintings and drawings only as had direct reference to engineering subjects. The pictures were a success, but the same can hardly be said of the models and machines which were collected in the lecture-theatre of the Institution. The International Exhibition had absorbed almost every scientific novelty brought out since the last conversazione. But although the exhibition did not reach in this respect the standard of previous years, it was both interesting and satisfactory. Some of the exhibits were duplicates of those in the International Exhibition.

Pateley Bridge, Yorkshire.—Last week an incline railway was commenced, which will connect the North-Eastern Railway at Pateley Bridge with the flag and landing quays on the top of the hill on the north side, and about 1,200 yards distance from the railway. These quays have long been noted for the large sizes of the landings which can be obtained, as well as for the hardness of the stone, but being at an elevation of 600 ft. above the railway, the quays have only been worked to a limited extent. Mr. Hodgson, engineer to the North-Eastern Railway, has prepared plans for an incline, getting over the difficulty of such a steep gradient. The whole range of rock on the top will be opened out by Messrs. J. & G. Metcalfe, the owners, which, when completed, it is expected will give employment to over 200 men, and be a benefit to the town and district.

The Bath Abbey Church Restorations.—The committee state that the progress has been so material, that the completion of this useful, interesting, and religious work is now clearly in view. The restoration of the choir, the apses for warming and lighting the whole of the church, and the entire re-seating, are not all that remains to be done. For these works with other contingencies, the sum of 5,000*l.* will be required.

Warnings and Examples to Workmen's Clubs.—In the form of a tractate, published for the Working Men's Club and Institute Union, 50, Strand, Mr. Hodgson Pratt gives some useful information, under the title of "Notes of Tour among Clubs; or, Warnings and Examples, including a Notice of the Trades Hall at Liverpool and the 'Model' Club at Wilsbeck." Mr. Pratt found the admission of idle and noisy apprentice lads, attracted by bagatelle or other games, a great evil in workmen's clubs, and a cause of failure. On the subject of pecuniary and permanent success, he says that workmen have only to combine in order to render such places of resort as profitable in a pecuniary sense as they will be in a moral, social, and intellectual point of view. To do that, however, they must make a "business" of such institutions, and supply their members with refreshments for the body as well as for the mind, and in many cases with lodging accommodation also for the benefit of members travelling in search of work. This is the true way to supplant the public-house and terminate the enormous miseries they produce. The workmen will at the same time put a large portion of the publicans' profits into their own pockets for the benefit of their families. The Bill now passing through Parliament will overcome the great obstacle which has hitherto prevented the trade societies on establishing their own halls, institutes, and reading-rooms for workmen out of employ, because it will enable them, if they register, to hold property."

Health and the Spectroscope.—We learn from the *Quarterly Journal of Science* of a most ingenious use of the spectrum analysis, which will doubtless suggest the usefulness of extending its application to the elucidation of many queries, where it has heretofore not been applied to. The case referred to is substantially as follows:—The water used by the inhabitants of a crowded court, amongst whom several cases of typhoid fever had appeared, was drawn from a rather shallow well, and was highly charged with various unoxidized compounds of nitrogen. It was suspected that, from some defect, the contents of a public urinal obtained entrance to the well. The fact that the well-water contained seven times as much common salt as the rural water of the vicinity was some confirmation of the suspicion. Professor Church obtained positive proof by the following method:—He produced two grammes of a lithium salt into the fluid, and, two hours later, was enabled readily to detect with the spectroscope the presence of him in a litre of the well-water, which by previous examination had shown no trace of this substance.

A Scott Statue for New York.—The Scottish society of New York having recently voted to place a statue of Sir Walter Scott in Central Park of that city, they have arranged with Mr. John Steell, R.S.A., of Edinburgh, for a copy, in bronze, of the well-known marble statue in the Scott Monument, Prince's-street, Edinburgh. The statue will, it is expected, occupy an important site in the park at New York, and will be placed on a pedestal of Peterhead granite, designed by the sculptor, and sent from this country. Bronze statues of Shakespeare, Schiller, Goethe, Humboldt, and others, eminent artists, and cast in Berlin, Munich, Vienna, Rome, and other Continental cities, also adorn New York's chief pleasure-ground. The statues as to the Scott statue were arranged through the Atlantic cable.

Proposed New Drinking Fountain for Brighton.—The Works Committee of the Brighton Council have considered the design and plan of the drinking-fountain proposed to be erected, by Mr. Chatfield, in the centre of the open space in front of St. Peter's Church, and we are instructed the surveyor to construct a skeleton of the proposed fountain on the site. A skeleton model has been erected nearly opposite the Gloucester Hotel. It is an obelisk shape, about 20 ft. in height, and will be surmounted by a triple-lamp; the base being two tiers of a circle, forming, we believe, two reservoirs from which cattle can be watered.

New Street from Oxford-street to Charing-cross.—At the last meeting of the Metropolitan Board of Works, the order of a Bill of the 26th May last as to one-half of the estimated net cost of the formation of the new street, St. Pancras, and Charing-cross Railway Company, and of a new street from Tottenham-road to Charing-cross, was agreed to.

The New Orphan Home at Cambridge. The chief stone of this benevolent institution has been laid. The proposed building will stand in the Fitzwilliam-road, Brooklands. It is intended to accommodate only twelve children. On the ground-floor are the day-room, the kitchen, washhouse, pantry, store-closet, &c., and on the first-floor are six bedrooms. The size of the building is 42 ft. by 19 ft. The walls of it are to be of light-coloured brick, varied by the interposition of courses of red brick. The heads and sills of the windows, as well as the plinth course, are to be of Box stone. The mullions and framing of the windows will be of wood, stained and varnished. The design is of a plain character, suitable to its purpose; but every consideration will be given to ventilation and convenience. The architect is Mr. Talbot Bury, of London; the builder is Mr. Laughton, of Cambridge.

Society of Biblical Archaeology.—At the last meeting of this society, Dr. Samuel Birch in the chair, Mr. George Smith, of the British Museum, read a Paper on the "Early History of Babylonia, commencing with a *resumé* of facts already ascertained by the labours of Sir Henry Rawlinson and others. He proceeded to describe *seriatim* the principal localities where excavations had been undertaken, and to identify them with many of the cities mentioned in the older Books of the Pentateuch. Mr. J. W. Bosanquet read a Paper "On the Date of the Nativity," considering in detail the facts of that occurrence, and of the government of Cyrenius and the Census of Caesar, as recorded in the Gospel, and by Josephus. The various eclipses and astronomical data incidentally connected with these events, were enumerated, and the author, reasoning from all together, was disposed to believe that the birth of Our Lord took place either in the autumn of the year 3, or the spring of 2, before the Christian Era.

South London Workmen's College.—From a printed statement for 1868 and 1869, as to the college opened at the beginning of 1868, for the purpose of trying how far a system of superior education offered to the working classes might be made self-supporting, it appears that it has been found possible to obtain competent teachers for 83 per cent. of the class fees fixed at a rate within the means of working men,—3s. 6d. per term of three months. A night-school for less advanced students is also taught for 80 per cent. of the school fee, which is 6d. per week; but in this case there are no entrance or term fees. If the college has become self-supporting in three years, with the exception of rent, the principal, Professor Huxley, proposes to make an appeal for the purchase or erection of a suitable building.

The Park-lane Improvement.—People are naturally complaining that after securing a fine opening from Piccadilly, through Hamilton-place to Park-lane, some authority has canceled or allowed to be erected, immediately facing Hamilton-place, a horse-drogh and drinking-fountain. The object gained by opening Hamilton-place is thus nullified, and it is surprising that the authorities should have allowed it to be placed in so crowded a thoroughfare. That it must be removed to some less inconvenient site is evident. Its present site is no place for pulling up horses and still further crowding the traffic and undoing all that is done. It is astonishing how little brain-work is brought to bear upon our "improvements."

Hard and Soft.—In the *Journal of the Franklin Institute* for March is an interesting account of Mr. H. C. Tilghman's process for cutting hard bodies with substances softer than themselves. A jet of quartz sand, for example, thrown against a block of corundum soon pierces a hole. Sand driven by a blast of air of the pressure of about 4 in. of water rapidly grinds glass; and at a meeting of the Franklin Institute numerous experiments were made showing several very beautiful and useful applications of this process. Amongst other things it has been used for engraving on glass, photographic pictures formed on films of gelatine with the bi-chromate of potash.

The Law Courts Site.—The *Morning Post* says that the select committee to whom the Bill for acquiring additional land for the site of the new Law Courts was referred have resolved, without hearing counsel for any of the parties interested, to refer the Bill back to a committee of the whole House.

The Prince Consort's Prize; Society of Arts.—The Prince Consort's prize of twenty-five guineas has been awarded to Thomas Dawe, aged 20, Devonport Mechanics' Institution, clerk, who has obtained the following first-class certificates:—

1868. Arithmetic, first-class certificate; navigation and nautical astronomy, first-class certificate, with first prize; mensuration, first-class certificate. 1869. Book-keeping, first-class certificate; algebra, first-class certificate. 1870. Metric system, first-class certificate, with first prize; domestic economy, first-class certificate, with first prize. 1871. Logic, first-class certificate, with first prize; English History, first-class certificate, with first prize; political economy, first-class certificate, with second prize; geography, first-class certificate.

Telegraphic Progress.—The Postal Telegraph Department is prepared, it is said, to lay on private wires between a place of business or private establishment and a postal telegraph office on reasonable terms. A rate of 7l. per mile per annum, over house or underground, or 5l. along a road, will rent a wire; 25l. will purchase a printing telegraph and battery; and 7l. 10s. per annum will cover the cost of the maintenance and repair of the apparatus, and even the supply of paper-ribbon on which the messages will be printed: 5l. 5s. will pay the clerks' services for issue, and a sum of 3d. for each message within the free limit.

The Visit of the British Association to Edinburgh.—A circular has been issued with reference to the visit of the British Association to Edinburgh in August next. The president-elect is Sir William Thomson, professor of Natural Philosophy in the University of Glasgow. The first meeting of the general committee will be held at one o'clock on Wednesday, August 2nd, and in the evening, at eight o'clock, the first general meeting of the Association will be held, when Professor Huxley will resign the chair, and Professor Sir William Thomson will assume the presidency, and deliver an address.

The Northern Architectural Students Society.—The first out-door meeting of the present summer session was held on Saturday afternoon last, the 10th inst. Permission having been granted by Mr. John Gibson, the architect, the members visited the new National and Provincial Bank in Newcastle-on-Tyne, now approaching completion. The members were conducted over the works by Mr. Glover, the clerk of the works, who took every pains to explain the construction and purpose of all parts of the building.

Birmingham and the "Irrigation System."—Birmingham has a "sewage difficulty," and the public works committee of the town council has recently been making inquiries respecting the irrigation system. The result is that the committee recommends that the system of disposing of the sewage by irrigation, already proposed, shall be adhered to. It is also recommended that the council shall purchase about 2,000 acres of land for this purpose, rather, it would seem, as an experiment on a large scale than as a final quantity.

The Manchester Abattoirs.—The foundation-stone of the new abattoirs in Water-street, Manchester, has been laid by the mayor. The contract for putting in the drainage and foundations has been executed by Mr. William Southern. Messrs. Bates & Co., of Droylsden, hold the contract for the erection of the superstructure. The North of England Iron Company are the contractors for the erection of the carcass market. The machinery will be supplied by Mr. Meiklejohn, of Dalkeith. Mr. Darbyshire, of Manchester, is the architect.

New Infirmary Wards at St. Luke's.—The new wards for the aged and infirm poor of the Holborn Union in the grounds adjoining old St. Luke's workhouse have been opened. The wards allow a large cubic space to each inmate, are painted, lighted by large bay windows, and have ventilating arrangements. In order that the aged and infirm poor may be properly warded without climbing upstairs, a lift has been fitted in a shaft, and those arriving or going out are conveyed from floor to floor in it.

New Masonic Hall in Londonderry.—The Masonic Hall in Magazine-street, Londonderry, built at his own expense by the late Mr. Alexander Grant, after having for a time been in other hands, has recently become the property of the Masonic body in Derry, and has undergone thorough repair, having now been decorated in a style of ornamentation unsurpassed in any similar edifice in Ireland.

Metropolitan Police Returns.—The usual annual criminal returns of the Metropolitan Police have been issued in a printed form. It is notable how comparatively close the numbers of those taken into custody, convicted, and acquitted run in successive years. Thus, in 1869, 72,951 were taken into custody, and the number in 1870 was 71,269. The number acquitted in 1869 was 779, and the number in 1870 was 780. The number convicted and sentenced in 1869 was 3,291, and in 1870, 2,855,—of course over and above those summarily disposed of or held to bail, the number of whom in 1869 was 40,408, and in 1870, 43,338. Of those tried and convicted in 1870, 2,238 were males and 617 females. Of the whole, 1,579 males and 424 females could read only or read and write imperfectly; 493 males and 186 females could neither read nor write; 164 males and 6 females could read and write well; and 2 males and 1 female had superior instruction.

Old Bond-street Gallery.—The summer exhibition here consists of 531 pictures and drawings. Without being able to give any great praise to the collection as a whole, we may point to works by Charles Jones (22), H. T. Dawson, Jun. (35), E. J. Westbrooke (36), Carle Barerle (41), H. Dawson (45), John Morgan (67 and 223), Jules Rainart (86), E. G. Sentzenich (169), Lionel Smythe (215), Burfield (530), and a few others as deserving a visit.

Wire Tramways.—We are informed that the whole of the capital of the Wire Tramway Company has been privately subscribed, the object being to carry on and extend the system of wire-rope transport, which is now making progress. Orders have been recently received from the Government for lines to carry gunpowder at Purfleet and salt in the Panjamb. It is in operation in several mines, at home and abroad.

School of Art for Lewes.—The subscriptions that have already been promised for a School of Art in Lewes give great hopes that Messrs de Patron and Parsons will succeed in carrying out the object they have in view. The site which is proposed for the school is that now occupied by the fire-escape, at the further end of Albion-street; and it is regarded as a central one, and as convenient as could be desired.

A Door Lock. we hear, has been invented which rings a bell and lights a taper on the instant that any one attempts to pick it; or it may be so arranged as to produce the lights only, should any one let himself in late at night.

The Horticultural Society's Conversation.—The Duke of Buccleuch's conversation will be held in the Conservatory on Tuesday evening, July 4th. It is confined to members and some specially invited guests.

The Town Theatre, Breslau, has been entirely destroyed by fire.

TENDERS

For new warehouse, in Farrington-street. Mr. T. Chatfield Clarke, architect:—

Ennor	£2,878 0 0
Myers & Sons	2,504 0 0
Hoskew	2,695 0 0
Hawtre & Son	2,667 0 0
Brass	2,083 0 0
Cunder	2,618 0 0
Browne & Robinson	2,505 0 0
Merritt & Ashby	2,512 0 0
Colls & Sons	2,341 0 0
Hill, Keddell, & Waldram	2,274 0 0

For Prince of Wales Assembly Rooms, Ramsgate. Quantities by Messrs. Pain & Clark:—

Mathews	£10,638 14 7
Harrison & Son	10,600 0 0
Sollitt	10,290 0 0
Hill, Keddell, & Waldram	9,860 0 0
Kelly	9,249 0 0
Hayward	8,276 0 0

For erection of new Crescent School, Margate, for Mr. John Dentry. Mr. Alfred Drewe, architect. Quantities by Mr. Edward J. Cumber:—

Wagstaff & Son	£7,798 0 0
Parsons & Son	7,800 0 0
Perry & Co	7,610 0 0
Pritchard	7,575 0 0
Wigmore	6,765 0 0
Raton & Chapman	6,335 0 0
Potter	6,299 0 0
Cooke & Greene	6,270 0 0

For the erection of new farmhouse and offices, at Haddenham, for the Right Hon. the Earl of Hardwick. The clerk of works on the estate, Mr. Erant, architect:—
Today

Freeman

For sheds and chimney-shaft, at Stratford, for the Imperial Chemical Company. Mr. F. Allen Edwards, architect:—

Chesnut	£1,270 0 0
Wignour	1,293 0 0
Whitlock	1,186 0 0
Lovely	1,161 0 0
Ebb & Son	1,132 0 0
Williams & Son	1,087 0 0
Aitchison & Walker	1,068 0 0

For the erection of Parochial Schools, at Heigham, Norwich. Mr. Edward Power, architect. Quantities supplied by Mr. Peebles:—

No. 1. Girls & Boys. No. 2. Infants.	
Rutland	£1,739 7 7
Wright	1,085 0 0
Browne & Bailey	1,064 0 0
Hawes	1,064 0 0
Wilkin & Curtis	959 0 0
Nelson	941 15 0
Young	839 10 0

For alterations and additions to a house and shop, No. 30, Church-street, Woolwich, for Mr. James Emptage. Messrs. W. Gosling & Son, architects. Quantities supplied:—

Blackmore & Morley	£393 0 0
Booker	369 0 0
Waterson & Co.	368 0 0
Vickers	355 0 0
Daniel	326 0 0
Jory	295 0 0

For additions to chapel, new schoolroom, &c., Blisworth. Mr. T. Heygate Vernon, architect. Quantities supplied by Messrs. Mann & Saunders:—

Chapel and School. Cottages.	
Shakeshaft	£1,209 0 0
Wheeler	1,198 7 0
Smith, Bros.	1,177 0 0
Adams	1,038 19 8

For alterations and additions to No. 184, Brompton-road, for Messrs. Cox & Yeman. Mr. J. T. Pidditch, architect. Quantities by Mr. T. B. East:—

Thums	£1,860 0 0
Rhodes & Roberts	1,820 0 0
Stimpson	1,797 0 0
Mathews	1,734 15 0
Stephenson	1,659 0 0
Morsman	1,650 0 0
Leggett	1,565 0 0
Lacy & Torkington	1,500 0 0

For sundry alterations at 44 and 46, Kennington-road, for Mr. J. Davis:—

Leueard	£234 10 0
Badcock	304 0 0
Wilcox	299 0 0
Bulford	290 0 0
Raher	277 0 0
Neal	271 10 0
Smith	270 0 0
Jellry & Dickinson	250 0 0
Teal	248 0 0
Francis & Jerrard	241 0 0
Wyatt	230 0 0
Basham, Brothers	229 0 0
Busham	221 0 0
Windows	218 12 0
Pearce	197 0 0
Pitcher (accepted)	194 0 0
Crook & Wall	191 10 0
Rooney, Brothers	181 0 0
Lisson	165 0 0

For the first portion of new farm-buildings, cottages, and farm-houses, on the Grange estate, Epsom, for the Right Hon. Lord Ashburton. Mr. John Cox, architect. Quantities furnished by Mr. Sidney Young:—

Roberts	£13,199 0 0
Palman & Fotheringham	13,199 0 0
Kimberley	11,398 0 0
Longmire & Barge	11,321 4 0
Colls & Son	10,977 0 0
Davis & Co.	10,828 15 11
Brass	10,312 0 0
Cooke & Green	9,920 0 0
Crosley	9,587 0 0
Bull & Son (accepted)	9,303 4 7

For additions to Holmwood, Beckenham, Kent, for the Rev. T. Lloyd Phillips. Mr. John Cox, architect. Quantities furnished by Mr. Sidney Young:—

Harris & Hooker	£1,409 9 11
Burrows & Brooker	1,130 0 0
Gascayne & Son	1,117 0 0
Crosley	968 0 0

For alterations to the Red Lion, York-street, St. James's, for Mr. Richard Goodwin. Mr. William Henry Rawlings, architect:—

Sykes	£768 0 0
Keynolds	760 0 0
Moultrie	746 0 0
Tidman	700 0 0
Wagner	680 0 0
Perkins (accepted)	675 0 0

For the erection of a shop, at 340, Essex-road, Islington, for Dr. Grey. Mr. Kirby, architect:—

Chisford	£185 0 0
Berrisford	164 0 0
Rooney, Brothers	155 0 0
Greeney	150 10 0

For new warehouse, at Bermondsey, for the Directors of the Leather Warehouse Company, Mr. Elkington, architect:—

Henshaw	£1,675 0 0
Corder	1,691 0 0
Browne & Robinson	1,665 0 0
Gammam & Sons	1,527 0 0
Little	1,488 0 0
Coleman (accepted)	1,429 0 0

For alterations and additions to the Cottage, Hallford, for Mr. P. Dunn. Mr. R. L. Curtis, architect:—

Dover, Duwell, & Co. (accepted), £300 0 0

For supplying and laying stoneware and iron pipes, of various sizes, fixing hydrants, &c., for the Dorking Water Works Company. Messrs. Jenkin, Trahan, & Tristcott, engineers:—

Devile & Co	£4,054 11 9
Anderson & Dunmore	3,006 0 0
Aird & Son	3,603 7 8
Smith & Son	3,411 16 0
Painter	3,069 0 0
Mills & Co.	3,008 0 0
Marshall	3,000 0 0
Ford	2,829 6 0
Stevens	2,761 12 5

For the erection of farm-buildings, at Haddenham, the Right Hon. the Earl of Hardwick. The clerk of works architect:—

Feast

For the whole work of the Howden Market-hall Company, Limited. Messrs. M. E. Hadfield & Son, architects:—

Kassell	£1,951 2 6
Levit	1,890 0 0
J. & W. Shaw	1,860 0 0
Alcock	1,745 0 0
Lenells & Son (accepted)	1,734 10 0

For villa residence, Wood-lane, Highgate, N. Mr. J. W. Reed, architect:—

Chalcraft	£1,557 0 0
Heath	1,492 8 0
Garrard	1,425 0 0
Goodman	1,346 0 0
Cooke	1,340 0 0
Weston & Co.	1,259 15 0
Ball	1,175 0 0
Hawkes	1,170 0 0
Robbins & Co.	1,167 0 0
Niblett & Son	1,136 0 0

For erecting Primitive Methodist Chapel, at Chesterton near Newcastle-under-Lyme. Mr. Geo. B. Ford, architect:—

Grosvener	£1,770 0 0
Ellams	1,475 0 0
Bennett	1,470 0 0
Cooke	1,469 0 0
Lea	1,461 0 0
Wood (accepted)	1,390 0 0

For new wing to Boden Hall, Cheshire. Mr. Geo. B. Ford, architect:—

Walworth	£2874 13 0
Dale	815 0 0
Poole (accepted)	760 0 0

For enlarging schools, at Crewe. Mr. Geo. B. Ford, architect:—

Wood	£218 0 0
Elson (accepted)	180 0 0

For pipe-laying for the Epsom Local Board. Labor only, the Board to supply their own pipes:—

Wainwright & Wilson	£1,497 0 0
Dowry	1,190 0 0
Landsbury	1,190 0 0
Holloway	1,067 0 0
Jeffery	1,050 0 0
Blomfield	998 0 0
Flay	918 0 0
Alcock	829 0 0
Patman	788 0 0

For bonded stores under St. Pancras Passenger Station, for the Midland Railway Company. Mr. J. H. Sandet, architect:—

Dover, Duwell, & Co. (accepted), £1,614 18 0

For the erection of Police Station, at Sandwich, Kent, for the Justices of the County of Kent. Mr. Martin Bulman, architect:—

Dover, Duwell, & Co.	£2,500 0 0
Wilson	2,688 0 0
Conesa, Brothers	2,640 0 0
Stiles & Son	2,605 0 0
Woodcock	2,590 0 0
Stiff	2,575 0 0
Harnett	2,544 0 0
Wise	2,533 0 0
Messrs. Denny	2,498 0 0
Johnson & Co.	2,424 0 0
Chamberlain & Ansell	2,393 16 0
Adcock & Hess (accepted)	2,376 0 0

Nos. 68 and 70, Ludgate-hill.—Messrs. Greenwood & Son wish us to say that the amount of their tender was 3,000, not 3,305*l.*, as sent to us and printed.

TO CORRESPONDENTS.

H. S. B. G. G. M. Y. F. T. C. W. H. C. G. C. G. M. B. A. J. & G. M. Mr. Y. T. J. H. G. & Son. T. W. C. H. M. F. A. K. C. A. & H. B. W. R. C. C. G. F. A. R. J. & G. M. F. T. F. J. T. C. L. W. W. J. A. Submitter. C. F. C. T. J. J. A. J. W. C. de M. M. G. R. J. W. E. R. T. F. J. S. K. B. D. W. T. G. H. S. Low Standing of Architects (G. A. wishes us to show, from the building architects are not thought much of in the country, is undesirable, however, to make ex. part with private design).—Mr. A. (question in type) J. F. (shall be put in base the Building Act in Russia (in our next). Jack Plans (unusually postponed).

We are compelled to decline pointing out books and at address.

All statements of facts, lists of Tenders, &c. must be accompanied by the name and address of the sender, not necessarily publication.

Note.—The responsibility of signed articles, and papers for public meetings, rests, of course, with the authors.

NOTICE TO SUBSCRIBERS.

Advertisements cannot be received for the current week's issue later than **THREE o'clock, p.** on **THURSDAY.**

WANTED, a RE-ENGAGEMENT, as
FOREMAN of WORKS; or would take Stone-work, Mason
by trade.—Address, 16, Office of "The Builder."

The Builder.

VOL. XXIX.—No. 1481.

The French Courts at the International Exhibition.



ON Monday, the 19th, a private view of the French Courts at the International Exhibition took place. Notwithstanding a somewhat short notice, and the unfavourable character of the day, in which storms of almost tropical rain swept repeatedly over the sky, and hid fair to deluge visitors in their transit from the railway-station to the Exhibition buildings, the galleries were well filled with guests.

It is a subject of congratulation to the French exhibitors that, after the terrible interruption to the industry of their country which has been experienced within the last ten months, a few weeks from the close of the civil war should have sufficed to bring

forward such a display as is now in the course of organisation. We say in the course, for the northern hall of the court is destined, as the sketches tell us, for objects expected to arrive within the present week. Much has already been received and arranged, and the immense resources and great elasticity of the French industry are remarkably illustrated by the display. Bearing in mind the peculiar circumstances under which France comes forward as a competitor, it may seem almost ungracious to apply the same measure of criticism that might, under ordinary circumstances, be just and reasonable. Nor must any remarks that may seem of an unfavourable character be taken without making proper allowance for pressure and for dislocation. Thus, one point, which cannot fail to strike every visitor to the French Courts, must be looked at rather as being honourable to the English directors of the general Exhibition, than as disparaging to the French exhibitors: it is this,—somewhat contrary to what might have been expected, the commercial element is much more distinctly revealed in the French Court than in any other portion of the Exhibition.

The great peculiarity, probably the great charm, of the present Exhibition, we take to be the home-like character of the galleries. There are various modes of display for objects of fine work of industrial art. Of these the least favourable is that of the shop or the bazaar—in which the object is the main object, and display is merely a preparation for sale. Then there is the museum arrangement, which, while educationally valuable, soon palls upon the visitor, who is tired by seeing the same objects again and again in the same positions. The constant change of change and novelty that characterises the arrangement of South Kensington, is not the charm of the place. People are at times perplexed, or even angry, at finding what they go to see spirited away to some very different

part of the building; but they are never bored. The same active spirit seems to rule the galleries of the International, and the visitor feels that he is in neither a bazaar nor a museum, but in a richly-stored Industrial Palace. Very little is needed to render the halls suitable, at any moment, for a great æsthetic levee. But in the long French Court a series of tribunes or stalls are fitted up by separate exhibitors, each bearing the name of the owner most conspicuously, and each, in fact, devoted to the displays of the products or the wares of that individual. It is probable that no other arrangement was possible under the circumstances of the case. Indeed, this exceptional mode of decorating one out of the many halls and galleries of the series is in itself an element of novelty and freshness in the Exhibition. Still, if the series of stalls and cases of the long French Court be compared with the pictorial grouping of other portions of the building, it will be seen that the English arrangement is by very far the most picturesque, and the most germane to the objects of the undertaking.

On emerging from the subterranean passage spoken of as the Fernery, the visitor enters on a corridor which is pierced by openings into the garden around which the French annex has been built. This open corridor forms, in fact, one side of the French quadrangle. It is adorned by French sculpture. Bronze figures of dogs, very truthfully sculptured, are the first objects that arrest the eye. There is a marvellously life-like pointer in that pale cane-coloured terra-cotta which our Continental neighbours affect. The central figure of the hall is the charmingly modelled bronze which illustrates, in the shrinking appeal of a human outcast, the fable of the grasshopper who sang all the summer and found penny arrive with the cold of winter. A very natural and graceful figure is drawn up and cramped together by the cold, and shivers under the single thin garment which tells of summer days. The modelling of the drapery is perhaps hardly clean-cut enough for excellence; the pose of the figure and the expression of the face are admirable. The sculptor is M. Cambos. Close by is another wintry subject, in white marble,—L'Hiver himself, by Roubaud; a figure chiefly notable for the bold freedom with which the garment has been tossed upon the shoulder. Close by is a subject which, if French in its execution, is Italian in its nationality and in its spirit. It is a bronze figure of a boy, "Le Padre Italian," by Moreau Xanthier; a peasant of the Apennines, with sheep-skin coat, bag-pipe, wooden sabots, and straps round his legs. With the exception of the right thigh, which is too thin when viewed in front, this is an admirably-executed figure. The expression of the face, no less than that of the attitude, is life itself, and life of a highly-picturesque type. This fine work is exhibited by the artist. Close by is an "Eve," in marble, twisted into a contortion like that of the serpent itself, but evincing great mastery over marble. There is a boy with a swan, by Pradon, of which the chief fault is that the proper point of view for the plumage of the bird is from behind the group. Thus regarded, the plumage of the wings is admirably modelled; but the effect is less happy when the face of the boy is looked at. Here is the bust of a "Madeleine," by Lanzirotti, in which the artist has made a decided mistake in sculpturing a solid marble tear just issuing from the eye. Had the effect been good, it would still have been contrary to a prime canon of sculpture. But the effect is not good, and that is so far satisfactory. There is a bust of Diana close by, so badly lighted that it is difficult to speak of it with certitude, but of which the setting of the head on the neck is very characteristic of the virgin huntress.

In entering the annex itself, the long room which is parallel with the general axis of the

building is found to be lined with stalls or tribunes principally filled with bronzes, with pottery, and with what are generally called *articles de Paris*. The return, or Northern Hall, is lined with pictures, and contains also statues, statuettes, plaques, *relievi*, and similar objects. The Southern Hall, at the time of the private view, was chiefly filled with flowers, of course from English nurseries, and some very rich and splendid carpets are displayed upon the walls.

The most novel, and in some respects the most beautiful, of the illustrations of French arts and industry, are some of the articles formed of the beautiful stone called the onyx marble of Algeria. Resembling more nearly the finest coloured alabaster than any other material with which we are acquainted in this country, this onyx has a special beauty of its own, nor can any material be imagined more appropriate to the service of decorative sculpture, as distinguished from sculpture proper. In many of the most elaborate applications of this material it has been combined with silver or with bronze. In some cases a counterfeit of life has been produced by this means, which attains almost to illusion. We were about to add—but which cannot be dignified by the name of sculpture,—when the memory of the chryselephantine work of Phidias recurred to the mind. Bearing in mind the qualification that *fac simile* is not the highest end of sculpture, it must be admitted that in some of the examples of the intermixture of bronze and onyx skill of the very highest order has been displayed. The Arab sheik and Fellah woman, by Cordier, two busts in the Upper Gallery, the life-size Moorish lampholders, and some smaller objects of the same compound structure exhibited by M. Cornu, if regarded as decorative furniture, possess no ordinary excellence. There is a pair of candelabra, some 2 ft. high, borne by a negro and negress, that are admirable specimens of modelling. Three little gold Cupids, supporting a vase of the onyx marble, form another group of great elegance. There is a vase, in onyx, and a pair of larger vases, in a more mottled kind of marble, exhibited by M. Cornu, of great beauty and most elaborate execution.

Next to, hardly second to, the objects in which this exquisite material is employed, rank the statues, statuettes, busts, and vases in bronze and in silver, which are displayed by several exhibitors. The more precious metal has been wrought in some cases with rare delicacy, and left with a dead surface, not the black, gloomy skin, which is called oxidised silver in some of our Regent-street shops, but a *mat* finish which is highly effective, and suitable to a noble metal. A casket of this description, very boldly adorned by sculpture, is one of the first objects that strike the eye on entering the Central Hall. But the "Cassandra," of M. Rochet, which is not described in the attached label, but which appears to be a silvered bronze, is the largest example of a work in this metal. The prophetess throws herself before the image of Minerva. The attitude, exaggerated in the extreme, seems to be taken from the figure of a sacrificing Bacchante, which is familiar to the lovers of old Wedgwood, as represented on one of the black basalt plaques. Apart from this violent contortion of position, the figure possesses much merit, and altogether it is one of the most noticeable objects in the Exhibition.

Less original, but perhaps of more permanent interest, is the noble statue of Augustus Cæsar, a cast in bronze, from the statue in the Vatican, which is exhibited by F. Barbedienne. The stall of this exhibitor occupies the upper end of the long apartment; it is covered with the most lovely bronzes. M. Achille Collas is the patentee of a well-known method of mathematical reduction of statues and *relievi*, which he produces on various scales. M. Barbedienne is the industrial worker of the patent. He has formed *ateliers* for founding

chasing, enamelling, marble work, and reduction, and has produced a series of art bronzes, copies of ancient and of modern sculpture, a list of which reads almost like a handbook of the subject. The bust of Diane de Poitiers, by the famous Jean Goujon, is one of the most striking exhibits in this tribune. It is reproduced, of the original size, and in five consecutive reductions, at prices of from 1,000 francs to 45 francs. The hair is piled up on the head of this celebrated beauty to a height that overtops even the Babel towers of the present day.

The Augustus Caesar is a noble figure, standing in that stiff, conventional attitude of command which is common to imperial figures, and clad in a cuirass embossed with golden figures. The face has all the grandeur of the Roman portrait sculpture, unrivalled even by that of Greece. The *casquet* of Rome is impressed on this bronze, in more senses than one. It was modelled and cast during the siege of Paris. The reliance on the future of France steeled by this simple fact recalls the attitude of the Romans after the battle of Cannæ. A faith like this is invincible, and has ever been ranked among the highest civic virtues. If we regard the Cassandra of M. Rochet as an instance of that exaggerated action towards which the wonderful power of Praxiteles gave the bias, departing from the severe dignity of Phidias, we may contrast the display of that tendency with the return to a conventional stiffness of form in the Augustus. On the other hand, the face of the Greek statues remained passionless and immobile long after the figures had become fired with life. The faces of the Roman emperors are true physiognomical studies. The Renaissance sculpture endeavoured to combine the grace of the Greek figures with the expression of the Roman portraiture. But the true Greek sentiment of the beautiful is one of those gifts which cannot be imparted by academic rule. It is questionable, therefore, whether we can name, as a whole, any series of modern works equalling in merit and talent the cut bronzes of M. Barbedienne. The exhibitor of the most striking silver articles, to which we hope to return, is M. Christoffe.

Glancing through the same apartment we point out, as deserving further attention, a fine case of enamelled glass, chiefly lamps and vases, of Moorish form and pattern. The extreme lustre and richness of a case of embroidered satin is a perfect triumph of textile art. Nothing can exceed the delicacy of the point lace displayed by a Belgian house, though manufactured, it is supposed, in France. The famous Anabasson tapestry is represented in elaborate specimens. A pair of Classic scenes represent,—one, the rape of Proserpine, or at least the approach of Pluto in his chariot, while the nymphs are gathering flowers, and grouped around the statue of Ceres; and the other, the departure of Europa,—the eagle hovering in the air being an addition to the usual grouping. The modern French nation is represented by numerous exhibits. There is a set of plaques, painted with the heads of wild beasts, rather forcible than beautiful, but in a style which is original for *faisance*. Armour and jewelry are the specialities of another exhibitor, but, though carefully executed, they are the armour and jewelry of the stage.

The works of the French sculptors whose names are best known to us at present, such as Olesinger, Carpeaux, and Cordier, are scattered throughout different halls. The colossal bust of Le Maître, rendered in the defiant tone of the Louis Quatorze era, is in the outer corridor. Near this is the terra-cotta model for the relief, by Carpeaux, on the Pavillon de Flore,—a nude nymph, very pretty, very life-like, and very French,—with seven little *amours* around her. It will be remembered that the classic Flora was marked by a certain almost colossal dignity of proportion. The work of Carpeaux may recall the traditional character of the Roman woman associated with the name, but otherwise might as well be called "Spring," or "Sunshine," or "The Surprise," or anything else, clever as it undoubtedly is. There is a model for a bust of Gérôme, by the same sculptor, of great merit. The painter looks as if one of his gloomy and powerful scenes was just rising in his imagination. In the Ariadne of Olesinger, while it is impossible to overlook the masterly modelling of the figure, the impression which it produces is not a pleasing one. The difference in the tint between the nymph and the tiger, between the skin and the fur, is far greater than that due to the difference of surface; and this much detracts from the sculptural effect of the group. Close by the Flora of Carpeaux is a large screen,

looking like a gigantic mantel-shelf, in *corton-pierre*, a *fac simile* of the screen in the bedroom of Madame de Maitenon, which gives a very happy example of the graceful ornamentation of the Louis Quatorze period. Cordier's "Love one Another," a little white boy embracing a little black one, shocks by the contrast of tint, whatever we may think of the moral. After all, we seek in sculpture excellence of another sort from that which is ordinarily attributed to the closing paragraphs of fables.

With regard to the paintings, we have already spoken of some of those, contributed on loan, which are displayed in the upper gallery of the eastern range. The north room of the annex is, as we before noted, chiefly devoted to their display. We must say, in all candour, that the English side of the Exhibition by no means suffers from comparison with the new arrivals. There is ample evidence of technical skill and academic training. But these qualities, taken alone, fail to produce good pictures. Their want is to be deplored, but their presence is not everything. The possessor is too often led to attempt mere *tours de force*, or to think that a big picture is necessarily a great picture. The sizes of the canvases covered by the French artists are often too vast for our limited, insular admiration. One of the most noticeable pictures in the *salon* is a very large scene representing the fall of Carthage, by Henri. At least, the figure on horseback in the distance must be taken for the Roman conqueror, entering in triumph. But why, on such a sorrowful occasion, the ladies of Carthage should group themselves, partially or totally nude, around an image in the Forum, is not clear. Neither has the ethnological type been preserved. We have a fine group of women, drawn with great technical skill, some of them—especially a brown-haired prostrated figure,—very beautiful; all affording points of admiration in the contrast of complexion, of hair, and of pose, but in whom we may seek in vain for the Punic features,—the Punician outline, tinged by an intermixture of Moorish blood.

Again, there is a Brobdignagian figure, Adam, or Cain, or some similar culprit, seated in an attitude of theatrical despair, and comforted by a giantess in sheepskin. The same awful Colossus appears on the opposite side of the hall, turning a deaf ear to a genius whom we take to be Hope. If these figures be contrasted with our latest English painting on a colossal scale, the *fac Thor* in the Royal Academy Exhibition, the verdict is safe for the English painter.

We must speak still more decidedly as to the "Study from the Nude," because it is a work of a nature to fortify those persons who object to undraped representations of any kind. It is, no doubt, a work of much technical skill. But if the drawing be correct, the model is either extremely ill-formed, or has been thrown into an unnatural and most inelegant position. In this companion picture in the upper gallery, there is no such defiance of the lines of sculptural grace, and the wild toss of the hair does much to redeem the anatomical character of the figure. The human form, especially the female form, is the most beautiful subject that the artist can represent. The greatest artists, while by no means superstitious as to its faithful representation, have ever held that that beauty was most divine when clad in a veil of modest mystery. The clear definition, *au grand jour*, of every detail, has in it not only a sort of irreverence, but, as destructive of poetic sentiment, declines from the highest mission of art. To say the very least, a nude statue or painting, to claim rank as a work of the highest order, must be clothed either in native modesty, or in perfect unconsciousness. The "Hero" is an example of the deterioration of a fine picture by insisting on giving brilliant prominence to the entire figure. No Greek artist represented Hero as entirely nude. The very beauty of the legend is off-ended by such a design; and, apart from that, the figure should have been seen by the light which she holds. The depths and contrasts of shadow thus caused would have made a very beautiful and original painting. The lamp, it is true, casts some downward shades, rather than shadow; but the full glare which lights up the entire form comes from some extraneous, not to say impossible, source. In these fine studies we detect much that is absolutely vicious in art.

There is another large picture, which seems to represent an incident which happily has not any foundation in fact, the capture of the

Princess Louise and the Marquis of Lorne by brigands. The face of the lady, whose figure is the best part of the picture, is, indeed, hidden, but the hero of the scene seems to be a French colour, and truthful, though disgusting expression, of the "Jester of King Henry II.," by Roybet, fixes the attention. There is an idyllic scene, by Delannay, and a twilight, by Corot, which looks as if painted on wet enamel. "Dante in Boia," by Heilbuth, an attractive picture, has also the same misty want of definition in the foliage. "L'Ecolière," by Galbrand, in pastel, is a fine drawing in a very noble style of medium. The brilliant colouring of "La Fontaine" charms, in spite of the drawing of the figure. The "Edie Ochiltree," by Cogniet, with the tenderly-drawn, highly-finished face, shadowy felt hat, and faded military cloak, is a good Waverley illustration. There is a curious representation of what seems to be a Dutch banshee, too high up to allow of reading the label. In landscape, there is a good view of the Châteaude Cheneouen, one of the gems of the Valois times. "A Marine View in Normandy," is very fine. "Une Mare," by Dupré, gives a special incident of French scenery. The old projecting timber houses of Honfleur form another very noteworthy picture; and there is a landscape, by Langret, in which, while we may feel regret at the fact that it is rather modelled than painted, there is much of a high order of merit.

In a word, while we congratulate France on an effort which gives the highest proof of her great recuperative power in industrial art, we feel that there are things that are to be avoided, as well as things that are to be admired, more especially in the higher art of that great country. Brilliance of effect, accurate anatomical knowledge, obedient power of delineation, technical mastery, over pigment both in preparation and application, boldness in scale, perfect organisation in both of the academy and of the *atelier*, evidence of all these is to be traced in the bronzes, marble paintings, and decorative furniture so profusely displayed at South Kensington. In many of these respects there is ample room for great improvement at home. But there are yet too high requisites, in the absence of which art can never be truly noble. If one of them be regarded as an exotic in our climate, the other, we fondly trust, has thrown deep and branching roots in our soil. The one is the instinctive love of the beautiful, inherent in the Greek blood, including Magna Græcia and the Grecian element of Italian nationality. The other is the brightness of the Teuton nations, the stern race that gave birth to chivalry. It is the spirit of reverence for what is sublime in the poetry of nature, reverence for what is noble in humanity for the dignity of man, for the pathos of sorrow and for the beauty and purity of woman.

THE STORY OF THE NORTH AMERICAN FISHERIES.*

THESE splendid fisheries, together with the greater part of the territories adjoining to them originally belonged to the crown of France, but through the fortune of war and by the capitulation of 1761, they became part of the British Empire. But still they bear the names of navigators, soldiers, statesmen, and missionaries who discovered and settled them for the French kings. O brave, generous, and gallant France, how often have you spilled your blood, and lost almost everything but honour, yet to-day, in the midst of thy desolation, thou art more lovely and respected throughout the civilised world than when you legions, urged by the whirlwind of conquest, spread rapine, ruin, and destruction over the face of Europe. When those fisheries became the property of Great Britain, all the subjects of her North American colonies had conceded them the liberty to fish in those waters, side by side with the inhabitants who lived upon the coasts; and, as a great deal of New England was barren and unproductive, numbers of her people flocked every season to those fisheries, to supplement by their labours the limited produce of their soil. It was an employment for which their adventurous spirit and quick genius were particularly fitted them, and one from which for many years they reaped a rich harvest; but when they rebelled against the rule of England, very naturally refused to allow them to share those fisheries, which are the rightful heritage

* See p. 458, *ante*.

of those people who remained loyal to her; but the rebellion became a war, which ended with those colonists becoming a nation, to commence the world on their own account. But, as they found it easier to live independent of their old mother England than without those fisheries, they made up their mind that they would have a share in them, by hook or by crook, and they adopted the means which children before their time and since have found so effectual to get gifts from kind, indulgent parents. First, they try to bully them, and when it fails, they try to coax. Accordingly, the Yankees stated that, as they helped England to take them from the French king, it was their right to share in their products, and they guessed they should; to which England replied that "while you were in the empire, you shared in its advantages, but as you are out yourself off from it by your own act, our right to participate in its resources no longer exists, and I reckon you shall not." But Jonathan, with becoming meekness, said, "You know there is more fish than the scattered population on those shores can take, or than they will ever require, so you may as well let us take some, or we steal them; or you have no time to watch them while Europe is convulsed."—an argument more potent than the first, for England, by the 3rd article of the treaty of 1783, in lieu of the free navigation of the Mississippi, allowed them to fish on the banks of Newfoundland and in the Gulf of St. Lawrence, and on the coasts and creeks and bays, wherever British fishermen used, and to are their fish at parts along the coasts, as long as those places remained unsettled. But the year of 1812 put an end to that arrangement, and as the treaty of peace made at its conclusion contained no reference to the fisheries, both countries had to fall back upon the law of nations, which allows them to fish within three miles of each other's coasts; but American fishermen could see no profit in the law of nations; therefore, as before the war, they commenced to fish inshore, but England at this time not having much fighting business on land, determined she would enforce the rights of her colonial subjects, seized, in the month of June, 1817, twenty of their vessels off the coast of Nova Scotia, and brought them into Halifax harbour, where, from the want of legal machinery to punish them, they were suffered to escape. But the act caused both nations to settle the question, and define each other's rights by a treaty made in London the 28th of July, 1818, not having been annulled, is what governs their relations in the matter at the present time. "By that treaty it was agreed that the inhabitants of the United States shall have, ever, in common with the subjects of England, the liberty to take fish on the southern coast of Newfoundland from Cape Ray to the Rameau Islands, and on the western and northern from Cape Ray to the Quirpon Islands, and on the coasts of the Magdalen Islands, and also on the coasts, bays, harbours, and creeks from Mount July on the southern coast of Labrador to and through the straits of Belle Isle, and thence northwardly indefinitely along the coast; and they shall also have liberty for ever to dry and cure fish in any of the unsettled bays, harbours, and creeks of the southern part of the coast of Newfoundland and of the coast of Labrador. But as soon as the same shall be settled, agreement to cure fish must be made with the inhabitants, proprietors, or possessors of the soil; and the inhabitants of the United States hereby renounce for ever any liberty heretofore enjoyed by them to take, dry, or cure fish on or within three marine miles of any of the coasts, bays, creeks, or harbours of England's American dominions not included within the above-mentioned limits, provided, however, that American fishermen shall be admitted to such bays or harbours for the purpose of shelter and repairing damages therein for purchasing wood of obtaining water, and for no other purpose whatever; but they shall be under such regulations as may be necessary to prevent their drying, drying, or curing fish therein, or in any other manner whatever abusing the privileges hereby reserved to them." Here is a specified limit laid down for the subjects of the United States to fish in what Britain, with her maritime supremacy, might lay claim to as her waters, notwithstanding the laws of nations, and here is complete renunciation of all previous claims by nations which won the majority of the frigates during the war of 1812; so that nothing could be a fairer bargain between two great powers. But it was much easier for American

Commissioners sitting in London to make a treaty in the name of the American people than for the fishermen living on the hungry soil of the North-Eastern States of New England to abide by its terms, and therefore I do not wonder that from time to time its provisions were violated by men who had very little fish to catch on their coasts, but who have daring and enterprise enough even to hunt the whale in every one of its ocean haunts; and, as before the treaty, seizures were yearly made by the British cruisers, no doubt very much to the annoyance of the American fishermen. The exact definition of the terms of the treaty also led to a misunderstanding between the two Governments; for while the Americans contended that the three miles' limit ran with the sinuosities of the coasts, in bays and creeks, the British Government, sustained by the practice of all maritime nations, and even by the Americans, with regard to their own coast, maintained the line three miles outside, headland to headland. The trade relations between the British North American colonies and the United States was also in a very unsatisfactory condition. It was subject to many galling restrictions, that very much retarded its development, and impeded the intercourse of two peoples lying side by side, who were, in the main, descended from the same stock. At length, tired of this almost hostile attitude towards each other, both countries agreed to a reciprocity treaty of trade and commerce for ten years, commencing in 1854, with one year's notice when either party desired to discontinue it. Under its conditions the principal Canadian products were admitted into the markets of the United States on the same terms as their own products, while Americans were accorded the free navigation of the St. Lawrence and the liberty to fish anywhere in the British North American waters, except in the rivers and inland lakes. The wisdom of this treaty soon became manifest. The fishery question no longer troubled either Government, and the fishermen of Maine and Massachusetts, no longer under the necessity of watching the British cruisers, to steal a cargo of cod or mackerel inshore, went home with their schooners laden to the water's edge, and the value of fish taken in British waters, which was about 280,000 dollars' worth per annum, rose to 1,265,700 dollars worth in 1856, while competition with them stimulated the men of New Brunswick and Nova Scotia to increase the value of the fish taken in those two provinces from 2,110,750 dollars' worth in 1850 to 2,950,235 dollars' worth in 1860. The beneficial effect of the treaty also became apparent in the greater intercourse of the peoples and the impetus which it imparted to the trade between both countries. The imports and exports, which amounted to about 10,000,000 dollars annually before the treaty, rose to over 25,000,000 dollars in 1864. But I suppose the course of commercial friendship, like that of true love, is not destined to run always smooth. The necessity for Canada to increase her revenue caused her to lay a slight duty on American and English manufactured goods, which they asserted favoured the English manufacturer, and broke the spirit of the treaty if not the letter, and the deplorable rebellion in the United States, which in addition to all the other evils it entailed upon that great and prosperous people, left a legacy of debt which required an increased taxation to liquidate, and as high protection duties unwisely formed a portion of the scheme to increase their revenue, in justice to the producers of the United States, Congress were under the necessity of abrogating in March, 1866, a treaty from which both countries derived so much benefit. No doubt the repeal of the Reciprocity Treaty was a heavy blow and a great discouragement to the rising trade of Canada, and some wise men there and in the United States predicted for it nothing short of utter ruin, but the impetus which eleven years of free intercourse between the peoples had imparted to it could not easily be arrested, nor the avenues opened up for trade and commerce during that period be permanently closed. At first there was much inconvenience; for Canada, having almost exclusively devoted herself to agriculture and the production of lumber, relied on the markets of the United States and of England for her manufactured goods, and although the free-trade markets of the latter were still open to her, she could not help feeling her humiliating and dependent position, and as a consequence resolved to become more self-reliant and self-sustaining, and commenced to manufacture for herself, The

boots and shoes, woollen goods, and various other articles of every-day use, which were formerly produced in the factories of New England and New York, now give employment to thousands of the population, who are yearly building towns and cities, and thereby establishing home markets, while the products of her forests and of her rich and fertile soil are more than ever in demand at higher prices on the other side of the line, and to such an extent that the trade relations between Canada and the United States has more than doubled since 1865. Also, with the repeal of the Reciprocity Treaty, the liberty enjoyed by the Americans to navigate the canals without leave, and to fish in the waters of the Dominion, were withdrawn, except to the extent guaranteed by the treaty of 1818. But the Imperial and Canadian Governments, recognising their embarrassment, were very unwilling to appear ungenerous to their cousins, and in hopes that some fresh commercial arrangements would be made, they allowed them to fish by taking out a licence at a merely nominal cost of 50 cents per ton. At the same time delegates were sent to Washington to effect a new treaty, if possible, but their mission proved a failure; yet the hope of bringing about some satisfactory trade arrangement was not given up, and accordingly the licence system, with some slight alterations and an increase in the tonnage, was continued up to 1869, which, as a protection to the fisheries, was worse than useless; and as a source of revenue, if ever it was intended for such, it proved an utter failure, for while in 1866 there were 354 licences taken out, there were only 25 in 1869. At length the Dominion Government became convinced that another treaty was impossible as long as the United States maintained a high and exclusive tariff, for the ordon of protection will not admit of an opening with safety to the system; and as experience had by this time taught them that they were very well off, and going on without a treaty, in justice to their people, with the consent of the Imperial Government, they resolved to protect those waters, the products of which three miles to sea were as much their property as that of the land along the coast, and for that purpose seven armed vessels cruised around the coast during the fishing season of 1870, to prevent American vessels from fishing or buying bait inshore, which almost broke up their voyages, for there is very little bait in American waters for deep-sea fishing. But as the fisherman, like the hunter, can hardly resist the temptation to enter upon a preserve when it promises sport or profit, many from the United States ran the risk of capture to make good hunts of fish; but all could not run the gauntlet safely, so those that failed had their vessels and cargoes confiscated, which appeared very hard to men who had enjoyed the liberty to fish in those waters for such a length of time; and therefore, on the representation of General Buller one of their members, President Grant, in his Message to Congress, complained that the Canadian authorities were unneighbourly and unfriendly, because they protected the property of their people, just as himself and his Cabinet protect the property of their people. Thus from the beginning this fishery question has been one of anxiety and trouble to both countries, and the resolution to settle it by a High Commission appears to be everywhere well received; and I am perfectly sure that the constitution of it gives great satisfaction to the people of Canada, and they are especially pleased, and feel highly complimented, to have their favourite statesman, Sir John A. McDonald, placed upon it. The Canadians were never averse to the Americans sharing in their fisheries, on the condition of getting something in return; and the Americans are not half so unreasonable as many persons in England think; but unfortunately while America retains her high protection tariff, she can give no commercial equivalent; and to open up her coasting trade to Canada, as many would suggest, is what would finally complete the ruin of her merchant navy. But England has a score to settle for the sloop *Alabama*, which, justly or unjustly, if it involve no disgrace, all her people desire to pay. Then let the commissioners get the bill, and pay it off with leave to fish, upon conditions which should retain for Canada her sovereign legal rights; and England can pay her back in many different ways, which would assist to build her up, and develop her resources. Let her only get Canada the money necessary to build her Pacific railroad, so essential to connect her different provinces, and, my

word for it, she will never complain that England bartered away her rights. Then, side by side with her mighty neighbour, from ocean to ocean, they could work in peaceful, generous rivalry, to open up this continent, and ameliorate the condition of mankind.

THOMAS CONNOLLY.

AN OLD MAP OF LONDON.

ALL topographers can appreciate the valuable assistance which they obtain from an old map, in their search after accurate localisation, for it appeals to the eye, and shows the various positions of streets and buildings in a way that no description can possibly compete with.

We have before us a very curious and interesting old map of London, which was unknown to the chief print collectors, but is now in the well-known collection of Mrs. George. Unfortunately it has lost its title, date, and engraver's name, owing to a portion of the left-hand side being torn away, and the only clue that remains, is the dedication "To the Honourable the President, Council, and Fellows of the Royal Society." From consideration of the chief features of the map, we are able to guess its date tolerably well, and we set it down somewhere between the years 1680 and 1690. This was a time of great changes and improvements in London, and it will, we think, be interesting to note some of the points that attract us in this map, and give us some idea of the state of the metropolis at that date. The first thing that strikes us is the importance of the Thames, which was then not merely a river, but the chief highway of the City. The number of landing-places and public stairs is very great, from Hungerford stairs in the west, to the Tower Dock in the east. Among them are the Dorset stairs, leading to the Duke's Theatre, near Salisbury-court, on the north bank, and Paris Garden stairs on the south bank of the river.

Berkeley House, Piccadilly (or Portugal-street as it was then called), is marked at the extreme left of the map, the bottom of which cuts off the lower half of St. James's-square. Next to Berkeley House is Albemarle House, that historical mansion which was built for Lord Chancellor Clarendon, was sold to the second Duke of Albemarle, and pulled down in 1683 by certain contractors who had bought it in order to build Albemarle, Bond, and other streets on the site. Next to this is Burlington House, the old red-brick building which was altered and improved by the third Earl of Burlington about 1715, and still stands behind the mass of masonry that is now rising in Piccadilly. These three houses were all built about the same time, in what was then a country road. To the east of Burlington House stand two houses on the site now occupied by the Albany, inhabited respectively by Sir Thomas Clarges and Lady Stanhope. If we now pass a little to the east in a northerly direction, we come to Wardour-street, which was built about 1686, and was called after Henry, third Lord Arundell of Wardour. In this map it is marked as So Ho, and in the grant of land from William III. to his favourite, William Bentinck, Earl of Portland (dated May 13th, 1700), it is called Old Soho, alias Wardour-street. Soho-square is marked as King's-square, a name by which it was sometimes known as late as 1789. There is an absurd story, told by Pennant, that this place was called Soho after the battle of Sedgemoor, in which engagement that cry was the watchword. Unfortunately, for the truth of this statement, this district is known to have been called Soho at least fifty years before the battle of Sedgemoor was fought. At the time that this map was printed Greek and Frith streets were newly built; the latter took its name from the builder, a Mr. Fryth; and the former from the Greek Church, situated close by in Hog-lane, St. Giles's, now Crown-street. A little to the north of Soho we find the now important Oxford-street, then only "the Road to Oxford, &c.," with St. Giles's Pound at its east end. Tottenham-court-road had no other name than "The Road to Hampstead." In Great Russell-street we notice Montague House, then recently built, and now improved off the face of the earth, to make room for the present British Museum. The next mansion is Southampton House, which occupied the whole north side of what is now called Bloomsbury-square. The west side of the square was called Allington-row; the east side, Seymour-row; and the south side, Vernon-row; but although these were the proper names, the square was sometimes called Southampton-square. In 1704,

when Bedford House and Gardens, which occupied the whole south side of Goveat Garden, were destroyed, the Russell family removed to Southampton House, and changed its name to Bedford House. When the New-road was projected, about the year 1756, the Duke of Bedford objected to it for the reasons that it would destroy his prospect and cover his gardens with dust. Bedford House was pulled down in 1800. If we now transport ourselves to Lincoln's Inn, we find in Great Queen-street two large houses occupied by the Earl of Middlesex and the Lord Chancellor. This last was Henneage Finch, Earl of Nottingham, who died in 1682, and was living here when Thomas Sadler and his confederates stole from his closet the Chancellor's mace and purse, which they carried openly through Lincoln's Inn-fields. To the south of the Earl of Middlesex's is Weld House, pulled down in 1695, and to the east Weld-street, now Great Wild-street.

Clerkenwell makes a very much grander appearance in this map than its present state would lead us to imagine. What is now the district of clockmakers, was then the abode of aristocracy. Here lived the munificent Duke of Newcastle and his eccentric duchess Margaret, who set up for a universal genius. A little to the east of Newcastle House were the house and gardens of the Bruces, Earls of Aylesbury, to whom the old hospital of St. John of Jerusalem descended from the Cecil family. A little to the south stood the mansion of the Earls of Berkeley, whose name remains in Berkeley-street. In Moorfields the *New Bethlem*, built by the philosopher and architect, Robert Hooke, is figured with some care. The original hospital for lunatics was situated in Bishopgate-street Without, but was removed about the year 1675 to this spot, where it remained till 1814, two years before which the present hospital was built in St. George's Fields. The Monument on Fish-street-hill was built between 1671-77, and is here called *The Pillar*. The two chief buildings represented on this map are St. Paul's Cathedral, which was not half finished at the date of publication, but is given according to the architect's design; and the Tower, in the plan of which the palace portion of the building is shown. We see by this map that London from Whitechapel in the east, to Piccadilly in the west, and from Clerkenwell in the north to the Thames in the south, remains to-day much the same in its chief lines of communication that it was in the seventeenth century. Although houses have been pulled down, and others built, few improvements have been made in the principal thoroughfares, but these have been left for us to make, now when house property has so much increased in value that any change costs an immense sum of money.

A BUILDER'S ACTION.

KIMBERLEY V. DICK AND WHITE.

In our volume for 1868 (pp. 587-9) will be found plans and a view of Hunewood, Wicklow, a mansion then in course of erection, for Mr. Fitzwilliam Dick, M.P., by Mr. Kimberley, under the direction of Mr. William White, architect. Mr. White afterwards read a paper at the Institute of Architects descriptive of the same building.

In the case which has grown out of the transaction, heard in the Rolls Court before the Master, Mr. Kimberley claimed for Mr. Dick and Mr. White about 15,000*l.* as still due to him.

Mr. Southgate, Q.C., and Mr. Begg appeared for the plaintiff; Mr. Dick was represented by Mr. Jessel, Q.C., and Mr. Pearson; Sir R. Bagallay, Q.C., and Mr. Cozens-Hardy appeared for Mr. White.

From the affidavit of the plaintiff it appeared that he had had previous business connexions with Mr. White, and had in all cases received from him the necessary plans and specifications. Their relations had been so good that Mr. Kimberley was prepared to do whatever Mr. White requested, believing him to act in good faith.

Mr. Dick intending to build, Mr. White undertook the commission, and prepared certain rough plans. These he submitted to Mr. Dick, and they gained his approval, always subject to the proviso that the total cost, including commission, should not exceed 15,000*l.* Two days after this approval Mr. White wrote to Mr. Kimberley to come to town, and on March 26th, 1868, the latter attended at Wimpole-street. In his affidavit he swears that "then he first learnt that the proposed works were to consist of a

large mansion-house, offices, and stables, with all their fittings, to be erected for Mr. Dick." Mr. Kimberley avers that he saw certain rough elevations, and a few bare hints of ground plans; that from these Mr. White read out probable quantities, to which he affixed prices, and that where quantities were unobtainable lump sums were put down by Mr. Kimberley, at Mr. White's suggestion. Mr. Kimberley says: "For instance, Mr. White would, from some of his drawings, state the number of cubic feet of excavation required. I would then state the price as so much per cubic yard, and then Mr. White's clerk would note down the number of yards and the rate per yard, and calculate and carry out the aggregate price." Believing in the architect, the contractor signed a tender on March 29th, 1867, for 13,560*l.*, on, as he states, the distinct understanding that he would suffer no loss. Of the 13,560*l.* of the tender, however, 6,000*l.* were put down in lump sums and at random, and these provisional amounts proved quite insufficient to cover the expenses afterwards incurred. Mr. Kimberley maintains that he signed even this tender under pressure, having been informed "that unless Mr. White sent the estimate in quickly the job would very likely drop through."

In the beginning of June the plaintiff fell seriously ill. During this time, on June 10th, Mr. Frost, Mr. White's clerk, came to his house at Banbury, and brought with him a formal contract and the proper specifications and working plans, and informed him that Mr. Dick was anxious to have them signed, and that his signature must be appended at once, so that he (the clerk) should have time to return to London and hand them to Mr. Fenton (Mr. Dick's agent), who was waiting to convey them to Ireland the same night. No draft of any of the documents had previously been submitted to the plaintiff; they were not read to him, and so rapidly was the signing performed that in half an hour Mr. Kimberley had initialled the whole seventy-seven sheets, and the defendant's clerk, who had left London at midday, was back in the metropolis at seven p.m. On this occasion he avers that Mr. Frost said that "Mr. White had taken care of his interests in the contract and plans, and that they were in accordance with the estimate made in March, and with the tender of the 29th of March, 1867." It was subsequently found that the works were much more extensive and greatly exceeded the tender, and the counsel for the plaintiff declared that "not fraud, but grave impropriety had taken place in the manner in which the contract was obtained on the 1st of June."

Plaintiff's counsel dwelt strongly on a quotation from Mr. White's lecture at the Institute. He said that according to Mr. White's own admission he had "worked up" his design by gradual and successive stages by subsequent consideration, but he omitted to read that these were "exhibited in two books, marked A and B, the latter exhibiting the almost completed design." Book B was the one before the Court, and was the one upon which, confessedly, the estimate was made.

No immediate difficulty arose, and the works were proceeded with. "It was not until the 6th of December, 1868," says the plaintiff, "that Mr. White gave me to understand for the first time that no excess in quantities was to be paid for, and said that if the items I then mentioned were not taken in the quantities he could not help it." Acting under advice, the plaintiff continued and completed the work, and Mr. Dick obtained possession in June, 1870. This was considerably after the contract date; but the plaintiff asserted that the delay arose solely from Mr. White's changes of plan and detail, and that erroneous information which he gave with regard to the accessibility of building materials. The mansion, as finished, cost 25,000*l.*, of which only 10,000*l.* had been paid, and the balance was refused. The plaintiff, therefore, instituted this suit, and claimed that the contract should be maintained in as far as it agreed with the rough estimate of March 29, 1867; that it should in other respects be deemed void; and that the balance due should be paid.

Mr. John Cox, surveyor; Sir M. Digby Wyatt, Mr. J. T. Knowles, and Messrs. Meakin Gardiner, gave evidence that a correct estimate could not have been made from the drawings &c., given, and in the short time allowed for doing it.

Mr. Southgate, Q.C., also led evidence, to prove that the stables, &c., which were put at a lump sum of 1,800*l.*, and were afterwards

estimated at a cost of 5,000l., ought to be paid by the defendants; and that Mr. Kimberley never intended to construct them according to the estimate plan when he framed his original estimate.

On July 4, 1867, the plaintiff said, he remarked to Mr. White that there were many things in the specifications which were not included in the estimates. Mr. White said he knew there were, but these were matters which would have to be gone into. By this, the plaintiff alleged, he understood the extras were under the estimates, although he did not state that they were not included in the contract.

Mr. Jessel, in his argument on behalf of Mr. Dick, said plaintiff knew that the works he had executed were those mentioned in the specifications and working drawings. He stated that the working-plans being thirteen in number, it could have occupied a skilful surveyor at least month to take out the quantities. He never said that he did not contract to build the house according to the specifications. He agreed to enter into a contract according to the form submitted to him, and the contract was not more favourable than had been stipulated for. There was this remarkable fact that a form was submitted to him at the time the tender was accepted, and the contract was in accordance with the general terms submitted, although he had forgotten this. Mr. Jessel also urged that Mr. White was not Mr. Dick's agent for the purpose of supplying accurate quantities; and that Mr. Kimberley had any remedy at all, it was against Mr. White. He was entitled, therefore, to ask the Court to dismiss the bill, and with costs.

Mr. Dick's evidence was:—That the plaintiff proceeded with the erection of the mansion, &c., comprised in the contract, from the early part of April, 1867, to the beginning of February, 1869, without complaining of deception practised on him, or any mistake having been made by him, expressing any dissatisfaction with the contract; and from time to time Mr. Dick had, previously to this suit, paid the plaintiff sums amounting to 8,000l. on account of the works, on certificates from Mr. White. The plaintiff, however, was guilty of great delay and negligence in the execution of the works. Payments had been made by him from time to time upon certificates of Mr. White, and he was perfectly ready to pay to the plaintiff whatever might be due to him under the contract as soon as he obtained the requisite certificates. He knew nothing of any communications or dealings between the plaintiff and Mr. White prior to delivery of the tender of March 29, 1867, or of the circumstances under which the plaintiff signed the contract; and he particularly denied that Mr. White acted for him as agent in furnishing any materials on which the plaintiff alleged that he based his estimate for the tender. Mr. Dick states, further, his belief that the plaintiff had full and sufficient information to enable him to make his tender, and that ample opportunity was afforded for, and that there was, in fact, full exercise of, judgment on his part as to the amount and sufficiency of the sums mentioned in the tender.

Evidence was given on the part of the defendant that some of the works were badly done.

Mr. Pearson said plaintiff knew the terms of the contract when he entered into it, and neither his court nor a court of common law would relieve a contractor who entered into a contract with his eyes open. The plaintiff did not seek to set aside the contract, but asked for the difference between the same and the value of the alleged excess of the quantities in the plans and specifications. He alleged that he signed the contract on the faith of Mr. White furnishing him with a correct estimate of the quantities; but this was not so. He stated that Mr. White afterwards drew buildings which would be more expensive, and containing larger quantities, of which he was not aware. He attempted to fix Mr. Dick upon the ground that White was his agent; but if these alleged misrepresentations were true, the plaintiff would have his remedy against Mr. White, not against Mr. Dick. With regard to the general authority of an architect, it had been held that he was the agent of the building owner no further than to see that the specifications and plans were adhered to, except he had some further special authority given to him by the building owner. The architect's business was simply to prepare the plans and specifications.

Mr. Pearson, in conclusion, urged that to grant

relief in such a case would be to open a door to fraud. Persons who were disposed to enter into contracts would be afraid of doing so if a builder were entitled, from what had passed between himself and the architect, to come upon the building owner and make a further claim.

Sir R. Baggallay, on behalf of Mr. White, said the contractor might have a remedy against the architect if he had been guilty of deceiving him, but not otherwise. In a suit in equity the architect could not be made responsible for costs if the substantial relief was sought only against another. Relief could not be obtained behind the contract except the contract itself was set aside. The plaintiff alleged that Mr. White induced him to sign the contract upon improper representations, but there was no allegation of improper conduct on the part of the architect after the contract. The whole case attempted to be made out by the bill was based upon the difference between the estimated quantities and the quantities themselves. The plaintiff must establish the fact, not only that there was a mistake at the time the contract was entered into, but that the mistake was known to Mr. White; that Mr. White was acting as the agent of Mr. Dick; and that he was perfectly cognizant of the fact. He submitted that, under the circumstances, the plaintiff had no right whatever to join Mr. White as a co-defendant in this suit. No doubt, it was common enough for builders to make speculative tenders, but were they justified in coming, after so long a time, because the speculation did not turn out well, and making all kinds of allegations? Suppose the stables had cost 1,000l. less than the amount estimated, would Kimberley then have complained? He imagined not. Mr. May (in Mr. White's office) swears that the defendant wished the plaintiff to be satisfied with the quantities taken, and he replied,—"Well, sir, I am." Since the signing of the contract, the plaintiff had also invariably expressed himself well satisfied with the contract, and the way in which the job was working out. In July, 1868, the plaintiff for the first time complained of certain deficiencies in the quantities of Bath stone and the amount of walling. In January, 1869, the plaintiff again mentioned the excess in some things, particularly the stabling, which he considered fairly worth 2,500l. He again stated, however, that he would not trouble Mr. White in any way, but would finish the job. Mr. E. Crutchlow (Mr. White's clerk) stated that the defendant was careful that the plaintiff should be perfectly satisfied with the estimate. He had prepared the specification, and his instructions from Mr. White were to be careful that it agreed with the estimate and plans. Mr. White subsequently went through the draft specification, and made some alterations in some few particulars in which it appeared to be in excess of the estimate.

Professor Lewis, architect, thought the drawings and particulars given relating to the mansion sufficient, when supplemented by the personal explanations of Mr. White, to allow an approximate estimate to be formed; but not for the stables and laundry, and that any sum put down for them must have been a guess. He had looked through the contract drawings, and had rarely seen any which conveyed more accurate information.

Mr. Ewan Christian, architect, Whitehall-place, testified to the same effect.

Judgment had not been given at the time of our going to press.

THE FORMATION OF FLINTS.

At a meeting of the Geologists' Association, on the 2nd inst., a paper was read by Mr. M. Hawkins Johnson, F.G.S., "On the Origin of Flints, and the Process of Silicification in general." After alluding briefly to the different positions in which these substances occur, the author proceeded to show that their formation is due to a chemical process which may be roughly expressed, in technical language, as the substitution of silicon for carbon. He pointed out how a crop of sponges invested with their gelatinous flesh or sarcodæ, and living at the bottom of a deep ocean, were suddenly buried in a thick stratum of white mud, consisting of the minute shells of *Foraminifera*; that they then died, and while in the process of decomposition, this interchange of materials took place,—the nascent carbonic acid parting with its carbon in exchange for the silicon of the silicate of soda which seawater is known to contain.

At the close of the paper, the author produced a tadpole, upon which he had experi-

mented, and which he had that afternoon subjected for two hours and a half to the action of nitric acid, without its undergoing any alteration, the inference being that the animal had become invested with a film of silica of sufficient thickness to protect it from the acid; another tadpole that had not undergone the same preparation having been converted into a brown cloud by immersion in the acid for the same time. Some further experiments should be made in this direction. The importance of being able to protect perishable surfaces from decomposition is very great.

METROPOLITAN DISTRICT RAILWAY.

NEARLY twelve hundred men are employed upon the station that is in progress near the end of New Earl-street, Cannon-street, and the approach to it from Blackfriars. Relays of men are employed and kept at work night and day. It is confidently expected that this last portion of the District line will be opened for traffic on Monday, July 3rd. The works are already in such a forward state as to admit of trains being run through from Blackfriars, and on Thursday of last week Mr. Gladstone, Mr. Glyn, M.P., with Mr. Fowler, engineer, Mr. Baker, engineer, Mr. Myles Fenton, of the Metropolitan, and other gentlemen, passed over the line in an ordinary train. The entrance to the booking-offices will be from the short frontage to Cannon-street, between New Earl-street and Bow-lane. The end of the station runs up to the top of Garlick-hill, the nearest platform, about 25 ft. below the street level, being about 40 yards from Cannon-street. When completed the station will have three double platforms, plankd, 350 ft. long by 15 ft. broad, with one single platform. There will be a cross platform also at the end of the lines, giving access to the longitudinal platforms. The station-inspector's office and a refreshment buffet will open upon this platform, the dimensions of which will be the width of the station, 63 ft. in one direction, and 45 ft. in the other. The platforms will be covered by umbrella-roofs of iron, filled in with glass for the whole depth. As the name is intended to imply, these roofs will be supported by ranges of central pillars. The eaves, which will project sufficiently over the rails to cover the entrances to the carriages, will be furnished with gutters, so that there will be no drip. The space over the rails will be open, to afford perfect means of escape to the smoke and heated air from the engines. There will be nothing distinctive in the external appearance of the station buildings, the general character of the neighbouring blocks being preserved. The buildings are five floors in height, exclusive of the basement, and afford ample space for booking-offices, dining-rooms, writing-rooms, and other conveniences, with a large amount of space remaining for business offices, or other uses. New Earl-street will pass obliquely over the line at a short distance from the station. In this locality the works are unusually complicated and costly, from the arbitrary nature of the levels of the street, and of the subway, that is carried across from one side of the line to the other. This subway is carried upon iron girders, and over it the street is carried upon second ranges of girders, with Jack arches between. By this arrangement, the imposition of a heavy mass of dead weight upon the roof of the line has been avoided, and an open space has been obtained that will be of great service for ventilation.

This final section of the District line, which is only about 25 chains in length, has involved an immense amount of labour, as may be inferred from the facts that in the last three months 150,000 tons of material have been taken off, and 50,000 tons of material have been brought to the ground. The station roofs, and the works near the station, will take above 1,000 tons of iron and steel. In some single days recently, as much as 2,000 tons of excavated earth from the works have been taken away by barges.

The new station, although entering from Cannon-street, will be designated the Mansion House Station, as a second Cannon-street Station would have been inconvenient; and it is, besides, within sight and a short distance of the Mansion House, the Royal Exchange, and the Bank. This extension will be the terminus of the District system, and an end, for the present, of the idea of an inner circuit. It may be remembered, however, that in the last Act obtained by the Metropolitan District Company, a clause

was introduced depriving the company of power to debar any other company that might, in the future, be willing to complete the circle. It is inconceivable that any separate company will ever engage to execute such an enormously costly and relatively unprofitable work as a line from New Earl-street to Tower-hill; and the circuit, if it is ever to be joined up, must be by a shorter and less costly route than by the abandoned portion of the District line, and the authorised portion of the Metropolitan line,—to which that company is held bound by Parliament,—that were to have met at Tower-hill.

The dispute between the Metropolitan and the Metropolitan District companies, as to the working of the trains, has been satisfactorily arranged, and they will, from next month, run alternate trains from Moorgate-street and Mansion House stations. Each company will have equal rights to through booking to all the stations. The proportions of the takings for the traffic to which the two companies are respectively entitled, will be settled in the ordinary way at the clearing-house. The District Company have already received a large quantity of rolling stock, which is being provided under contracts with a number of eminent firms.

TRAMWAY PROGRESS.

The select committee on tramways have decided that the line of tramway which is to pass over Westminster Bridge and then turn on to the Embankment, shall not be continued along Bridge-street.

At a special general meeting of the North Metropolitan Tramways Company, the following Bills pending in Parliament have been approved:—An Act to empower the North Metropolitan Tramway Company to construct new tramways, and for other purposes; and an Act to empower the company to construct additional street tramways in the counties of Middlesex and Surrey, and the City of London, and for other purposes. The approving of a third Bill, authorising the promoter of the Columbia Market to make certain improvements and tramways in connexion with the said markets, was postponed, certain alterations in the Bill being necessary.

The tramway between the City and Holloway has now been laid along the City-road, and past the Angel on its way to Holloway. The portly carriages have begun to run between the City and the Angel, where they will have a sharp turn to pass when they go on to Holloway.

There is active preparation for a perfect network of tramways on the Surrey side of the metropolis; as, in addition to the existing Clapham, Brixton, and Westminster tramroad now in use for public traffic, a line of tramway is being laid from Camberwell-green to Kennington-junction, and a new tramway is in course of completion from Blackfriars Bridge to Camberwell, a portion of which is laid on asphalt; and this line will be connected to the Peckham tramway, and will then form an entire route from Blackfriars and the Elephant and Castle to Greenwich, and this portion will be shortly opened for public traffic. Tram-rails will also be laid from the Elephant and Castle at Newington, down St. George's-road, and connected to the present Westminster line.

METROPOLITAN WATER SUPPLY.

Sir,—When we complain that it is impossible to obtain a sufficient supply of pure water for our metropolis, we lose sight of the fact that the impossibility arises solely from the nature of the demand, which requires a water pure enough for human consumption, and yet plentiful enough to be used for every purpose, even for the watering of our streets, and cleansing of our sewers.

The most favoured village population, whose clear unfading spring Londoners cast envious eyes upon, would soon exhaust their supply were they thus prodigal in its use. In fact, in London, and in our large towns, we attempt more than is attained in any country district, except, indeed, on the borders of our mountain streamlets. The difficulty of laying and maintaining a double service of pipes, &c., seems almost insuperable; but let this once be faced and mastered, the rest is easy. We should find a source of supply sufficient to give the purest and best of water for human consumption to the whole of London, with proper precaution to prevent waste or misuse, but not to limit or stint its quantity.

Further, we require a clear and inoffensive,

but not necessarily a chemically pure water; and this could be had more easily than now in unlimited quantity for every common purpose. We could choose the softest water, best fitted for washing, which cannot be when it is to be used also for drinking and cooking. In a word, we are attempting to combine two objects, and we attain neither. We demand a water of the purest quality, and in quantity sufficient for every purpose, and both from the same source.

THOMAS BIRNETT.

ILLUSTRATED WALL-PAPERS.

WELL printed, in tints, on large sheets of good paper, Messrs. Partridge & Co. have issued a number of the best engravings originally given in the *British Workman*, each surrounded with the tale or descriptive matter referring to it. The desire is that they may be used for decorating the walls of cottages, workshops, schools, and nurseries. They are excellent specimens of the art of wood engraving, and well adapted to the purpose in view. The price is little more than nominal. We willingly assist in making them known, and sincerely hope that they will be largely made use of.

THE COST OF CONCRETE BUILDING.

Sir,—Mr. Tall's statement in the *Builder*, that the cost of concrete walls varies according to circumstances, from 6s. to 12s. per cubic yarders as much on one side as Mr. Wonnacott's does on the other.

It is generally allowed that for ordinary work a not less proportion of cement shall be used than one part out of eight by measure, and with that proportion Mr. Tall says in his pamphlet it is possible to do walling at 4s. per cubic yard. This is simply ridiculous, as one-eighth of a yard is two bushels and five-eighths of another bushel; and, assuming the walls to be half "packing," more than one and a quarter bushel of cement would be requisite, costing in London 2s. per bushel; and to this must be added value of labour, packing-stones, gravel, haulage, apparatus, &c.

A concrete wall measures when finished, if no packing is used, one-fifth less than the materials used in the same, exclusive of the cement; and I find that in a 9-inch wall sufficient packing only can be used to compensate for this diminution in bulk; and I do not agree with Mr. Tall's views in using as much packing as possible, but in my work I lay down as a rule there shall be 6 in. of concrete between each layer of packing-stones, and no two pieces of the latter shall be placed nearer than 3 in. to each other, or 2 in. from either face of any wall.

Mr. Tall says his labourers earn 7d. per hour in building the walls by measure; therefore, as four men are required for the purpose, it must follow that in a working day of ten hours they must do (at the price Mr. Tall, in his book, gives as the fair value, exclusive of fixing the apparatus, viz., 1s. 6d. per cubic yard) nearly 16 yards,—an amount of work in an ordinary way impossible to be done as it should be without the aid of crushing, mixing, and hoisting machines, the cost of which would prevent their use on any but extensive works, and then not always with profit.

It is doubtful whether, as a rule, any material advantage is gained in letting piecework the building of concrete walls, unless constant personal supervision can be given; the natural desire to do as much work as possible in the least amount of time often leads to the materials being improperly mixed, and an immediate amount of water used. The few pounds additional cost in having men on whom reliance can be placed to do this special work by day payment is, in my opinion, after a trial of both systems, money judiciously expended; and in my own experience I find that good substantial work, using only the best materials, can be done in this way, every expense and charge included, at prices varying from 10s. to 15s. per cubic yard, according to circumstances.

Mr. Tall's assertion that the attempts to produce concrete apparatus differing from his have been failures, is not correct, as I have superintended within these last two years concrete buildings, for the walls of which the apparatus of another maker has been solely used, which walls, had bricks been used, would have required a million and a half; and I hope, with the same apparatus to have an equal amount still to do.

Being misled by the representations that have been repeatedly made, and remain unconvinced, that concrete buildings could be erected in any weather, I had a considerable amount of walling done in December, 1869. The sharp frosts which succeeded heavy rains in that month, caused us to re-build a portion, and seriously damaged the remainder. The higher specific gravity of the Portland cement manufactured at the present time than formerly causes it to set much slower, and be consequently for a time more easily affected by sudden frosts; but from actual trials made during the two last winters, I find if concrete walling be done not later than October, or earlier than March, the most severe frosts, or changes of temperature, have not the slightest influence on it afterwards.

There is not any doubt about the truth of Mr. Tall's remarks, that the results and capabilities of concrete buildings are much exaggerated by the patentees of concrete apparatus, and the public thereby led to expect results beyond what can be obtained. Concrete, for many purposes and in many places, is far superior to bricks or stone, but it will never supersede entirely the use of those materials.

T. P.

Sir,—Being the first to erect a cement concrete building in London (viz., my warehouse, in Essex-street, Southwark), perhaps you will kindly allow me to state my personal experience on the subject.

The warehouse referred to (which probably you will remember visiting during its course of erection in 1869) is 70 ft. by 60 ft., and 60 ft. high. The cost of the concrete walls did not exceed 2s. per rod. I paid Mr. Tall for one of his patent building machines 134l. 15s. With this apparatus I have erected the above warehouse, a chapel, residence, shops, farm buildings, &c., and thousands of feet run of secondary walling, and am now erecting another warehouse, 60 ft. by 60 ft., and 60 ft. high, adjoining my present one; the total cost of all exceeding 10,000l.; and I can with confidence state that with the same apparatus I could execute a similar amount of work again.

I see Mr. Wonnacott adds 6s. per cubic yard to the cost of concrete; for it will be seen that this sum is excessive, when compared with these facts. It is not a fair comparison to add the entire cost of the apparatus to the first building erected with it, any more than it would be fair to add the entire cost of the scaffolding used in a single brick or stone building. It must be borne in mind that I use not a single pole, putlog, or corner in the erection of any of my buildings; which, placed, if added to purchase, I have no doubt would cost quite as much as the apparatus for the class of building I am erecting. With reference to the apparatus not being regarded as builder's plant, I must ask Mr. Wonnacott to excuse me if I differ in opinion with him on this point. I have no other plant but the apparatus; and how is it possible the works I have executed could be erected without it? Since the completion of my first warehouse, I have been frequently applied to to erect buildings in concrete. In several instances I have complied, and I am happy to state, with the aid of Messrs. Hilton & Anderson's Portland cement, the whole of the works have been satisfactory in every respect. These are my experienced facts.

The warehouse I am now erecting, adjoining the present one, is under the supervision of the same eminent architect that superintended the erection of my first stock, and I respectfully invite any one interested to inspect the works in progress.

H. GOODWIN.

EPSOM CEMETERY.

The new cemetery at Epsom was consecrated by the Bishop of Winchester on the 9th inst. 1 August last the board invited six architects to send in designs for the cemetery buildings, who those by Messrs. Shaw & Young, of London, were selected. A contract was entered into with Mr. T. Nye, of Ealing, in September, and the works are now brought to a termination. The new cemetery is situated on a rising ground on the Downs, between the Grand Stand and the town, and contains about seven acres of land, which is enclosed by a Kentish rag-stone wall surmounted by a dwarf wrought-iron railing. There are two entrances, one in the Down Lower-road, and one in the Middle-road. The gates are of wrought-iron scrollwork, the decorative work being made to emphasise the structural line; the piers are of Kentish rag and Bath stone.

At the entrance in the Downs Lower-road, a gate lodge, one story high, containing room for the cemetery keeper, and wash-rooms, &c. for the public. Facing the approach is a sumptuous bay window with tracery heads, and the porch is carried up as a turret, the upper part being constructed of timbers. In the centre the cemetery are two detached chapels, viz., Episcopal and Dissenting. The former consists of nave and chancel, with a round tower on the north side, and porch of massive timber work on the south side. The latter is simply a nave, with an octagonal east end and a square tower over the porch at the south-west corner. The upper part of this tower

constructed with timber-work, with tarring
employed in it. The whole of the build-
ings are in the Early English style, of a simple
character. The walls are built with Kentish
sand and Bath stone: the roof is an open
timber one, covered with sea-green slates, and
finished with a red crested tile ridge. The lead
lights, in which stained glass is sparingly intro-
duced, as well as all the fittings and furniture,
are specially designed.

The works have been carried out by Mr. Nye,
under the direction of the architects. Mr. R.
Horton was clerk of the works.

THE HORTON HOSPITAL, BANBURY.

This hospital, now completed, was commenced
in June, 1869, by the late Miss Horton, of High-
gate, London, and was intended by her to be a
benefit to the town of Banbury. Her death, in
July, 1869, caused a stoppage of the works for
nearly 18 months. They were, however, resumed in
January, 1870, by her great-nephew, Mr. J. H.
Horton.

The building stands in its own grounds, and
is constructed in red brick with black bands and
green-ground Bath stone dressings, and is of a
simple Gothic design. It consists of a centre
block with lofty tower, containing the executive
portion of the establishment, and two wings in
which are the wards for patients. In the centre,
executive portion, there is on the ground floor
entrance-hall, 10 ft. by 16 ft., paved with
marble tiles, leading into a corridor about
10 ft. long, varying in width from 9 ft. to 7 ft.,
which access is obtained to all parts of the
building. On the right and left of the entrance-
hall, and connected with it and the corridor, are
a surgeon's, matron's, and porter's rooms.
Coming from the corridor is the operating-room,
10 ft. by 16 ft., with an open timber roof and a
dentist's gallery, well lighted by four large win-
dows and a lantern light. Under the gallery
lavatories for the use of the students, with
hot and cold water for the use of the operating-
room; waiting-rooms are provided for men and
women, and dispensing and consulting rooms, a
room for convalescents, 16 ft. 6 in. by 14 ft., and
rooms for hospital stores and comforts. The
wards contain the wards for male and female
patients respectively, constructed on the pavilion
system. They are each 48 ft. long by 24 ft.
wide and 16 ft. high, with fireplaces at each end,
lighted on both sides and at end. At one
end of the wards, and having direct ventilation
from the external air, are lavatories, sinks, bath-
rooms, &c., with an ample supply of hot and cold
water laid on; and at the other ante-rooms,
dressing-rooms, and nurses' rooms. The
wards and the rooms appertaining to them
are plastered throughout with polished Parian
cement. The dressings to doors and windows
are also executed in cement, and the floors are
inlaid waxed over. Ventilation is obtained to
wards and rooms adjoining by means of
opening in the ceilings, air-flues, &c.

With the exception of the kitchen and bed-
rooms for the surgeon and matron, the whole of
the hospital is on the ground floor.

The whole of the works under the contracts,
amounting to a little over 6,000*l.*, have been
carried out by Messrs. Franklin & Sons, of Ded-
dington, from the designs of Mr. Charles H.
Drever, of London.

TRANSMISSIBILITY OF INTELLECTUAL QUALITIES.

At a meeting of the Statistical Society, on the
14th, Mr. William Newnham, F.R.S., President,
the chair, Mr. Hyde Clarke read a paper "On
the Transmissibility of Intellectual Qualities in
England." As one kind of test of intellectual
action he took the statistics of the writers of
books in the "Biographia." Of 2,000 authors,
1,000 were born in country districts and 1,250 in
town districts. Examining the towns and the
distributions in them, 333 were allotted to
London, 73 to Edinburgh, and 53 to Dublin.
The largest numbers in the tables beyond these
are found in cathedral and collegiate cities.
The deductions he drew were that intellectual
activity is distributed unequally, but that it is
more among the town or more highly-educated
population than among the rural population.
He pointed out that the larger the concentrated
educated population the larger is the intellec-
tual development, and he referred to the like
examples of Greece, Rome, and modern Europe,

where the same law is to be traced. The great
modern centres of industry in England occupy a
low relative position in the list, and are scarcely
to be noticed; but they are now beginning to
contribute. He affirmed that the literary class
was produced from the educated class, and not
from the illiterate classes. While no educa-
tional effort will produce men of great genius, he
inferred that literary attainments are in relation
to literary culture, or the culture of the educated
classes, and that by extending education to other
classes of the population the intellectual capacity
of the community will be extended and pro-
pagated within certain limits.

COMPETITIONS.

West Bromwich Public Buildings.—We can
now go a little more into particulars as to the
result of this competition. The committee ob-
tained the assistance of Mr. E. Christian in
making the selection, and say in their report,—

"Your committee recommend the following plans in
the order named, and suggest also that the premium for
second plan of Town-hall and Library be divided among
the two named as second in the proportion of the proposed
expenditure, and that this be a condition of the award of
second premium. Your committee also recommend that
the acceptance of 'Compans's' plan of Town-hall, and
'A in a circle' for Free Library, be also conditional
upon the architects to whom they belong consenting to
the carrying out of such plans only to the extent to which
they are selected. Town-hall and Offices.—1st, 'Com-
pans'; 2nd, 'Progress.' Free Library.—1st, 'A in a
circle'; 2nd, 'Fleur-de-lis.' Markets.—1st, 'A in a
circle.' Baths.—1st, 'Bonâ Fide'; 2nd, 'Progress.'
Subjoined are the names of the successful candidates:—
'Compans,' Messrs. Alexander & Henman, High-street,
Stockton-on-Tees; 'Progress,' Mr. William Hale, Temple-
row West, Birmingham; 'A in a circle,' Messrs. Waller
& Proud, Wolverhampton; 'Fleur-de-lis,' Mr. Joseph
Hewitt, Edmunds-street, London; 'Bonâ Fide,' Mr.
Pincher."

The report was adopted. The following resolu-
tion was then passed:—

"That the plans of 'Compans,' 'A in a circle,' and
'Bonâ Fide,' be accepted for the buildings mentioned in
the report of the General Purposes Committee, subject
to the conditions named in the report and instructions to
architects; and that the second premium be given to the
architects named in the same report, and subject to the
like conditions."

By another resolution the General Purposes
Committee were empowered to communicate
with the architects of the plans accepted, and
to obtain tenders and report to the Board.

Winchester Guildhall.—In coming to their
decision the committee selected, from forty-six
designs submitted, six as especially meritorious.
The following is a list of them, with the names
of authors:—No. 25, "Utile Dulce," accepted,
Messrs. Jeffery & Skiller, Hastings; No. 1,
second premium of 50*l.*,—motto, "Tria juncta
in uno,"—Messrs. James Newman, Russ, &
Minns, Westminster; No. 27, "Concentration,"
Mr. J. J. O'Callaghan, Dublin; No. 26, "Manners
maketh Man," Mr. Edw. W. Godwin, London;
No. 8, "Cæsar Gwent," Messrs. Woodzell &
Collett, London; No. 38, "Compass," Mr. Chas.
F. Crapp, Bristol.

THE TRADES MOVEMENT.

Newcastle-on-Tyne.—A mass meeting of the
engineers on strike has been held on the Town
Moor. About 5,000 were present, who marched to
the moor preceded by bands of music, the
greatest order prevailing. Resolutions were
passed, declaring that the conduct of the masters
had been such as to justify the men in going
out; and that, believing that the hours of labour
should be reduced to nine per day, and being
now on strike to secure that system, they would
not on any account recommence work on any
other terms than fifty-four hours per week. The
strike has paralysed the engine trade, so far as
this district is concerned. There is no reliance
that orders given to Newcastle establishments
still working will be executed, the fear being
that all the men employed in them may be forced
out on strike any week. It is calculated that
the firm of Messrs. Stephenson alone have lost
orders through that cause to the large extent of
30,000*l.* Great fears are entertained by the
manufacturing engineers of the district that
already the trade has been injured to an extent
not recoverable for many years to come. The
practice of coercing their fellow workmen to
quit work is said to be prevalent amongst the
unionists.—The strike among the joiners of
Newcastle and Gateshead has extended over
nine weeks. During that time we are told, the
men have gradually been leaving the district for
other centres of employment, upwards of forty
hands having been sent to the north, while

other places have received supplies. The union
officials also state that they have delegates
engaged in advocating their movement in Lan-
cashire, and, of the men who originally came
out on strike, probably less than one-half now
remain in the locality. The masters, on the other
hand, have been filling up the places of those
who left them, and it is understood that further
action in this direction is still contemplated.

West Hartlepool.—The whole of the body of
labourers, who number nearly 400, employed in
the Bond yard and about the docks at West
Hartlepool, by the several contractors, struck
work on Monday week, because their employers
refused to comply with their request to shorten
the time of labour on Saturdays to a couple of
hours less than the existing period, which now,
inclusive of the dinner-hour, extends up to four
p.m. The men desire to cease work in future
at one p.m. without an intermediate dinner-hour.

—As far as the firm of Messrs. Denton, Gray,
& Co., of West Hartlepool, is concerned, the ship
carpenters' strike is at an end. A deputation of
five of the men had an interview with Mr. Wm.
Gray, to whom they offered to accept that gen-
tlemen's original offer of 6*d.* per day extra
wages, the hours (57½ per week) to remain as
before; they also offered that, if the nine hours
were to be conceded to the men upon old work,
they would be content with 5*s.* per day. Mr.
Gray remaining firm to his first proposal, the
deputation withdrew, promising to confer with
the body of the men in the course of the evening;
and the result of this conference was that as
many of the men as the excessively wet weather
would permit to work, presented themselves at
the yard, it being fully understood that as soon
as the weather moderated the others would
follow.

Lincoln.—A meeting of master builders was
held to receive the bricklayers' delegates, when
the following resolution was passed:—

"That, considering the agreement entered into a few
years ago, between the employer and employed, whereby
six months' notice should be given on either part of any
alteration of rules, and since the bricklayers had given
printed notice to the employers only on March 8th, 1871,
to take effect at the present time, thus breaking faith, the
employers are not prepared to discuss the question now,
but are willing to meet the bricklayers' delegates a month
before the proper notice expires to settle the question."

The stonemasons having given the proper six
months' notice, the employers, at an adjourned
meeting, proposed that the wages should be as
follows:—

"Four shillings and pence for the first five days of
the week, and two shillings and pence for Saturday,
leaving off work on that day at half-past twelve."

Middleton.—All the masters of the carpenters
and joiners of Middleton, with one exception,
have granted an increase in the wages of their
employees of 1*s.* per week, and agreed to allow the
men to cease work on Saturdays at twelve o'clock
instead of one. The wages are now, therefore,
2*s.* 6*d.* per week, and the hours fifty-four to the
week. The men asked for 3*s.*, but gave way at
the request of the masters.

NOTTINGHAM ARCHITECTURAL ASSOCIATION.

The annual meeting of this society was held
on the 2nd inst., Mr. T. C. Hine, president, in
the chair. Mr. Hine, in a few remarks, con-
gratulated the members of the association on
the success which attended the great conference
of architects which took place in London the
week previously, and at which he was present as
a delegate from the Nottingham Association, in
pursuance of the resolution passed at their last
meeting. It was with sincere regret that he
adverted to the remarkable fact that, at the very
time the metropolitan and provincial architects
were gathered together in general conference, to
discuss questions of professional practice and to
ascertain how far they could best promote the
advancement of architecture in its æsthetical
and constructive branches, the inhabitants of
the next greatest city in the world were madly
engaged in the wilful destruction of some of the
finest architectural monuments of present and
past ages. Happily, however, these senseless
and disgraceful proceedings were confined to one
city. Mr. Hine then alluded to the fact that our
continental neighbours set us an example in
respect to conferences; for at the 15th Biennial
Congress held in Hamburg, the German gather-
ing, which consisted of 800 architects and engi-
neers, was on a great scale, and would make the
most cheerful and lively of our own appear some-
what dull. Their meetings were evidently as

social and recreative in their character as they were intellectual; for upon this occasion, after they had transacted business matters, there were two *conversations*, two excursions down the Elbe, a public breakfast, a public dinner, and a special representation at the theatre, the whole concluding with a grand display of fireworks.

A vote of thanks was proposed to the President of the Nottingham Architectural Association for the satisfactory way in which he had represented the association, and to the other officers of the society for their past services; after which a ballot was taken for the election for the ensuing year, the result being as follows:—President, T. C. Hine, Pres. Arch. Assoc.; Vice-President, R. Evans; Treasurer, R. Jalland; Hon. Sec., F. Jackson, C.E. Council: S. Dutton Walker, F.S.A.; J. C. Gilbert, J. Jackson, J. S. Norris, C.E.; W. H. Booker. Auditors: W. A. Hazell, W. S. Bokitt. Mr. Walker strongly urged the new Council to arrange for a series of papers on architectural and engineering subjects for the ensuing session, after which the meeting adjourned.

PROPOSED COMPLIMENT TO THE "COMÉDIE FRANÇAISE."

THE arrangements for giving a complimentary banquet to the members of the Comédie Française now in London are making satisfactory progress, and the result will, we hope, be worthy of the purpose. The desire is not merely to offer a hearty welcome to the oldest-established body of actors in Europe, now visitors here under distressing circumstances, and to show right appreciation of the admirable skill and harmoniousness they exhibit, but to do honour to the art itself. The list of stewards already includes—

The Earl Granville, Viscount Powerscourt, Lord Lytton, Lord Houghton, Lord Dufferin, Lord Henry Lennox, Capt. Armstrong, Messrs. G. Bancroft, Shirley Brooks, F. Madox Brown, Dion Boucicault, P. Calderon, R.A., G. Calhoun, John Clarke, Dutton Cook, Charles Dickens, Sir Charles Dilke, bart., W. Hepworth Dixon, George Du Maurier, General Sir H. De Bathe, George Evans, Lord E. Fitzmaurice, M.P., J. A. Froude, Capt. Hamner, Sir Thomas Hardy, D.C.L., John Hare, John Hollinghead, Tom Hood, Walter Lacy, R. Lee, Sir Baldwin Leighton, bart., Fred. Leighton, R.A., C. Appleton, H. N. Barnett, Bayle Bernard, J. B. Buckstone, C. Calvert, H. S. Cheltenham, H. F. Chorley, Willie Collins, Sidney Colvin, F. W. Cosens, E. Deacy, Right Hon. B. Disraeli, Dr. Doran, F.S.A., A. W. Dabour, G. Godwin, F.R.S., Jonas Levy, Fred. Locker, N. Maccohi, W. C. Macready, Westland Martin, LL.D., Herman C. Merivale, J. E. Milais, R.A., Alfred Morrison, W. A. F. O'Shaughnessy, Sir Robert Peel, bart., Samuel Phelps, Rev. W. B. Pyke, J. R. Planché, Sir F. Pollock, bart., W. R. S. Ralston, Charles Reade, R. W. Richardson, M.D., Clement W. Scott, Palgrave Simpson, E. A. Sotherton, Algernon C. Swinburne, L. Alma Tadema, Tom Taylor, Cave Thomas, May Thomas, Hermann Verin, E. M. Ward, R.A., B. Webster, J. A. M. Whistler, Alfred Wigan, W. G. Willis, C. L. Grunissen, A. J. Lewis, H. Merivale, C.B., Sergeant Parry, George Painter, Henry Reeve, Rev. W. Knolly, Col. Richardson, W. H. Russell, LL.D., Charles Santley, Sir Bruce M. Seton, Bart., G. Clarkson Stanfield, J. Ashby Sterry, H. Smart, Sir W. Tite, M.P., Alfred Tennyson, and others, in number altogether about 120.

The entertainment will probably take the shape of a *dinner* at the Crystal Palace, and will be given about the 5th of July. As the size of the party is to be limited, tickets will be obtainable only through a steward. Mr. Joseph Knight and Mr. Lewis Wingfield are acting indefatigably as honorary secretaries.

BUILDINGS FOR MUSIC.

SIR,—There appears to be good reasoning in your recent observations on the subject of buildings for music, &c.

The question is whether a room intended for concerts or public speaking should exceed a certain length, height, and width, and also the material with which the walls and ceilings should be composed. As regards the former, I believe it was and is considered, that St. James's Church in Piccadilly is nearly perfect for the advantages of sound, and that clergymen have generally approved of it.

In some of our early parish churches it used to be the fashion of introducing a sounding-board over the pulpit to confine the sound. As regards the material to be used for assisting sound, I believe it has long been considered that wood has the preference over any other material for lining the walls up to a certain height, and forming the ceiling of the same material. Another point is the form a room should take for the purposes of conveying sound agreeably, without too much vibration, echo, &c. The question for consideration is whether there would not be an advantage in forming the orchestra end or platform in that of a curve, and also the ceiling over.

In the new House of Commons it was found that the room was too lofty for the comfort of speaking, and the late Sir Charles Barry lowered it in height, and formed the ceiling in wood, and canted off the sides, which had been previously tried in another public room, and had been found advantageous. There is another advantage in using wood: it is capable of every species of decoration, which can be renewed at pleasure, with less cost and damage than plaster. The concert-room in Store-street I have heard spoken well of, and the end (although not elegant in form) has been found to assist sound: it is played off at the back of the orchestra.

In old Westminster Bridge each of the stone recesses was semicircular in form at the back, as also the ceiling, and conveyed sound in an extraordinary manner, and formed an echo in the opposite recess. A word to the wise.

A SUBSCRIBER.

HOUSE OF COMMONS.

Prison-Building and Convict-Labour.—In reply to Mr. Goldsmid, Mr. Bruce said it was the intention of the Government to ask for a vote of money during the present session for the purpose of building a convict-prison. The Home Department had had no consultation with the War Department as to the possible employment of convict-labour upon the works, which had not yet been decided upon. Government had decided upon nothing which might relate to the fortifications of Chatham, and nothing would be done before Parliament was consulted.

Thames Embankment.—On the motion of Mr. Glyn, in the absence of Mr. Gladstone, a select committee was appointed to inquire whether, having regard to the various rights and interests involved, it was expedient that the land reclaimed from the Thames, and lying between Whitehall-gardens and Whitehall-place, should, in whole or in part, be appropriated for the advantage of the inhabitants of the metropolis; and, in such case, in what manner such appropriation should be effected.

South Kensington Museum.—Mr. C. Bentinck asked the First Commissioner of Works when he would be prepared to exhibit the plans and model of the proposed Natural History Museum at South Kensington, and whether before the estimate for the work was proposed; and when the instructions and correspondence relating to the new Natural History Museum, which had been ordered to be laid upon the table, would be in the hands of members. Mr. Ayrton replied that the correspondence relating to the new Natural History Museum would be laid on the table next day. With regard to the model, he had never contemplated such a thing; but, with respect to the drawings and plans, they would be laid on the table, but it would be some time before they were ready. Mr. C. Bentinck asked whether the estimate for the large expenditure involved would be proposed before the plans were laid on the table. Mr. Ayrton said, "If the plans are not laid on the table when the estimate comes, the vote must necessarily be proposed without them."

THE PEBBLES IN THE STREET.

A LECTURE by Canon Kingsley has been delivered in the King's School, Chester, the subject being "The Pebbles in the Street." There was a good audience.

In commencing, the lecturer proceeded to say that when he first came into Chester, almost the first thing which caught his eye, and aroused an interest which rose almost to awe, was the rounded pebbles—cobble, as they called them—with which their streets were paved. He never saw any stones exactly like them, although he guessed what they were. He had been spelling out their story for years past in other places; in Scotland, Wales, and Ireland. They were, to him, old friends with whom he had, as yet, only corresponded, but whom he had at last met face to face; and when he took up the notion of giving lectures on physical science, one of his first thoughts was—"I wonder if the people know the strange, I may say the awful, history of the pebbles beneath their feet; and, if not, whether they would care to hear it from me?" And now the time had come. The first fact, which he was sure would strike them about these pebbles was, that they are fragments of rock, different from any rocks around Chester; the second was that all are more or less rubbed and rounded, and also scratched. There are sand-

stone rocks about Chester, but those pebbles which are sandstones are exceedingly hard and crystalline. Many of them, like some of those in Abbey-square, are rounded fragments of white limestone, but the greater portion of them are fragments of rock which they would not see *in situ* till they got into mountainous districts into Wales, or the north of England, or Scotland.

The lecturer then went into the subject of glacial action, and explained, in an interesting way, how the cobbles probably came to where and what they were. As a humble student of the subject, who had looked the facts in the face for more than twenty years, he was about as certain, he said, that they could only be explained by ice as he was certain that his having got there by rail could only be explained by steam. But what would no doubt startle them was in being asked to believe that such enormous changes of climate had taken place. They would be very astonishing if there were no facts to prove it. But there could be no reasonable doubt that the climate of this northern hemisphere had changed enormously more than once; that disturbances of land and water, of the shape and size of continents and seas, had taken place again and again; and there could be no doubt that before the age of ice vanished the whole of the north of Europe was more of an island than it was now.

THE PALMERSTON STATUE AT SOUTHAMPTON.

SIR,—My attention has been called to a letter in your number of May 27th, on the subject of the above statue, signed by "A Friend to Justice." I am much obliged to the writer, but not knowing who he is, this is the only way I have of thanking him.

Previously to meeting the Palmerston Committee, I had offered to do a much smaller statue for 500*l*.; but at the meeting when I received the commission, 800*l*. was proposed as the amount to be paid to me, which was seconded and carried unanimously, and entered in the minutes of the meeting.

As the work progressed I frequently mentioned the amount of 800*l*. in correspondence without any objection being made to it; on the contrary, the mayor wrote,—"You have been very indulgent," and promised to take steps to raise the money. More than two years passed and the statue had been finished and exhibited in the Royal Academy, before I first heard from the town clerk that the committee considered 500*l*. a legal debt, and the 300*l*. a debt of honour. The balance of the 500*l*. was not even paid until I commenced legal proceedings.

THOMAS SHARP,
Sculptor of the Palmerston Statue
at Southampton.

DRINK AND PAY THE PIPER!

SIR,—I read, in the *Builder*, of poisoned water in leaden pipes; also of attempts to electro-plate the interior of pipes. I should like to have the monopoly of piping to the tune of half-price and no poison. Gutta-percha tubes are made of various bres. I would thrust broad stoneware rings inside pipes, a stout lath (steeped in gutta-percha solution) to rest on the rings to prevent the pressure of the earth collapsing the tube. The above could be laid quickly, cheaply, and would last for ages. Perhaps some of your readers may perceive some drawback to the above which has escaped my perception.

R. T.

ON THE ARCHITECTURAL TREATMENT OF PORTLAND CEMENT.

ARCHITECTURAL ASSOCIATION.

At a meeting of this Society on the 2nd inst. Mr. Plimbe read a paper "On the Treatment of Portland Cement." In the course of it he said, "Firstly (and chiefly), I would submit that Portland cement should be no more treated as stone than it should as wood, or any other material equally different nature. It should be treated exclusively and entirely as a plastic material, always remembering that it is a comparative thin coat laid over and upon some other material, forming the bulk of the walling, it being general presumed that it is of superior hardness and durability, and more waterproof than the material it covers, and that to that extent it is intended."

a protection and preservative of the same, it seems to me, would indicate that it should be treated with great breadth and in large surfaces. I should certainly be exceedingly careful not to break up the surface, and should always endeavour to treat it as a covering laid on, and preserve a flatness and absence of everything but high relief and deep sinking. Carrying out idea of its being a plastic material, I should object to run such mouldings as could be aimed in the thickness of the cement itself; I think care should be taken to keep the mouldings as fine as would be done in designing other plaster work, such, for instance, as could be employed for inside cornices and similar plaster features. Anything like elaborately moulded and blocked cornices, requiring the cores and other artificial means of obtaining projection should be avoided; but if it were necessary to project walls or to use a cornice, I should prefer to use such as could be run on any projection that could be obtained in the material of the walling itself. For instance, in the concrete building I am erecting, I bring over the eaves as a shallow cove at top, and I purpose using the same with coloured cement, adding or two shallow mouldings, such as can be in the thickness of the cement. Anything like the shape of architraves, pediments, or other things to window and door openings should be avoided; but good effects might be got by mouldings and running shallow mouldings round recesses. Jointing or lining the surface, as usually seen in stucco work, should be avoided as an imitation of stone jointing, and as destroying breadth and flatness of surface; but incised lines and ornament of shallow depth may well be employed to obtain richness of effect and to give the surface without destroying the breadth. A true treatment of cement-work would probably lead to a very extensive use of these shallow sinkings, both in lines and ornament, and such a treatment would be legitimate, as they could readily be run and worked in the cement. The texture of the face of the work is of importance. If finished off and floated with a wooden sand is brought very much to the surface, and a rough texture is given to the work, being generally the surface now given to cement work as usually executed. The advantage of this rough surface is doubtful, especially in London. It soon discolours, and there is but little chance of its washing clean with water. An exceedingly fine, almost polished, face can be given by finishing with a steel trowel; in this case the cement comes to the surface, but is apt to show the working of the trowel, and to leave a smeared surface far from nightly or agreeable in appearance. The face that would probably meet with most approval is one which may be described as between these two, and is obtained by floating with a steel trowel, but by finishing the process by rubbing it on the work instead of floating: this gives an exceedingly hard surface without the massive polish obtained by the last method, and is much finer than the floated work that it would probably retain its colour much better. Of course it is highly desirable to avoid painting cement work, but at the same time the atmosphere (and that of London particularly) discolours it after it has had some years' exposure. I have but little doubt, however, that it could be cleansed from time to time at no more expense than would be incurred by staining and re-pointing brickwork and by scraping stone work, as is usually done in cleansing these materials. Particular attention should, I think, be given to the local colour of the work. As a rule, a bland cement mixed with Thames sand does not give an agreeable colour, but it may be improved by mixing with different-coloured sands, in white to deep red.

Cement work is particularly well adapted for coloured decoration, and with proper management and careful design in its use I believe exceedingly good results might be obtained. The cement should be coloured before working, as its colour is entirely different from any colouring put on after the work is set. So important do I consider this part of our subject that I should like to see every cement-designed building stained in colour. All kinds of colours will mix with cement; some kill it, others are themselves destroyed by admixture with it. As a rule, mineral colours will stand best. Of the specimens on the table, the dark red is made of one-fourth part of purple brown (oxide of iron), two parts of sand, and one of cement, all mixed dry before making up for use; the light red is made with Venetian red, in the same proportions; the

blue is made of German ultramarine, mixed as before; the green is obtained by green ultramarine, and this, by daylight, is of an exceedingly nice tint: the colour, itself, however, is expensive, so much so as to render its use in large quantities somewhat improbable: the proportions are as before; the yellow is made of cadmium yellow and Thames sand: brighter colours might be obtained, but it is hardly a colour that could be used in decoration to any extent unless mixed with others. Good blacks might be made with black manganese mixed in the same proportions. All these colours could be varied by altering the proportions and by using different-coloured sands. The admixture of colours with cements, no doubt, will give different results as regards setting and colour, varying with the cement and sand used; before employing the same, direct experiment should therefore be made. This facility of mixing colours with cement is, I feel, a strong point in its favour, and should be fairly tried by all interested in or using cement architecturally.

Cement work may be ornamentally treated by a kind of stencil process, which is almost as rapidly executed as ordinary paint stencilling, and it can be done by experienced workmen almost as cheaply. A stencil-plate having been set to the required pattern, and of the necessary thickness (according to the relief wanted), it is laid over the ground when the latter is sufficiently set to allow of its being worked, but as soon as possible after the general surface is laid on. Coloured cement, or, of course, the same coloured cement as the ground, is then filled into the perforations of the plate, and floated off flush with its upper surface. The plate, on being removed, leaves the pattern as shown in the specimen on the table. If the ground is roughed for an extra "key" to the stencilling, by picking through the pattern of the plate before filling in, great extra durability results; and, as the ground is hardly set, the stencilling sets and hardens with it, so that a most durable kind of ornamentation is obtained. This plan could be adopted to any extent, and pattern over pattern might be stencilled, and different colours might be used, to the extent of many layers, as shown in the specimen on the table [showing a green ultramarine ground, coloured with various coloured cements, filled into a second stencil-plate].

A perfectly legitimate method of enriching a cement surface would be to stamp thereon patterns in bands, or as a diaper, in low relief, as it is setting, and unquestionably the result would be satisfactory. Enriched surfaces of this kind, using different dies, and doing the work by hand, so as to give a slight variety of texture, could not fail to have an exceedingly good effect. Metal dies, with polished faces, would give the best results. Some time ago, Mr. Ferrey, in a short paper read before the Institute, advocated this method of decorating the ordinary stucco-work of churches and other buildings. I am not aware if he has employed it, nor can I say whether in stucco the effect he expected to obtain was gained. I have no doubt, however, that such a method could be employed in the treatment of a cement surface.

THE SHORT HISTORY OF A HOUSE.

"This is the House that Jack built."
Nursery Rhyme.

THE greatest aim of John Cheapside's life, on retiring from business in the City, was to purchase a few acres of land on the borders of some undisturbed suburban neighbourhood, within a sixpenny railway ride of London. On this plot of virgin soil he desired to build a house for himself and to cultivate a kitchen and flower garden. The retired City merchant advertised for tenders; and, in less than a week, received a score of designs and estimates from builders who acted as their own architects. Cheapside, being the cheapest and economical through life, bought in the practical and the work commenced. The house, begun at the close of autumn, was carried on without intermission through the frosts of winter, was papered and painted in the spring, and was ready for its owner to take possession ere midsummer. The contractor was an expeditious hand, and being bound to time, he kept faith in his agreement, and was handed back his bond. Mr. Cheapside was delighted with the appearance of his newly-finished mansion, which was embellished with a stucco front, preserved from damp by an outlying roof, supported by a series

of tasteful consoles painted to match the exterior frontispiece.

A flight of stone steps ascended to the hall-door, and a series of other steps descended to the breakfast-parlour beneath. The hall-door had a porch, and the windows in front were surrounded with architraves, surmounted by a cornice, of charming proportions. The builder, who studied economy, as well as his client, by buying labour in the cheapest market, put in timber which compensated in weight for what it wanted in dimension. Saps, in his opinion, when kept in by paint, preserved the fibres from premature exhaustion, which over-seasoning was so apt to produce. Plaster, well diluted with road-mud, formed an excellent ground-work; and the lime-putty skimming for the external coating, was gauged in thickness according to time and atmospheric changes. In Mr. Cheapside's mansion, where paper soon succeeded this finished wall, the whitewash brush was nearly a sufficient application; and, to all intents and purposes, the thickness of the coating, in many respects, had scarcely more body than what the dried surface of a wall presents after the whitewasher has done his duty. The painting-work of the new house was done in what is called the "usual manner." The drainage of the mansion was carried out to a horse-pond, about 30 yards in the rear; but there was an unmistakable gradient, whose downward incline led to the source of the sewage, instead of to its supposed outfall.

Mr. Cheapside entered in on his new take in the summer of 1869; and before that day twelvemonth two of his children had died of zymotic diseases. Two servants also had sickened in that time, and were removed to a fever hospital; and his wife never knew a day's health from a month after she entered the family mansion. It was all put down to the "visitation of God." In the midsummer of 1870, the stranger who passed by the new mansion of Mr. Cheapside might see that a settlement had taken place over the hall-door and each of the windows; and if he got liberty to enter the house, he would discover in most of the rooms cracks in the ceilings and openings in all the joints of the joiners' work; he would discover the heads of the door-frames and windows out of square, and the doors sunk on one angle, half an inch or more from their top rebate. He would have found in the lower rooms the paper spewing forth a deadly ooze, and hanging, in other places, in large patches from the walls. In the back premises would be found a flooded sink, unable to get rid of the refuse-water; and if further scrutiny were deemed necessary, by lifting the pump-handle a flow of brackish water, "all alive, alive," would be had, which needed neither taste nor smell to prove its solidity.

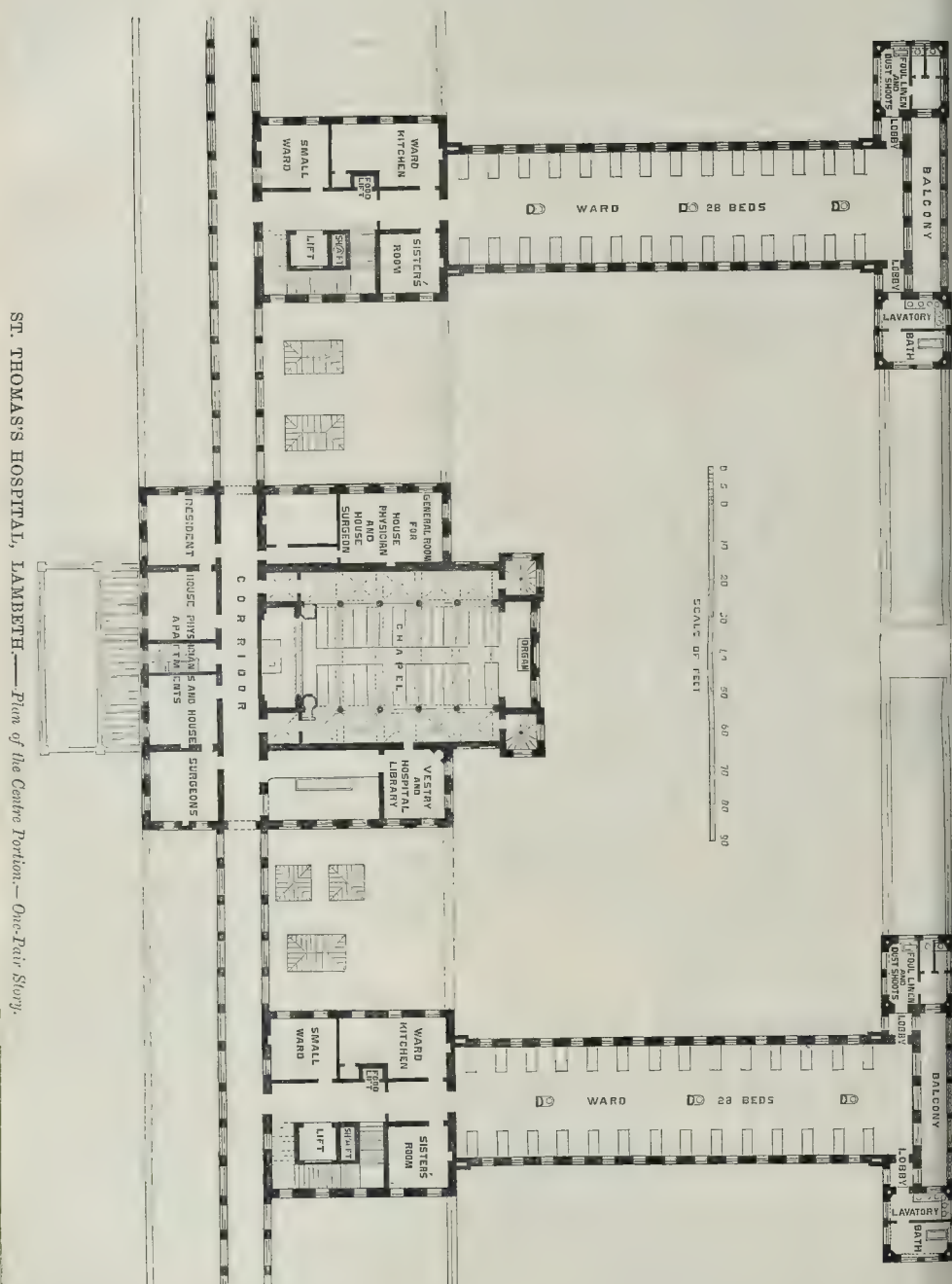
Time passes. A visit now (1871) would show two bills in the windows—"To be Let or Sold." The winter's snows and frosts have nipped in twain the Roman cornices, dilapidations have set in, and gloom is everywhere apparent.

The builder still lives with a light heart, and has plenty of jobs on hand. The owner rents a better, though old-fashioned red-brick structure of the reign of Anne, farther away from the City. His wife has completely recovered from her chronic hysterics and headache, and her children are rosy and full of animal spirits.

Mr. Cheapside himself acknowledges that he is completely cured of his mania for building without advice, and adds that he has not the least pity for those who allow themselves to fall into the hands of the Philistines.

As most stories have a sequel, so has this short history of a house. The Great Metropolitan Circular Extension Railway Company are at present laying down a line of railway which cuts obliquely across the garden of Mr. Cheapside's late mansion. One of the solicitors of the company, who was for some months in the secret of the line of route, purchased Mr. Cheapside's freehold at an alarming sacrifice, and the said solicitor is chuckling over his bargain and the compensation in prospective. The railway company is about awarding a proper sum to him for the great loss he is about to sustain.

Cheapside's mansion for the next twelve months will be transformed in part into a depot for railway plant, and a refuge for navvies and their cooking utensils. Its suburban quiet has for ever departed, and shortly "a sale of building materials" will furnish the last chapter in the curious anti-climax to the sylvan dreams of John Cheapside, City merchant.





ST. THOMAS'S HOSPITAL.—View of the Albert and Victoria Wings, and the Chapel, as seen next the River. —Mr. HENRY CUNBER, Architect.

THE OPENING OF ST. THOMAS'S HOSPITAL.

HER MAJESTY THE QUEEN, with the Prince and Princess of Wales, and a Royal and noble following, formally opened the new Hospital on Wednesday morning last, naming the two wards to have illustrated, respectively the "Victoria" and the "Albert Ward." The address made to the Queen thus proceeded,—

"A portion of the ancient site in Southwark where the Hospital was founded by your Majesty's royal predecessor, King Edward VI., having been required for a public undertaking, it became our duty to reconstruct the Hospital in a readily accessible position, where its usefulness could be maintained unimpaired, and where buildings could be erected thoroughly adapted to the requirements of the charity, and at the same time worthy of the royal foundation. We have spared no pains to accomplish this important object, and with the approval of the High Court of Chancery, this new Hospital has been completed. Its design and construction it has been our aim, whilst adding unnecessary expenditure, to secure every important sanitary advantage that science or experience could suggest for the benefit of the suffering poor who would seek admission within its walls, and we trust that the plan and arrangements adopted have resulted in an Hospital which will favourably compare with the structures for similar purposes of bygone times, and which will form an addition to the many monuments of beneficent charity ever to be associated with your Majesty's auspicious reign.

We feel pride and gratitude in the remembrance of the interest which his Royal Highness Prince of Wales's Consort was pleased to evince in the welfare of the old Hospital in Southwark, and we regard it as a high privilege that in the reconstruction of the Hospital on the site on the Albert Embankment we have been honoured by the gracious presence of your Majesty at the commencement and at the conclusion of our work. It is our fervent hope that, by Divine aid, the governors may administer the important charity committed to them, and that their work may be worthy of the noble building now inaugurated by your Majesty's royal presence, and that your Majesty may be always able to look back on this day with unalloyed satisfaction."

The Queen, in a written reply, said,—

"I thank you for your loyal address. I congratulate you on the completion of a work of so much importance to the suffering poor of the metropolis. The necessity for re-erecting the ancient site of your Hospital has been fully turned to account by the erection of more spacious and commodious buildings in this central situation; and I rejoice that a position of appropriate beauty and dignity has been found for them on the noble roadway which now flows the course of this part of the Thames, of which they will henceforth be among the most conspicuous ornaments. It gives me pleasure to recognize in the plan of the buildings, so carefully adapted to check the growth of disease, ample and satisfactory evidence of your resolution to supply the needs of the sick, and the best suggestions of science for the alleviation of suffering and the complete and speedy cure of the sick and disabled. These great purposes are not least effectively promoted by an adequate supply of careful and well-trained nurses; and I do not regret that in this respect your Hospital is especially fortunate, through the connexion with it of a staff trained under the direction of the lady whose name will always remain associated with the care of the wounded and the sick."

At the conclusion of the ceremony, the Treasurer of the Hospital, Mr. Francis Hicks, was called to the dais, and was knighted.

We give in our present number a view and plan of the centre portion of the Hospital, including the two wards named by her Majesty and the chapel. We have so recently printed an elaborate description of the whole establishment by the architect, Mr. Henry Currey, that any account now is unnecessary.* In our volume of 1865 (xviii., p. 556) will be found plans, to a smaller scale, of the Hospital as a whole, and a general view of it.

LIGHT AND AIR CASES.

LADYMAN V. GRAVE.—COURT OF CHANCERY.

This was a case of light and air, which came before the Court upon an appeal from Vice-Chancellor Stuart. The plaintiff, who had filed a bill and obtained a perpetual injunction against the building of a wall by the defendant as to interfere with the access of light and air to the plaintiff's windows, purchased a house near Keswick in 1865. At the time of the purchase by the plaintiff the vendor was the lessee for the residue of a term of ten years of a piece of garden-ground, which came up to within 24 in. of the back of the house. In 1867 the defendant became the owner in fee of this piece of ground, and he shortly afterwards commenced building a row of cottages, the outer wall of which was carried up at a distance of only 18 in. from the plaintiff's premises, the fact, as alleged by the plaintiff, being almost entirely to exclude the access of light and air from the windows at the back of his house.

The case involved two main questions,—1, whether there had been such a unity of possession of the house and garden as to deprive the defendant of being regarded during the twenty years next after the house of the plaintiff was built; and 2, whether the windows of

the plaintiff's house had become ancient lights before the passing of the Prescription Act (2 and 3 William IV., c. 71), so as to take the case out of the operation of the fourth section of that Act.

The evidence was given by luminous, and greatly in conflict; but in the result the Vice-Chancellor was of opinion that the defendant had failed to prove the points relied upon in his favour, and granted a perpetual injunction as prayed for by the plaintiff.

Mr. Dickinson, Q.C. and Mr. Fisher, appeared in support of the appeal; Mr. Greene, Q.C., Mr. John Pearson, Q.C., and Mr. Plummer, were for the plaintiff.

The Lord Chancellor gave judgment at great length, observing that the question turns first upon the law of the case, and secondly upon the facts to which the law was to be applied. The Vice-Chancellor had decided the question entirely upon the facts, but he could not help coming to a conclusion contrary to that of the Vice-Chancellor upon the facts. In his opinion it was established upon the evidence that, assuming the plaintiff's house to have been built in 1865 or 1874, from 1818 onwards there had been unity of possession of the house and garden over which the easement was now claimed by the plaintiff. Now, with respect to the acquisition of a right to light and air, it was clearly established that a man could not at one and the same time be owner of land and claim an easement over it; in other words, the easement and ownership could not exist together. The enjoyment of the access of light over contiguous land must be had during the whole twenty years required by the Prescription Act (2 & 3 Wm. IV., c. 71), in the character of an easement distinct from the enjoyment of the land itself as appurtenant to the land. It was clear that the various occupiers of the plaintiff's house had enjoyed this orchard or garden with it, and as part of it, for so long a period that the right of an easement over the garden had not been acquired for the period required by the statute. Differing, as he did, from the Vice-Chancellor on the result of the evidence, the law as applied to the facts would prevent the right from having accrued within twenty years before the commencement of the suit, and the bill must therefore be dismissed with costs.

THE CONTRACT FOR THE BRIGHTON TOWN-HALL.

WE mentioned recently that Mr. Nightingale having refused to sign the contract proposed, the tender of Mr. Lockyer, next lowest, had been accepted. It has been suggested that we should state the objections that were taken, and we willingly do so.

Mr. Nightingale's solicitor (Mr. J. W. Mackrell) having perused, on his behalf, the agreement and specification, pointed out several points which he considered should be modified.

"The specification, Clause 2, requires," he says, "that the work shall be proceeded with in strict accordance with the directions of the architect, and in accordance with the surveyor shall direct, and, if necessary, by men working at night; and Clause 126, that the work shall be completed by the 31st of August, under a penalty of 10*l.* a week. The contractor was not informed that he might be put to the extra expense of employing men at night, and it would be only fair that, in the event of his having to do this, a proportionate sum should be added to the contract price; and as he would be wholly in the hands of the surveyor, as to the execution of the work, no penalty should be payable unless the surveyor shall certify in writing that the works could have been reasonably completed in the time appointed. The time should be extended in proportion to the time which has elapsed since the tenders were accepted. The surveyor is made (Clause 13) the sole referee. It has now been conceded by Government in the Courts of Justice, that, by the corporation of London, and other public bodies, and by the Institute of Architects, that, except as regards quality of materials and workmanship, the contractor shall be at liberty to have any decision of the architect, with which he may be dissatisfied, referred to some other architect, to be named in the contract; and I presume the corporation of Brighton will not object to a similar provision. The 11th clause would make the contractor responsible in case of fire; and as it would be impossible for him to insure the work he is erecting, it will be only fair that the corporation shall undertake the responsibility. The terms of payment (Clause 127) are less liberal than those now in practice in London, the usual terms being 80 per cent. during the progress of the works, 10 per cent. more on completion, and the balance three months afterwards. I presume the corporation will not object to this variation. There are some minor points which should be modified, as to which I do not think there would be any difference of opinion. I notice that it is proposed that the agreement shall be under seal, and necessarily so as regards the corporation; but it is not usual for the contractor to execute under seal, and it is very objectionable, as it brings him under a responsibility for a period of twenty years; whereas, otherwise, he would be responsible for a period of six years, which, of course, is ample for all proper protection for the corporation; and if the instrument be under seal, it may make the disposition of his estate, in case of death, more difficult."

Mr. Lockyer consented to sign the contract without alteration, and the work was given to him.

THE WIDENING OF PARK-LANE AND CUTTING THROUGH HAMILTON-PLACE

SIR GEORGE OSBORN writes to us as follows:—

As was obvious from the first to the most ordinary capacity, the making an opening through Hamilton-place with the view of relieving the southern outlet of Park-lane from the ever-increasing traffic would prove a complete failure, and the result was more than confirmed by the prediction. The real desideratum was to widen the lane from Holderness House to a "bell mouth" down to Uxbridge, and the object could be attained by one way,—and one way only,—namely, by pulling down all the houses on the west side of the lane which are opposite Holderness House, and terminating with the house occupied by the Duke of Cambridge. All interference with Hamilton-place would thereby have been obviated, and the lane

would have become, as a boulevard, a noble metropolitan feature.

How does it stand now? The Lane, from Holderness House southwards, is utterly unimproved, and the windows of the houses in its narrow throat are still beset with mud by passing vehicles, and the general aspect of its débouchure is cramped and ignominious; whilst the ruthless demolition of the houses on the east side of Hamilton-place leave, what are the real culprits, to appear an obnoxious and obstructive oasis. They must be doomed; but, if so, the space will be too great for the purpose desired.

THE DESIGNS FOR THE NEW MUNICIPAL BUILDINGS, LEICESTER.

SIR,—Amongst the numerous designs now exhibiting at the Corn Exchange, Leicester, there is scarcely one that does not possess considerable merit, and it is to be regretted that the authors of them, with the exception of the fortunate three, whoever they may be, should go unremunerated for the skill and labour bestowed upon them. Clever as they are, the narrow strip of ground they have to work upon precludes the possibility of anything like a bold façade. We see towers and spires springing out of almost dead walls, instead of being effective by standing out in bold relief. I would ask, does not the external grandeur, independent of details of most of the public buildings throughout the kingdom, chiefly consist in their projections and recesses,—in fact, in broken lines. But here, look at any one of the ground plans (elevations in perspective are apt to deceive) and you see invariably one monotonous straight line, and no help for it. Surely it would have puzzled any man, or body of men, to have chosen a more objectionable one for such a purpose. W. L.

CHARGES FOR QUANTITIES. CAMBERWELL INFIRMARY.

SIR,—Last week the Board of Guardians opened tenders for taking out the quantities for this building, which is to be erected under Mr. W. Cross, architect. They were as follows:—

Poland	1 <i>½</i>	per cent.
Gritten	18	"
Meeking	14	"
Pain & Clark	1	"
Dixon	1	"
Strudwick	1	"
Cross	17 <i>s.</i> 6 <i>d.</i>	"
Curtis & Son	17 <i>s.</i> 6 <i>d.</i>	"
Lansdown & Pollard	1	"
Hammock & Lambert	15 <i>s.</i>	"
Lansdown	14 <i>s.</i>	per cent.
Dawney	14 <i>s.</i>	"
Murphy	10 <i>s.</i>	"

After several propositions, Mr. Meeking's tender, at 1*½* per cent, was accepted.

I think that this selection was most unjust, both towards the ratepayers and the competitors. The lowest tender ought to have been accepted. Before the tenders were sent in, the name of the selected surveyor was proposed in the Board, and therefore the unfairness I complain of is more evident, the competition being a mere mockery. ARCHIBALD D. DAMNAY.

EXTINCTION OF FIRES.

SIR,—The appalling news from Paris causes us to quail with horror, especially those who have walked amidst its splendour and magnificence. Three bottles,—one of water, one of sulphuric acid, and one of potash or salt,—a few of these trics tied together (and kept ready on a shelf), if dashed into fire, produce a gas that stops combustion, without damaging house and stock with water. Any person can test the above at the cost of a few pence. R. T.

OWNERS BOUND TO INSPECT BRIDGES AND BUILDINGS.

KEARNEY V. THE GREAT WESTERN RAILWAY COMPANY.

This was a case (Court of Error, in the Exchequer Chamber) which involved a principle of great importance as to the liability of owners of buildings for injury happening to passers-by from the falling of bricks, slates, or tiles. The plaintiff was passing along a highway under one of the bridges of the company, when a loose brick fell down from it upon him and injured him. Just before it fell a train passed along the bridge, and about the same time several other bricks had fallen from the bridge.

It was proved that the bridge had been built for three years, and that no one had noticed anything wrong about it. The case was tried before Mr. Justice Hannen in 1869, and he left it to the jury whether there had been any negligence on the part of the company either in the construction or the maintenance of the bridge. The jury found for the plaintiff, damages 25*l.*; but the judge reserved the question whether there was any evidence of negligence, and he himself was of opinion that there was not. The case was argued before the Lord Chief Justice, Mr. Justice Lush, and Mr. Justice Hannen, when the last learned judge was of opinion against the plaintiff. The Lord Chief Justice was of opinion that there was evidence of negligence, on the principle *res ipsa loquitur*, and Mr. Justice Lush, though with some hesitation, concurred in that opinion. The company appealed.

* See pp. 59 and 83, ante. The plan now given is specially described in p. 63.

The Lord Chief Baron, after hearing the counsel for the company, consulted the other judges, and proceeded at once to pronounce a unanimous judgment in favour of the plaintiff, and upholding the judgment of the Queen's Bench. There was, he said, a duty on the defendants, who had a bridge over a highway, so to take reasonable care that people might safely pass under it, and there was *prima facie* evidence of negligence. He could not deal more satisfactorily with the case than by using the language of the Lord Chief Justice, who said "*res ipsa loquitur*." A brick fell without any assignable cause. This conclusively showed that it was loose, and there was evidence that several other bricks fell at the same time. It was the duty of the company from time to time to inspect their bridges, and see that there were no loose bricks which might cause danger; and, on the whole, there was evidence to sustain the verdict.

A COLLEGE OF LABOUR AND ART.

SIR,—Mr. Craig, in his letter, whilst proclaiming the novelty of his idea, has no doubt forgotten to read the communication which appeared in your journal a few weeks ago (p. 297), signed as below. As I am pleased to find the ideas of others working in the same direction as my own, I will not find fault with him further than to say I do not believe the founding of any institution for children of small or great ability only, in which they may be educated to one course of industrial pursuit, regardless of their inclination or suitability for the same, other than a great mistake, resulting in that misdirection of energy which, with a false pride and want of principle, leads to discontent and poverty, followed too frequently by intemperance, vice, and social degradation—disorders generally intensified by indiscriminate charity.

Your correspondent "B." also falls into error; for, taking the numberless ten-shilling work institutions as the only possible form of charitable educational establishment it is possible to found, he condemns them all together. Let me now ask the latter, is it not a shame that in this little island, blessed as it is with an invigorating climate and an amount of wealth with which no other country can compare, there should be no great city without a plague-spot in its midst, of its own creating, where men and women exist surrounded by everything that is loathsome to sight, smell, and feeling, yet amongst whom are found very many who try to do their duty to their God, their children, and their fellows amidst the misery which surrounds them, till their hearts break in the unequal struggle? Is it not a greater shame that there exist no adequate means of saving those children who have been taught and do try to shun the gilded temptations held forth by the votaries of vice and immorality, and help themselves to burst those bonds of infancy which such a fearful state of life is ever tending to cast around them? And does he really think that half a million could be ill spent in rescuing one or two thousand children annually from a probable ruin of mind and body, in rearing them in a purer atmosphere, and fitting them for all sorts of manual labour? If he does, I entirely disagree with him, and hope the time is not far distant when if not the one, many hands will be held forth to give the aid required.

J. J. A.

STONE AND STONE-WORKING.

SIR,—As a stonemason I quite agree with Mr. Pain, that the joints and beds of stonework should be square and true; but do not blame the mason if they are not so, for quantity, not quality, is the rule, and I have seen good masons discharged for doing what Mr. Pain blames them for not doing. Masons are quite aware that mitred joints are not masonry, and no mason would make them in stone work; but what is he to do, having a carpenter or joiner as clerk of works, who knows as much about masonry as the stone knows of him? Should the joints be ordered in the mitre, and the mason refuse to make them so, what is the consequence? I will leave it to Mr. Pain to say. As a mason, I am surprised to read that the exception to the rule is a mitre-joint in a pointed arch; that the joint should be made at the mitre of the key-stone. All arch joints should be made to the radius line. Can the centre line of a pointed arch be made so? If it cannot, it is also decidedly wrong. I have fixed pointed arches with joints made in the key-mitre which have been ordered to be made so by a carpenter clerk of works, and also with the key-stone worked to the radius joint. Practical experience tells me that the centre joint is wrong; the arch is not so strong; the mason cannot, as the term is in the trade, drive the key home. If a moulded arch, the members are weak in such a joint, and

liable to be burst off. I have worked under a clerk of works who did say (he was a carpenter) that in tracery for windows the joints should be made at the intersections of the tracery; so I should think it is not to be wondered at that Mr. Pain should find so many cracked walls in the Lake District, or any other district. I am at a loss to know what the temptation is the mason has to resist in not putting in the bond-stones in the walls. Where is the working man on the building, excepting the foreman, who can see the drawings or the specification, although experience tells him bond-stones are necessary, and should be put in? The mason has to work from the instruction he receives from the foreman, who perhaps knows so little beyond his own trade as not to know what a bond-stone means.

I also think it immaterial which way the stone is bedded, provided it is not put face-bedded. For instance, a cornice with great projections and undercut mouldings should be joint-bedded, with the exception of the quoins, where great care should be taken in selecting the best stone. String-courses, with moulding, undercut, and coping to gables, should be joint-bedded. No wonder we see so many of the stone buildings going to decay; for, if you take the advertising pages of the *Builder*, you find carpenters and joiners preferred for clerks of works; few and far between is a mason preferred. But Mr. Pain states that it is from being uneducated and unsteady that they are not appointed to situations of trust. He is condemning a class in the building trade whom, from his own remarks, he has not given the opportunity to fill the office of clerk of works.

THOMAS COOK, a Working Mason.

ACCIDENTS.

Brixton.—An inquest has been held in Penton-place, Kennington Park-road, on the body of William Cielito, a carpenter. Deceased fell from a scaffold in Church-street, Brixton, and expired in a few hours, leaving a wife and eight children destitute. A verdict of "Accidental death" was recorded.

Manchester.—An excavation has recently been made, adjoining a building occupied by Messrs. Thomas Ravenscroft & Co., cotton waste merchants, Mark-lane, Hyde-croft, for the erection of new premises for a wholesale druggist of Hanging-ditch. It had been necessary to excavate below the depth of the walls, and means were taken, it was supposed, which would render them secure. A portion, however, fell with a loud noise, causing much consternation in the neighbourhood. Five or six hours later another portion fell, as was anticipated. To avoid any further accident workmen were at once set to work to shore up the remaining walls.

SYMBOLIC VAGARIES AT THE CONFERENCE.

SIR,—Part of a letter from Mr. Rolfe, which you printed in last number (and to which the epithet "nonsense" is, I think, quite as applicable as it could possibly be to anything that was omitted), furnishes a ludicrous, though somewhat painful, instance of the kind of absurdities which we are asked to listen to in the name of architecture by people who pride themselves on being specially "church architects." All parties have a right, of course, to their own peculiar superstitions, and Mr. Rolfe's paper would have been quite in place at a meeting of Medievalising clergymen; but no such paper ought to have been read to an assembly of architects. The very title, as corrected by the lecturer, is an absurdity. What, in the name of wonder, has the Purchas judgment to do with "art?" If art is anything more than a mere name, it is something quite beyond the reach of such a storm in a teacup as that or any other squabbles of the kind. If the gentlemen who waste their own and other people's time in these trivialities could only be induced to open their eyes and look around them, instead of going round and round within their own little "Medieval" circle, they might find out the fact that the course of modern thought is in reality leaving them quite on one side, and that not one unprejudiced person in a hundred would regard discussions of this nature but with utter indifference. If the "symbolic" architects do not find this out for themselves, the knowledge of it will presently be forced upon them in an unexpected and uncomfortable manner when the ecclesiastical bubble bursts, which, judging, from the signs of

the times, may be sooner than some people expect.

Mr. Rolfe has no right to complain of your report of his paper, and its reception at the Conference, as, if the plain truth were told, the majority of those present were laughing at him. He is at liberty to "recommend his brother architects" to make altars 7 ft. 5 in. long, if he likes; and they will, no doubt, appraise the advice at its due worth; but when he infers that all those who ridicule his "pure symbolic spirit" are actuated in their profession only by "money-grubbing" motives, he says what is either silly or impertinent, or both.

In one point I concur with Mr. Rolfe. I think there was room for considerable improvement in the arrangement of the Conference programme, as to allowing more time for papers and discussions, and not attempting the consideration of such a multiplicity of subjects. But this first Conference was, in great measure, experimental. Improvements will, doubtless, be made next year, and, among other things, we will hope that those of us who may travel from some distance to attend the meetings and interchange information, may not again be invited to sit and listen to such childish nonsense about symbolic ritual, which has about as much to do with architectural art as rat-catching. Modern society has other work for the architect than the brushing up of ecclesiastical old clothes.

A PROVINCIAL ARCHITECT.

THE CRYSTAL PALACE COMPANY.

The report of the directors to the proprietors states that the comparative return of admissions for the six months ending 30th April, 1870 and 1871, shows an increase in favour of the latter. During the past six months large portions of the roof have been renewed, on the same improved system which was noticed in the former report. In addition to these works it has been found necessary to put the water-towers into a state of thorough and substantial repair. The work was put up to competition, and has been let by contract to a respectable firm. The reconstruction of the Rosary has been brought to a close; the ironwork is finished, and the painting will be very shortly completed. The outlying portions of the company's land bordering on the Penge and Thicket roads, have been let to Mr. Robert Hendrey, on a building lease of 99 years. Mr. Hendrey is bound under his agreement to cover the land within four years, from 25th March last with houses, to cost 73,000*l.* The ground-rent of which will be 1,302*l.* 8*s.*

The managers of the Handel Festival will have reason to congratulate themselves on the success of their labours. If the "fiasco in Egypt," which is to be performed on this Friday, the 23rd, be as well done as have been the preceding works, there will be nothing to say in the way of criticism. The execution has been for the most part perfect. The continued pressure on our space alone prevents us from giving such an account of the festival as would be worthy of it.

JUNIOR EXAMINERSHIP IN THE OFFICE OF HER MAJESTY'S WORKS.

At the recent open competitive examinations held in London by the Civil Service Commissioners for two appointments as above, the undermentioned gentlemen obtained respectively the first and second places; viz., 1. R. J. Thompson, Royal Engineer Department, Chatham; 2. A. L. Edwards, New-croft, London.

CHURCH-BUILDING NEWS.

Barley, near Royston.—The foundation-stone in connexion with the rebuilding of the church here has been laid. The greater portion of the old church, which was in a very dilapidated condition, has been taken down. The tower south aisle, and a portion of the south arcade have, remain standing, and will be restored. The new building will consist of chancel, with organ-chamber and vestry, nave, north aisle, an porch, and new fittings of wainscot oak will be provided. Mr. Butterfield, of London, is the architect, under whose control the works are to be carried out. The contract has been undertaken by Mr. Gibbons, of Bantingford, with the exception of the seating in nave and aisles, which will be executed by Mr. Saville, of Barley. The estimated cost of the works is about 3,000*l.*

Woolley.—St. Peter's Church, Woolley, having

been closed since May, 1870, has been re-opened, for a restoration at the hands of Mr. J. L. Harrison, of London, architect, the whole of the work being carried out by Messrs. Simpson & Jones, of Hull, builders. The Ecclesiastical Commissioners, as lessees of the tithes, restore the middle chancel; the cost of restoring the north-west Chapel, and the nave of the church, has been principally defrayed by Mr. G. H. Wentworth, the patron of the church, aided by others. The whole building has been re-roofed; the pillars or arches have been scraped; the chancel, into which there was formerly a descent in the nave, has been considerably raised; the tower arch, which has been bricked up, is opened out. The east window, which was small, is replaced by a new one of five lights, of proportions proportional to the unusually large chancel, and with tracery. The whole church is paved with Milton's tiles, in a variety of patterns. Open benches throughout the church supply the places of the high pews, and the raised ends have been worked up with the new material. The ancient stained glass, which was shattered about the chancel windows in a most fragmentary way, and in almost hopeless condition, has been worked up into the original objects by Messrs. Clayton & Bell, and it now fills the east windows in the north and south choir, and the two north windows in the Westworth Chapel. Amongst the subjects are "The Virgin and Child," "The Crucifixion," "The Resurrection," "The Holy Trinity," "St. Catherine," and "The Light in armour, together with the arms of the noble, Hammerton, Wentworth, &c. In the north choir a window has been placed by Messrs. Barrard, & Westlake, the gift of Major J. M. Whittington to the church, the subject of which is "Christ blessing little Children." There is also a centre light in the window of the north aisle, by Clayton & Bell, the gift of Mr. J. M. Mammatt, the subject,—"The Good Shepherd." Three other windows are also being repaired, one by Clayton & Bell, given by Capt. Wentworth; two by Messrs. Morris & Co., one the gift of Mrs. Campbell, the other of the tapers of Woolley. A font, carved and with marble columns, given by Mr. and Mrs. Wilmot, placed at the west side of the south door.

Withington.—It is proposed to restore the parish church of St. Michael, at Withington. The Hon. and Rev. G. G. C. Talbot, the rector, is bringing under the consideration of parishioners, and all interested in the preservation of this church the need that exists for considerable reparation of much of the fabric, and the desirability of effecting improvements in the interior, which would provide twenty-five additional sittings. He has obtained from Mr. and Mrs. Andon a plan for the complete restoration of the church, at an outlay of 1,400l.

Whitlsey.—St. Andrew's Church is now being subjected to the first processes of restoration. The church is now cleared out. The bases of some of the pillars, hidden before by woodwork, are altogether decayed. This seems to have been the case before the pews were set up, instead of solid masonry, corresponding with the upper portions, there is nothing but rubble and plaster. Where the stonework remains in large pieces have been cut away to make room for beams and uprights, and two columns which supported the west gallery, are cut nearly off through. For gas-pipes, and hat-pegs, similar devastations have been made on a smaller scale. The area of the church is found to be encumbered in all directions by vaults and caves. In taking down the pews it was found that most of them had a movable floor, so that once living occupier might sit just over his last resting-place, and his coffin be let down to a grave beneath. Leadon coffins were not considered necessary, though they sometimes occur, and instead of brick arches, oak planks covered the vaults, while in some places, as far as can be proved by appearances, nothing but common grave received the St. Andrew's parishioners. The state of squalor and rottenness which pervaded the whole area of the church is disgusting, and it is a matter of wonder that any one walking along the aisles had not found himself on a sudden in a dark pit among "corruption, earth, and worms."

Great Berkhamstead.—The exterior of the restored church, the re-opening of which has now been noticed, as seen from the streets, is already nearly all new work, but it does not convey the impression of newness in an unpleasant or intrusive manner. The grey flints of which the building is composed and the general treatment of the new masonry, give to the work already

the quiet look of an old building. There have been no funds as yet available for the restoration of the outside of the central tower, which is much decayed, nor for the entire north side of the church, and for some other external parts. The new work is, as far as practicable, a reproduction of the original work. All the fittings and floors have been renewed, some old tombs and monuments being preserved. New roofs covered with lead have been put up on the south transept and on the chancel, and the walls of both have been to a large extent rebuilt and raised. The entire outside of the church was covered with stucco, upon walls repaired with brick, and the windows were cased in cement. The exterior was throughout in the ruinous condition in which the north side still remains. The plaster has been removed from the west wall, and from the greater part of the south and east walls,—that is, to the extent the funds would permit. These walls have been entirely rebuilt or faced with flint or quoined with stone. The windows and doors in them having perished, they have been restored in stonework. An unsightly vestry, to the north of the chancel, which concealed some architectural work connected with the chancel and north transept, has been removed, and various restorations effected in the parts which it had defaced. The entrances to the church have been rearranged, and a porch, long disused on account of its inconvenient position, has been thrown into the church, its turret staircase being now surmounted with a stone spire, which adds to the picturesque quality of the building on this its most prominent side. The interior of the church has been entirely refitted and refitted. The old-fashioned and straight-backed high pews have been removed, and their places supplied by open seats. The seats and furniture are entirely of English or Riga oak throughout, the pavement of tiles intermixed in the eastern part of the church with Derbyshire fossil marble. The organ, built by Messrs. Walker & Sons, stands on the floor in the south transept. The interior is now heated by hot-air apparatus, and lighted by coronas of gas suspended from the roof. The cost of the restoration, up to the present time, has been about 5,000l. The architect was Mr. Butterfield. The contractors were Messrs. T. & J. Matthews and Mr. W. Nash, of Berkhamstead. The stonework was executed by Mr. Lingard, of Berkhamstead; the sittings, pulpit, communion-table, &c., by Mr. Restall, of Gloucester, the gas fittings by Mr. A. F. Painter, of Berkhamstead, engineer; and the heating apparatus by Messrs. Haden, of Trowbridge. The font was constructed by Messrs. Field & Co., of Westminster. It is placed at the west end of the church and is of fossil marble, with shafts of red Mansfield, and caps of Caen stone. The old Court House near the church, in which it is said that the Black Prince used to hold his court, has been restored and is now used as a Sunday-school. The approach to this relic of antiquity is to be widened by cutting off a small slice of the churchyard.

Grantham.—Barton Pedwardine Church has been re-opened, after rebuilding. The church has a nave and chancel, with an unrestored chapel on the north side, and accommodates about 120 persons. It is in the Geometrical Decorated style, and has been erected under the personal superintendence of Mr. Charles Kirk, of Sleaford. The chancel rises two steps from the nave, and the altar elevated on a footpace stands out as seen from the west end.

Longton.—During the last two or three months St. James's Parish Church has been undergoing alterations and improvements. The whole of the interior has been cleaned and coloured, and the windows reglazed with tinted glass, whilst the chancel wall and pavement have been laid with encaustic tiles. The whole area of the church has been seated throughout uniformly with open benches, the centre aisle being narrowed so as to increase considerably the number of sittings. The north and south galleries have been removed, and the west gallery reserved for the use of the school children. The lighting has been re-arranged, the gas burners being round the capitals of the pillars. The organ is removed to the north end of the church, and restored and re-cased. All the seats are free. The organ improvements have been carried out by Messrs. Bellamy & Stringer, of Hanley. Mr. Howson has removed the galleries and done the woodwork, and Mr. Bentley has executed the colouring and painting.

Bolton.—The Church of St. Mark, in Fletcher-street, has been consecrated by the Bishop of

Manchester. The church contains 900 sittings, the whole free; and the cost of erection has been 5,300l.

North Cray.—On the 26th of May, Bishop Parry, the suffragan of Dover, consecrated a new chancel to the church of St. James, North Cray, a little village in Kent. The previous chancel was very small and decayed, but the new one has been built upon a much handsomer scale and style, and as a monument to the memory of Mr. and Mrs. Western Wood, who resided at North Cray-place for many years, and whose good deeds there will not readily be forgotten. Mr. Wood had been M.P. for the City of London, and was brother of the present Lord Chancellor. This tribute to departed worth is the affectionate gift of their son and daughters, and they and the Chancellor have filled the windows with good painted glass, by Clayton & Bell, the only exception being the pious contribution of one window by a resident lady, Miss Laurie. The architect was Mr. Edwin Nash, of London, who also designed the nave and aisles of the building, when erected, in 1852. The style of the whole is fourteenth-century Geometrical, the east window having a peculiar arrangement of five lights, two being narrow, and three wide. There is a reredos formed with some fifteenth or early sixteenth century oak carving, brought from Belgium, representing the Last Supper, and the other fittings have been formed with old woodwork of corresponding character, in the arrangement of which the rector, the Rev. H. W. Johnston, assisted much.

Hackney-road.—The foundation-stone of a new church, to be erected at the north end of Goldsmith's-row, Hackney-road, has been laid by Mr. Richard Foster, of Upper Clapton. The church will consist of nave and aisles, apsidal chancel and aisles, and turret on the gable at the east end of the nave. It will be of brick, with coloured ornamental bands externally and internally, and is intended to accommodate between 500 and 600 persons. Mr. Francis T. Dollman, of the Adelphi, is the architect; and Messrs. Dove, Brothers, of Islington, are the contractors.

Loomb (Worcestershire).—The church of this small parish has been reopened. Through neglect and lapse of time Loomb Church had become totally unfit for divine service, its walls being mouldy, timbers rotting, and floor damp and filthy. The necessity for restoration was obvious. The services of Mr. Hopkins, of Worcester, the Diocesan Society's consulting architect, were secured. The total cost of the work essential to be done was 800l., and the deficiency on the day of the reopening was about 80l. No building committee was appointed, the rector himself superintending the works, under the direction of Mr. Hopkins. Messrs. Warr & Woolgrove, of Little Tew, near Evesham, Oxon, were the builders, by whom the work has been done. The Milton and Forest stone was used. The whole of the church has been restored. In the nave the modern and dilapidated roof has been removed, and a new ribbed barrel roof substituted. The interior of the roof of the Blaket Chapel has also had the plaster and whitewash removed, and its original form restored, panelled, and ribbed. Both these roofs have bosses at their intersections, carved by Boulton, of Cheltenham. The arch in the Blaket Chapel has been entirely rebuilt. The modern porch has been removed, and the old Early English design restored from existing fragments. All the stonework of the church generally has been made good, and the old seats and fittings swept away, giving place to oak stalls in the chancel and open deal benches in the nave; while the floors have been laid with Godwin's encaustic tiles, in varied patterns. The floor of the belfry has been renewed. The church is warmed with one of Porritt's stoves, inserted beneath the floor of the nave. The churchyard has been drained, the fencing repaired, and the soil lowered, to prevent damp to the structures.

Wickhampton, Wiltshire.—The church in this secluded village, which dates back to Norman times, has been restored. It had of late years fallen into a state of ruinous decay. Not only were the walls falling outwards, and rebuilding necessary, but the roof had given way, and the floors and internal fittings were in a very bad condition. The contractors for the work were Messrs. Norman & Co., of Weymouth, builders. The south chancel wall has been rebuilt, as well as the porch and portions of the other walls; the north wall has been taken down as far as the porch and entirely rebuilt; the stonework of the east window has been cleaned, and that under

the tower (long blocked up) renewed in accordance with the original pattern; another window in the west end has been treated in a similar manner; while several other windows have been repaired where they were defective; all being done in Hamhill stone, which was used in the old work. An oak chancel-screen, with carved tracery in the canopies, is the work of Mr. Grassby, of Dorchester. Some portions of the old screen are inserted in the new one. A new open roof of stained deal, with the tie-beams and arched ribs, resting on Hamhill stone corbels, has replaced the ancient wagon-headed roof. The chancel, as well as the central and side aisles, have been paved with tessellated tiles from the manufactory of the Poole Architectural Company. The old pews have been abolished, and substituted by open low seats of varnished pitch pine. The contract stipulated for deal seats, but Mr. Norman, determined not to do things by halves, at his own expense used the most costly material. The tower has received a new roof, and the bellringers' floor has been renewed. In addition the whole church has been covered with a lead roof.

DISSENTING CHURCH-BUILDING NEWS.

Margate.—The chief stone of a new Primitive Methodist Chapel and Schools at Dane-hill, has been laid. The contract is for 1,000l. This, with 245l. for the site, &c., brings the amount to 1,245l. The intended buildings will comprise school, with boiler-house, chapel and vestry above, and a parsonage-house adjoining, fronting on Dane-hill. The style of architecture may be said to be Early English Gothic, ornamental brickwork being introduced. The King-street front school-room windows will be deeply recessed, and with stone heads, these continuing round the building as a tooth course; those of the chapel will have heads arched, terminating in projecting dormers. Dane-hill front will have a three-light window, and an entrance on either side, chiefly in stone. The house will be in unison with the chapel. Internally the school will be coloured in a warm tint. The chapel will contain seatings for about 300 people; these seatings will be open. The roof with dormers on either side will be open, plastered on rafters, exposing the principals only, which will be hammer-beams, with curved ribs, &c.; all woodwork being stained and varnished. The works are proceeding under the directions of the architect, Mr. Alfred W. Phillips, of Margate. Mr. W. Osborne, of Ramsgate, is the builder.

Bloxwich.—The foundation-stone of a United Methodist Free Church, to be erected at Blakenall, near Bloxwich, has been laid. The church is to be built upon land belonging to Lord Hatherton, in the road leading from Blakenall to Bloxwich, and is to occupy, together with an adjoining residence, 1,080 square feet of land. The church will be 40 ft. long and 27 ft. high, and it is to accommodate 280 people; but is intended to have movable seats, so that it may be used for the purposes of a Sunday School until the erection of proper schools, for which sufficient land has been secured. A vestry, 14 ft. square, is to communicate with the church, and also a second room, suitable for meetings. A small residence adjoins the church, and the two buildings are to be erected in the Gothic style, at a total cost of 600l., from plans designed by Mr. E. Chamberlain, of Walsall. The builders are Messrs. Tonge & Son, also of Walsall.

Holey.—The opening services in connexion with the New United Methodist Free Church, Oak-street, Holey, have taken place. The land on which the chapel was built, with the piece of land adjoining, and which was bought in the same lot, cost 427l. The contract for the building of the chapel was 2,974l.; the excavations cost 125l. The organ, when completed, will cost 330l.

Woodbridge.—A contract has been signed by Mr. Foedike, builder, of this town, for the erection of a new Wesleyan Chapel in St. John's-street. The building is to be of brick, in the Italian style, and will be lighted and warmed according to recent methods. Messrs. Cattermole & Eade, Ipswich, are the architects.

Worthing.—The Wesleyan Chapel in Bedford-row has for some time past been undergoing considerable alterations. The chapel has been re-seated with open seats, of pitch pine. The pulpit has been removed and a large recess formed, supported on either side by two ornamental capes; the rostrum being approached by

two flights of stairs. The balustrades and iron-work are painted with a brown colour, picked out with gold. This ornamentation is carried out in respect to the communion-rails, and the front of the organ gallery. The old west windows have been removed, and two circular-headed sashes inserted in their place, fitted with stained and ground glass. The building is lighted by means of four star lights suspended from the ceiling, round which a new cornice has been placed. A font has been presented by Mr. Lund, and an organ has been purchased. The cost of the improvements will, we believe, be about 400l. The architect was Mr. Albert Bridgman, of London, and the contractor Mr. Edward Snewin. The decorations, paintings, &c., were executed by Mr. John Inkpen.

Extheaston.—The new Congregational Chapel which has been in course of erection in this village for the past twelve months has been opened. It will replace the mission-house further up the main road. The new chapel, which stands in the centre of the village, and abuts on the London-road, has been built from the designs of Messrs. Wilson & Willcox. The cost of the building and site was at first estimated at 1,000l., but in consequence of the peculiar character of the ground, the chapel standing on the extreme side of a plot of ground adjoining the road, and at a level of 8 ft. or 10 ft. above it, difficulties arose in securing a good foundation, and the cost has exceeded the estimated sum by about 200l. The chapel, which will seat 300, is built of rough stone, with Bath stone facings, and the character of the building is Early Gothic. At the south-western corner is a turret, with spire, and at the same end of the building is a three-light window with simple tracery above, while underneath are three lancet lights. There are two entrances to the chapel at this end, one being under the turret. The vestry is at the south-east corner, and is approached by a flight of steps from the road. At the eastern end there is a small chancel, lighted by two lancet windows placed on either side of the organ, while above is a large circular window of simple tracery work. The pulpit has been superseded by a carved lectern, supplied by Messrs. Morgan & Lovell, which stands upon a raised platform. The seating of the chapel is of white deal, varnished, and is arranged in a central block, with blocks of seats on each side. The masonry work of the chapel was executed by Mr. Mann, jun.; the wood work by Mr. Mould; the gas fittings and iron work, were by Messrs. Tuck & Son; and the painting by Messrs. Amos & Weeks.

Newcastle-on-Tyne.—The corner stone of a new United Presbyterian church and schools now in course of erection in Westmoreland-road, Newcastle-on-Tyne, was laid on the 26th ult. Accommodation is provided for 800 persons in the church and for 300 children in the schools; the former being entered through a projecting porch, by stone terrace steps, raised about 5 ft. from the ground; and the latter, owing to the gradations of the side streets, is approached on the level at the opposite end. The style of architecture adopted is Early Gothic, and the character of the walling is what is locally called "sneek walling," with ashlar dressings. The total cost will be between 4,000l. and 5,000l. Mr. Thomas Oliver, of Newcastle, is the architect; Messrs. N. & R. Reed are the contractors; and Mr. R. Davidson is the clerk of the works.

Sheffield.—The new Baptist Church in Glossop-road has been opened for Divine service. It is built of stone, in the Gothic style. A stained window has been placed over the baptistry by Mr. T. W. Cann, of Smethwick, near Birmingham. The subjects in the four lights of the window are the Adoration of the Magi, the Agony in the Garden, the Crucifixion, and the triumph of the faith of Thomas in the interview with the Saviour after His resurrection. In the tracery at the top of the window is an illustration of the Redeemer in Glory. The subjects are placed under canopies upon an ornamental ground, surrounded by a border. The carving was done by Mr. Hems, of Exeter. Messrs. Innocent & Brown, of Sheffield, were the architects, and Mr. Wm. Dickinson clerk of works. The slating was by Mr. W. Ellis; the plastering by Messrs. Harrison & Chadwick; and the painting by Mr. J. H. Jenkinson. The joiners' work has been carried out by Mr. J. Spink, the manager of Messrs. Garside & Shaw's Joinery Works; and the masons' work throughout the building has been executed by Mr. Thomas Nelson, the resident partner of the firm of Messrs. B. & T. Nelson, of Wadley Bridge.

It is estimated that the church will seat 820 persons—500 downstairs and 320 in the gallery. The total cost of the whole buildings—the land being leasehold, will be about 6,500l. Towards that sum nearly 5,000l. have been raised.

Totnam.—The foundation-stone of a new Congregational chapel has been laid at Totnam. The new building, which adjoins the present chapel, and stands at right angles with it, is a portion of the burial-ground, is designed to accommodate 300 persons, viz., 230 on the ground floor and 90 in the gallery at the end. The walls are of red brick of the neighbourhood relieved with white arches, bands, and patterns. The window and door openings are circular-headed, the architecture being of a Romanesque character. The internal dimensions of the building are 47 ft. in length and 30 ft. in width. The roof is to be partly open, and divided into four bays by wood principals springing from stone corbels, the spaces of these trusses filled in with wrought-iron scrolls. In the end wall is a large archway forming the back of the chancel, and so containing two doorways, one opposite each aisle, communicating with the old chapel, which is to be converted into a school-room and vestry. Stained deal benches are provided throughout the building. The gallery is approached by a staircase, contained in a projecting gablet at the side next the road. The estimated cost of the works, when complete, is 600l. Mr. King, jun., of Haleside, is the contractor who is carrying out the works, under the direction of Mr. Charles Pertwee, of Chelmsford, architect.

SCHOOL-BUILDING NEWS.

Stone, Stafford.—A new school and teacher's residence, in connexion with Christ Church, have just been commenced here. The plans arranged to meet the requirements of the Committee of Council on Education, who make grant towards the expense of the building. The school will accommodate 100 children. The cost of the school and residence (exclusive of the site, which was given, and boundary walls) will be 530l. Mr. Samuel Dorman, of Birmingham, is the architect; and the builder is Mr. Thomas Turner, of Stone.

Bradford.—The new schools which have recently been erected in connexion with St. Thomas's Church, Cropper-lane, Bradford, have been formally opened. The principal front is towards the church, and the style of architecture adopted is in harmony with that of the church itself. The front part of the building consists of a room 146 ft. long and 20 ft. wide. This serves as a boys' and girls' school, being divided by a movable wooden partition. At the rear of this is the infant school-room, 48 ft. long and 20 ft. wide, with a sliding gallery each end. Each of the principal rooms is entered by a separate door. There is accommodation in the shape of class-rooms, play-grounds (which are provided with gymnastic apparatus) and service-room. The rooms are well heated and ventilated on Messrs. Haden's patent principle. All the rooms have open timbered roofs, and the interior walls are lined with pressed brickwork. The schools will, it is expected, accommodate 730 children, and they will be used both on Sundays and weekdays. The entire cost has been about 2,500l. The architects were Messrs. Lockwood & Mawson, of Bradford, and the contractors Messrs. Ives & Son, of Shipley.

Reading.—The new Grammar School, which is being erected on the Redlands estate, is progressing towards completion. The entire range will be finished by October. The building has a total frontage of 400 ft. in a straight line. The central portion and western wing are now complete in the exterior, and will be entirely finished by the latter end of June. The bell tower, 125 ft. high, is finished, and the view of the town from the base of the spire is extensive and picturesque. The whole of the building, with its central corridor, is composed of Reading red bricks. In the centre is the principal stone of polished granite, which was laid by the Prince of Wales. From this stone, which is surmounted with a carved capital, four large groined arches spring. These are connected with six or eight smaller arches. The school-room on the ground floor is now in completion, and in various parts of the building glazing has commenced. The master's house also is in a forward state, and the rooms are ready for the doors. On the first floor, approached by a staircase between the study and the dormitories, are the dormitories, thirty in number.

about 9 ft. by 7 ft., and 10 ft. high. Each contains about 450 cubic feet. On this are the bath-rooms and linen storeroom. The dormitory is a story devoted to hospital purposes. The building is roofed with iron, and the eastern wing is rising. The architect is Mr. Alfred Waterhouse.

Whitby.—The memorial stone of a Wesleyan School has been laid at Glaisdale, near Whitby. The want of a school at this place has long been felt—a want made more manifest by the erection of extensive ironworks. The school, which has been given by Mr. William Harrison, Esq. of Whitby, is situated at a place called Glaisdale Green. The school is being built by Mr. John Smith, of stone procured from an adjoining quarry. Most of the people residing in the place have contributed to its cost, but Hebron, of Lealholm, is the principal donor.

Newcastle-on-Tyne.—The new schools, in Bath-street, in connexion with the Bath-lane church, erected about ten years ago, for the Rev. Dr. Sherford, have been formally opened by the Mayor of Newcastle. The schools are in the style of architecture as the church, viz., Early Gothic, and are built of stone, to correspond with the older building. Accommodation is provided in school and class rooms, for 600 children, and the total cost will be about 3,000l. Thomas Oliver was the architect, who was the architect of the church; Messrs. Lowrey, Messrs. N. & R. Reed were the contractors; Mr. Henry Andrews was the clerk of the works.

Dodworth.—A new national school has been formally opened at Dodworth, near Barnsley, so that there is now school accommodation for 700 children more than is required by the Education Department. The new school has been erected by Messrs. Robinson & Son, of Leeds, builders, from plans prepared by Mr. Charles Robinson. The new erection, which is in the church, will be used exclusively for a school. The main room measures 51 ft. by 15 ft., with a mean height of 15 ft., with classrooms, 15 ft. by 14 ft. Including the classrooms, there will be accommodation for 150 children. The building, which complies with all requirements of the Education Department, has been erected, including the enclosure wall, at a cost of about 500l. The money has been lent partly by Government grants, partly by grants from various societies, and by subscriptions obtained by the Rev. J. Hudson, vicar, and others.

Brackley.—New schools have been opened here. They have been erected on a prominent site in the town given for the purpose by the trustees of the Bridgewater Estate and by Magdalen College, 500l. towards the building having been contributed by the Earl of Ellesmere. The plan of the new school-buildings is in the shape of the letter H, the right and left limbs forming the boys' and girls' schoolrooms, the sizes respectively being 67 ft. by 21 ft., and 50 ft. by 21 ft. The middle, or connecting bar, is the infants' school, which is 40 ft. by 20 ft. The school-rooms to the two first-mentioned schools are placed on the outer sides of these rooms, and each 18 ft. by 12 ft. The entrance porches, a hat-and-coat lobby to the boys' schools fill the spaces between the front gables to Main-street; that to the girls' school is placed on the outer side of the room next Chapel lane. A common corridor is formed along the whole length of the frontage to the street, by which means the master and his curate, or visitors, may pass under cover from school to school. There are playgrounds situated at the back of the schools, enclosed by stone walls, and separated for each school. The master and mistress's residences are to be built on extreme angles of the frontage to the street. They will form separate semi-detached wings to the main street frontage. The architecture of the building dates about the end of the sixteenth and beginning of the seventeenth century. The walls are built of a stone from Mr. Taylor's quarries, near the site; the dressings are of Bath stone. The porches and upper portion of the centre gable are half-enclosed in oak framework, and it is intended to dress the upper portions of the residences in the same manner. The roofs are covered with Staffordshire tile, laid in diaper work with bands. The rooms are lighted with large windows, and are ventilated. Plain wainscot, to the height of a yard and a half, is carried around all the rooms and class-rooms. The walls above are plastered. The open timber-work is being carried out by the local builder, Mr. W. Hawkins, under the plans

and superintendence of Mr. C. J. Bather, of Shrewsbury, architect. The cost of the whole of the building, when complete, will be between 2,000l. and 3,000l.

Clayton.—The memorial stone of new day and Sunday school-rooms, in connexion with the General Baptist Chapel at Clayton, has been laid. A plot of ground was secured in a central and eligible situation, near to the chapel. Designs were furnished by Mr. Thomas Horsfield, architect, Halifax, from which it appears that the building will be erected in the Gothic style of architecture. The form is rectangular. The large room will be 18 yards by 12 yards within. This room will be lofty and well ventilated, the roof being open timbered. Four class-rooms are provided at each end, and a small vestry behind. The front elevation will have two projecting gables, with a three-light window. In each also there will be a small centre gable with a window on each side, surmounted with finials and spire. Separate entrances will be provided for the boys and girls, with playground on every side of the building. Tenders for the erection having been invited, those of the following contractors were accepted, namely,—Masons, Messrs. John Drake & Sons, Thornton; joiners, Messrs. Henry Illingworth & Sons; plasterer, Mr. A. Bolton; slater, Mr. James Smithies, all of Great Horton. The entire cost of the building, including the site, has been estimated at about 1,700l. The building, which is to be used as a day and Sunday school, will be capable of accommodating from 500 to 600 children.

Bishopston, Bristol.—The foundation stone of new schools for the parish of Bishopston has been laid on a site nearly opposite the Church of St. Michael and All Angels, the gift of Bishop Monk's trustees. The schools are arranged for the accommodation of 100 children. The school-room is 40 ft. long and 18 ft. wide, and has Gothic traceroed windows at each end; a class-room 18 ft. long and 14 ft. wide, communicating with the school-room by folding doors; and a smaller class-room, 11 ft. square, all approached by a porch. The roofs are of open timber work, stained and varnished, covered with slates, and have an ornamental bell-cot. The walls are to be built of Pennant stone, with freestone dressings. The cost of erection will be 600l. The designs were prepared by Mr. J. A. Clark; and Mr. J. Stephens is the contractor for the works. It is intended to build a teachers' residence as soon as funds can be obtained.

Books Received.

In the current number of the *Food Journal*, Dr. Hyde Clarke contributes some valuable observations and suggestions, headed "On Fashion and Example in Food." We should like to see them widely distributed and read: much good would result. Shall we be going out of our way if we notice in half a dozen lines the variety and value of the information which is scattered there, here, there, and everywhere, by this writer? Men like Dr. Hyde Clarke, living in our midst, and never tired of communicating the knowledge they possess, deserve more general recognition than they sometimes obtain.—The "Natural History of British Butterflies," by Edward Newman, F.L.S. (published by Tweedie), makes a very pretty and useful book, and will lead to many "collections." It is very fully illustrated; but engravings in black and white scarcely suffice for this purpose: colour is wanted.

Miscellaneous.

Society of Arts Conversazione.—On the 16th inst. there was a great gathering at a conversazione in the South Kensington Museum. The party included their Royal Highnesses the Prince and Princess of Wales, the Duke of Edinburgh, Prince Arthur, the Princess Louise, the Marquis of Lorne, and other members of the Royal family. Lord Henry G. Lennox, M.P., president of the council, received the visitors. The band of the Coldstream Guards performed in the centre of the court. After the promenade concert had concluded, their royal highnesses were conducted through the museum and the schools. During the evening a number of glees were sung at intervals in the lecture theatre.

The Rock of Cashel.—This is one of the most interesting spots in Ireland, and the buildings on it have been too long neglected. We are glad to hear that a mixed committee of Protestant and Roman Catholic gentlemen has been formed in Ireland for the purpose of purchasing it from the Irish Church Commissioners, and securing from further decay, with the ultimate view of restoring the now roofless Cathedral of St. Patrick's for public worship, and preserving King Cormac's Chapel. The rock was abandoned about a century ago by the then Archbishop, Dr. Price, who obtained an Act of Parliament constituting St. John's Church, which stood on a lower and more accessible site, the cathedral of the Irish establishment, and since that time the cathedral has been disused. The "Rock of Cashel" is rich in historical associations.

Technical Education.—Colonel Hogg, the Chairman of the Metropolitan Board of Works, presided at a meeting held on Tuesday evening last, in St. James's Hall, to promote scientific and art education through the establishment of a National Technical University. The chairman said this could best be done by means of a university, where ideas might be exchanged, past experience combined with present knowledge, and the administration of industrial instruction systematised. Sir A. Brady moved a resolution pledging the meeting to support the committee formed for establishing a National Technical University in its further efforts. Mr. Brassey, M.P., honorary treasurer of the committee, seconded this, and appealed to the general public for subscriptions to carry out an object of such great national importance. The resolution was agreed to. A second resolution, declaring that the foundation of the proposed National University for Technical and Industrial Training was the only plan by which a comprehensive and efficient system of science and art education could be obtained for the people of Great Britain, was also adopted.

The Derby Guardians and the Architects of their New Workhouse.—The design of Messrs. Giles & Brookhouse having been selected by the guardians, on the understanding that the architect's commission was to be 3 per cent., the guardians seem to have expected that Messrs. Giles & Brookhouse would thereafter offer to take 2½ per cent. as their commission, inasmuch as they had previously said to some of the guardians that rather than be rejected, they would willingly agree to accept 2½ per cent., although they had actually applied upon the terms of the advertisement, which were 3 per cent. The Board had selected their designs on these terms, however, and they were advised to abide by that decision. It has been resolved, nevertheless, by a majority of the Board, "that the Clerk be instructed to communicate with Messrs. Giles & Brookhouse for the purpose of officially ascertaining whether they were prepared to accept a commission of 2½ per cent."

Paris.—It ought to be widely known that the preservation of Notre Dame is due to the house surgeons and some of the medical students of the Hôtel Dieu close by, who risked their lives in effecting it. Photographs of the destruction of the Vendôme Column and of the principal barricades, published just before the army entered Paris, included photographs of many of the insurgents, and will lead to some condemnations. Excepting in a few parts, the damage done by fire is not in the first place observable; the external walls remaining. The fire-proof floors used in all buildings of any size played a good part, and in many cases prevented the spread of the fire from floor to floor. Nevertheless, the *Figaro* estimates the destruction of buildings and furniture during the insurrection at ten millions sterling.

Metropolitan Association for Improving Dwellings.—The report of the directors states that the deaths upon the entire property of the association had this year been 66, out of an average population of 3,934, of which 41 were children under ten years of age. The average rate of mortality in the eleven separate buildings of the association had been under 17 per 1,000; while that of the metropolis generally had been 24 per 1,000. The profits for the year, after paying all interest on borrowed capital, amounted to 5,478l. The directors recommended that a dividend of 4½ per cent. only be paid to the shareholders free of income-tax, which would absorb 4,885l., and leave a balance of 593l. to be carried to the guarantee fund, which would then amount to 5,036l.

Early Relics: Letcombe Castle.—The other day Mr. John S. Phené, who is making an archaeological inspection of the earthworks in Oxfordshire, when examining Letcombe Castle, one of the great embanked forts or camps along the ridge road on the chalk hills of Berkshire, came upon an apparently small stone, almost level with the turf, and firmly embedded, and somewhat foreign to the locality. Borrowing a small weeding-spu from one of several persons working in the camp, he set to work to dislodge the stone. This, as the hole deepened, became wider, and at a depth of 15 in. assumed the form of an almost perfect cone, a shape which had apparently been produced by chipping, and not by rubbing, or the application of any cutting instrument. At this depth, the stone was found to be standing on five or six large flints, and, on being removed, exhibited a cist or chamber beneath, the walls of which were formed by the flints, and the floor by a flat slab of stone. In this cavity were human bones,—portions of which only Mr. Phené was able to secure, as the rest crumbled away; some flint scrapers; a triangular piece of flint, with true sides and angles, and which, on a very reduced scale, would show, as by a section, the form of the conical cover; half of a hatchet-shaped flint; the apparent outline of an umbo of a shield, which also crumbled, but left its flat base firmly attached to the bottom slab; and also a small fragment of an urn, or drinking-cup, of an unusually hard material.

The New Leeds Bridge.—The works connected with the construction of the new bridge at the foot of Brigatote, Leeds, are being proceeded with. The original estimate was 10,849*l.*; but as improvements have been added, the actual cost will exceed the sum named. The new erection will be built on the skew, and will be composed of one arch, having a span of 102 ft. 6 in. The fan-girders are composed of cast-iron, and architectural effect will be given to the ironwork by ornamental scroll-work being freely introduced into the spandrels. There are perforated cast-iron parapets, from the centre of which will rise a light gas-pillar. The total width of the bridge between the parapets is to be 60 ft., being an increase of 27 ft., as compared with the old bridge. Two 12-ft. caneways are provided for in the design, and a roadway 36 ft. in width. The contractor for the whole of the work is Mr. David Nichols, of Leeds, whose tender, 15,319*l.*, was the lowest of eight, the highest being 16,900*l.* The ironwork is being constructed by Messrs. Bulter & Pitts, of Stanningley. The quality of the wrought-iron used is to be such as will bear a minimum tensile strain of 20 tons to the square inch. Mr. Coslett is clerk of the works.

The Workmen's Club and Public house Question.—A deputation, consisting of Lord Lyttelton, Sir John Bowring, and other gentlemen, have called the attention of Mr. Bruce, the Home Secretary, to the public-house imitation of those twenty-five or thirty of the 500 workmen's clubs which provide beer and spirits to the subscribers. The Rev. H. Solly said that the publicans' clubs were spreading, and were likely to do injury to the *bona fide* workmen's clubs; whereas even those of the latter which provided strong drinks tended greatly to diminish the supply induced by constant touting for "orders" in public-houses. Mr. Bruce sympathized with the object of the deputation, and promised the careful consideration of the Government.

The Proposed College of Physical Science in Newcastle.—The movement continues to make satisfactory progress. The subscriptions now amount to 22,000*l.* A large number of applications have been received for the vacant professorships. The success of the college will depend upon the selection that is made on this occasion. The Cleveland iron trade are likely, it appears, to give tangible support to the proposed college.

The Gas-Wells of Erie.—An American scientific journal gives an interesting account of the gas-wells of Erie. The average depth of the wells sunk is 600 ft., and they yield from 10,000 to 30,000 cubic feet of gas a day. In the manufacture this natural gas is burned without any other fuel for raising steam, and in many private houses no raising fire is employed. The City of Erie Gas Company have a well pouring 24,000 cubic feet of gas a day into their gasholder; this, mixed with 12,000 ft. of ordinary coal-gas, furnishes the supply for illuminating the town.

The National Portrait Gallery.—The fourteenth annual report of the trustees of the National Portrait Gallery has been issued. The 82 donations mentioned in former reports have now been increased to 91, and the purchases from 217 to 229. The total number of visitors to the gallery during the year 1870 from its opening, at South Kensington, on March 23, was 58,913, being 34,497 in excess of the previous year, when the gallery was in Great George-street, Westminster.

Restoration of St. Andrew's Holborn.—Vice-Chancellor Wickens has granted the prayer of the rector and churchwardens of St. Andrew's, Holborn, that some improvements and alterations to the church might be declared to be fit and proper to be effected, at a cost not exceeding 7,200*l.*, and that the petitioners might be authorized to enter into contracts for the purpose of effecting the same.

Voluntary Architectural Examination: Royal Institute of British Architects.—The following gentlemen passed the preliminary examination of 1871, viz.:—

W. E. Brown, Chelmsford; J. W. Rountwaite, Sunderland; E. Square, Great Percy-street, London; F. P. Johnson, Bow-road; Y. Trubshaw, Strand, London; W. J. Martin, Reading; J. Conder, Strand, London; H. W. R. Berts, Alton, Hants; C. H. Shoppee, Doughty-street, London; and J. Dean, Barnsbury, London.

No candidates presented themselves for examination in the class of proficiency or distinction.

New Water Supply for Louth.—A water company has been legally constituted for the purpose of supplying Louth and the neighbourhood with water, under constant high pressure, to some 11,000 inhabitants. The danger of well-contamination will thus be obviated, and there will be increased safety from fire, and facilities for washing the streets and flushing the sewers.

Proposed Public Library, Museum, and Picture Gallery, for Brighton.—The town council have voted, by a majority of 18 to 6, in favour of this very desirable object, and referred the matter to the vestry once more to decide on it, as is requisite under the provisions of the Pavilion Act.

The Priory of St. Bartholomew, Smithfield.—A correspondent states that a crypt forming a portion of the old priory of St. Bartholomew is about to be demolished, to allow of the erection of some warehouses: we hope not without absolute necessity. All the relics of old London are gradually disappearing.

The Birmingham Irrigation Scheme.—The report of the local committee recommending a scheme of sewage-irrigation on land near Birmingham has been printed. The cost of conduits to the sewers outlet near Salfley is estimated altogether at about 110,000*l.* The committee recommend the council to let the land to farmers.

The Cost of Paupers.—A statement of the weekly cost per head of workhouse paupers, in respect of food and necessities and clothing, for the half-year ending Michaelmas, 1870, has been just published. It varies from 1*s.* 10d. in Maidstone, Kent, to 7*s.* 5d. in Billesdon, Leicestershire.

A Well-merited Compliment.—We are glad to hear that her Majesty the Queen, at the instance of the Prime Minister, has conferred a Civil List pension of 100*l.* a year on Mr. J. R. Planohé, in consideration of his contributions to dramatic and antiquarian literature.

Surveyor to the Cheshunt Local Board.—Mr. W. Dewey has been elected surveyor to the Local Board of Health at Cheshunt, by a majority of 6, to 4 for the Rev. C. Mayo.

Lecturing in India.—Lord Napier, the Governor of Madras, has been delivering a lecture on Painting with special reference to India.

News for Emigrating Authors.—The latest Californian discovery announced is a spring of indelible ink.

TENDERS

For additions to Ascot Royal Hotel, Messrs. Clark & Holland, architects:—		
Hollis	2,637	0 0
Capps & Rizzo	1,870	0 0
Reay-cl	1,830	0 0
Kelly	1,798	0 0
Watson	1,760	0 0
Lacy & Torkington	1,760	0 0
Paget & Dakin	1,693	0 0
Hanson & Sons	1,689	0 0

For building three large warehouses in Hamel-street (late Red Cross-square), City, E.C. Mr. Herbert Fox architect:—

Pritchard	27,725	0 0
Dove, Bros.	2,670	0 0
Colod	2,660	0 0
Turner	2,655	0 0
Browne & Robinson	2,534	0 0
Higgs	2,493	0 0
Coadet	2,387	0 0
Bird	2,380	0 0
Williams & Son	2,283	0 0
Hill, Kedell, & Waldram	2,150	0 0
Scovener & White	2,127	0 0
Perry & Co.	2,100	0 0
Myers & Son	2,075	0 0
Perry, Bros.	2,017	0 0
Gannon & Sons	2,012	0 0
Henshaw	1,887	0 0
Brass	1,670	0 0
Stimpson	1,487	0 0

For additions and alterations to Park Cottage, Looe, Cornwall. Messrs. Goulty & Gibbins, architects:—

Loat & Son	£ 85	0 0
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For additions and alterations to 10, Arundel-gate, Brighton, for Mr. William Field. Messrs. Goulty & Gibbins, architects:—

Nell & Tuxford	£500	0 0
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For finishing two houses in Albert-road, Church Hill Estate, for Mr. H. T. West. Messrs. Goulty & Gibbins, architects:—

Nash & Co.	£318	0 0
Nell & Tuxford	307	0 0
Baker	277	0 0
Bostel & Botting	250	0 0

For the erection of five houses in Gladstone-road, Chesterfield, Derbyshire, for Mr. H. McLeasach, J. S. Hollinson, architect:—

Excavators, Masons, Bricklayers, Slaters, Plasterers, Smiths, and Painter's Departments.		
Forrest	£1,000	0 0
Maw	1,000	0 0
Right (accepted)	1,011	0 0

For sundry alterations and additions at the Wheatash Inn, Bury, Herts, for Messrs. Salter & Co.:—

Hailey	£349	0 0
Waterman & Co.	348	0 0
Holland (accepted)	335	0 0

For the erection of the Free Baths, Derby. Mr. Geo. Thompson, architect:—

Eyer	£2,430	0 0
E. Thompson	2,381	0 0
J. W. Thompson	2,233	0 0
Brigdet	1,973	0 0
Dunsany (accepted)	1,923	0 0

Ironwork.

Corbin & Co.	£593	5 0
Haywood (accepted)	325	0 0

For the erection of an additional factory and of buildings, for Messrs. J. A. Clarke & Co., silk throwers and trimming manufacturers, Forest, Nottingham. Sidney R. Stephenson, architect:—

Wright & Son	£2,953	0 0
Brady & Barker	4,648	0 0
Mariotti & Co.	4,670	0 0
Svensson & Weston	4,570	0 0
Middleton	4,310	0 0
Wool & Sight	4,350	0 0
Barker	4,321	0 0
Dennett & Co.	4,295	0 0
Hell & Son (accepted)	4,287	0 0
Vickers	4,200	0 0

To pull down Nos. 16 and 18, Old-street, and build a warehouse over. Messrs. Tolley & Dait, architects. Quantities supplied:—

Johnson	£1,585	0 0
Langford	1,580	0 0
Alexander	1,432	0 0
Joslyn	1,425	0 0
Rooney, Bros.	1,420	0 0
Byshop	1,395	0 0
Tulley	1,390	0 0
Preedy	1,390	0 0
Smith	1,387	0 0
Brigman & Nutball	1,375	0 0
Ennor	1,375	0 0
Bamford	1,375	0 0
Sabey & Son	1,261	0 0
Carmody	1,237	0 0
Aitchison & Warper	1,215	0 0
Garrard	1,175	0 0
Lissall	1,180	0 0
Cook	1,165	0 0
Watson	1,080	0 0
Fossett	577	0 0

For erecting a new wing to Mortimer Lodge, Windsor Park, S.W. Mr. Herbert Williams, architect. Quantities supplied by Mr. Charles Reilly:—

Taylor	£232	0 0
Turner & Sons	799	0 0
Adamson & Sons	777	0 0

For building a pair of villa residences, Collings-Gipsy-hill, for Mr. Richard May:—

Bowler	£2,400	0 0
Peckett & Taylor	1,945	0 0
Pearce, Bros.	1,835	0 0
Riley	1,814	0 0
Lock & March	1,750	0 0
Spencer	1,439	0 0
Blackburn	1,139	0 0
Mason & Brisk	1,130	0 0
Dover, Dowell, & Co. (accepted)	1,124	0 0
Wevell	845	0 0
Corderoy	750	0 0

small-house, Hythe, Kent, for Mr. H. B. Mackeson. Charles Baily, architect. Quantities by Mr. Charles Baily.

Haywood.....	£3,941 13 0
Bowley.....	3,850 0 0
Stiff.....	3,756 0 0
Brooks & Co.....	3,746 16 0
Adcock & Rees.....	3,473 7 0
Holdous.....	3,365 0 0
Slippee (accepted).....	3,365 0 0

for the erection of new schoolrooms and turret for by Chapel, High Wycombe. Mr. Arthur Vernon,

Banghurst.....	£1,018 2 3
Knight.....	988 0 0
Cropper.....	983 0 0
Nash.....	922 10 0
Reavell.....	900 0 0
Loxley.....	840 0 0
Woodbridge.....	825 15 0
Spicer.....	800 0 0

for the erection of fifteen cottages at West Green, Ham, for Messrs. Smith & Gale. Mr. F. Borcham, architect.

Burgmore & Morley.....	£2,984 0 0
Child & Son.....	2,890 0 0
Child & Son.....	2,559 0 0
Ridgway.....	2,400 0 0
Worship.....	2,240 0 0
Fouracre.....	2,237 0 0
Coates.....	2,065 0 0
Lozell.....	1,990 0 0
Lozell (accepted).....	1,580 0 0

a new channel and resealing the Church of St. Colchester. Mr. A. W. Blomfield, architect.

Gloucester.....	£1,857 0 0
Runnels.....	1,614 0 0
Gloucester.....	1,550 0 0
Gardner.....	1,470 0 0
Gardner (accepted).....	1,416 10 0

rebeneching and repairing the Adelphi Chapel, Strand. Mr. John Leaning, architect. Quantities by Mr. John Leaning.

Brown & Robinson.....	£2,893 0 0
Little.....	945 0 0
Little.....	945 0 0
Ramsay.....	884 0 0

roads and sewers on the Manor House Estate, West of St. Luke's, Chelsea. Mr. Pattison, architect.

Brown.....	£3,168 0 0
Jay.....	2,769 0 0
Wainwright & Wilson.....	2,224 0 0
Pizzay.....	2,195 0 0
Killingback.....	1,998 10 0
Walker & Loral.....	1,975 12 0
Riley.....	1,839 0 0
Brass & Son.....	1,934 0 0
Leggett.....	1,898 0 0
Wright.....	1,847 0 0
Lacy & Torkington.....	1,800 0 0
Neave (accepted).....	1,659 0 0

alterations and additions to Aldenham Lodge, for Mr. Thomas Bagnall. Mr. E. H. Horne, architect.

Phillips & Son.....	£2,710 0 0
Hill.....	2,637 0 0
Hill, Keddell & Walderman.....	2,637 0 0
Brown.....	2,647 0 0
Wicks, Bangs & Co.....	2,640 0 0
Sturges & White.....	2,638 0 0
Bottom.....	2,640 0 0
Foster (accepted).....	2,467 0 0

villa and stable buildings at East Sheen. Mr. E. B. Bell, architect. Quantities supplied by Mr. E. B. Bell.

Thomas.....	£2,733 0 0
Heald.....	2,673 0 0
Sharphington & Co.....	2,604 0 0
Adamson & Sons.....	2,641 0 0

for the erection of a villa residence at Croxford, for F. J. Cleaver. Mr. H. A. Alexander, architect. Quantities by Mr. Henry Laxton.

Bugler.....	£2,335 18 0
Hammond.....	2,982 0 0
Hammond.....	2,975 0 0
Manbridge.....	2,895 0 0
Cheskin.....	2,774 0 0
Potter & Ferriss.....	2,748 0 0
Pavitt.....	2,380 0 0
Baxter.....	2,215 0 0

draining and forming roads of new cemetery at, for the Knifield Burial Board. Mr. Thomas J. surveyor.

Bugbird (accepted).....	£1,555 0 0
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for the erection of two cemetery chapels, lodge, quarry, enclosure-wall, &c., at Enfield, for the Enfield Board. Messrs. Osborn & Russell, architects.

Moreland & Son.....	£2,075 0 0
Merrion.....	2,798 0 0
Robbins & Co.....	2,623 0 0
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Perry, Bros.....	2,741 0 0
Baby & Son.....	2,583 0 0
Wright & Whittier.....	2,574 0 0
Gammson & Son.....	2,435 0 0

for the restoration of Stavington Church, Beds. Mr. C. Fisher, architect.

Foster.....	£1,450 0 0
Wickes.....	1,411 0 0
Moore.....	1,390 0 0
Moore.....	1,269 0 0
Tooley.....	1,187 0 0

Alterations to Maidstone Gaol, for the Justices of the County of Kent. Mr. Martin Palmer, architect.

Dover, Down, & Co.....	£2,769 0 0
Abnet.....	687 0 0
Bridge.....	558 0 0
Cost, Bros.....	558 0 0
Holloway.....	538 17 0
Wallis & Clements.....	515 0 0
Davis (accepted).....	428 10 0

For the erection of a farm-house on Sir Henry Menz's estate at Cheshunt. Mr. Thomas J. Hill, architect. Saunders (accepted). £1,400 0 0

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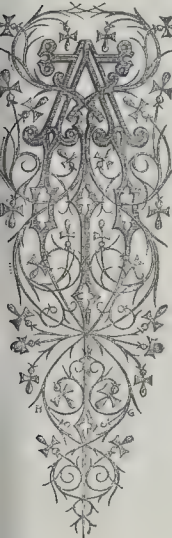
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ERS AND CONTRACTORS.

The Builder.

VOL. XXIX.—No. 1482.

The Russian Building Art at the Exhibition in St. Petersburg.



St. Petersburg, concerning which but little has transpired in England, owing, no doubt, to the all-engrossing character of the events of the last nine months. The Exhibition of 1870 was the twelfth of its kind held in Russia,—far surpassing in its importance anything that had been previously witnessed. It demonstrated the progress of science and art since the time of Peter the Great; and, as might be expected, was highly instructive and interesting. The St. Petersburg Exhibition was likewise successful to the number of visitors from the capitals and the interior, producing much such an impression as did our first Exhibition of 1851; the railway system of Russia, which has inaugurated a new epoch in the economy of the empire, having contributed materially towards the success of the undertaking, by facilitating the means of communication. During the Crimean War there were only two lines of railway in Russia, the one from St. Petersburg to Moscow, 400 miles in extent; the other, a suburban one, of seventeen miles. At present, 6,997 miles are open for traffic, 2,055 miles in course of construction, and many others projected and agreed on by the Government. It is to be regretted that so little is known to the general English public of the great reforms, social and administrative, that have taken place in Russia since the above event. Considering the influence which they already exercise upon the well-being of the country at large, these sweeping measures should claim on our part far greater attention than has hitherto been accorded them; for it is only by studying these reforms that we arrive at a just estimate of the state of the country. A visit to the late St. Petersburg Exhibition also would have served to remove many prejudices, and have enlightened us upon matters of which we were totally ignorant; for it cannot but be admitted that Russia, in many things, is still all

but unknown to the West. In describing Exhibitions it is usual to dilate upon the structure itself, as it generally affords ample material for comment. In its outward aspect, the St. Petersburg Exhibition had scarcely anything to boast of, for the structure itself was nothing more than a great square of brick buildings which had formerly served as a salt depôt, and, as may be conceived, no little ingenuity had to be exercised by the architect, Mr. Hartmann, to give it as much as possible an artistic appearance to make it a fit receptacle for the articles sent by 3,100 Russian exhibitors. Two entrances were rebuilt in the Renaissance style, and flags hid the nudity of the walls in other parts of the building. The interior, on the other hand, presented a *coup d'œil* of the most æsthetic kind of halls; naves and galleries constructed according to the Russian school which was so much admired at the Paris Exhibition of 1867, the materials used being wood, iron, and glass, the light coming from lateral openings in the roof. All this was very effective, and would afford many useful hints in the construction of buildings of a similar nature in our colonies where wood is cheap. There were two annexes for machinery, and the whole area was over 21,000 square yards. One of the characteristic features of the Exhibition was the number of gardens formed in the interior of the building, which served to enliven the scene. One of the most important sections of the St. Petersburg exhibition was that devoted to architecture, simple and decorative, and articles of Russian domestic economy. When we speak of architecture in its widest sense there is no country in the world which affords such a diversity in the manner of construction as Russia, owing to the variety of races over which the Czar holds sway;—from the stately modern palaces to the peasant's *izba*, from the gorgeous remnants of the ancient Oriental palaces of the Khans of the Crimea to the felt huts of the wandering Kalmuc and Kirghis, the hill-side dwellings of the Tartars, and the flat-roofed houses of Georgia and Armenia; and, as a distinct type of building, the ancient church architecture that is still to be witnessed in the old towns of Moscow, Novgorod, and Kiev, which has for centuries been so conspicuous a feature in the building art of that section of the Russian people, called Veliko-Rosseesky, or Great Russian.

Section 2, class 11, of the Russian National Exhibition, according to the catalogue, was devoted to specimens of wood for building purposes, in the rough and finished state; and class 8 contained building materials and appurtenances, which were subdivided in the following manner:—(a) Minerals for constructive purposes; architectural decorations in marble, granite, jasper, &c., in the natural and manufactured state; inlaid work in real stone and imitation: (b) Lime, cements, and artificial stone: (c) Articles of common stone, different kinds of pavement, flagstones, &c., and millstones: (d) Exterior and interior decorations of various sorts, articles manufactured of gypsum and alabaster: (e) Bricks, tiles, pipes, roofing-tiles, and potteryware.

In Russia, wood is the principal material used for constructing purposes, as being more accessible than any other produce of the earth. If we exclude the capitals of St. Petersburg and Moscow, and some of the chief provincial towns, it may be said that wooden houses form the rule, brick and stone the exception. It was only after the foundation of St. Petersburg, in 1703 that they began to construct houses to any extent of brick and stone, the example being invariably set by the Government, who formed their various departments of these materials. Stone is very rarely seen except in those localities where it can be obtained from the immediate vicinity. To a Russian, a wooden house holds out a multitude of recommendations.

Firstly, wood is more easily fashioned into the wished-for shape than brick or stone; and then, a wooden house is more quickly built, costs very much less, and, when well built, is much warmer. In the capitals, however, the Government discourages the erection of wooden houses in various ways; for instance, after a fire the reconstruction in that material is prohibited. Any one who visited the Paris Exhibition may recollect the beautiful specimen of Russian woodwork,—the national cottage or *izba*. This, however, should be looked upon rather as an elegant reproduction of the peasant's dwelling than a distinct type, or that which is generally met with in that country. It is true that approaches to the model in question are to be met with now and then on rich private estates, and the estates of the appanages of the Imperial family, in the model villages; but, as a rule, the villages of Russia present a very dilapidated appearance, and the *izba* in its normal state is nothing better than a log hut, and as yet forms almost the only dwelling of about 54,000,000 of the Russian peasantry; and there is reason to suppose that in its shape and general arrangement it has remained unaltered from time immemorial. The *izba* is constructed of pine or fir logs laid horizontally upon each other, the interstices being filled up with moss or tow; the roof is made of rough planks or straw thatch, and glazed windows are a luxury. Some of the better kind of buildings contain the *klaiz*, a separate building, the summer chamber, without a fireplace, which is also used as a repository for the goods and chattels of the peasant. The most prominent feature in the *izba* is an enormous stove, which occupies a greater portion of the chamber. On the top of these stoves or ovens the peasantry arrange their sheepskins and pillows, and the bedroom is complete.

The cost of a pine-log *izba* in the forest districts must be very trifling, when we consider that a pine-log, 22 ft. long, and 10 in. to 22 in. in diameter, is cut down for about 3s. 8d. English money, and it should be noticed that this is the best red pine. The handy manner in which the Russian peasant handles his axe, almost the only instrument which he uses, renders his task an easy one, in which he is also helped by his neighbours, who expect a similar service from him in return. Next in the scale of wooden houses come those inhabited by the upper middle classes, which are to be met with to a great extent in Moscow and the provincial towns, and they are certainly the most complete and comfortable dwellings that can be imagined. They are square in shape, formed of logs well caulked, and covered with planks, generally painted white, from one to two stories high, the foundations in the better ones being of stone. The arrangement of the rooms leading into one another, as to convenience and comfort, leaves nothing to be desired; and the various offices attached, including the kitchen, serve to keep the dwelling-rooms free from dust, smoke, &c.; on the outside, sometimes balconies are added, and Venetian shutters. The roofs, which are constructed of rafters, covered with $\frac{1}{2}$ -in. planks or sheet-iron, are painted or tarred, with a view to preservation. Fir shingles are also used where these materials cannot be afforded; they are coming more and more into use with the perfection of their manufacture by machinery. There was one exhibitor at the Russian National Exhibition who quoted as low as 1s. 4d. per 1,000 fir shingles hand-made, which undergo the process of boiling in copperas in large copper boilers. Roofs are covered by contract with this article, at the rate of only 2s. 8d. per square fathom of 7 ft., and are very durable. Roofing-felt has also been adopted in Russia several years ago, but it is not so well made as our own, and appears to be a sort of coarse cardboard, saturated with tar or asphaltum. There was only one exhibitor of this

article, whose yearly production was 12,000 rolls or pieces, of the value of about 8,000l. This article has also been, in some instances, successfully used in the interiors instead of laths and plaster, the square fathoms of 7 ft. costing about 3s. 6d.

Various specimens of wood, deal, timber, planks, and boards were exhibited, chiefly from Finland, Petersburg, and Riga; but considering the importance of this branch of trade, the show was very poor. European Russia is covered with forests to the extent of not less than 180,000,000 dessiatins (about 372,000,000 acres); the principal group being situated in the Ural-Alaunnak districts, and to the north of the same. In the north of Russia, the prevailing species are timber-trees, fir, and pine, intermixed towards the Ural with larch, Siberian cedar or stone pine, and towards the Baltic Sea with birch, aspen, and alder; in the middle region, oak, maple, ash, and lime are chiefly met with. The principal oak forests are situated in the governments of Kazan, and in Courland, the lime-tree, in the governments of Kostroma, Viatka, Perm, and Lithuania. The forests of the Caucasus abound in oak and beech, and many other hard woods used in cabinetmaking. Although the greater part of the forests of Russia belongs to the Government (to the extent of about 306,600,000 acres), forestry is almost unknown, and hundreds of thousands of trees are yearly destroyed through bad management. A Riga firm exhibited some fine red deals, but there were no prices stated. The establishment has three steam-engines of 110-horse power, sixteen iron sawing-frames, with eighty vertical and eleven round saws, employing 455 hands. The return was given at about 100,000l. yearly. An exhibitor from Finland showed fine specimens of deal planks and boards, at 122s. per Petersburg standard. Of machine joinery-work, there were door-casings, cornices, and skirtings exhibited by one firm only, employing thirty men and two steam-engines. From Poland (Warsaw), there were exhibited oak boards for inland flooring, from 2s. to 4s. 6d. per square archine (28 in.), and some splendid specimens of inland flooring of Petersburg make, at 75l. per square fathom of 7 ft., in the style of Louis XIV.; also samples of inland flooring, from 37s. 6d. to 19l. for the same measurement of good workmanship.

The building materials employed in the construction of the houses of the capital consist of bricks, wood, and iron, the latter being chiefly used for roofing purposes. Now and then iron girders, &c., are introduced, but wood being comparatively cheap, the former does not find much favour among the builders, cheapness being the order of the day at St. Petersburg, as it is in London. Latterly a spacious covered entrance, or portico, consisting of cast-iron pillars and sheet-iron roof, is being almost universally adopted for the better class of houses in the capital. Iron roofs may be reckoned amongst the architectural superfluities of Russia, whether applied to wooden or brick houses. The quality of the iron is also very superior to anything of the kind manufactured in this country. The manner of constructing the roofs is noteworthy. The sheets of iron are laid upon the rafters lapping over each other so as to fit perfectly tight at the edges. On the sides of the rafters they are fast, but nowhere else; in other respects, the whole roof rests loosely upon the house. Holes pierced for rails are found to diminish the durability. These roofs are commonly painted of a bright green colour, which in a clear atmosphere has a very pleasing effect. Sometimes for cheapness they are painted red. These roofs, it is said, last more than twice as long as tiles, and do not cost twice as much (the duration of one is reckoned at twenty and the other at fifty years). The iron roofs, moreover, are lighter than any other. In case of fire, however, they are more dangerous, as they heat sooner and are difficult to remove. All the Russian iron roofs are made to incline at a very slight angle. This is done for a variety of purposes, for the cleaning of the same from snow during the winter, for the sweeping of chimneys, which is effected from without by means of a broom attached to a heavy iron ball and rope, which is pulled up and let down the chimney. Easy access is also obtained in the smaller wooden house to the eave of water which is kept near the chimney in case of fire. At the Exhibition there were several exhibitors of sheet iron for roofing purposes, among which were the oldest firms most celebrated for the quality of the material they

supply.—Mr. Demidof and Mr. Jacovlef, who have their works in the districts of the Ural Mountains. The sheets are 56 in. by 28 in., and represent two descriptions of iron, bright surface and dull surface. Mr. Demidof's prices were, for both sorts, from 2 r. s. 90 cop. to 3 r. 80 cop. per pood (28s. 11d. to 31s. 4d. per cwt.); Mr. Jacovlef quoted for bright surface from 2 r. 40 cop. to 3 r. s. (19s. 10d. to 24s. 9d. per cwt.), and for dull surface from 2 r. s. 30 cop. to 2 r. s. 55 cop. (19s. to 21s. 1d. per cwt.).

Bricks are extensively made in the vicinity of the capital, and are also imported from the interior by the rivers and canals. They are manufactured both by hand and by machinery, driven chiefly by horse power, pugnilla and other appliances of English manufacture being well known in Russia. The bricks resolve themselves into two kinds or qualities, dark red and pale red. At the Exhibition there were two exhibitors of this article from the neighbourhood of St. Petersburg, who quoted for dark red bricks, 12 r. 50 cop. (33s. 4d.), and 15 r. (40s.), and for pale red bricks, 10 r. (26s. 8d.) per 1,000, of excellent quality. It should be observed that their size is somewhat larger than those used in London.

There were also specimens shown of fire-bricks manufactured in the vicinity of the capital, at 35 r. (93s. 4d.) per 1,000, the clay being obtained from the interior, near the River Vitiegra, in the circle of Borovich, of very good quality.

Fire-brick is an article of considerable export to Russia from this country, and can be found in all the brick-yards of St. Petersburg, and English clinkers also. An exhibitor from Kief showed samples of clinkers for paving purposes, at 17 r. s. (42s. 6d.) per 1,000. Portland and Roman cement, which is also sent from this country to Russia, particularly to St. Petersburg, was also shown by several exhibitors, the price quoted by them being per pood, 25 cop. (2s. 1d. per cwt.) for Roman, and 35 cop. (2s. 11d. per cwt.) for Portland, and some makers far in the interior charged as high as 50 cop. (4s. 2d. per cwt.) for the same product. It should be remarked that there is no duty whatever on the foreign article, and it is scarcely possible for the native manufacturers to compete with those of England, Germany, and France. Alabaster is also imported from abroad to some extent, and duty free, but the neighbourhood of Riga supplies gypsum stone in large quantities, which is manufactured at St. Petersburg into alabaster, the price of which was quoted at the Exhibition at 30 cop. per pood (2s. 6d. per cwt.).

Drainage-pipes were also exhibited by a Finland maker, who produces 1,000,000 pipes yearly. Drainage in Russia for all purposes is still in its infancy. It is a question whether Russian makers would be able to compete with those of this country, considering that the manufacture is admitted duty free. In some districts the old-fashioned red roofing-tiles are also in use. An exhibitor from the government of Kief showed some specimens at 19 r. (45s.) per 1,000. There were no evidences of the employment of slates. Notwithstanding the immense quantity of granite principally of the red species, to be found in Finland, almost in the vicinity of the capital itself, it is little used in the construction of private houses at St. Petersburg, owing probably to its excessive weight, the soil being of a swampy nature, and the expense of working it. Still, upon the whole, a great quantity of granite has found its way from Finland to the banks of the Neva since St. Petersburg was founded, and enormous blocks of that material, obtained at great cost and trouble, now display themselves in the capital in the shape of monoliths, pillars, caryatides, pedestals, &c. It must be admitted that the climate of St. Petersburg is most ruinous to architectural decoration, and it is quite afflictive to see how much the fine granite monuments frequently suffer from the effects of the atmosphere. The frosts of the winter are particularly destructive. The moisture that finds its way during autumn into the pores of the stones freezes in winter, and some of the largest blocks are rent in two, and, on the return of spring, fall asunder. A magnificent specimen of granite work, the Alexander column, a monolith, 84 ft. high, surmounted by a colossal bronze figure of Faith, erected opposite the winter palace at St. Petersburg, is split in several places, no doubt from the same cause. Red granite has entered largely into the materials of which the St. Isaac Cathedral is constructed. From the level of the upper part of Peter's-place rise three broad flights of steps formed from masses

of granite rock brightly polished. These steps lead from the four sides of the building to the four chief entrances, each of which has an superb peristyle. The pillars of these peristyles are 60 ft. high, consisting of one solid piece, and having a diameter of 7 ft. They are crowned with capitals of bronze, and support the enormous beam of a frieze formed of six fine-polished blocks. Over the peristyles and at twice their height rises the chief and central gilded cupola, higher than it is wide in the Byzantine proportion. It is supported, also, by thirty pillars of smooth polished granite, which, although gigantic in themselves, look small compared to those below. The effect of the sun's rays on this enormous mass of polished granite and gilding is most brilliant, and affords a spectacle to be viewed in no other country. At the Exhibition there were no specimens of granite work to be seen.

An immense quantity of red granite has been used at St. Petersburg in the construction of the quays, which inclose the rivers and canals to the extent of nearly twenty English miles.* These quays, however, have scarcely any claim to architectural merit beyond their solidity, and compare unfavourably with our Thames Embankment. The grey and blue-grey species of granite are more seldom seen, but some very fine samples of that material may be found in the capital, notably the two columns at the entrance of the Nicolai Boulevard and the colossal figures supporting the portico of the Hermitage.†

ITALIAN SCULPTURE AT THE INTERNATIONAL EXHIBITION.

THE Italian sculpture in the Eastern Gallery of the International Exhibition is such as to strike even those who considered themselves to be not unacquainted with the state of art in that peninsula with surprise as well as with admiration. In the Women's International Exhibition last year there were not a few specimens of Italian sculpture of that class which is properly designated as "very clever." The cutting of the marble was sharp, delicate, and finished with perfect mechanical accuracy. The effect of texture was faithfully given. Features and form were copied with almost the fidelity of photography. But life was either altogether absent, or was present under a vulgar and degraded aspect that destroyed any of the higher treatment proper to the noble art of the sculptor. Such figures as the statues of Lord Palmerston and of Count Cavour were, rigidly considered, only waxwork in marble. Realism had been carried to the extreme, and, in the entire absence of any loftier ideal motive, could only offend cultivated and refined taste.

All that the Italian sculpture to which we have now to refer has in connexion with this realistic stone-cutting is the exquisite purity of the material. It is a puzzle to English sculptors by what means their Italian competitors can command such blocks as they draw from the quarries of Carrara. Price cannot do it, nor can, as far as we know, judgment. The agents for the Carrara quarries in London will take no responsibility as to flaws in the costly stone which they sell. For the integrity of the most expensive material required for any artistic work (when we pass from the province of the goldsmith, the jeweller, and the cameo-worker), no security is offered to the purchaser. It is stated that no amount of judgment and of experience will enable an artist to tell, with certainty, from the inspection of a block, whether stains, flaws, or sand-cracks will appear within. Writing without intimate acquaintance with the quarries of Carrara, but with much experience as to quarries in general, the idea is unavoidable, that locality, or the selection of certain well-known beds or portions of beds, may be of the first importance. But, in this case it would be within the power, and actually it would be worth the while, of the merchant to sell, at a very high price, warranted blocks. Nothing of this kind is done. There remains the hypothesis that the Italian sculptors possess the secret of removing the unsightly blue stain from their finished works. Sand-cracks, or the darker stain, which indicates the degradation of the tissue of the pure marble into that of

* When we consider the nature of the soil of St. Petersburg, the difficulty of obtaining a solid foundation, the enclosing the rivers and canals at a period when little machinery was in use, it must be admitted, was a gigantic undertaking.

† To be continued.

inferior stone, may be detected at some distance beneath the surface. Not so with the stain, which appears to be almost independent of the tissue of the marble. Many efforts have been made to remove it; but that it is not to be, and is, removed by a process to which its objection does not apply, there is some reason to suppose.

With exquisite purity of material, and admirable skill in the mechanical treatment of marble, any of the statues in the International Exhibition combine claims of a higher order on the admiration of the man of taste. Something of an old Greek spirit has lingered in, or has returned to, Florence. The names of Amici, Caroni, Tantardini, Guglielmi, Pagani, Tantardini, and Torelli, deserve to be inscribed in the *Libro d'oro* of Art. Nor are the works of these men, just of whom assume the title of professor, like those of Wyon, of Marshall Wood, and of Crittenden in the Western Gallery, the excellent productions of individual sculptors, entirely dependent as to character, in each instance, on the idiosyncrasy of the artist. There is an æsthetic stamp about the Italian sculpture. It is the work of a school,—and of a school of a high rank. Italy has, at least, ever since the Renaissance, possessed a great advantage over her countries in the facility with which the greatest artists have filled their school with pupils and with assistants. An ever-living classicism has purified Italian art. The charms and requirements of the climate, the consequential habits of the people, and the taste for natural beauty inherent, have much to do with this. The effect is undeniable, and most advantageous. The two poles of art, so far as method of production is concerned, may be taken as the evolution from the inner consciousness "in a closely-guarded studio, on the one hand, and imposition and execution in public, like that of the *improvisatore* in poetry, on the other. The former may give us Teutonic force, and original originality; the latter is the method which enriched the schools of Phidias and of Praxiteles. It is wonderful to observe how the intense personal jealousy of the Italians is counteracted by its spirit of the school. With us, a far less personally jealous race, we have no body, order, or association of sculptors, but only individual competitors, who, in their isolation, can never fully free themselves from some of the weaknesses of the amateur.

The contrast between the sculpture of France and that of Italy is of the most marked and elegant character. In mechanical skill it cannot be denied that Carpeaux and other exhibitors are equal to any living workers in marble. That damped modelling of the figure, which, while it may depend more upon the choice of model and the illuminative management of the artist than on executive skill proper, is one of the greatest charms of undraped sculpture, the Italians must perhaps be given to the French. In prettiness of taste, evinced in such a treatment, for instance, of a bust, as converts it into an exquisite ornament for a saloon, instead of a work of art for a gallery, the French sculptors excel. But their very excellence is turned to the degradation of their art. The line, which is not merely that of demarcation, but that of opposition, between the undraped and the indecorate, by them entirely disregarded; or rather, indeed, it is kept too constantly in view, and that with a purpose that demands the most distinct and earnest reprobation. There is more that is objectionable,—not to prudery, but to severe taste,—in a modern French bust, than in an Italian undraped statue. The intellectual or moral difference between Raffaele and Grosse is exemplified and intensified by French work "in the round," as compared with that of other countries. It is in the meretricious expression and management of the head and features that the chief source of this extreme debasement of the art is to be found. Donativeness may, or may not, be admissible in sculpture. Its presence or absence defines the distinction between a Venus and an Eve. The highest purity demands the entire absence of consciousness,—the "not ashamed," of the earliest poetry. But very pure and noble sculpture may be instinct with a very vivid sense of feminine or boyish modesty. Again, the range of the artist as to the expression of the more tender emotions is almost unrestricted. Sentiment may rise to the loftiest poetry, or may sink in trivial productions, into sentimentality. Passion may be repressed with Homeric grandeur, or may carry the whole soul before it in its burst,—but in all this there must be admitted,

only the idea of the celestial Aphrodite. But when sentiment or passion is so treated as to become a mere matter of *métier*, of sale, and of purposed corruption, art is outraged by the degradation of the artist. And French sculpture, in this respect, has arrived at its Sedan.

It is, perhaps, more due to the circumstance of its being one of the first Italian sculptures unpacked, and having been magically lighted when thus seen, than to absolute primacy of merit, that Signor L. Amici's exquisite marble group of a woman with a child in her arms fleeing from the destruction of Pompeii (2,742a) heads our list. The subject is at once natural and full of pathos. The terror of the woman does not overcome the instinct of the mother. Form, attitude, and features are all at once truthful and sculptural. Those who have seen the heavens gradually covered with a veil of perfect and absolute blackness, the ragged edge of the portentous cloud, as it rapidly obliterated the sky, illumined by the reflected fires of the awakened volcano, and who have had to seek shelter from the warm rain of ashes, falling in little pellets, which burst with the shock of their fall, and cover every object with a grey, a red, or a black ash, will have the scene vividly recalled to mind by this admirable piece of sculpture.

There are six works by Professor A. Tantardini, as to each of which we find an independent note. The extreme perplexity of the catalogue is not without some compensation, when it thus leads to a mode of observation which it is impossible for any prejudice to influence. A critic would hardly have prevailed on himself to refer to all the productions of one artist, to the exclusion of those of so many others, if aware that he was so doing. The mastery obtained by Tantardini over marble, and the manner in which he makes its pure surface assume the texture of silk, of velvet, or of flesh, if it be one of the lowest, is yet one of the most magical, of his gifts. In his graceful, draped, half-size reading-girl, the treatment of the skirt, with the creases made by the folding of the silk yet unobliterated, and the softer material of the slippers peeping from beneath its folds, is masterly in the extreme. No less charming is the execution of the drapery that is slipping from the rounded shoulders of the Bather (2,768a), which she retains with those taper fingers, and of the hair escaping from its net. This statue has the rare merit of investing the truth of everyday, or rather every-night, costume with all the grace of classic drapery. 2,764a had been noted by the writer as "The Naughty Boy," before it was discovered, at the flag-end of the catalogue, under the title of "The Orphans." The little fellow's lip is pursed up to repress the howl which his sweet sister is endeavouring to avert. It will come, however, anon, and with an outburst like that of a trumpet! "The First Grief" over the loss of a pet bird (2,763a) is another charming figure by this artist. The Bride and the Widow (2,761a and 2,762a) two busts of the same lovely woman, the first with the sunny hope of life bright in her eyes,—the other, with a simple kerchief knotted, as if in real texture, beneath her chin, sad, with a bewitching sorrow, are a pair of heads that are absolutely given away for 60*l.* apiece. The name of Tantardini is nearly new to us, but it is one not to be forgotten.

There is a statue by Professor Caroni, which at first caused some confusion in the mind, from the fact of its being exhibited in *replica*, once as "The Albanian Slave" by E. Lloyd, and then as "The Circassian Slave" (2,693 and 2,746a), by Mr. C. E. Norchi. The artist has well deserved the commission to execute this graceful and delicate figure more than once in marble. The drapery of the head, truly sculptural and effective as it is, and giving that shadow, under a downward light, which is the very life of sculpture, is somewhat more successful in the latter copy. The chain which is linked round her wrist, and hangs free from the torso, is rather too clever, rather too much of a *tour de force*. It would have been added, by an antique sculptor, in bronze or in silver; and the contrast thus afforded to the delicate purity of the marble would have been good, both in itself, and as evincing an avoidance of the very great waste of the artist's time that the retention of the marble links, during the completion of the figure, must have caused. The illusion of the statue, moreover, is somewhat weakened by the evident impossibility of the chain. The woman is half-reclining, and supports herself on the right arm.

Let her be compared with the masterly treatment of the same subject, by Gérôme, in "A Vendre," in the Royal Academy Exhibition, and the difference between the adumbration of that which is divine, and the masterly delineation of that which is animal, in woman, will be comprehended without further remark. The lower limbs are perfect. The under lip is a little too narrow for the harmony of the face. There is also an "Ophelia," by the same artist, in which the embroidery of the hem of the petticoat, and the rich waves of the hair are marvels of patient manipulation. The old story of "Love Conquering Strength," is gracefully translated into the modern Italian tongue as "Cupid with a Lion."

"The Child Moses" (2,690), by F. Barzaghi, is one of those groups which, until some others were unpacked, might have been cited as almost the finest piece of sculpture in the Exhibition. A full-formed, well-modelled Egyptian girl, the maid of the daughter of Pharaoh, is bringing the future legislator, nestled in his ark of bulrushes, from the Nile, to present him to Thermuthis. The expectant, submissive look of the maiden, the ethnological truth of face and figure, the natural and graceful balance of the pose, are all admirable. The skill of the sculptor, to descend to that lower, but still masterly gift for the cultivation of which these Italian professors seem to have grudged no expenditure of time, is displayed in the bold projection of the asp-like ornament on the girl's head, and in the high polish of the arcanet on her neck, which gains such relief from the flesh surface as to make the latter look soft to the touch. This figure was better lighted when on the east side of the gallery than it is at present.

There is a realistic, but yet charming figure by C. Fantacchiotti (2,748a), incorrectly entitled "*L'Incanta*" (perhaps "*L'Incanta*" is meant), suffering from a thorn in the finger. The "Little Shepherdess" is another noteworthy statue, by the same sculptor. Each of the two groups by L. Guglielmi, "Daphnis and Chloe" (2,750a) and "Ruth and Naomi" deserve admiration. But the subjects are trite, and are such as to receive no aid to their conception from those incidents of the living life of Italy,—in those hot months when foreigners fly the shores, and the natives revert to something like heroic costume,—which give such vividness to the imagination of the sculptor. There is a group of Hagar and Ishmael (2,752a), by Professor Lazzarini, which is marked by pathetic sentiment of the tenderest nature. It is a sculpture one can only bear to study by aid of the reflection that the mother did not lose her child, after all. The sorrow and anxiety in her face might have won the angel to speed on his message of relief.

It is a labour of love to congratulate our Italian *confratelli* on the position which they have secured among the artists exhibiting in the galleries of South Kensington during the present season. A proper handbook is a desideratum, and it should be matter of consideration to the Italian Commission whether they cannot supplement, by adequate labels affixed to the statues, the scanty information of the official catalogue. Only two or three of the works we have described are referred to in this production in the proper place, under the head "sculpture." At page 205 comes an unexplained appendix, naming twenty-seven objects of Italian sculpture. But no indication is given as to size or scale, statuettes are entered as statues, and the abode of the sculptor is concealed under the general nationality of "Italy." If there is any country in which it is essential to distinguish the province and the city of an artist, it is the one which was the home of the Renaissance, and in which local peculiarities and types are so strongly marked. To refer, for instance, the works of Giorgione and of Perugino to "Italy" would be at once set down to an entire ignorance of the Venetian and the Umbrian schools. Why should the names of such men as those whom we have quoted be confounded under a title which, if now a political as well as a geographical expression, is that of a country so rich in the genius of the present, as well as in the glories of the past, that ignorance of her several schools is ignorance of art itself.

St. James's Tower, Taunton.—The rebuilding of St. James's tower is to be proceeded with as rapidly as possible. The old structure having been razed to the ground, the work of rearing a fac-simile of it is to be forthwith commenced.

GOTHIC MOULDINGS.*

We have had no lack of books since the commencement of the Gothic revival in which the profiles of the mouldings which form the framework and anatomy of that great architectural style have been illustrated with more or less accuracy and completeness, either in conjunction with general illustrations of the style, or occasionally in works devoted solely to the subject of mouldings. From most of these latter the present work of Mr. Sharpe differs in regard to the larger scale and (we shall probably be justified in saying) the greater accuracy with which the profiles are given; and from all other works in which mouldings are illustrated, in its employment of different colours to distinguish the different periods or styles to which the mouldings respectively belong. In this work the author has, for the first time we believe, adopted in publication the plans long in use by him in drawings made for reference or for illustrations to lectures, and explained recently in a paper read by him to the Architectural Association. Taking the prismatic spectrum as the basis, the mouldings belonging to his six periods are shaded as follows, in regard to their date and sequence: Norman, black; Transitional, blue; Lancet, green; Geometrical, yellow; Curvilinear, red; Rectilinear, crimson. Such a system is, of course, chiefly valuable for convenience of immediate reference and classification among a large number of drawings, and for better placing the subject before the eyes of an audience at a lecture; but it is not without value in a book published for study, as the colours become identified to the eye with the character of the various mouldings, and assist the memory in referring each to its true date and place in the archæological sequence of styles.

The first part of the present work contains mouldings of pier-arches, and is to be followed by two further parts, illustrating, respectively, "horizontal" and "vertical" mouldings. Then the comprehensive divisions will give an additional interest, to the work when complete, as furnishing matter for what a physiologist would term "comparative anatomy" of the mouldings used in these three classes of positions; and it will prove useful and suggestive to the student to compare the forms and profiles made use of by means of the same period, and in the same buildings in their various positions. A still wider comparative generalisation of Gothic mouldings might perhaps be made, by grouping them in reference to the nature of the material in which they are cut (the soft and hard qualities of stone, &c.), and also with reference (in the case of external mouldings) to the nature of the district in regard to exposure to weather and wet. So much were the details of the earlier Gothic mouldings founded on common sense and practical considerations, that we should not be at all surprised to find very interesting and curious results and coincidences evident on the tabulation and comparison of English Gothic mouldings on these two systems, if any one with plenty of time on his hands should think it worth while to undertake such a line of study. To return, however, to the matter in hand: the general type and historical development of the mouldings of English Gothic have long been so furnished not only to architects, but to not a few amateurs also (some of whom are, indeed, among most industrious exponents and illustrators of the subject), that it would be superfluous to say anything here in further elucidation of these topics; and our fitter task may be to take this opportunity of calling attention to and deprecating the comparative neglect by many living architects of this durable and effective source of masonic expression,—the *penchant* for brick and, by consequence, for flat soffits, in place of the deep-recessed orders of mouldings which gave such interest and variety to the true Gothic arch. This recent fashion has given rise to another variation in architectural character in this country; and so far we perhaps may speak of it with indulgence, as of anything which adds another sentence to an architectural conversation-book, and widens our ideas of architectural language and expression; but, on comparing impartially the effect of such mouldings as those of the pier arches of Carlisle, Lichfield, Lincoln, and elsewhere, as given by Mr. Sharpe, with the flat brick soffit of the recent type of modern Gothic

church, we are constrained to say, "Verily the old is better." Local specialties of treatment may be studied here, too, as in the curious contrast presented by the mouldings, on two contiguous pages, from Lichfield and Glasgow respectively, the latter showing a broad fillet and depressed roll, curiously at variance with the feature at the English cathedral of identical date (1275). It is worth notice, too, throughout such a collection, to observe how completely the recognition of the material to be dealt with is kept up throughout; for even in the waving lines of the mouldings of the decadence, as illustrated so characteristically by the profiles from Beverley Minster given on the last page of the book, we still see the thorough stone treatment, tamely and indolently carried out, indeed, in comparison with that which marked the vigour of the style, but yet with full appreciation of the nature of the substance which the workman had under his tool. The nearest approach, indeed, to a forgetfulness of the material, might be said to occur in some of the mouldings which mark the last efforts of the Transitional and the first of the "Lancet" period; when hollows and projections, and under-cuttings were for a little time dangerously exaggerated in the search for a novelty of effect afterwards obtained through the new profiles of the later Lancet and the Geometrical styles. We strongly and confidently recommend this work to the notice of students of architecture, those who are now busied in furnishing themselves with tools and materials for worthily carrying on their chosen profession. To the older students of the art, a comprehensive and well-arranged collection of Gothic mouldings, needs no recommendation; its value and interest alike are patent to them; and some of us can recall, in looking at such a collection, the interest with which, when unfledged students, the real value and meaning of their, at first, uninteresting profiles and delineations became evident to us, and they became gradually looked on as objects of study of far greater interest, for the time, than any views or pictures whatsoever, which we contemplated as gauds suitable only for the ignorant public. In truth, the theory that architecture is no art save when dressed up with the aid of pictures and statues, could scarcely receive better refutation than by such a collection of the mouldings of the Medieval styles (the British especially), suggesting such almost endless variety in mere masonic expression; and, to those who can read their language, not without poetry and pleasant association of their own too.

HOMER AND HIS GREEKS, AND THE LONDON SCHOOL BOARD.

It may be confidently affirmed that at no time, at least in the history of this country, was "education" so much and so earnestly in the minds of men as it now is; and the determination within the last few days to come to some definite conclusion as to what to teach to everybody, and how to teach it, makes the subject of education more than ever interesting. It may perhaps serve some useful purpose, or at least afford a hint or two, if we record a few facts specially come at in the way of artistic teaching and education; for we must contend that no system of education can be considered as perfect as may be, even if ever so elementary, which does not take the artistic element into consideration. And first, we would ask the curious reader to note how very different have been the views on the subject of education in different periods of the world's history. No subject can be more curious, and even puzzling, or more worthy of the study even of the most experienced. Take, for instance, only to glance at it, the system of things educational in the days of old Homer, when, as we are now assured, for Mr. Gladstone says in his book on Homer, that it is as good as a proved fact, there were no "three Rs" at all,—no "reading," for there were no books to read; no "writing," for letters were not invented, and we may surely say, this being the state of things, no "arithmetic." What a state to be in! An intelligent man or youth, therefore, in the days of Homer, must have been on a level with our very lowest of people; could have known nothing, in our sense of the word; yet so far from that old heroic age being ignorant, in every sense of the word, surely it could not have been so; for it produced not only Homer himself, which was a good deal, but a whole people to admire him, to listen to him, to repeat what he said, and to really appreciate

him. People could not read the *Iliad*, for it was never written, only by the old poet invented, and then *rhapsodised*, and then caught up by the attentive ears of a listening multitude, remembered with a truly wonderful tenacity of memory, and then rhapsodised in portions, at least, again and again through the whole length and breadth of the land which gave it birth. What would have been said at the London School Board? some one had proposed to teach the "Psalter" in this way, not to allow the *printed* book into the school-room, but to compel the pupils to take up the Psalms by ear, and so to teach each other—if they could? What a wonderful people were the old Greeks! They seem to have taken to art, or the way to refine existence, by a sort of natural and necessary instinct. They could not help it: they seem to have acted, and moved, and lived, not like ordinary people who need all this to be drummed into them, but as a nation of artists. Let it be observed that Homer, great as he was, could not have stood quite alone in his greatness; for the very power and willingness to listen to him and remember him, implies a power of a high order in those who surrounded him. Mr. Gladstone spent seven years of leisure, he tells us, in writing a long and learned book for the sole purpose of endeavouring to bring into more extended notice this very *Iliad* of Homer's, and to make it, so to speak, the "text-book" of University education. He ranks the Homeric poems so highly that he considers the *Iliad* as the "Pagan's Bible," and says what the Bible in Hebrew was to the Jew, the *Iliad* in Greek was to the Greek: indeed, and in short, a special Revelation to the Pagan world. More cannot be said about any book or any thing. Such was the age of Homer, and the state of public "education" in that age; and now comes a very curious thing indeed to contemplate,—a something for the School Board to ponder over in their efforts to devise a system of education for those who now cannot or will not get it.

The special object of the coming educational scheme is, as everybody now knows, to compel everybody to be educated. No ragged boy in the streets is from henceforth, we hope, to be allowed to run without reading; and the object, the ultimate object, of this capacity to read is, of course, nothing in itself, but only a means towards an end. Indeed, may we not say it?—Mr. Gladstone would most surely, the ultimate object is, and must be, to put it into the power even of the lowest and the raggedest, to read Homer, to understand him—that is the expression he uses,—and to find a delight in him, nay, and even inspiration, and certainly art.

But here may we not pause a moment to ask ourselves whether Mr. Gladstone has not to some extent, perhaps to a very considerable extent, misread his favourite book? In no one part of it does he seem to have got at the idea that the details of the *Iliad* were got from actual life, the life to be found around the author of it. Mr. Grote allows this to the utmost, and it seems to us to contain the secret of the whole matter. No man certainly could write the *Iliad* at this present day in the midst of London town, however clever and learned he might be, and that from the simple fact of the whole of the state and surroundings of modern London life being so different from that of the old Greek life in the days of Homer. No man can even so much as translate the book, much less write another like it; for the multitude of translations made year after year live only to die out, and to be replaced by others. So difficult is it to live or think in another age or language, even if it be in some sort a better one,—to go out of the present into the past, and think and write from thence, to imagine oneself in it, or to be a part of it, and yet is not this the object to a very great extent of modern modes of education? Mr. Gladstone says,—"I want you University students to enter more fully into the meaning and spirit of this grand old Greek," and into the times in which he lived and worked; and we may suppose that, if there be any poor ragged son of genius who shall rise up but a little above his fellows under the new educational plan, the highest and best thing for him to do will be to read Homer, and to, as far as possible, live again with him, and in his heroic age. But the question here comes,—and it is this which has called for these few thoughts about it,—what was it if Homer's day which rendered the actual life and surroundings of it so far worthy of record and artistic thought?—what was it that made it worth the trouble of so much and such earnest and learned study on the part of those who, in

* "The Mouldings of the Six Periods of British Architecture, from the Conquest to the Reformation." By Edmund Sharpe, M.A., F.R.I.B.A. No. 1. Sixty Plates. London: E. & F. N. Spon. Birmingham: S. Birbeck. 1871.

is enlightened time, have devoted so many ears to the understanding of it? In short, can we copy those superlative old Greeks in any way? Can the Metropolitan School Board get anything, not out of Homer, but out of the old Greek life, to go by, and to compel the Arabs of London, on a level with the Greek who could neither read nor write, to imitate, and learn, and flow? If they can do this, and it be worth the doing, then will these ragged and untutored children be in a position not a little singular; might they not, in such a changed state, even inspire a Homer? for it was of such that Homer wrote. Mr. Gladstone gives a long account of the old Greek games, and shows, and costume, and modes of life and building, and of the manners of the time, and calls it all "old-world ways," and seems to more than half regret that has all of it passed away. But is there no portion of it that may be most usefully revived and imitated? for, after all, it is not to be forgotten that human nature is pretty much the same as it ever was, especially among the lower classes of the people. If right, perhaps, be an awkward thing for our time minister to meet and to shake hands with the old Greek poet, and to enter into friendly chat with him, even on the subject of his own poem, which both would know so well. Homer would doubtless talk a little strangely, at a modern street *gamin* meeting a Greek boy would find no difficulty; Nature would bring them together, and the purposes of life would be the same to be one and the same. Play is play all over the world, and play with the ancient Greeks as art in action, living fine art, not yet drawn on canvas or wall surfaces, nor hewn out of marble, but living and in action,—art in its origin and as founded on nature.—What did the Greek do with this part of his life's education, if education it may be called; or, if not education, his life's work? Why, it covered the old temples with sculptured art of the very best order; it painted his houses, and made on the most insignificant articles of domestic use,—his pots, and pans, and water-jars,—things of art and of beauty, not to be stored up in museums and carefully looked up in glass cases, but to be put to every-day and common use. Living all day art and fine art round him, and constantly moving activity, and knowing little of anything of foreign influences, he could do no more than copy and use the living fine art round him. It was worth the copying and perusing, as we all know as well; for our museums and collections are filled with it, and our schools go by it, and the art professors teach by it, and without it it would be very difficult to say where we should be, or what we could or could do. What would become of the Royal Academy without the Antique? But the great Antique came from games and shows! It is, therefore, that leads us to the thought how much in the way of a higher and a purer is a more natural art the London School Board might perhaps imitate by the taking a hint from Homer and his Greeks, and by trying to account not Homer's writings merely, what he said, but what he knew and recorded of the times and ways in which he lived. It is a good chance for a something a little different from the jog-trot ways of the schoolmaster and "experienced teachers." Let us have, then, The three Rs, of course,—reading, writing, and a little arithmetic,—and in addition, it is especially put forth, two hours a week,—a little enough,—for "drill," as it is termed, i. e. a series of small soldiering after the modern fashion of it; indeed, boys are put through the military drill and exercise as men, and as though they were intended to go out and fight in regimental order on a small and juvenile scale. But why should this be? What is to be accomplished by compelling everybody to the stiff and mechanical ways and gait of regular soldiers? How much better would it be to cultivate grace and ease of movement, and to draw attention to the study, never to be surpassed by any artificial study, of natural movements and actions, actions of movements in which the ancient Greeks were much delighted, and whence they got and taught out their superlative art? In short, might not a portion of every day's schooling, even among the ragged at least, be devoted to instruction in play, to teaching games,—Greek games,—as practised at the Olympic Games and the gymnasium. Sacred games these were held among the Greeks; and Mr. Gladstone links that the fine perception among the Greeks of the beauty of the human form compelled them to adopt the anthropomorphic idea of it,

and hence every great Greek game in which the beauty of form found expression was termed sacred. How could the day, then, either begin or end more profitably or better in these rough schools than by instruction in the games of the old Greeks, and by the practice of those athletic and skilled exercises which enabled the Greeks to not only work out their fine art beyond all other peoples who have anywhere been found; but it made their very lives artistic. How, then, could we possibly do better than imitate the old Greeks by a little instruction in living art to those who could appreciate it so well, and all else, indeed, that appertains to bodily strength and activity and grace; and to whom mere book work is a painful task and a wearisome occupation, and one of which they do not very readily in their circumstances see the object?

What a pity it is that we cannot see more thoroughly and clearly into the life of the old Greeks, to know exactly how they were "educated," when books were not; and then to compare such a state of things in any individual with one in the present day when books or records of things and of the doings of others are ever, thing, and all important; and without a knowledge of which no man can have any place at all in the social system. But of one thing we may be quite sure, and it is a remark worth cogitation by those who are so much interested in matters educational; it is, that whatever a book may contain of powerful description, or scientific account and explanation of a beautiful object in nature, as a star, or a flower, or a mountain, or a cloud, it cannot possibly be better than the object itself. Who would not sooner go and see the "chain of the Andes" than read all the fine descriptions in the world about them? And it is certain that the form and movements of the human figure are more impressively conveyed to the mind of a rough youth by the sight of such forms and such movements, than can be conveyed to him by all the books in the world. How much remains to be done in this way when dealing with those who do not take to learning, as it is called, and to whom books convey so little, but whose minds are all alive to the interest and beauty of natural objects, and who, after all perhaps, have a keener and a truer idea of fine form and grace and fine art than some of those who spend all their lives in reading about them?

THE "MESSIAH" AND THE ALBERT HALL.

If the question be raised, what, at the present time, is the noblest production of the powers of man, a momentary hesitation may be felt as to a reply. Of some of the master-pieces of human genius little is left but the tradition of their grandeur, the record of the profound effect which they produced upon contemporary admirers, or the shadow they have cast in the form of copies. Such, for instance, is the case with regard to the Jupiter of Elis, the Juno of Argos, and the Minerva of the Parthenon. The architecture of Greece or of Rome may be regarded by some as likely to furnish the answer to the question; and the perfect grace of the Athenian temples, or the colossal grandeur of the Colosseum, may utter from their ruins voices which have some faint echo of the music of the past. Add antiquity, of a hoary and almost unmeasured date, and the evidence of power, telling of gigantic resources, and we have some idea of the spell that hallows the Great Pyramid. Or we may think of the triumph of science when applied to the relief of human suffering,—a subject in which few names can compete with that of Jenner. The dark, celestial eyes of the Sistine Madonna may be thought to cast a reproachful glance at those who should omit the name of Raffaele from the Olympic contest of human genius. Faith in the future, rather than experience of the present, might speak of a regeneration of mankind ensuing on the performance of all drudging labour by the goblin first enchained by Watt. The solemn tones of Homer, rolling in all the grandeur of remote antiquity, and all the familiar charm of our own boyhood, would claim a verdict from many. But perhaps neither any of these great names, nor any other of the heroes and giants of human genius, has produced so stirring, so enduring, and so exalting a work as the "Messiah" of Handel. Borrowing the words, with an appropriate selection that in itself is almost prophetic, from the sublimest passages of the inspired Hebrew poetry, the master has clothed them in a pathos and glory of sound that holds the listener under the power of a mighty

enchantment. The work is undying, for each adequate performance is the term of a new life. It appeals to almost any number of auditors, at the same moment, with a power that becomes greater in proportion to the increase of their number. Unlike some other masterworks of art, it demands no previous education to enable the auditor to realise its beauty. While it speaks to the musician in a language he only can understand, it has a voice for every ear, and a message to every heart. Not only does it charm and entrance, but it stirs and elevates, the soul. The effect of the performance is that of a solemn religious service, in which nothing occurs to jar upon any shade of intelligent opinion; and the auditors go forth, with minds moved and enkindled, full of sense of the beautiful here, and of hope of the more perfect hereafter.

Now to bring within the reach of the multitude, and that both in a physical and an economical sense, this glorious music; to open a hall so vast that it can contain ten thousand auditors for the performance of the "Messiah" and other oratorios, admitting visitors at prices grading down to the low price of a single shilling; is a work of which any country may be proud. This is what was done at the Royal Albert Hall on the 22nd ult. The same week witnessed the rendering of the same oratorio, at the Crystal Palace, by an orchestra almost four times as numerous as that at Kensington. Yet the latter did not suffer by the comparison. The acoustic properties of the Albert Hall, now that the *velarium* is extended so as to obviate reverberation from the glass, were such as to invest the performance with a remarkable charm. Through the vast and fairly-filled building, on that Thursday night, the voices of the solo performers floated with a limpid purity of tone so distinct that not a note was lost. In the earliest airs, the singers, especially the soprano and the bass, appeared somewhat oppressed by the sense of the unprecedented magnitude of the space which their notes had to traverse. To the effort made in consequence of this sense of difficulty may be attributed the somewhat hard and shrill, though wonderfully clear, pitch of "And lo the angel." But as the performance advanced, and the singers became aware, whether by their own sensations or by the freely-expressed applause of the hearers, that undue effort was uncalled for, the cessation of any strain on the vocal powers was evinced by the warbling sweetness of the notes. In "He was despised," Miss Palmer sank almost to a whisper, without failing to make that whisper as distinct as it was musical. The chorus, "For unto us," was *encored*; most deservedly, as regards the performers; but *encores* are a species of barbarism that sadly interfere with time and order, and ought never to be permitted when the convenience of so many persons depends on punctuality. On this score the only complaints are to be made. The conductor was late in commencement, and was too philosophically indifferent to the plainly-expressed wishes of the audience as to the opening of the second part.

It is evident that much has to be done in order to provide adequate railway accommodation. At a little after eleven, the scene at the stations of the Metropolitan Railway amounted to a perfect scramble. What it was later it is easier to imagine than to describe. The trains become more infrequent late in the day, so that when most accommodation is required, least is forthcoming. Then the pilgrimage from the station to the Hall, through the pelting, pitiless storm of the 22nd inst., involved with the majority either a fight for a seat in the omnibus, the expense of a cab, wet feet, or a combination of these three sources of discomfort. Underground, or at least under-roof, communication is indispensable. The large gathering that took place under such forbidding circumstances is an encouragement to the railway company no less than to the proprietors of the Albert Hall. A liberal expenditure will be amply rewarded. Pending the construction of the subway, a special service of trains should be organised on great nights at the Museum and Hall.

This necessary reform once effected, it is hard to limit the amount of public enjoyment, and public benefit, that may be derived from the Albert Hall. The concerts at the Crystal Palace have attained a high and deserved name. In spite of the disadvantages of a building originally as ill designed for acoustic purposes as it is well possible to imagine, these fine performances have attracted a regular musical colony to settle in the neighbourhood of

Sydenham. When the advantages of the Albert Hall are fully known, all available spaces will doubtless be regularly filled. The boon to the great public of admitting some 2,000 auditors at the low price of a shilling, is immense. As an educational element, such a privilege is of the greatest value. It places within the grasp of those who most need the solace of exquisite music that for which the more wealthy do not grudge the payment of more than twenty times the sum. Such an influence will work like leaven among the masses. To the lecture-hall, the school-room, the church, all honour, each in its place. But it is certain that attendance on these centres of culture is rarely, in the first instance, spontaneous. Noble music, on the other hand, not only has its own power of culture, but adds that of attraction. Provide the seats, place them, as now, within the reach of the many, and they will fill of their own accord. The oratorios at the Albert Hall form a new and most attractive addition to the institutions of the metropolis.

AN INQUIRY INTO THE CAUSE OF EPIDEMICS.

It is common with many other towns, Leicester is subjected to periodical outbreaks of disease of a zymotic type, and it has been observed that diarrhoeal epidemics occur yearly, and at much about the same periods within certain limits. Generally, however, these attacks are preceded by or accompanied with other diseases of the same order,—such as small-pox, measles, or scarlatina. And especially during last summer and autumn the inhabitants suffered severely from a double attack of diarrhoea and scarlatina.

At the period of greatest severity, it was stated in the local papers that as many as one thousand cases of scarlatina were at that time under treatment. Be this, however, as it may, the Registrar-General shows in his return that this combined epidemic swept off nearly 500 of the inhabitants during its continuance of from four to five months; and it is remarked that these deaths were chiefly confined to the infantile population. Believing that an inquiry into the probable causes of these annual attacks, or, however, the causes tending to render the people more susceptible to the influence of disease, would, if properly applied, result in advantage, not alone to Leicester, but likewise to other towns somewhat similarly situated, Mr. Weaver, C.E., has carefully investigated the subject, and has just now published the result of his inquiries, the pith of which he desires to have known.* It is Mr. Weaver, therefore, who here speaks.

For the yearly epidemics referred to, various causes have been assigned, none of which, however, appear to us satisfactory. For instance, in respect to zymotic complaints generally, the late Medical Officer of Health of Leicester, in his annual report for 1865, states:—

"A plentiful supply of pure water is one of the sanitary measures most required in the prevention of cholera, as well as in all other zymotic diseases; and the attention of our leading medical authorities, particularly in the metropolis, has been directed to this subject; and it is proved by them that, according to the purity or impurity of the water has been to a great extent the amount of disease."

"In Leicester the supply of water by the Waterworks Company is both ample and pure."

We may here pause to remark that, so far as the first part of this question is concerned, we heartily agree with the reporter; but as to the second part, we are entirely at variance with him, and affirm that the alleged supply is neither ample nor pure, as will be presently shown. The present medical officer of health, in his report of 1867—an exceptionally favourable year, alluding to the few deaths from fever, states:—"Forty deaths from fever in a population of 88,500 inhabitants, speaks volumes as to the success which has attended the sewerage of the town and the attention which is always being paid to its sanitary condition; and a great deal must also be attributed to the supply of pure water supplied to many houses." After referring to the wells of the town being liable to contamination by leaky drains and privy cesspools, he proceeds:—"For it is now well understood that both typhoid fever and cholera are propagated as much from impure water contaminated by faecal matter, and containing the germs of these diseases, as from aerial emanations from these agents." The worthy doctor might also have included diarrhoea, for it is well known to be produced by impure water; in proof of which we could adduce hundreds of cases.

Leicester enjoys peculiar ideas on the causes of its annual diarrhoeal epidemics. At the time of a most severe attack, in the autumn of 1868, the registrar-general threw out a broad hint for investigation, by saying that there must exist conditions in Leicester exceptionally favourable to the diffusion of diarrhoea. In answer to this challenge, a committee of the Local Board reported that the main causes of the special diarrhoea mortality were the existence of open privy cesspits in the town, and to the fact of many dwellings being placed upon a damp subsoil; also to the use of impure water, and to domestic ignorance and neglect. With this resolution the responsible officer did not entirely agree; and believed that summer diarrhoea did not arise from zymotic causes. On the contrary, he believed that simple heat is the cause of summer diarrhoea in this country, and in the strong and robust it yields easily to treatment and diet, and that in the children it runs a different and a longer course, and the weak succumb.

In this same report, "It is not denied for a moment when diarrhoea prevails extensively among adults and persons of mature age, as well as children, that it probably does arise in many instances from sanitary defects; but that is not the case in Leicester." And, pray, why not the case in Leicester? Whence this immunity to a specific cause that, it is admitted, may exist elsewhere, and yet not here?

There has been more than enough of fencing the question on the part of the authorities of Leicester; and it is high time for the people to grapple with the cause of these yearly epidemics that affect the whole population, and sweep off hundreds of its infants to very premature graves. A paltry saving of a couple of thousand pounds to the borough rates is no palliation for the suffering and sorrow developed in thousands of homes. Those who are responsible for the health and government of this town have a terrible responsibility resting upon them in respect of these outbreaks, and for their lapses in not stamping out, or at least ameliorating, the conditions essential for their prevalence.

Nay, it is perhaps criminal as concerns the suffering and unnecessary deaths of the people under their government, and uncommercial as regards the pecuniary aspect; for where can be the gain in a yearly moiety of surplus profits from the Waterworks Company, amounting to about 2,000*l.*, when there is a direct money loss to the community at large of at least ten times this sum, from the increased funeral and medicinal expenses.

Long consideration and patient research into the subject of this pamphlet prove that the yearly attacks are due to causes that will be presently mentioned, and that such attacks are preventable. When having pointed out the same, it will remain for the people of Leicester, and independently, to continue more minutely and follow up the investigations here broadly conducted by us.

During the annual diarrhoeal attack of 1869, in one week there were thirty-one deaths from this complaint; and it is observed that all were under medical treatment, excepting two attended by a medical botanist. Out of these thirty-one cases, twenty-four of the houses were supplied with water from the waterworks tap, and the remaining seven cases were supplied from wells. It is estimated that about one-third of the population are supplied from surface wells; the water of a great many is of doubtful quality, whilst some are notoriously bad. Yet, notwithstanding this, it is remarkable there were comparatively so few deaths amongst the consumers of well-waters. This is but one instance out of many. Observation shows that the prevalence of diseases vary as the rainfall; some, like diarrhoea, abating with heavy rains, whilst fevers become intensified. Repeated chemical examination of the public water supply reveals the fact of its varying quality.

These and other facts being noted, it became necessary to look a little more closely into the antecedents of the water that is supplied to the people of Leicester, and to determine the grounds of varying quality, and the source of organic and sewage pollution.

The reservoir, with an area of about 80 acres, and gathering grounds comprising some 2,700 acres of cultivated country, and over which are spread numerous villages, is situated at Thornton, about ten miles to the west of Leicester.

Two small streams, known as the Markfield and Thornton brooks, supply the reservoir, these conveying in time of flood considerable volumes of water; at other times the water is of meagre quantity. The village of Thornton lies abreast of the reservoir, on the apex of a ridge, at an elevation of 100 ft. or so above it, in a very insanitary condition, abounding with cesspools, stagnant sewage, defective drains, fever and diarrhoea, together with a polluted water-supply derived from the village of Bagworth, a mile away. The greater portion of this drainage descends the hill-side towards the reservoir at the base, conveyed in pipes terminating in open ditches, or upon the green sward, whence, beyond doubt, it mingles with the waters of the reservoir. A few yards from the reservoir, on the rising slope of the hill, is the church and graveyard of Thornton, where are many hundreds of interments; no doubt its drainage, following the law of gravitation, descends to the reservoir beneath, as likewise do the contents of the foul open sewer running by the east wall of the churchyard.

These little streams, and their smaller feeders, run at the bases of several other villages, such as Stanton-under-Bardon, Shaw Lane, and the considerable villages of Markfield (whose population numbers more than 1,000 persons in this latter village alone); presumably much of the sewage and graveyard drainage of these insanitary places descends into the brooks. Nay, no doubt exists, for we have direct evidence in some instances that the sources of some of the feeders are the public sewers of these elevated villages; notably in the case of Markfield, as we bear witness. Likewise on the banks of the brooks the often loathsome drainage of farmyards and cottages, with their attendant necessities, runs directly into the streams.

The various forms of zymotic disease in these villages are typhus, enteric, and scarlatina, whilst diarrhoea and low kinds of fever appear to be permanent residents. The general sanitary arrangements are not good; the water derived from surface wells sunk in their midst, is, at least in some instances, considerably charged with sewage.

We entered a house at Stanton, and inquired for the mother of the family, and were informed that she died some time ago; further inquiry elicited her death was due to typhoid fever. On looking at some of the well-water in a tumble glass it was perceived to be charged with sewage. No chemical analysis was necessary: the evidence was clear. There were disintegrated animal and vegetable remains: its colour was milky from soap-suds: the taste and smell were conclusive. It would be no very bold statement to predict that this family cannot long imbibe this filth without incurring the same penalty suffered by the mother. Were any one so far forgetful of himself as to administer a dose of strychnine to this family, and the fact became known (being transgression of the law of this land), considerable agitation would doubtless be created throughout the country; every paper would chronicle the details, and the culprit in due course suffer for his misdeeds. Now the result to the family we conceive to be much about the same in either case, whether strychnine or sewage be taken; it is true that the first may act more sharply, although it is equally correct that the effects of the second are at times quick as rapid.

Ask at any village in England if they have good water, and you will be invariably answered, "There is none better to be found, sir." But at any doubts you may have, when you are in with a mass of incredulity. Let a hamlet lose score or two of its people from typhoid enteric, and see with what stoical indifference the remainder continue to drink of the water that propagated the disease. We entered a house, a little while ago, wherein a case of typhus was reported,—it was in one of the villages previously referred to. A cursor observation showed no sanitary defects, but the water presented to the eye, to the smell, or taste only too sure evidence of its sewage character. That the husband had imbibed his fever from the water we could not doubt, and wondered to how many of his neighbours or others the disease would be conveyed, and the distance and time that would be involved in the process. We saw in our mind's eye that the excretal emanations from the afflicted person thrown to the rear of the cottage, gradually descending into the ground, assisted downward by the daily dews and occasional rains until it reached the water-bearing stratum beneath but

* "A Sanitary Enquiry into the Probable Causes of Yearly Epidemics in England, as observed at Leicester," By Richard Weaver, C.E., Sanitary Engineer and Analyst, London: Simpkin & Marshall.

wards, from which the village wells are supplied. And this is another of the places from which Leicester derives a portion of its water-supply.

The public water-supply of Leicester being of late years inadequate to the requirements of the people, another reservoir has just been constructed near to Bradgate Park, about six miles from the town. Strange as it may appear, nevertheless the fact remains that no present provision is made for a pure and wholesome water; there is analogous origin, quality, and impurity in the drainage of villages, as in the older reservoir.

The Royal Sanitary Commissioners, in their report recently issued, state in reference to water-supply and disease:—"Were an extensive analysis of water for domestic use to take place, there is no doubt that many sources now but little suspected would prove to be poisonous or wholesome, and the prevalence of disease in many districts would be fully accounted for; for in such cases, and for other purposes it seems eminently desirable." We concur heartily in this suggestion, having known very many instances where disease has been clearly traced to the unsuspected use of impure water.

The whole of the sewerage system, both ancient and modern, being closely connected and ramifying in every direction (in the case of the former sometimes in localities where this is little suspected), it will be readily understood that the sewer gases flow to every part of the town with great facility; and it must be known that the sewers of Leicester generate a vast quantity of gas, primarily due to the defective condition of many of them and their flat gradients, whereby the flow of sewage is retarded, and considerable quantities of the suspended organic matter gradually become attached to the sides and inverts of the sewers, slowly choking them. This matter decomposing, fills the subterranean passages with gas and volatile organic bases, and be it understood that this gas flows in a direction opposite to that in which the aqueous sewage is travelling; so when the sewage descends the gas ascends. By its law excretal and other sewage matter,—at least, the volatile portion of it, and it is nearly all volatile at some period,—may be conveniently transmitted to any portion of a town, no matter how distant from the place of original conveyance to the sewers, nor whether at a considerable elevation or lying in a valley; because the gas will ascend to the elevated positions, and the fluid descend into the hollows. This being understood, it follows that great necessity is implied for due ventilation of these sewers; that the gaseous products of decomposition may be conveyed away to the external air as rapidly as possible; and to render them yet more perfect there should even be provision for stirring in fresh air at the lower positions.

In the absence of ventilation, zymotic disease and epidemics are spread through a town, because the complaint once introduced, the natural vacuations of the afflicted pass into the sewers, conveying great numbers of germs, and as the mode in which the aqueous and gaseous sewage is distributed has been already discussed, it will be at once perceived that the seeds and germs of epidemics are disseminated in a similar manner. Having reasoned thus far, it is necessary to inquire into the provisions made for effective ventilation of the Leicester sewers. In the aggregate there are a great number of ventilators promiscuously scattered over the town; most efficient many of them undoubtedly are. We can, indeed, conceive nothing better for the intended purpose than the tall chimneys of manufactories; these perform excellent duty in the particular sewers to which they are attached, and those manufacturers and others granting the use of their stacks for ventilation are conferring a much greater benefit upon the locality than so simple an action would appear to convey. On the other hand, there are whole districts without any ventilation whatever, other than that finding its vent into the houses of the people, and similar extraneous and improper modes. It would be tedious to mention localities; still it is notorious there are districts in Leicester wherein the recent epidemic of scarlatina was most persistent, and families were swept off. The causes we have already treated upon, and need not repeat; it will suffice when we say that these afflictions were due to impure water, and impure air from the plentiful escape of deleterious sewage gas into the houses, and of this we have no earthly doubt. But who is to blame? For to attribute these deaths to the act of God we conceive to be

about as wicked and improper as to attribute to Him the doings of the drunkard or thief.

The wholesale daily discharge of large volumes of sewage into a slow and sluggish stream necessarily results in ruining the river, of which any one whose olfactory organs are sufficiently fortified may be easily convinced by walking for a mile or two along its course, particularly a month or two hence. The effect of this wholesale poisoning is very serious upon the health of those who unfortunately dwell near to the river, and in the numerous villages and hamlets adjacent. No doubt this relic of barbarism has nearly run its final course, and we need not dwell on it. We can only add, that the Leicester process for treating sewage is the worst in every respect, whether of cost or results, of a considerable number investigated by us. We clearly admit the existence of other causes of epidemics; such as dwellings erected upon made ground; this ground containing more or less garbage thrown in with the soil and *debris* to fill up the hollows. Another cause must be mentioned, not confined to any particular class or division of the people, and therefore more general in its action; it is one to which little importance is usually attached, we think erroneously. It is the adulteration of food, both liquid and solid, particularly the former, which practice is somewhat extensive. Of course, epidemics are not caused by sophisticated food; but the more delicate children and weaker adults are thereby rendered more susceptible to their influence, and likewise the tone of the general health of the population is correspondingly lowered. Indeed, that isolated cases of zymotic attacks do occur through the agency of adulteration there can be no doubt; we have noted several such instances. But, after all, this turns upon the primary question discussed in this paper; what has been described is but adulteration upon a grand scale. *Impure water, impure air, and impure food* are very synonymous terms, and often,—too often, indeed,—arise out of each other. The whole may be well included in one word, and that is "adulteration." Mr. Weaver has done a good work.

THE NEW LAW COURTS.

As not one brick has yet been laid of the new Law Courts, it may not, perhaps, be even now too late to reiterate a protest against the great central vaulted hall which is part of the design, and which if executed will, I believe, be the greatest architectural mistake perpetrated in our days.

In the first place, it is not Gothic in any true sense of the term. No Gothic hall, on anything like the same scale, and applied to civil purposes, was ever vaulted during the Middle Ages in any part of Europe. So far, at least, as my knowledge extends, this is absolutely true. Churches were vaulted, no doubt, but they always stood free, and the thickness of wall and the depth of buttress necessary to sustain the vault were in no sense inconvenient, while they improved most materially the architectural effect. The case, however, is widely different when the vaulted apartment is stuck down in the centre of a number of offices where every inch of space is valuable, and where the building cannot be seen from the outside. Had an architect been employed to design these courts in the thirteenth century, he would most probably have occupied the central space by an open court—perhaps he might have provided a cloister round it;—but our hardy forefathers would hardly have asked for even this. Could we call up a real Gothic architect from his grave, he certainly would have roofed this court over, out of respect to the more delicate constitutions and effeminate habits of the present day; but as certainly he would have done it so as to obstruct the light and the free circulation of air to the smallest possible extent. An imperforate, gloomy, solid vault is the very last expedient that could have occurred to his mind.

A second objection is the intolerable amount of inconvenience this vault entails on other parts of the building. Where you have vaults of this extent, you must have buttresses; and where buttresses, unless the building stands free, you must have small courts between them. In the plans adopted and published, 1868 and 1869, the great hall was surrounded by twenty-six small courts, 10 ft. wide by 20 ft. in length and 40 ft. deep. Into these the consultation-rooms, refreshment-rooms, and other offices looked, with a blank wall in front of them towering some 60 ft. higher. In the plans now adopted, but to which the

public have not access, it is understood, the worst features of these courts have been "ameliorated." But the fact cannot be got over, that a great building like this, in the centre of the City of London, honeycombed with small courts, must be inconvenient, expensive, and most unwholesome. Had the building been erected as proposed in 1868, I believe the Sanitary Commissioners would have ordered the hall to be pulled down again at whatever cost; and if the vault is to remain, I do not see how the present one can be much better. But so few people can realise what is only shown in a plan, and of these so few will take the trouble to do so, that no one seems to be aware of what is about to be perpetrated.

A third objection is the expense. When it was my business to do so, I took considerable pains to try and realise what additional expense was entailed by this vault. It is very difficult to do so, and could not be done accurately without taking the quantities out from a set of drawings from which the vault was omitted. But taking the expense of the vault itself, the extra thickness of the walls, the buttresses, the loss of space, the lining the walls of the twenty-six small courts with stone or tiles, and the extra incidental expenses, I calculated that the extra expenses entailed by this inconvenient anachronism was something between 50,000*l.* and 100,000*l.*

I got a glance the other day at the present design for the Strand front of the new buildings. It contains a good deal of beautiful detail, as was sure to be the case from a master of Gothic detail such as Mr. Street undoubtedly is. But I have no hesitation in saying it is the meanest design for the principal front of so important and pretentious a building which has been proposed in our day. The excuse for this, no doubt, is that the expense of the whole has been so cut down that there are no funds available for a larger or more imposing façade. Exactly so; but if Mr. Street insists on wasting 50,000*l.* to 100,000*l.* on a useless internal vault, he has no reason to complain that he has not funds enough to dignify his external fronts.

The truth of the matter is, nobody wants this vault except Mr. Street. The public do not want it, as the hall is not to be a thoroughfare, and few consequently will see it, and the few who are there on business will have something else to think of. On the other hand, every one will see the Strand front, and it will be either an ornament or a disfigurement to our metropolis. The lawyers do not want the vault. They want light and air above all things. They do not want to be stifled in dark, close consultation-rooms, nor to breathe the pestilential air of a deep, dank well-hole when taking a slight refreshment. The Treasury do not want it, for they do not want to spend more money than they can help. But notwithstanding all this, it probably will be executed. Mr. Street is not only a man of great ability, but he has a very strong will of his own, and unless some one as clever and as strong as himself, and in Parliament or some position to command attention, will take it up, he will certainly force his crochets on his unwilling clients in spite of their wishes or interests. When it is too late to remedy it, every one will, no doubt, be clever enough to discover the enormous blunder that has been committed. But this will be but a very small consolation to ourselves, and still less to all future generations of lawyers, who will live to mourn over the ignorance and apathy of the men of the nineteenth century who allowed such an absurdity to be perpetrated. JAS. FERGOUSON.

THE CITY TERMINUS OF THE METROPOLITAN DISTRICT RAILWAY.

THIS, the most important station of the District Company, is to be formally opened to-day (July 1st), and a large number of distinguished persons have, we understand, accepted invitations to be present at the ceremony. The extension will be opened for public traffic on Monday next. Other works of importance have also been so far completed as to admit of their being opened for business from to-day, when the Metropolitan district commences to run their own locomotives and carriages, under such arrangements with the Metropolitan Company as will obviate any inconvenience to passengers using the lines. The works to be opened to-day are the extension of the line from Blackfriars to the Mansion House Station, concerning which we gave some details in last week's *Builder*, and upon

which we need not here dilate. The other works to be opened include the enlarged station at South Kensington, at which the public will have hereafter nearly three times the space and accommodation that they have hitherto enjoyed. This has been an arduous undertaking from the massive size and the extreme hardness of the station wall, of brickwork and concrete, that had to be removed. The obdurate mass was disintegrated by blasting and the use of steel chisels. With wise forethought, Mr. Fowler, C.E., engineer-in-chief of the line, had originally designed this station with a view to its future enlargement, which has greatly facilitated operations and kept down the cost of the additional provision. Another important work has been pushed forward to completion in time for opening to-day, in the line to connect the Kensington High-street station with the station at Addison-road, and to form a junction in that locality with the West London line.

It may be interesting, in anticipation of the ceremonial of to-day, to note the dates and stages by which this unique system of railway communication has been developed. The germs of the Metropolitan and Metropolitan District system are to be found in a project which came into existence as the North Metropolitan Company, which obtained an Act in 1853. In 1854 the Metropolitan Company obtained their first Act: since that year the Acts that have been obtained by the Metropolitan Company, with its associated lines, and by the Metropolitan District Company, are to be numbered by dozens, under which the following communications, constituting so much of the "inner circle" as has been constructed up to this time, have, with their outer outskirts, been made and opened. The first portion of the Metropolitan line, from Farringdon-road to the Great Western Station, about four miles in length, was opened on the 10th of January, 1863. The Hammersmith and City line, of a little over three miles, followed in 1864. Then came the eastern extension from Farringdon-road to Moorgate-street, about one mile, opened in 1865. From this date an interval of three years elapsed without further additions, but in 1868 large additions were made to the system. These include the opening of the Metropolitan and St. John's Wood, the western extension to Gloucester-road, Brompton, each of about two miles and a half; and, in the same year, the first section opened of the Metropolitan District line, from Brompton to Westminster Bridge, also about two miles and a half in length. This important extension was opened on the day before Christmas, 1869. The south junction, between the District and West London lines, about two miles and three-quarters in length, was opened in the following year; the extension, of about a mile, carried under the Victoria Embankment between Westminster and Blackfriars Bridges, was opened in May, 1870; and now the final extension is to be opened, from which an increase in traffic may be expected out of all proportion to its length. The additions to the receipts of the company from the opening of the Mansion House Station will, we have no doubt, be geometrical rather than arithmetical, in that it will as a point of departure command a large traffic, and will also, as a convenient and attractive destination, greatly increase the takings at all the stations on the route.

THE WORKING MEN'S COLLEGE.

From the tenth report of the College in Great Ormond-street, it appears that of the proposed new buildings, the six class-rooms are ready. These rooms are built on the ground in rear of the College, two on the east side, and two on the west, each room measuring in the clear 30 ft. by 23 ft., including corridor so arranged as to be a portion of the room: the height is 12 ft., and they are lighted by a 12-ft. span skylight.

The north-west corner, being an oval-shaped room in plan, measures 37 ft. by 30 ft., with three large recesses and small dressing-room attached: the height is 12 ft., and the room is lighted by a Gothic-shaped light, oval in plan, rising to the height of 7 ft. from all, and measuring 23 ft. 6 in. by 19 ft. over, supported by eight Gothic ribs, 9 ft. high, standing in Bath stone corbels left for carving. The north-east corner is filled in with a quadrant-shaped room, measuring 35 ft. by 22 ft., including corridor as before, with one large recess and three smaller; is 12 ft. high, and lighted by a very high-pitched glass roof.

The class-rooms are planned so as to leave a space in the centre 69 ft. by 29 ft., with circular end for museum, and large room over, measuring 75 ft. by 30 ft., and 85 ft. high, supported on inner walls of class-rooms; with 6-ft. gallery round museum and over corridor.

The new class-rooms have cost about 2,400l. irrespective of gas or fittings, and are charged with debentures to the amount of 600l. in consequence of the subscriptions falling short by that amount.

The amount required to finish the museum is between 500l. and 600l. The committee propose to complete this portion of the design as soon as the necessary funds are either in hand or are promised. A further sum of 1,500l. will be required to erect the large hall and complete the building.

The number of new students who entered the College in the October term of last year was 144. Nearly two-thirds of the students are engaged in handicraft. In the Adult School the clerks number one in every ten students. 5,411 members have joined the College since its opening in October, 1854. There were 542 members attending classes during the past year.

The College, it is believed, will be self-supporting when freed from its temporary in-conveniences. Help should be given.

TRAMWAYS FOR LONDON.

The promoters of Tramway Bills, until recently, had a good time in the current session of Parliament, many large and important concessions having been granted to Tramway Companies, by the House of Commons especially. Amongst these are the Paddington, St. John's-wood, and Holborn street lines, of seven miles; the West London of seven miles; the London street (Kensington, &c.), nine miles; London street Extensions, three other Bills, twenty-three miles; with Bills of the Metropolitan, the North Metropolitan, the Pimlico, Peckham, and Greenwich, and other companies, to whom powers have been given, by the Commons, to construct nearly 130 miles of tramway in London and its suburbs. In addition to these lines there are about twelve miles of tramways already open, and more than thirty miles to add to these that are authorised and partly constructed. When all the schemes already authorised have been carried into effect, users of the tramway cars, as well as users otherwise of the streets of London, will have very full means of judging of the value of the tramway system, and of its compatibility with other kinds of street traffic. Although so many important Bills have passed the Commons, everything is not quite *couleur de rose* with the promoters, — there are flies in the ointment. It may not be much of a blow or discouragement that the Metropolitan Street Company are not to be permitted to take up or let down passengers on Westminster Bridge, or that they must turn round to the Embankment short of the Clock Tower, and be debarred from passing New Palace Yard, or crossing the approaches to the House. It is true that it detracts from the prospects of traffic that there must be a break in the tramway communication between the Sanctuary and Bridge-street, Westminster, and that the cars must not emerge from the end of Whitehall-place into the thoroughfare opposite the Admiralty. These, however, are not the chief causes of disquietude, but rather the disposition on the part of the Legislature to subject the tramway companies to the liability of having their powers and privileges cut off summarily, by the lifting of the tramways, on certain representations and findings. Mr. Dent's committee passed the London Street Tramway (Extension, &c.) Bill, which includes, among many sections, one of above six miles in length from Shepherd's Bush by Uxbridge-road, Oxford-street, and Holborn, to Newgate-street. The committee, however, seemed to have a misgiving in sanctioning this project, and proposed a clause to the effect that the tramway should be removed at once, if adequately proved to be a nuisance. On the remonstrance of the promoters, we believe, the clause was withdrawn, on the understanding that they would give a clause in the Lords. The Metropolitan Street Company got their Westminster, &c., Bill in the Commons loaded with the condition that the First Commissioner of Works may order the removal of the tramway on the expiration of forty days after notice of removal has been laid on the table of the House.

The impression is rightly gaining ground that

Parliament is going too fast and too far in sanctioning tramways so freely and extensively as the Houses are doing. There can be little doubt that a reaction will set in, not against the tramways, but against the manner in which they are introduced, held, and conducted. The principles recommended by the vestry of St. George, Hanover-square, are certain to grow in public favour, namely, that concerning tramways the following things are desirable:—1. Their construction upon one broad, uniform, and comprehensive design, adapted to the wants of the whole metropolis. 2. Their correspondence in working. 3. The control of the streets and street traffic in the hands of the public authorities. 4. The whole pecuniary profit to the ratepayers. The tramways are in great favour at present; the reaction will come when the streets have to be taken up, in two or three years, for the renewal of the wooden sleepers, which are of very poor quality, and not cross-sited or otherwise treated for preservation, upon which the rails are laid. A weak point in the tramways, as hitherto constructed, is that they are much farther removed than even the railways from being worthy of the designation "permanent way." In a few years there will be a necessity for constant repairs, that will greatly imperil the success of the tramway system, and this point, above all others, demands the attention of tramway promoters, if they desire to escape an outcry in the future, in which users of the public thoroughfares, "frontagers," and the local authorities will be of one accord.

LONDON STREET AND RAILWAY IMPROVEMENTS.

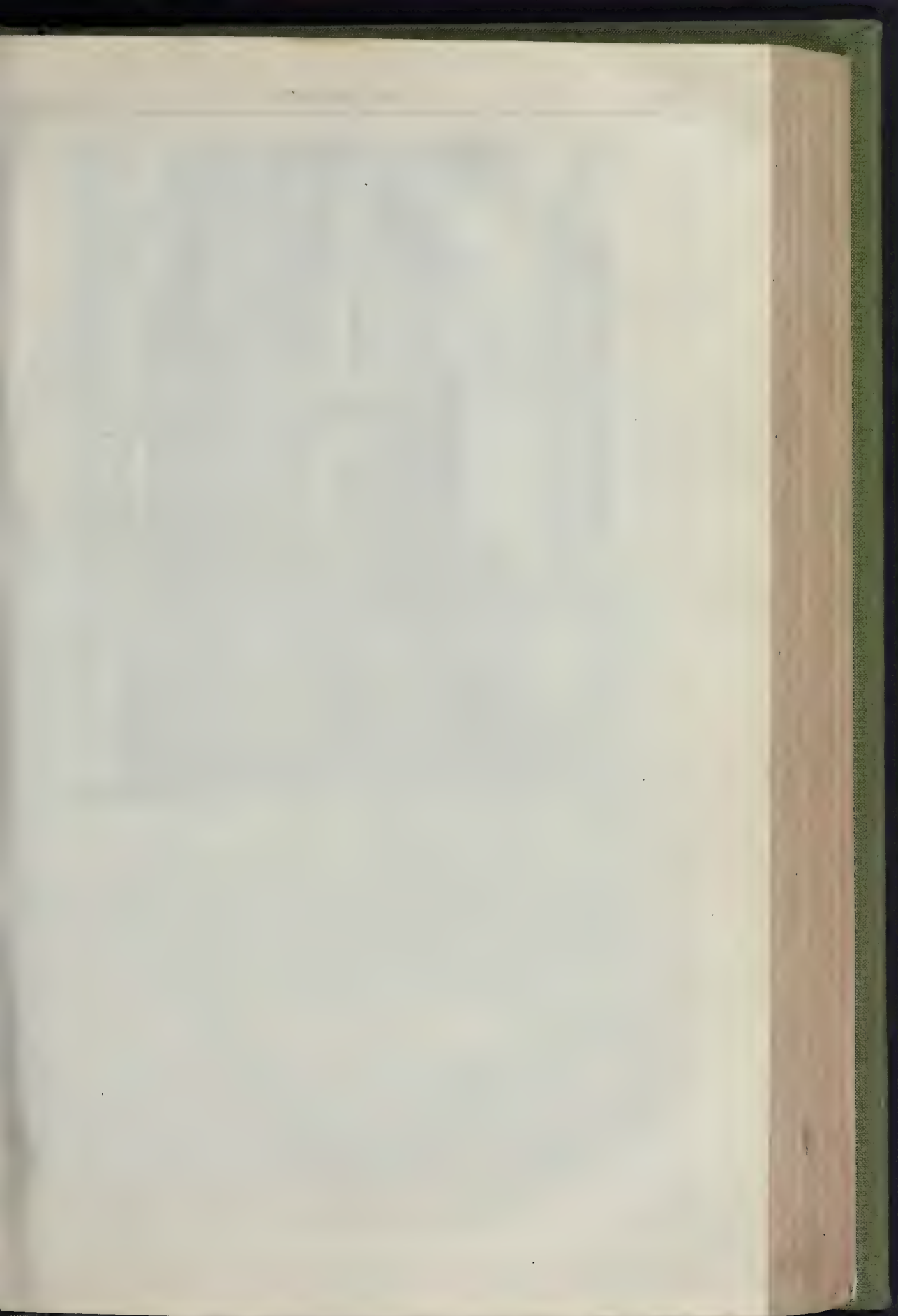
In the House of Commons, on the 22nd ult., Mr. Baikes asked the hon. member for Bath whether the proposal for the expenditure of 200,000l. on the new street from Tottenham-court-road to St. Martin's-place, now intended to be made under the provisions of a Bill at present before Parliament, had been entertained by the Metropolitan Board of Works; whether eminent contractors had not expressed their willingness to make this new street free of cost; and whether the Metropolitan Board of Works seriously contemplated so large an outlay of money to be obtained from the ratepayers of London under these circumstances.

Sir W. Tite said that the proposal had been entertained by the Metropolitan Board of Works. They had never had an offer to make the street for nothing. In 1864 an Act passed for joining the southern and northern railways each with the other. Four years elapsed and nothing came of it. The Metropolitan Board were then asked to take the matter up by the persons concerned; and about the same time a proposal was made to them to construct a new railway something on the old plan. In 1870 a further project arose, and an application was made to the Metropolitan Board by a Mr. George Elliott, who had something to do with the former railways, and who said that he could bring forward contractors who would take the whole matter in hand. The Board paid every attention to the application of Mr. Elliott, who became bankrupt in the meantime; and the names he had given were inquired into, the result being that the Board were advised to have nothing to do with them. Other parties who had promoted the Bill again applied to the Board, who had since ascertained that the street would cost half a million of money. When, therefore, the promoters of the railways, which would work under the street, offered to complete this important project for 200,000l., the Board accepted the offer.

Mr. Peek asked the President of the Board of Trade whether his attention had been called to the leaky state of many of the railway bridges spanning the public thoroughfares of the metropolis, and the consequent inconvenience to people passing under them; and, if so, whether he proposed adopting any measures to compel companies to keep their lines in proper order.

Mr. C. Forster said the Board of Trade had no authority to attend to the leaky state of railway bridges.

Closed Churchyards as Recreation Grounds.—The parish churchyard at Mile-end Old Town is opened as a public recreation ground, under certain regulations for the preservation of order.



IPHOVEN CHURCH, NEAR NÜREMBERG.—*External Staircase.*

IPHOVEN CHURCH, NEAR NÜREMBERG.

On the high road from Würzburg to Nuremberg, about fifteen miles from the former place, stands the little town of Iphoven. It is prettily situated upon a small stream, which is one of the tributaries of the Main, and is in a district quite unknown to the English tourist; yet it offers many attractions to the painter or architect, as it possesses many interesting old buildings, and the wall and gates are quite perfect; in fact, the place seems to have been little altered since the sixteenth century.

Iphoven contains three churches, one of which, the Pfarr (or parish) church, is a building of considerable size and architectural merit. It consists of a nave and aisles under one roof (called in German a "hallenbau"), vaulted, and supported by five very tall and slender columns on either side. There is a long chancel, with a three-sided apse and a lofty tower at the east end of the north aisle of the nave. The whole building seems to be of about the same date,—the close of the fourteenth century,—though some parts are perhaps works of the succeeding century. The most interesting portions of this church are two singular staircases, one of which we give an illustration. This is attached to the east side of the tower, to the lower story of which it has access. We should mention that the lower or basement story of the tower is used as a sacristy, and is prettily vaulted. What is, however, most singular, is the fact that this staircase has no outlet at the

top, and leads simply to a bagioscope, if it may be so called, pierced through a flying buttress, and looking into the chancel by a *grated* opening; but what is so peculiar is the fact that this opening does not point in the direction of the altar; nor is it possible, when looking through it, to see anything but the opposite wall of the choir. What was the original use of this singular structure is not known, nor even suggested. We will illustrate the second staircase on another occasion.

"MANSION HOUSE BUILDINGS."
LONDON.

ONE of the most important sites in the new Queen Victoria-street, and, indeed, in the City of London, is now being covered by Mr. James Wheeler, of the firm of Wheeler & Co., glovers, in the Poultry. The ground is fan-shaped, terminating in a very acute angle at the intersection of the two streets; the frontage in the Poultry is 57 ft., and in Queen Victoria-street 95 ft. The lease was purchased of the Metropolitan Board of Works by Mr. Wheeler at the sale in 1870, the rental being very large.

The building, which is now nearly roofed in, consists of fireproof sub-basement for wine-vaults, basement, ground, and four upper floors. The ground-floor is laid out for six shops, three of which are let to Mr. Felix Deroy, bootmaker; Messrs. E. & S. Watson, watchmakers; and Messrs. Mappin & Webb, silversmiths. Messrs.

Wheeler & Company will occupy one of the shops in Queen Victoria-street.

The shop-fronts have been designed, and are being carried out in keeping with the rest of the building. The whole of the upper part is so arranged that no internal divisions are necessary, and yet that each floor can be sub-divided as may be found most convenient; the outer walls, being tied in and the floors carried upon strong wrought-iron girders, with columns and stanchions to support them.

All the ironwork and fireproof flooring in the basement and elsewhere has been supplied by Messrs. Moreland & Son, of Old-street, St. Luke's. Access to the upper floors is obtained from Queen Victoria-street by means of a large private entrance, having an inner hall and handsome stone staircase.

The style of the building is Gothic, freely treated. It forms a striking contrast to the severe Classical examples which stand in its immediate proximity, viz., the Union Bank, the Mansion House, the Exchange, and the Bank of England; all of which are of bold outline, and of large proportions. As seen in our view, the angle has been treated artistically, the sky-line being broken by a circular tower and spire, which, from its position, will always be a very prominent feature.

Messrs. John & John Belcher are the architects; Messrs. Jackson & Shaw are the contractors; the clerk of the works is Mr. James Barnes; and the carving has been artistically carried out by Mr. J. W. Seale.



"MANSION-HOUSE BUILDINGS," LONDON.—MESSRS. JOHN & JOHN BELCHER, ARCHITECTS.

THE RESTORATION OF WORCESTER CATHEDRAL.*

THE REV. C. BOUTELL has put into the form of pamphlet some remarks made by him, and previously published in the *Worcester Herald*, on the subject of the proposed restoration of Worcester Cathedral. Mr. Boutell's remarks are worthy of consideration, and, indeed, there is reason to believe they have already been formally taken into consideration by the Cathedral Restoration Committee, to whom they were referred by the Dean.

The primary object of the writer appears to be to urge such a plan for fitting up the building as may render the restored cathedral available for public worship under the most advantageous conditions. In the development of this object Mr. Boutell meets the arguments of those who would dispute the worthiness of our cathedrals on the ground of their failing in present official utility, and fairly disposes of them. Worcester Cathedral is shown to possess not only sufficient but pre-eminent qualifications for providing for the accommodation of a "great cathedral congregation," and all that is asked that those qualifications should be used.

As to the restoration of the effigies, Mr. Boutell writes,—

I appeal to you, Very Reverend Sir, to have the dust dirt carefully washed away; but I pray you not to forbid even the semblance of any restoration. If a new effigy of King John be required, let a new effigy be made; but, at the same time, let the old one remain the old one.

The restoration of a statue involves very different principles and considerations from those involved in the restoration of an edifice.

BUILDINGS FOR MUSIC.—NO ECHO!

MR.—Your correspondent, "A Subscriber," whose letter appears in last week's *Builder*, contests his observations by mentioning the acoustic effect produced by the recesses in Old Westminster Bridge, which, he says, "were singular in form at the back, as also the ringing, and conveyed sound in an extraordinary manner, and formed an echo in the opposite sense. A word to the wise!" I wish in turn to turn a word with the unwise, and to take this opportunity of asserting most emphatically that a room designed for musical performances is precisely what musicians do not want. The difficulty of getting this into the heads of architects and other persons who construct or advise about concert-rooms seems almost ineradicable, and can only be accounted for on the position that most of these persons know nothing of music as an art, but are only acoustic priests. Any one who had anything that could be called musical experience or knowledge would not be but aware that, of all qualities in a music-room, a decided and perceptible echo is of the most injurious to the effect of music. In a building with a redundant echo, certain very fine effects may incidentally be obtained, such as the reverberation and prolongation of the sound of the organ in some larger cathedrals; but that is not music,—it is simply a fine effect of sound, which affects the senses just in the same way as thunder and other impressive sounds. But as "music" cannot exist in mere noise, but in an appeal to our mind feelings through the medium of a language created by the union and sequence of sounds related in pitch and duration by fixed laws, it is obvious that everything which tends to interfere with and confuse the original rhythmic harmonic proportions of such sounds must be inimical to their effect. Some persons, of course (children especially), find more pleasure in listening to an echo than in attending to music, as others like to look at an ivy-covered wall rather than at architectural detail; but to give that echo has anything to do with music because it occasionally accompanies and enforces it, is just as rational as to say that ivy is an essential element of architectural design and that it often grows over buildings.

The object, in a large concert-room, is, or should be to have such materials as will not allow up or imbibes too much of the sound enough to have it very strongly reflected is almost desirable, but to arrange roof and walls in such a manner that the reflection of the sound

shall be broken and dispersed, and not collected and localised in any one focus; which would cause to a certain portion of the audience a disagreeable and concentrated echo. For this reason, I should look on a semicircular or domical roof as one of the worst forms for a very large music-room, as it is sure to concentrate the echo, and make it disagreeably prominent at one point or another. Behind the performers let there be everything that can reflect the sound forward; and here a semicircular wall at the back may have a very good effect; but in the auditorium there should be nothing that can tend to concentrate the sound reflected from the wall on to any one point. That seems to be the common sense of the matter; not very scientifically expressed, certainly. It should be observed that the echo difficulty only applies to large halls; in smaller-sized rooms it may be left out of the question, as the echo has not space to develop itself, so as to be heard at an appreciable interval after the original sound.

Architects who are building concert-rooms would probably get more valuable hints from practical musicians than from acoustic theorists, who are not musicians, and who indulge in the wildest statements. Only last week a letter appeared in a contemporary paper, in which we were told that the materials of which a wall or roof was composed had no effect in increasing or diminishing the echo. The letter was signed C.E.B., which we must conclude stands for "Civil Engineer." It would be idle to bring examples to refute such nonsense; but it really seems as if a large number of architects and engineers either had no ears, or made no use of them.

H. H. S.

SEWERAGE OF CLEETHORPES, LINCOLNSHIRE.

THE sewerage works at this agreeable watering-place have just been completed, after between two and three years' labour by the parishioners and sewer authority. The main outfall sewer is constructed of 18-in. sanitary pipes, and has its outfall into Humberstone Beck, about a mile and a half below Cleethorpes; the other outfall sewer has its outlet into Grimsby drain, in Beacothorpe, which is a separate district. A deposit-tank is constructed in Legmare drain, at the main entrance to the outfall sewer, to cleanse the outfall. Sewer and deposit-tanks are also placed at the outfalls into Grimsby drain; there is another tank placed in Litherly-road, near the church. There have been about five miles of sewers constructed, the whole of which are ventilated. Cleethorpes is a healthy salubrious watering-place, and much frequented by sea-side visitors. It is situated about two miles south-east of Grimsby. The sewerage works have cost upwards of 3,000*l*. The old sewerage used to have its outlet on the shore in front of the Dolphin Hotel, and in the bathing-ground, which was very objectionable. The contractor for the works was Mr. Joseph Bancroft, Cleethorpes, and Mr. Alfred E. Skell, Great Grimsby, was the engineer.

THE UNCULTIVATED LAND.

SIR,—The thanks of the community at large, and of the working classes in particular, are due to you for the article in the last issue of the *Builder*, on the cultivation of the land of the United Kingdom, and I trust that you will not let the subject rest, but from time to time call attention in your influential journal to the startling and disgraceful facts therein so plainly and distinctly stated.

The fact that three years ago, in rich, scientific, learned England, with its statesmen discussing more or less the affairs of the whole world, its philanthropists and clergymen sending missionaries to the ends of the earth, its university professors and doctors studying every problem coming within range of the human intellect, with its (to use the words of Lord Carlisle) "seething and fermenting mass of degrading and brutalising vice, which threatens to engulf our teeming population,"—this vice, too, which is mainly caused through poverty,—that, with all this, one-third of the land was uncultivated, is most astounding. In the presence of this, too, the flower of the reproductive class are flying the land, we are importing food, and idle hands have not work to do.

Ask capitalists whether it would not be better for them to sink their money in the land of

England than in Egyptian, Turkish, Russian, or French bonds and securities. Let the clergyman, while bemoaning the vice and misery begotten of poverty and ignorance, ponder on the fact that one-third of the land is uncultivated. Let the judge, while deprecating the heavy calendar that lies before him, remember that one-third of the land lies uncultivated. Let the statesman, while studying how to uphold the power of England in the ranks of nations, know that many of the strong arms and warm hearts of her sons and daughters are leaving her to increase the strength of other nations, because one-third of the land lies uncultivated. Let the rich and powerful, who sneer and are surprised at the discontent and murmurings of those beneath them in the social scale, awaken to the fact that one-third of England's broad land lies uncultivated. Then, when those who can alter this state of things do their duty, we shall see the dawn of better days.

A CLERK.

"ERRONEOUS ESTIMATING."

UNDER this heading, Mr. H. R. Wagner, who tendered at the lowest amount for the works at "Buckingham Palace-road" (highest 2,183*l*, lowest 800*l*), concerning which there was much correspondence, writes now to say that the work has been completed, not merely to the satisfaction of the parties for whom it was done, but of himself; he claims, therefore, that the expression we rightly applied of "Erroneous Estimating" attaches not to the lowest on the list, but to those who were highest. We think it unnecessary further to reopen the matter.

Mr. Wagner adds,—

"The chief thing I complain of in competitions is the very short interval allowed by architects between the time of exhibiting the plans and specification and that for the delivery of the tenders. I also think the quantities are not the architect's affair, directly or indirectly, only as regards his own connexion with his client's instructions as to probable cost of outlay. Let each applicant, after examining the plans and specifications, by himself or by his representative, employ his own quantity-taker, if he requires it; there would then be no question as to the fairness of estimates, and quantity-takers would become a distinct, responsible, and remunerative profession. Errors might occasionally arise in taking out, which a very simple revision would suffice to detect and rectify."

NEW BANK, BISHOP AUCKLAND.

ON the site formerly occupied by two unpretending-looking buildings in the market-place, known as Messrs. Backhouse & Co.'s Bank, a handsome Gothic structure has been erected, from the designs of Mr. George Gordon Hoskins, of Darlington. We believe this is the third new bank which Mr. Hoskins has built for this same firm. It has a frontage of about 50 ft. The contractor was Mr. Robson, of Darlington, and the carving has been executed by Messrs. Farmer & Brindley, of London. Mr. John Hindmarch was the clerk of the works.

ST. ALBAN'S ABBEY REPARATION FUND.

A NUMEROUSLY-ATTENDED meeting in aid of the fund for the reparation of the abbey of St. Alban's was held in Willis's Rooms on Thursday last week; the Earl of Verulam in the chair. Mr. Scott, the architect, was present.

The chairman explained the object of the meeting. Some months since, he said, those who resided in the neighbourhood of the noble old abbey of St. Alban had been startled by learning that the great tower was about to fall; and by the aid of a number of gentlemen who had sent him in 50*l*. each, Mr. Gilbert Scott had been enabled to set a builder to work to perform such work as was necessary, not to repair, but to preserve the building. The abbey of Kirkstall, Jervaux, Fountains, and Glastonbury had all fallen, and he trusted the people of England would aid those of the neighbourhood who had put down their names for large sums, and would enable them to keep up this building, which is a noble monument of the olden times.

The Marquis of Salisbury moved the first resolution, as follows:—"That this meeting learns with deep regret that a building so venerable and of such historic interest as St. Alban's Abbey is in so precarious a condition." There was now absolutely no fund whatever, he said, by which this ancient monument could be sustained. The sum asked for by the architect for putting the building into the condition in which it ought to be was 49,000*l*, and it was necessary to appeal to the people of England to make a general effort to prevent the disgrace

*Some Remarks on the Restoration of Worcester Cathedral, in a Letter to the Very Rev. the Dean of Worcester. By the Rev. Charles Boutell, Worcester: 1871. Office.

of allowing so great a possession to fall into decay.

The Dean of Westminster seconded the resolution, and said that the abbey of St. Alban had peculiar and exceptional claims upon every educated Englishman, in connexion with the death of the Roman citizen of Verulam who was now called St. Alban. That day on which they were assembled to take steps for the restoration of the abbey was the anniversary of his martyrdom, though by a stupid blunder of the calendar of the English Church it had been entered as the 17th instead of the 22nd. It should not be forgotten that the author of the "Novum Organum" was Viscount St. Alban's, in whose words the abbey might be described as "one of those great remnants which have casually escaped from the shipwreck of time." The history of these ancient monuments, and it was the peculiar duty of the men of this time to preserve them for future ages.

Earl Cowper supported the resolution, which was put and carried unanimously.

The Bishop of Winchester moved the second resolution, as follows:—"That the restoration of St. Alban's Abbey may be justly regarded as a national undertaking, for which we have the precedents of former collections throughout England and Wales, and that a National Restoration Committee be at once formed for the purpose of thoroughly carrying out the work."

Earl Stanhope seconded the resolution, and hoped that at some future day the cathedral of St. Alban's might become the centre of a new bishopric.

Lord Ebury supported the resolution, and said he hoped the subscription would not stop at the amount asked for, as those who had any experience in estimates knew that a tolerably wide margin ought to be allowed for additional expenses.

The resolution having been carried,

The Bishop of Rochester moved a vote of thanks to the Earl of Verulam for presiding on the occasion.

THE SEAMEN'S HOSPITAL, GREENWICH.

The following is a list of the strange and distressing tenders sent in for painting the outside of the Seamen's Hospital (late Infirmary of the Royal Hospital), Greenwich:—

W. Robert	£792 0 0
G. Stephenson	483 0 0
W. Challis	309 0 0
W. Shurmer	298 0 0
T. F. Ashton	286 0 0
R. Soper	260 1 3
G. W. W. Berry	246 0 0
S. H. & W. E. Coe	235 0 0
G. Smith & Co.	214 10 6
F. W. Kendall	213 0 0
J. Smith & Son	190 0 0

ST. ANDREW'S, PLYMOUTH.

By the removal of the old inclosing wall of the churchyard of St. Andrew's, Plymouth, the effect of the recent alterations in that locality consequent upon the erection of the New Guildhall has been disclosed. The appearance of the tower to Bedford-street is improved; and additional width is gained for Bedford-street and the entry from Old Town-street into Whimple-street. A correspondent, in describing these improvements, regrets that the works did not include the removal as well as the sloping off of the higher portions of the churchyard. There was no greater blot on the appearance of the town than the dead wall in Bedford-street; and the substitution for it of the dwarf wall and palisading, designed by Mr. Hine, with the green slopes of turf behind, is a change to be regarded with satisfaction.

The works have been carried out by Mr. Petibick. The capitals, which are each about 16 ft. in girth, have been carved by Mr. Harry Hems, of Exeter, and his assistants, and are highly spoken of by our authority.

From the angles of each of the two piers at the end of the Church-alley project angels with outspread wings, with the arabesque above. In the centre of either capital is a shield bearing on its face the town arms, and the monogram of St. Andrew and his cross. A ribbon with a raised inscription upon it encircles each capital. Upon the one is inscribed, "Turris fortissima est Nomen Jehova. A.D. 1871." And on the other the text, "He (St. Andrew) first findeth his own brother Simon, and saith unto him, We have found the Messias. And he brought him to

Jesus." Some of the angels hold the ribbon in their hands, whilst others again have musical instruments of a Mediaeval character. Angels are likewise introduced on some of the other capitals, and upon one is a dove holding a ribbon with the legend "Then would I flee away and be at rest." "Exception," says the *Western News*, "has been taken to the introduction, in subordinate fashion, of Masonic emblems. But the objectors cannot be ignorant that such signs occur continually in our noble cathedrals, which were to a large extent the work of the brethren of the craft in the Middle Ages. The 'masons' marks' are not the least interesting of their minor features; and Mr. Hems, as a brother, has but given another proof that he works in the old spirit."

CAMBERWELL INFIRMARY COMPETITION.

Sir,—In your last impression there is a letter complaining of the unfairness of the selection of Mr. Meakin to take off the quantities. Will you allow me to retrace the conduct of the guardians a little further,—viz., to the competitive designs; and to state that, 1st, the premium was awarded to a gentleman whom the guardians acknowledge to have exceeded the "Instructions to Architects," even to there being in his design one more floor than stipulated. 2nd, That the estimated cost exceeded by some thousands that of the estimated cost of other competitors' designs who had given all the accommodation required. 3rd, That unsuccessful competitors were refused even a sight of the premiated designs; in fact, most rudely refused. 4th, No sooner had the premiums been awarded than the guardians agreed to pay the selected architect an extra 25% to alter his design to meet the accommodation required by the "Instructions to Architects."

If the public interest in these matters is really to be studied, the Poor-law Board should cause inquiry into the whole circumstances attending such an unfair competition, such a wasteful extravagance of expenditure; and learn the reason for this "private" Bard thus so directly damaging the reputation of members of the architectural and surveying professions; otherwise the public mind must be more closely directed to the whole question of local self-government; and it certainly behoves the ratepayers to watch carefully the next elections, and mode of nomination; taking care to commence the voting for the last-named on the list, for there is a "dodge" in the manner in which the present guardians prepare even that.

A COMPETITOR.

THE ARCHITECT OF THE HOUSES OF PARLIAMENT.

In a recent debate, Mr. Ayrton is reported to have said:—"It was not merely the question of what was paid to Mr. Barry, but a question of the thousands, the hundreds of thousands of pounds, which the House was called upon to supply to meet the cost of carrying out his suggestions. There were now no more of those suggestions, and consequently expenditure was less."

Mr. Barry naturally feels that this statement is calculated to give rise to an impression that he has been in the habit of suggesting large expenditure to the Government, and that it is an injurious imputation upon him which is absolutely untrue. He writes:—

"I have never taken the initiative, nor, indeed, have I had the power to do so, in any suggestions involving expense, and my duties have been strictly confined to carrying out faithfully the instructions I have received from time to time from my official superiors. Mr. Ayrton's personal acquaintance with me is of the slightest, and I have had nothing to do under him except to complete some few works commenced before he took office. I think he does himself injustice in supposing that 'suggestions from any quarter would have formed a difficulty for him, and I regret that he should have made such an unfounded assertion on a point not within his own experience. The testimony which has been borne in my favour by all his predecessors in office, who have personal knowledge of the subject, may be thought conclusive as to my public conduct, and I feel sure that I shall not appeal to them in vain to repeat it if necessary."

The truth of this was shown on Tuesday evening, when the debate was renewed, and two ex-commissioners,—Lord John Manners and the Hon. W. Cowper-Temple,—defended Mr. Barry in the most vigorous and complete manner. Mr. Beresford Hope also spoke very strongly on the subject. As to the assertion that Mr. Barry

had proposed the erection of a new House of Commons, Mr. Hope said:—

"Mr. Barry was in no way responsible for the expenditure which has been incurred. The committee was moved for by the hon. member for Newcastle (Mr. Headlam) after something like a general expression of opinion on the part of the members of the House, that the hall in which they met was inadequate for the transaction of their business; and the committee sat for two sessions. A pen-and-ink sketch of a plan for the rearrangement of the House was produced by the hon. baronet the member for Manchester (Sir Thomas Bazley). A very ingenious one it was for an amateur; and this Mr. Barry reproduced in the more workmanlike form of a regular plan drawn to scale. Then the committee, of its own motion, and not at all at the instigation of Mr. Barry, got plans of the Houses of Legislature in different parts of the world, which were also reduced to a common scale by Mr. Barry; and the value of this collection was attested the other day by an application made to himself for a copy of the Blue-book by a member of the German Parliament and of a committee which has appointed on the subject of building a new Parliament House."

CASES UNDER BUILDING ACT.

WINDOW OPENING IN NEW PARTY WALL.

MR. PALMER, builder, was summoned at the Greenwich Police-court, before Mr. Patteson, on the 9th of June, by Mr. Tabberer, district surveyor, for having, in rebuilding the Three Tunn Tavern, London-street, Greenwich, reinstated an ancient window-opening in the new party wall above the roof of the adjoining premises, contrary to Section 13 of the Metropolitan Building Act.

For the defendant it was argued that the party wall only extended as high as the gables of the old building adjoining, and that the upper portion of the wall was an external wall, and therefore the formation of a window was no illegal.

The Magistrate, after hearing the evidence, adjourned the case for a week to consider his decision, and to allow him an opportunity of inspecting the premises.

At the re-hearing the Magistrate said that, taking the intention of the Act into consideration,—viz., the preventing greater security against fire, and also the deduction of the term "party wall" in the interpretation clause, it could not but come to the conclusion that the wall in question was a party wall for its full height within the meaning of the Act, and that therefore the defendant had no right, when rebuilding the house, to make any opening in it; there must therefore be an order to amend in compliance with the terms of the Act. He would state a caveat, however, for a superior court if desired, which the defendant expressed himself anxious to have.

Mr. Gellatly, solicitor to the owners, Messrs. Taylor, Walker, & Co., Brewers, appeared for the defendant.

COMPLETION OF A BANKRUPT'S CONTRACT.

In the Court of Exchequer, Smith and Others v. K. and Another, was a special case, and raised a point some importance to builders. Robert Young contracted with the Earl of Verulam the St. Alban's justices to build a gaol, under a contract by which he was to be paid instalments upon the amount of the cost of the work, and to be retained for the work done less 20 per cent., which was to be retained as a kind of security till the work was completed. Young required advances from the plaintiffs, his bankers, assigned to him all moneys coming to him under the contract. He afterwards became bankrupt, and the defendants, who were his sureties, proposed to the justices to complete the work for the balance remaining unpaid of the contract price. This offer was accepted, and they completed the works at a considerable loss. The plaintiffs claimed to be entitled to the last instalment payable to the parties representing 20 per cent. retained by the justices on Young's work, and as having been earned by him before the bankruptcy; the defendants claimed it as due to them under their contract with the justices, and as never having become payable to Young, as he never carried out completion of the works.

The Lord Chief Baron (the other members of the Court concurring) held that the defendants were entitled to judgment of the Court; the plaintiff, if so advised, was at liberty to appeal.

HARBOURS OF REFUGE.

On the question, in Parliament, that £3,476, be voted to complete the sum of £9,476, for the construction of harbours of refuge,

Mr. Bentinck said there were not to be found on record more marvellous monuments of human folly than some of the items in this vote. The first three were called Dover Alderney, and Holyhead. As far as Dover was concerned it was a complete waste of money. As the present rate of proceeding, it would take 30 years to complete the harbour. At present it was no harbour at all. At Alderney, it was, perhaps, the worst case of all. It was not a harbour, it was a nest of rocks. It was not a harbour of refuge or a harbour of shelter. No seaman would take a vessel into Alderney, except in very fine weather. So that it being a harbour of refuge, it was one of the most dangerous places in which a vessel could be placed, and it was a dead loss to spend money every year on the harbour. As to Holyhead, a pier had been run out in the wrong direction, which made the harbour not so good as before. He begged to move, in order to bring the matter to a test, the omission of the sum of £1,483, Alderney Harbour.

Sir J. E. B. seconded the motion. The works were of the most appalling nature, and were avoided.

ry class of ships. There were the most violent and certain currents running in all directions,—such as the case of Alamy and the Race of Sark. The money might as well be thrown into the sea; for the end of the was 132 ft. from high-water mark, and, that being so, might be easily understood what the base of the structure must be when operated upon by the most violent currents and an ocean swell. Voting money year after year upon this preposterous scheme was nothing but a waste of perfect fatuity.

The vote was ultimately struck out without a division.

ACCIDENTS.

Church struck by lightning.—During the recent thunderstorm the Church of St. Nicholas, Lifford, was struck by lightning, which first severed the flagstaff, some of the splinters being over 200 yards, and then went through the roof of the church, leaving a large hole, breaking the windows, and passing into the earth close to a stone, a piece of which was broken off and cracked.

Full of a Chapel.—At Bolton, the roof of the primitive Methodist Chapel in Higher Bridge-street has fallen. The building, a stone structure, capable of seating some 400 persons, was erected in 1836, and had been continuously occupied up to February last. About that time it was noticed that the foundations of one of the walls had given way, and the congregation decided to use new schools which had just been erected in Lifford-street, until the chapel could be rebuilt, work which was expected to be commenced at year. The giving way of the foundations was attributed to the erection of a large shop adjoining, as in excavating the cellar for this purpose the workmen came upon a bed of quicksand, which extended underneath the graveyard. The walls of the chapel, however, had been propped, and nothing occurred to indicate the perilous condition of the roof until the ceiling fell, followed by the entire destruction of the roof. The gallery and all the pews in the chapel have been completely demolished, and the walls on one side have been forced out of their perpendicular in a dangerous manner.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—Some of the Belgian miners who were brought over from Antwerp by the master joiners to supply the places of the men on strike, have returned to Rotterdam. Messages were paid by the strike hands, who were said to have forced them to return to their own country. The Belgians each had a cheque of 30s. as a parting gift from the men on strike. They alleged, as an excuse for their behaviour, that they were afraid to remain longer in Newcastle, and that they were tired of annoyance caused by the picketers. One of the bribed has been retained in Newcastle to induce the other Belgians to leave work as well. The masters, meantime, said they were going to sit still and allow the league to take away from them the men they had been at the trouble and expense to bring over, and summoned an Englishman and a Belgian in the matter. One summons charged the president of the league with conspiracy and intimidation; and the other charged one of the Belgians, "the leopold duck," with breach of contract, having entered into an agreement to serve for three months. Since then Richard Young, alias leopold, has been charged at the Police Court, under the Masters and Servants Act, with using threatening language in order to induce Joseph Herbert Souterman, a Belgian, to leave his work. The case, however, failed, and defendant was dismissed. Frederick Jonasson, a Belgian miner, was then placed in the dock, charged on summons, under the 8th section of the Masters and Servants Act, with intention to abscond, in violation with a breach of contract. It was proved the defendant was engaged in Belgium six months. Joseph Elliott, a Belgian joiner, English extraction, deposed that the defendant, the president of the Joiners' League, and two other men, came to him and several other men, while working, and urged them to leave the town on Saturday. Mr. Hamond said, from Elliott's evidence, the magistrates had no alternative but to order the defendant to find two reties in 20l. each for his appearance on Monday.

West Hartlepool.—At the West Hartlepool Petty Sessions, Robert Irvine and six other Whitehaven ship-carpenters have been charged with breach of contract to Messrs. Norton, Gray, & Co., and doing damage thereby the amount of 10l. Mr. Brydon, clerk to the

firm, proved engaging the men, who signed agreement for twelve months, at 6s. a day. They came to the yard on the 1st of June, but refused to work. The Bench said that they had no alternative but to convict the whole seven in a penalty and costs of 5l. 15s. 6d. each, or two months' hard labour.

COMPETITIONS.

Charlton Cemetery, Kent.—Pursuant to an advertisement inviting plans and estimates for the erection of the chapels, entrance-lodge, and gateway, for the proposed new cemetery in the parish of Charlton, 45 sets of drawings were sent in for the consideration of the Burial Board. The cost of the whole of the buildings, &c., was not to exceed 1,800l., and the Board offered a premium of 25 guineas for the design selected, and 10 guineas for the next approved design; stipulating, however, that they would not be bound to employ the architect whose design might be accepted, but that, in the event of his being employed to carry out the work, the premium should be deducted from his commission. The Board ultimately determined in favour of the plans bearing the motto "Industria." The architects are Messrs. Brown & Pearce, Norwich. Mr. J. H. Brown and Mr. J. B. Pearce are acting jointly on this occasion, and have been entrusted with the carrying out of the works. The plans show two chapels, which are to be connected by an arcade. Two entrances are provided to each chapel, the coffin entering by one, and departing by the other door. The episcopal and dissenting chapels are both of the same description and extent, the architecture being Gothic. The external walls are faced with Kentish rag, and internally with white kiln-burnt bricks, relieved with bands of black and red. The walls are to be built hollow, with Bath stone dressings. The columns at the entrance porch of the arcades and of the doorways, are to be relieved with Mansfield stone. The roofs are to be covered with tiles. A bell-turret rises from the centre of the arcade to the height of 50 ft. Attached to the entrance gates is a new lodge; also a waiting-room. The estimated cost for executing the works is within the amount estimated by the Board. The second premium of 10 guineas was awarded to Messrs. Hayward & King, of London.

CHURCH-BUILDING NEWS.

Newcastle-upon-Tyne.—The foundation-stone of the new church in the parish of St. Philip, in Newcastle, has been laid. The sum of 6,000l. was originally estimated for the erection of the church and schools; about 1,000l. remain to be raised. The church itself is to be erected on a site at the head of Garden-street. When completed, the church, all but the north aisle, will seat 496, including choristers and children, and the north aisle will provide for 190 more adults. The work is to be carried out from the designs of Mr. George Redmayne, of Manchester, architect.

Kingsnorton.—Active steps are being taken by a committee with a view for the restoration of the parish church, which has long shown signs of decay and want of improvement. Five estimates were submitted for consideration. The committee did not decide which they would accept. Two were selected as being likely to meet with the sanction of the committee; but more information was required from the builders before the committee could decide which they would choose; and the meeting was adjourned until another day, for the information to be obtained in the meantime. Mr. Hopkins, of Worcester, is the architect employed. The committee again met to consider the estimates and plans. Plans were decided upon for various divisions of the work; and the committee resolved to proceed at once with the work of restoring the nave, roof, and north aisle first, intending to commence with the vestry and other parts when sufficient funds are forthcoming, and with the tower and spire as soon as possible. The architect recommended a thorough restoration of the whole fabric of the tower and the spire, which he considered it necessary to undertake without delay. The cost of the work in this part was estimated at something like 500l. The committee approved of these and other suggestions, and considered that the particulars of the restoration thus specified,—viz., new roof for the nave and aisles, the rebuilding of the

north wall, the setting upright the pillars and arches of the aisle, the removal of the vestry, and the restoration of the parapet on both sides,—should not exceed 2,000l. This, with the sum required for the tower and spire, therefore made a total of 2,500l. Towards this sum subscriptions amounting to 1,114l. 12s. have been promised for the restoration of the spire and tower, and 803l. 5s. for the nave and aisles, making a total of 1,114l. 17s.

Middleton.—The consecration of the new church and churchyard for Great Wollaston parish, in the diocese of Hereford, has taken place. The new church will be free. The cost of the edifice, which seats 200 people, would usually be (exclusive of ground) about 1,000l.; but by begging part of the material and the carting, and hiring simply the building labour, it has been erected for about half the usual sum. The style is Early English Double Rectangular, with nave, chancel, organ-chamber, vestry, porch, and bell-turret. The architect was Mr. E. M. Goodwin, Carmarthen; the builders, Messrs. Davies, Welshpool. The benches are stained deal, similar in construction to those in Chester Cathedral, called the "Chester Bench." The inside arches are of blue brick, as is also the recess, forming at once both a credence-table and piscina.

Bosbury.—The church here, after undergoing final restoration, has been re-opened for public worship. The chancel, which had long been in an unsatisfactory state, having passed into the hands of the Ecclesiastical Commissioners, has been both internally and externally renovated. There is a new roof, of the ancient pitch, covered with Broseley tiles, with Bridgewater crest; the east wall, with the exception of the pillars, has been rebuilt, and the windows restored and filled with glass; the other windows in this same portion of the church have also been re-set and restored. The floor has been laid with encaustic tiles from the Lugwardine works, and the walls re-stuccoed. In the nave the floors have been laid with plain encaustic tiles, the oak screen has been restored, the windows are new, and the whitewash has been removed from the walls. The porch has been renovated, as has also the ancient Grange chapel. An organ-chamber has been erected on the north side of the chancel to receive an instrument built by Messrs. Speechly & Ingram, of London. Both the chamber and organ are the gift of Mrs. Frederick Hope. The total cost to the donor of organ and chamber will be not far short of 1,500l. The organ consists of thirty-one stops. Mr. Ewan Christian, of London, was the architect for the restoration; and Mr. Joseph Cox, of Leominster, builder, the contractor by whom the work has been executed.

Charlton Kings.—The new church at Charlton Kings, built by Mr. Charles Higgs, at a cost of 7,000l., has been opened for divine worship. It is now more than five years since the foundation-stone of the edifice was laid, and it is at least two years since it was completed; and even now the consecration is delayed until certain arrangements respecting the endowment have been made. The church stands on a prominent site, in one of the most pleasant approaches to Cheltenham. The architect was Mr. J. Middleton, of Cheltenham. The church is built in the Geometrical Decorated style, and consists of a nave, 52 ft. by 25 ft., and 45 ft. high; with side aisles of similar length, and 12 ft. wide. The chancel is 40 ft. by 21 ft., with an apsidal termination, and is lighted by five two-light windows. There are also north and south chancel aisles. The roof of the chancel is of polished wood, decorated in gold and colour, the ribs being supported on marble columns, resting on corbels of angels in attitudes of praise and adoration. The columns employed in the nave and aisles are vermilion, white, and graduated shades of blue and grey; while in the chancel gold has been introduced. The seats are of oak, and the chancel stalls are carved. The west window is filled with stained glass, by Hardman, and is in memory of the late Mr. E. Potter (of East Court), having been presented by his children. It is intended, we believe, to connect the tower and spire with the south porch, making the southern entrance under the base of the tower. The design of the spire and tower contemplates a total height of 176 ft., of which the tower will be 100 ft. The spire will be broached. The church will accommodate 900, and the sittings in the aisles are at present free. The contract for the erection of the church was carried out by Mr. W. Jones, of Gloucester; the carving was executed by Mr. Boulton, of Cheltenham; the

ornamental ironwork by Mr. Lethren, of Cheltenham; and the organ was built by Messrs. Hill, of London. Mr. J. Middleton was the architect.

Toller Whelme.—The recently-completed new church, built by Mr. William Pope, at his sole cost, has been consecrated. The structure is situated on an eminence in close proximity to Mr. Pope's residence, in the valley of Toller Whelme. It consists of nave and chancel, with a vestry on the north side, and a square tower with battlemented parapet. It is constructed of stone found in the neighbourhood, with dressings of Ham Hill stone. There has been no pretension to architectural effect; the building has windows in the Early Decorated Gothic style. Mr. Pope personally superintended the work. Although a number of designs were submitted to him, it is said he has not followed any of them, entrusting the masonry to Mr. R. Chedd, of Bamptonham; and the carpentry to Mr. Saunders, of Beaminster. The dimensions, excluding the tower, are 50 ft. by 20 ft. The nave has an open roof of stained red deal, and was constructed according to the plans of Mr. Warr, formerly of Corcomba. The east window, in the chancel was the gift of Richard and Elizabeth Genge and their family. It has triple lights, with geometric tracery, and contains a representation of the Crucifixion. The quatre-foils are filled in with stained glass, in the centre one being the figure of an angel bearing a "crown of glory," while in the others are represented angels, each bearing a scroll with inscription. This window, and also those of the nave, were designed and erected by Mr. W. Holland, of Warwick. The design of the west window, which has a couple of lights, consists of figures of the four Evangelists, bearing symbols, two figures of the Saviour occupying the centre compartments. The stained glass in the quatrefoil bears the sacred monogram I.H.S. This window, surmounted by a circular light of plain cathedral glass, is the work of Messrs. Cox & Son, of London. On the north side of the nave are three single-light windows, the centre one representing the patron saint, John the Evangelist, having been erected "In memory of William Pope (father of the founder), who died December 14th, 1831; and of Sarah, his wife, who died April 8th, 1828. Both buried at Corcomba."

Oldham.—The Bishop of Manchester has consecrated a new church, at Shaw, near Oldham, henceforth to be called Holy Trinity Church. The building, which has been erected at a cost of 9,000l., consists of a nave with three aisles, and chancel with two side aisles. The sittings, consisting of open benches, provide accommodation for 746 persons. The style of architecture is that of Early Gothic, the roof being open-timbered. The font, costing 75l., has been paid for by subscriptions collected by the children of the Sunday school. His lordship previously consecrated an additional plot of ground, consisting of 548 square yards, to be used as a burial-ground.

DISSENTING CHURCH-BUILDING NEWS.

Driffield.—The foundation stones of a Primitive Methodist chapel have been laid on the site of the old one at Garton-on-the-Wolds, near Driffield. As stone and bricklaying ceremonials are becoming rather elaborate affairs nowadays with some sects, we may here quote what a contemporary says of this one:—

"The chief corner stone was laid by Miss Mary Elizabeth Raiton, of Driffield, assisted by the Rev. C. Kendall, of Fley; and the second stone by Mrs. Jefferson, of Driffield. In a cavity of the first stone was placed a bottle containing a number of documents connected with the event, and Miss Raiton covered it with a donation of 5l., and Mrs. Jefferson put 4l. on the stone that she laid. A copy of the life of Mrs. J. T. Robinson, of Hull, written by the Rev. Jos. Wood, was presented by the Rev. P. Milson to each of the above ladies, as a memento of the occasion. The privilege of laying bricks by the company was then allowed, and a large number of individuals took occasion to do so, each placing a sum of money on the brick laid. Mr. T. Holmes, Driffield, on laying his brick and depositing his sovereign, presented 5l. on behalf of Mr. T. Atkinson, Driffield, whose heart had ever been with them. Mr. P. Knaggs, of Wetwang, also presented 5l. About forty other bricks were laid by different individuals, who each deposited a sum of money, and Mr. Major, of Sledmere, gave forty children 5d. each, who all went through the same ceremony."

The ground has been given by Sir Tatton Sykes for the site of the chapel, which will be erected from designs by Mr. J. Wright, of Hull; the contractors being Mr. Gage, bricklayer, Driffield; Mr. Smith, Driffield, stonemason; Mr. Hall,

Driffield, painter; and Mr. Brethorwick, Norton, joiner.

Cambridge.—The Wesleyan Chapel, Hills-road, Cambridge, has been dedicated. The chapel is of the middle period of Gothic architecture,—a white brick building, with stone dressings. Its dimensions are:—Extreme length inside, 72 ft. by w.dth, 42 ft.; height from floor to ceiling, 40 ft. There are sittings for between 700 and 800 persons. On either side of the building there are five windows, three two-light and two three-light, the latter having coped gables and stoned cornices between; also buttresses to the piers. In the front or east end, looking on to Hills-road, is a triplet of windows, the centre one being much larger than the others. The principal entrance is under the large window. In the door-jamb are red Mansfield stone shafts, with carved caps and label terminations of animals. Of the two stone turrets, the highest is 85 ft. from the base, and has about a score of Bath stone gargoyles around it. The bases of the turrets are shown on the inside by carved corbels. At the west end of the building, in the upper part of the organ gallery, is a large wheel window, filled with stained glass in quatrefoil tracery. The whole building is fitted with hot-water apparatus by Messrs. E. Heady & Son. Beneath the chapel are a large schoolroom, classrooms, and offices, with an area of from 4 ft. to 7 ft. wide round the building. The building cost about 4,000l. The architects were Messrs. Hill & Swann, of Sheffield and Leeds. The contractor was Mr. Thoday, Cambridge; clerk of the works, Mr. Cooper.

Antley, near Accrington.—A new Wesleyan chapel, in the Italian style of architecture, was opened at the above place on Thursday, May 11. The building is from the designs of Mr. Wadlington, of Burnley; the cost will be 2,500l., accommodation being provided for 600 persons.

Banbury.—The corner stone of a new Wesleyan Chapel for Grimsbury has been laid. The structure will be in the Classical style, the materials being red brick, with freestone dressings, moulded cornices, and window architraves. The front will be pedimented, and brick pilasters, with stone capitals and bases, introduced at intervals around the front and sides. Connected with the chapel will be a school-room, two class-rooms, and a large play-room, the latter being on the basement floor. The chapel will be heated by hot water. Internally it will contain a small gallery resting on iron columns, accessible by two flights of stairs from the entrance lobbies. The seats and internal fittings will be of best red deal, stained and varnished. The design for the building has been supplied by Mr. Hackett, of Banbury; Mr. Kimberley, also of this town, being the builder. The estimated cost is upwards of 1,600l., the greater portion of which has been given by Mr. W. Mewburn, the remainder being obtained by voluntary contributions.

VARIORUM.

We get from Messrs. Cassell & Co. the *Technical Educator*, the *Household Guide*, *Cassell's Magazine* (always amusing), the *Quiver*, *Little Folks*, and the *Illustrated History of the War between France and Germany*, for July. We take from the *Household Guide* a paragraph on the "Management of Earthenware":—

"New earthenware should, before being used, be soaked in cold water for twenty-four hours; this will render it less liable to crack, as well as enabling it to be made thoroughly clean. For washing articles which are not greasy, such as tea things, &c., every housekeeper should be provided with a good-sized wooden bowl, for by contact with this they will be less liable to be chipped and broken than when an earthen basin is used. Still further, to avoid the danger of breakage, one article only should be put in at a time. A small cloth should be kept with which to cleanse them while in the water, for merely rinsing them and then wiping them on the tea-cloth will not insure cleanliness. For washing the insides of jugs, a miniature mop, with a handle 1 ft. long, like those sold for cleaning the chimneys of lamps, is indispensable. A little soda should sometimes be used for washing jugs, and if the same is occasionally used for washing tea-things, it will make them look much cleaner and brighter. Soda should, however, never be used except in small quantities, nor should it be constantly employed, as it has a tendency to injure the glass. Soap or potash has not this injurious effect, but neither cleanses so thoroughly as soda."

"Transactions of the Manchester Statistical Society, Session 1870-71. Manchester: Roberts, Printer." The papers in this issue are more than usually interesting and important. Besides the Report of the Session, it contains papers on the Comparative Mortality in Large Towns, by Dr. E. J. Syson; on Infant Mortality and Death-rate in Large Towns, by Mr. Thomas R. Wilkinson; on Trade-unions in Relation to National

Industry, by Mr. Elijah Helm; on Certain Industrial and Social Aspects of England during the Fourteenth and Fifteenth Centuries, by the Rev. R. H. Gibson, B.A.; on University Endowments and the Higher Education of the Nation, by Professor A. S. Wilkins, M.A.; and on the Post-Panic Period, 1866-70, by Mr. John Mills.—"The Homing or Carrier Pigeon (*le Pigeon Voyageur*): its History and General Management, and Method of Training." By W. B. Tegetmeier, F.Z.S. London: Routledge." To those interested in this subject the present is a timely occasion for this little treatise by the honorary secretary of this year's Grand Anglo-Belgian Concours at the Crystal Palace, and the author of previous books on pigeons and poultry, as well as the editor of the *Fauna's Poultry* department. The homing pigeon during the late war was a useful messenger; but Belgium is its true home. Pigeon-races may be said to be the Belgian's great national pastime, just as horse-races are with us.

Miscellanea.

Foundation Stone Laying of Literary Institute, Bradford.—The foundation stone of a new Church of England Literary Institute, has been laid at Bradford, by Mr. M. W. Thompson (president of the Institute), in the presence of a concourse of spectators, estimated to number about 3,000 persons. The site is between North Parade and Manor-row. The plans were prepared by Messrs. Andrews, Son, & Pepper. The new Institute will face North Parade. The ground floor is designed for a reading-room and library, 42 ft. by 41 ft., and 19 ft. high, approached by two corridors, with folding-doors, communicating with the principal staircase leading to the lecture-hall and class-rooms above, and occupying a space of 22 ft. by 22 ft., constructed of stone, and well lighted. At the rear on this floor are arranged a suite of class-rooms. On the first floor is the lecture-hall, 59 ft. 6 in. by 40 ft., and 26 ft. high, seating 550. This room being of an obtuse angle, columns and pilasters have been arranged to meet the difficulty, and these will be combined with a groined and enriched ceiling. At the rear of the lecture hall, and on the same level, is a large class-room, by which arrangement the rooms can be used conjointly for bazaars or for public meetings. A gymnasium has been provided in the basement, 60 ft. by 60 ft., and 20 ft. high, well lighted, and with lavatories, &c. adjoining. At the rear is a suite of class-rooms. On this floor is also a heating apparatus. The elevation is divided into five bays on the ground floor, the end bay, ornamented and decorated, being devoted to the entrances. The windows between the entrances will light the reading-room. Those on the first floor are filled in with mullions and tracery whilst the centre bay is ornamented with figures and canopies on each side. Over this window is a three-light dormer window, with carved pinnacles. The style of the building is French Gothic. The contracts are let as follows:—Messrs. J. Moulson & Co., masons; Mr. S. Jackson, joiner; Mr. J. Schofield, plumber; Mr. B. Dixon, plasterer; Mr. J. Tattersall, slater; Mr. W. Hird, painter; and Messrs. Rushford & Thornton, ironfounders. The cost will be about 5,600l.

The Chateau of St. Germain.—Here died James II., disowned and an exile. He lies buried in the church hard by, where a monument was erected to his memory by George IV., and repaired and restored by Queen Victoria. During the late unhappy war the noble chateau was unharmed by the Prussian soldiery, and served as a barrack for troops and a hospital for wounded soldiers. We may be pardoned for adding that, although the present Earl of Perth now the head and representative of the long-headed Drummonds, was not born at St. Germain, yet his sister, Lady Clementina Davie who is still living, first saw the light of day in one of the state-rooms of the chateau, just before her parents had been driven out of its hospitable walls by the philosophes.—*The Lamp.*

Kent Archaeological Society.—The Council of this society met on the 12th ult. It was resolved that the annual meeting of the society at Sevenoaks and Knole should take place on Wednesday and Thursday, the 2nd and 3rd of August next. Mr. G. Scharf will illustrate to the meeting the noble collection of paintings there.

Society for Improving the Condition of the Labouring Classes.—The twenty-seventh annual meeting of the members and friends of this society has been held at Willis's Rooms, the Earl of Shaftesbury presiding. Mr. Payne, secretary, read the report, which stated that the committee were gratified to have a satisfactory report of the houses for the past year. The fire mortality amounted to only 21 in an average population of 1,567, or about 15·4 per thousand. The amount received during the year from all sources for the general purposes of the society was 5,729l. 2s. 10d., making, with the balance in hand at the beginning of the year, a total of 6,427l. 1s. 8d. The current expenses of all the lodging-houses, including repairs, amounted to 3,468l. 7s. 1d.; loan repaid interest on loans, &c., 1,614l. 12s. 3d.; salaries and agency, 566l. 2s.; printing, publications, advertisements, books, and stationery, 182l. 7d.; rent of offices, postages, coals, cleaning, and all incidentals, 145l. 1s. 11d., leaving a balance at bankers, and cash in hand, 17l. 9s. 9d. The real property, &c., belonging to the society was estimated at 35,924l. 8s. 5d.; general liabilities of the society amounted to 398l. 17s. 5d., leaving assets 15,231l. 6s. The Earl of Harrowby moved the resolution for adoption of the report, which was unanimously agreed to.

Shut out the Noisy Ones.—Our esteemed temporary, the *Spectator*, says:—

The discussion about the riot on Commemoration provokes us to ask a question of the *Builder*. It is at all times in modern society to have swift control over the expectations admitted to Courts of Justice, Legislative Chambers, University ceremonies, and the like, a control more effective, mild, and independent of police or law. Would it not be possible in all such places to have a shutter of iron "venetians" which, falling at a pull in front of the galleries, would effectually cut the sight off the body of the hall? They could see, hear nothing, and not be heard, while the curtain is drawn up again as soon as they had recovered respect for the place.

Of course, it could be done, the manner how depending on the construction of the particular building to which the application was required; our contemporary scarcely asks the question earnest, knowing very well that such a measure saying "shut up" would not prove a quiescence of the difficulty. Surely if the quiescence were adopted in the various colleges to cut the minds of the undergraduates, an improvement could be brought about. A certain amount of anxiety on Commemoration Day, and the exercise of a little real fun and wit, no one would object to or wish to prevent; but the vulgarility and positive ruffianism exhibited on late occasions are a disgrace to all concerned, teachers as well as pupils.

The Dockyard Extension Works at Chatham.—The first portion of the vast new works at Chatham has been opened in the presence of the Right Hon. G. J. Goschen, M.P., Lord of the Admiralty; Captain Robert R.N., O.B., controller of the Navy; and other official persons. Mr. A. Gabrielli, the contractor who has constructed the completed works, and Mr. Golla, C.E., the contractor's agent, were also present. The portions of the works now brought into use are the rearing basin and two docks. Two other docks are now being built by Mr. Gabrielli. The basins are made, and are closed by caissons. The rearing basin is 21 acres in extent; it is a depth of 33 ft. of water; at the entrance the water was 30 ft. when the first ship entered. The basin is 1,320 ft. long by 700 ft. wide. The two other basins are 520 ft. in length, over all, and 110 ft. at the coping. The factory basin, which was completed early last year, has an extent of 200 acres; it is being made principally by convicts under Government officers. The other fitting basin, will be 33 acres; it will be completed for some years. There are other basins to be erected, and much other work to be done.

Society for the Encouragement of the Fine Arts.—An interesting lecture on "The History of Pottery and Porcelain" was delivered on the 22nd ult., by Mr. W. Chaffers, at the house of the Society for the Encouragement of the Fine Arts. It was illustrated by examples of the most important fabricues, principally from Chaffers's collection, and diagrams were exhibited on the walls, showing the marks of the various manufactories of Europe from the fifth century to the present date, whilst photographs of the finest specimens were also shown.

Glasgow Albert Bridge.—This new bridge, crossing the River Clyde at Hatchesontown, has just been opened. The Act for its erection was passed in 1866, but building operations were not commenced till 1868. The new structure is carried over the river in three spans, instead of five, as in the case of the other bridges over the Clyde; and, in order to place the foundations beyond any danger arising from the alteration of the river bed, they have been carried right down through the sand, so as to rest upon the hard substratum at a depth of 80 ft. This portion of the undertaking was effected by means of sunk cylinders. Each cylinder was 10 ft. in diameter; and after the interior had been excavated it was filled in with concrete, formed of sand and hydraulic mortar, which hardens into one solid pillar. The upper portions of the cylinders, which are 12 ft. in diameter, are built in with solid ashlar, and upon these piers of masonry are founded. Into the interior of each pier ponderous iron beams are built, and these receive the weight of the malleable iron girders which form the arches of the bridge.

The Architects' Commission on the New Workhouse for Derby.—Messrs. Giles & Brookhouse wrote, in reply to the proposal of a reduction of their commission from 3 to 2½ per cent., in terms such as might have been anticipated by the malcontent members of the local Board. If the Board, they said, considered them morally bound to accept a lower commission than the advertisement fixed, they would accept it; but they had been appointed at 3 per cent., and it seemed hard that the commission should now be reduced. The mover of the motion for reduction, finding apparently that such a reduction could have no legal effect, and would be inconsistent with the dignity of the Board, withdrew his motion; so that the guardians have virtually decided that the architects were not morally bound to reduce their commission below what the Board had agreed to give.

Underground Remains of Roman Bath.—In some vaults of the old houses that formerly stood opposite the *Chronicle* office, the surveyor, Mr. C. E. Davis, has found a beautiful arrangement of ancient Roman arched drains, about 7 ft. high, and from 2 ft. to 3 ft. wide, evidently constructed for the drainage of the baths. The clue to these was found in 1865, but they have only now been traced. One advantage derived from the explorations is that he has been enabled to utilize an excellent system of drainage, perfectly air and steam tight, originally constructed for the drainage of the hot baths, but for many years only partially used for that purpose. Information has also been obtained relating to the hot springs and the drainage of this part of the city, which may prove of considerable value to the corporation, if, which is not at all improbable, they should become the sole conservators of the mineral waters.

Maison d'Abri.—A portable wooden hut, which is called *une maison d'abri* by the inventor, M. E. Colibert, a French architect, was exhibited in the gardens of Apsley House. This hut was designed with a view to carry into effect Baron Gudin's proposal to provide dwellings on certain terms for the French peasantry and poorer class of citizens, whose homes had been destroyed during the war. M. Colibert, who planned and superintended the erection of the *cités ouvrières*, has invented "pour loger les Alsaciens et Lorrains en Algérie," a house which may be packed and carried in a common country cart, and set up by two persons in less than half an hour. The hut is made of yellow deal, with a floor 10 ft. square, walls 7 ft. high. The hut can be made here, and delivered in France or in Algeria at a cost of between 8l. and 10l.

Knightsbridge Barracks.—It is stated that the removal of Knightsbridge Barracks has been indefinitely postponed. The Government have been unable to complete the arrangements for removal in consequence of a new project to include the demolition of other property and some considerable alterations of the roadway, both of which improvements would require the co-operation of the Metropolitan Board of Works and a special Act of Parliament.

Intended Compliment to the Comedie Francaise.—The complimentary Breakfast intended to be given to the members of the "Théâtre Français" is fixed to take place at the Crystal Palace on Saturday next (the 8th), at two o'clock. Lord Dufferin will preside, and a very interesting gathering may be expected.

The Proposed Public Library and Museum for Brighton.—A public vestry meeting has been held at the town-hall, to consider the resolution of the town council adopting a report of the Pavilion Committee, for the construction of a public library and museum, with other rooms for the reception and exhibition of works of art, on the northern part of the Pavilion Estate, at an estimated cost of 6,000l. The meeting was more influentially attended than any of a parochial character which has been held in Brighton for many years. The vestry, after some discussion, passed a resolution consenting to the proposal of the town council. For amendment against it, only nine hands were held up. A poll was demanded.

Subsidence of a Railway.—A singular accident has occurred on the Manchester, Sheffield, and Lincolnshire Railway, between Guide Bridge and Dukinfield Stations. At the spot indicated the railway line runs parallel with the canal, and the river runs on the opposite or lower side of the rails. A main sewer from Ashton, which runs under both the canal and the line and empties itself into the river, burst, the water undermining the south line of rails, which gave way, leaving an opening about 12 ft. in diameter. The trains were stopped some few yards on each side the opening, and both the up and down passengers had to alight and walk from one train to another.

The Trade-Union Outrage at Manchester.—John Rogers and William Manning were charged at the Salford Police-court with setting fire to one of a row of houses in course of erection in Edward-street, Lower Broughton. The prisoners are hand-brickmakers, and it was shown that Mr. Rhodes, the proprietor of the houses in question, had incurred the displeasure of the hand-brickmakers by using machine-made bricks. The prisoners, who by the advice of their solicitor, Mr. Cobbett, reserved their defence, were committed for trial at the assizes. Another man, named John Atherton, was charged with attempting to set a building on fire in Wellington-street under somewhat similar circumstances. He was committed to the assizes.

A Social Gathering.—Mr. T. H. Wyatt, as President of the Royal Institute of British Architects, gave a dinner on Saturday last at "The Trafalgar," Greenwich, to the Council of the Institute, when about twenty sat down. As the dinner was strictly of a private character, we will simply mention that it was a very social and cheery gathering. Outside, too, strange to say, remembering the sort of weather we have had, several gleams of sunshine were distinctly visible. The president's very agreeable design was carried out in the modern style, treated freely, all the orders receiving consideration in turn.

Architect to the London School-Board.—It is proposed at the next meeting of the School Board, to elect an architect and surveyor, at a salary of 500l. per annum. He will be required to give his undivided attention to the duties of the office. In answer to the invitation issued eighty-four gentlemen have sent in letters of application and testimonials. After examination the committee recommended the following six gentlemen to the Board, from whom the selection and definite appointment of an architect and surveyor to the Board will be made:—Mr. Joseph James, Mr. J. W. Morris, Mr. Thomas Porter, Mr. John S. Quilter, Mr. E. E. Robson, and Mr. William Wigginton.

The Ashton Public Baths.—The report of the committee of the town council on the construction of these baths, has been read at a meeting of the council, and ordered to be printed. The total cost, according to the report, has been 14,044l., including 11,272l. to the contractors, Messrs. Clay & Sons; 1,164l. for engineering works to Messrs. Haden & Son; 353l. to Messrs. Grierson, Brothers, for pipes, gas, and other fittings; 204l. as salary to the clerk of the works; and 654l. to the architects, whose names, it oddly happens, do not occur throughout the report, although they are repeatedly alluded to.

Great Central Station.—A select committee of the House of Commons has sanctioned the Bill for creating a great central railway station for the metropolis between Holborn Viaduct and Farringdon-road Station. The South-Eastern, Chatham and Dover, South-Western, Great Western, London and North-Western, Midland, Great Northern, and Great Eastern Companies are all interested in the project, which, when carried out, will be a great boon to travellers.

MONIALS left at the Office in reply to Advertisements, and strongly recommends that CIRCULARS ONLY should be sent.

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Extension Railway.—The Plant and Material will be on the site of the Extension of the Blackwall Line, by order of Mr. R. L. GOWER will sell by Auction, on WEDNESDAY, JULY 10, at TWELVE O'CLOCK, the CONTRACTOR'S PLANT: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

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TUBES.—Important and extensive line of Valleys, Railway
Wagon, Rail, Tubing, &c.
The works, Manchester-road, Millwall, on WEDNESDAY, JULY 10, at TWELVE O'CLOCK, the CONTRACTOR'S PLANT: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.

WALTER MITCHELL WILL SELL
BY AUCTION, in the PRAM-ES as above on MONDAY, JULY 10, at 11 o'clock, the following: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402,

high salary. Good draughtsman and accountant. - Address, A. Garrett, Office, Co. Chester.

The Builder.

VOL. XXIX.—No. 1483.

Architecture in Parliament.



HE little fight which took place in the House of Commons last week over the body of Mr. Barry suggested a point or two for comment beyond the question on which the debate, or dispute, immediately turned. Starting from the spirited defence of the ex-architect of the Houses of Parliament by Mr. Hope, the discussion subsequently assumed the form of an inquiry as to whether the money spent in decorating Stephen's Crypt (or "the vault," as Mr. Ayrton prefers to call it) was a justifiable, reasonable, or desirable expenditure. Such a discussion necessarily opens questions which have a general import and bearing on the duties of Government with regard to the architectural ornaments of the country. The decided and most absurd conflict of opinion among honourable and right honourable members, as to the value of the crypt and its decorations, arose entirely from the one-sided view of the matter adopted more or less by both parties to the debate. The mere restoration, and even decoration, of the crypt, as a monument of the finest period of Gothic architecture, would probably have been almost unanimously approved by the House. But the act of decorating and refitting as a place of worship has been, unintentionally perhaps, but almost unavoidably, identified with the ecclesiastical revival, which is by no means contemplated in an equally unanimous manner either in or out of Parliament. This identification was palpable in the discussion, not merely in the remarks, but in the very names of the speakers who took the onus of defending Mr. Barry and his work, and whose sympathies in connexion with the subject are publicly known. It was this tacitly understood connexion between the decoration of the crypt and the church revival which gave a certain effect to some of the strictures of the First Commissioner of Works, who suggested that perhaps some of the honourable gentlemen opposite "did not recognise the Reformation; that he recognised it, and the law of the land;" the remark was of course in reality not much to the point; but the ecclesiastical and ecclesiological bias of the defenders of "the vault" gave a convenient handle to Mr. Ayrton, of which he was not slow to avail himself. It is to be regretted that an architectural question of this kind should be mixed up with a question of religious party feeling; and we are the more inclined to regard this as the real point which divided the House, as we note with pleasure that a member so intimately associated with the modern "progress" party in the House as Mr. Sandella took the opportunity of protesting against "undue parsimony levelled against the ancient historical monuments of the country;" a protest for which he is to be thanked, and which sufficiently indicates the readiness of men of sense and education to forget party spirit in matters where the conservation of our national monuments, as things valuable in themselves and not to be willingly let die," is concerned. A

party of progress which is careless of its country's past will not be likely to do the best for that country's future. We may, we think, take to ourselves to relieve the mind of Mr. Dillwyn, who thought the restoration in question might be a very artistic work, but "doubted whether the country appreciated it." The whole of "the country" does not visit Westminster; but of the considerable number of persons who do visit the Houses of Parliament for the purpose of mere inspection, we will venture to say, arguing from what has come under our own hearing, that the majority regard the restored crypt as one of the most interesting and beautiful things to be seen in connexion therewith, and that many are more pleased with that than with anything they see there. We speak from what we have heard from persons not architects, and having no special architectural knowledge or bias. And, taking into consideration the fact that the crypt was in all probability originally decorated with colour, though perhaps less lavishly than it is at present, we cannot think that the mass of educated persons in the nation would regard it as a waste of public money to restore in its original state so beautiful a specimen of the great era of our national architecture, situated as it is in a neighbourhood which may be said to form the nucleus around which our history centres, even though it prove of no practical use whatever; if what is beautiful can be said to be of no "practical use." It is noticeable that the only speaker on the occasion who appeared anxious entirely to defend the First Commissioner and his proceedings was Mr. Melly, who thanked the right honourable gentleman "for the admirable manner in which he had filled his office and discharged the painful duty, imposed upon him by the extravagance of former officials, of restricting the expenditure of the country." We need hardly remind our readers that we have never joined in the vulgar abuse which has in some quarters been directed against Mr. Ayrton by persons who seem to imagine that in doing thus they are best serving the interests and dignity of the architectural profession, which the First Commissioner has not spoken of with the respect it deserves. But we are bound to express deep regret that the holder of an office which involves the care of the art-property of the country and of the architectural beauty of the metropolis, should so continually show his indifference to art and contempt for artists (if words mean anything), and are compelled to admit that his influence, where it extended, has certainly not been exercised in favour of the artistic and architectural improvement of the metropolis. This is perhaps the only civilised country in Europe in which such a post as that of Commissioner of Works would be assigned to any one who had made open profession of utter want of sympathy with art of every kind. Mr. Melly, however, is a "philanthropist;" he is honourably known for his exertions to ameliorate in many points the condition of the poorer classes; but he is one of the so-called "practical men," of benevolent mind; many of whom, if they had it all their own way in the world, would make it a most respectable, comfortable, and well-conducted world, but one too dull for any one but themselves to exist in.

We alluded to the mixing of ecclesiastical party spirit with the architectural question, the debate on which we have been criticising. That this was not the only kind of party spirit at work on the occasion might naturally be expected. When Mr. Cowper-Temple remarked that the economy of which the First Commissioner boasted in regard to the new dining-room "was secured by spoiling Mr. Barry's design," we read that there were "Opposition cheers,"—words which are significant enough. With many of the opposition, no doubt, the question was not so much interesting as an architectural one, but as an opportunity for getting one or two hits at a

member of the Liberal cabinet. It really strikes us as a thing much to be regretted that matters which, above all others, should be totally unconnected with party politics, which are equally of consequence to all parties, should thus be liable to be tossed about by changes of political administration. We are all equally concerned in the beautifying and improving of our public buildings, parks, and our chief city generally. Questions of art have no connexion with those of a Progressive or a Conservative policy. Why should their direction be influenced by these considerations? As it is, an able Commissioner of Works may have formed consistent and admirable schemes for public improvements, the direction of which may at any moment be taken out of his hands by a change of ministry, and his schemes overthrown or stopped half-way by some less able successor, with different ideas on the subject. It would surely be more satisfactory if the office of Commissioner of Works were made a permanent one, confided to a really able and suitable man, perhaps as minister for art generally, for a term of years, and who could be re-elected if desirable. If one ministry differed from another in its notions of expenditure on such matters, it would, of course, hold the purse-strings, and have all the control over the public works expenditure which it seems necessary for a Government to have. The office of Director of Public Works is one which requires special qualities and a special kind of education for its due fulfilment; and it seems anything but rational that duties of this nature should be liable to be turned over to a gentleman who may be perfectly unfitted to carry them out, but whose political ideas happen to coincide with those of the Ministry for the time being.

THE BUILDING ARTS OF RUSSIA.*

MARBLE enters very sparingly as yet into the composition of private buildings in Russia. There was an exhibitor from Moscow who had samples of marble work, the raw material being obtained in the neighbourhood of that city, and called Padolian marble, a grey species. The prices attached to the specimens were as follow:—Steps, per archine ($\frac{1}{2}$ yard) in length, 5 r.s. (12s. 6d.) polished, 4 r.s. (10s.), unpolished; landing slabs, per square archine, polished, 5 r.s. (12s. 6d.); plain, 3 r.s. (7s. 6d.). Window-sills, polished, per verahok ($\frac{1}{4}$ in.), 1d. The finer qualities of marble (raw material) are all imported, on which there is no duty. The working of stone in Russia is effected entirely by hand labour; but there is no doubt that with the increase of the material property of the country a demand will spring up for some of our machinery, which has been lately introduced for the above purpose. There is already one establishment at St. Petersburg where stone is dressed by machinery. The museum of the School of Mining sent to the exhibition specimens of jasper, porphyry, marble, agates, &c., in the raw state, obtained from Siberia; but these materials are as yet too expensive to be applied for architectural purposes, even in the houses of the most wealthy. Specimens of their application, on a large scale, for the above purposes (decorative architecture), are to be seen only in the imperial palaces, such as those of Tsarskoye-Selo, near St. Petersburg, where the interior offers enormous treasure and splendour. There are chambers of amber, mother-of-pearl, jasper, porphyry, and agate; colonnades of malachite, mosaic pavements, &c.

Notwithstanding the abundance of malachite found in the Ural Mountains, it is rarely to be seen in the shape of doors and mantelpieces, such as were exhibited in the London Exhibition of 1851. The price quoted for raw malachite by Mr. Demidof at the late Russian Exhibition was 125 r.s. per poood (1,030l. per ton).

No modern city can boast that it is so entirely composed of colossal buildings as St. Petersburg. The Winter Palace, for instance, has 6,000 inhabitants. In the Infantry Hospital several thousand beds are made up. In the Foundling Hospital there are many thousand children. There are single houses from which their owners

* See p. 497, ante.

derive princely revenues. The ground which is occupied by the Corps of Cadets forms a square of which each side is about a quarter of an English mile in length. There are other buildings,—such as the Admiralty, the Hôtel de l'Éat Major, the Gastinny Dvor and other markets,—buildings which occupy space enough for a small town. It was the custom formerly to build private houses, occupying an enormous area, no higher than two floors; but, with the increase of the value of land in the capital, high buildings became indispensable, so that they are now constructed from three to six stories high. The styles adapted at St. Petersburg for private and public buildings are varied. The building of a house in St. Petersburg is always done by contract, under the superintendence of a qualified architect, who is subject to the Government architect and surveyor, whose business is to watch the operation of construction. The erection of a house is a much more costly undertaking in St. Petersburg than in any other part of Russia. Provisions are dear, and the price of labour is always comparatively high. The building can only take place in the summer months, which necessitates the employment of an extraordinary number of workmen, who engage by contract for the whole term, when the wages are paid, the contractor providing lodging and food. As a rule, the houses are well built, with brick walls, a desideratum in a cold climate. The staircases are invariably of stone; and, considering the primitive nature of the tools and appliances of the workmen, the work is rapidly executed (the hours are from three in the morning till eight at night, out of which two hours' rest is allowed after dinner). The Russian trowel is only the size of those used by plasterers in this country, and of the same shape; and for the battering of the bricks a separate instrument is employed, somewhat in shape like a plasterer's hammer. The spade used is of wood, tipped with iron. Nearly all the wooden appliances are knocked together on the spot, such as troughs and barrows. Of the latter, the iron wheel and axle are the only parts which are carried from place to place. Ladders are also knocked up on the spot. The bricks are carried on the back, on a kind of stand, with carved arms, which rest on the shoulders; and the mortar is trodden with the feet, to the ruin of the boots of the poor workmen. This primitive mode of construction all adds to the cost of building in Russia. The introduction of appliances and machinery, such as proper windlasses, hoists, mortar mills, &c., would be of incalculable benefit, both to the workmen and employers, considering that building in the capital is always conducted on an extensive scale. One of the terms which is strictly enforced at St. Petersburg is the covering of every dwelling-house with stucco, which must be coloured, and kept in constant repair, as the climate acts very disastrously on the appearance of the houses. Almost every spring the stucco peels and tumbles off; and nothing has so disagreeable an effect as Corinthian or Doric columns which, in dilapidated buildings, expose in patches the red brick of which they are constructed. This is constantly to be seen in the provincial towns. Another feature of Russian architecture is the class of summer residences in the neighbourhood of St. Petersburg. Every one who can afford it leaves the capital for the summer months. The poorer classes resort to the villages in the vicinity, and the rich to the country-houses, called datchas. They are generally built on the banks of the Neva, and are of wood, in all manner of styles. Gothic, Italian, and even Chinese specimens are to be found, of the taste of all ages. Although they have generally cost enormous sums in the erection, and display much luxury, we should look in vain for the architectural grandeur of the Italian villas or the comfort of English country-houses.

One great characteristic of the Russian building art is church architecture, of which Moscow and the ancient towns Kief and Novgorod contain remarkable specimens of what is called Russo-Byzantine style, of which one of the chief features is the towers surmounted with the cupolas in the form of a bulb or onion, not unlike those of the pavilion at Brighton, on the top of which is a cross. With a general similarity in appearance, the form of the towers varies considerably, striking the eye by their irregularity and their diversity of colours and gilding. It is to this particular that Moscow owes its remarkable appearance. It would appear altogether that very little attention has been paid in Russia to the studying of their

ancient church architecture, or archæology, generally speaking, until quite recently, when the initiative was taken by a private gentleman, Mr. Prokhorof, who undertook on his own account the publication of a work entitled "Antiquities of Christendom and Archæology." It contains, among other things, etchings of interesting specimens of frescoes of the twelfth century from the Church of St. George at Staro-Ladoga or Ruric's Fort. Following in the footsteps of the above gentleman, the Moscow Architectural Society have despatched several of their members for the purpose of illustrating ancient Russian sculptural monuments, particularly in the ancient towns of Pereslavl-Zhlesky, Rostof, and Yaroslaf. Photographic views are to be taken of the exteriors of the churches, from parts which have been the least subject to innovation, and of the interiors. It is the intention of the society to form a gallery of these photographs, the first of its kind, at the forthcoming Moscow Technical Exhibition of 1872.

At the St. Petersburg Exhibition were to be seen some plaster casts of frescoes in the Russo-Byzantine style, together with a facsimile of the doors of an Ikonostas, or altar-screen, taken from the ancient church at Suzdal, which attracted much notice.

The church architecture of St. Petersburg differs from that of the old towns. It has neither so many nor so distinguished churches as Moscow, although the major part are built in a pleasing and tasteful style,—in the modern Russian, which is a mixture of the Grecian, Byzantine, old Russian, and New European architecture.

The St. Petersburg Exhibition, in an artistic point of view, presented far more important features than the Russian department at the Paris Exhibition of 1867. Not only separate articles, but whole groups of objects forming of themselves already complete and distinct exhibitions appeared here with characteristic and remarkable originality. Of these carvings in wood were particularly noticeable. The Russians are masters in wood-work, and a particular kind of artizans in the capitals, and, indeed, in all Russian cities, are the carvers in wood. It was to be expected that among the inhabitants of the immeasurable forest districts of Russia a peculiar dexterity in wood-carving would develop itself. The sculptors in wood in the towns are distinguished from the carvers of the villages, who devote themselves principally to the production of articles of domestic use; the former work to a very great extent at the ornamental parts of the interior of churches, where the Russians love to see pomp and splendour, for which an enormous quantity of wood-carving and gilding is required. For fine work the lime is chiefly used. Each workman, when engaged on a piece, has a drawing before him, working on a block of wood with chisel, knife, and hammer, and the dexterity with which he will form the whole figure from a flat picture is remarkable, considering how little he is indebted to any sort of instruction. In church decoration the most striking objects exhibited were the Ikonostas above mentioned. The Ikonostas is a high screen carved in wood and gilt, which separates the holiest of holies from the rest of the church, on which are represented images (paintings) of Jesus Christ, the Virgin Mary, the four Evangelists, and other saints. The drapery of these paintings is made in solid silver and silver gilt, raised and engraved. In the middle are the doors, or Tzar's gates, as they are called, which generally constitute masterpieces of the carving and gilding, of which a specimen was exhibited by a Moscow firm, beautifully formed of golden columns, and mixed and interlaced with vine-leaves and ears of corn, richly gilt. Part of an Ikonostas in oak destined for the Russian Church of the Trinity at Jerusalem was also conspicuous. The price of the whole Ikonostas was to be over 1,000*l*.

It is somewhat remarkable, that while various reforms are being introduced in Russia, modelled on those of Western Europe, a complete change has come over the taste in ornamental art. The Roman, Greek, and Italian French styles are being abandoned, and a purely national taste is cultivated. This was apparent at the Exhibition; in fact, may be regarded almost as a sort of fanatical patriotism, and a curious instance of this spirit was noticeable some time ago in the Stroganof School of Design, in Moscow (containing 200 scholars). In that school, the pupils who learnt landscape drawing, were to copy nothing but Russian landscapes. Those who studied flowers were to embody in their designs

Russian flowers only; while designs of a more complex character were taken from Russian illuminated missals, or other works of Russo-Byzantine art. With regard to the latter, a very interesting work has been published and executed in Paris, from the designs by the pupils of the above school, taken from Russian illuminated manuscripts, entitled, "History of Russian Ornamental Art, from the Tenth to the Sixteenth Centuries." This publication should claim the attention of our own designers and architects, as being novel, and the designs applicable to the ornamental art of this country,—the innumerable figured patterns and ornamentations shining in splendid colours, sometimes on a golden ground, with endless and varied plait work and geometrical figures of the most wonderful kind, all this in combination with leaflets, flowers, stalks, and twigs, and strangely intermixed forms of dragons, affording rich material for the artist and artizan. The Count Stroganof School of Design has already considerable influence on the development of native industry, and produces a large number of designers, who find ready employment in Moscow. A useful work has just been published, entitled "A Guide for making Russian Designs."

Besides drawings and plaster casts of ancient Russian architecture, there were exhibited by the same school very fine specimens of painting on china, delf, enamelled iron, flooring tiles, &c. In the department for wood carvings, there were some fine specimens of Russian woodwork, fretting, with curious carving, notably the kiosk, where Bibles were offered for sale, and the pavilion containing Mr. Tatishchev's collection of Russian woodwork, a case in the form of an izbonushka (a little izba), containing samples of mosaic, a garden pavilion, finished with a kind of wood tissue.

As to Heating and Lighting.—In general the Russian stove is a large, clumsy, oblong mass that rises nearly to the ceiling of the room, to which it is a disfigurement rather than a decoration. It is these drawbacks that have lately been noticed by Russian builders, and in some of the modern houses a kind of compromise has been effected between the Russian stove and the English fireplace, which, as regards cheerfulness, is certainly an improvement. English fireplaces, with marble chimney-pieces and fire-irons, &c., are occasionally imported, but the duty and expenses are too high to make them a regular article of traffic. The Russian stove as at present constructed, of white glazed tiles, is, doubtless, of Dutch origin, as the shape and size of the tiles is that which prevailed in Holland about two centuries ago; they are clumsy in appearance, heavy, and quite unsuitable for any kind of ornamental work. At the Exhibition some of these tiles were shown; white, at from 7 copeas (2*d*) to 15 copeas (5*d*), each; and of a red colour, 3 copeas (1*d*) to 6 copeas (2*d*) each. There is this peculiarity to be noticed in the glazed tiles manufactured in Russia: after being a short time in use the enamel invariably cracks all over, presenting a very unsightly appearance. There is another kind of Russian stove which is fast superseding the one just mentioned. It is of a cylindrical form, and is constructed of red brick, covered with sheet iron. It is cheaper than those constructed of glazed tiles, but does not retain the heat so well; and its gloomy appearance, and when the dark green colour with which it is generally pointed has been burnt and blistered, tends considerably to mar the total ensemble of the apartment in which it is erected.

The cooking stove or *plita* used in the capitals has now almost entirely superseded the old-fashioned Russian *pech*. The former is fashioned somewhat like our kitcheners, but they have this advantage that they can be approached from three sides; it consists of a thick iron-plate set in brick and glazed tiles, with baking oven,—taking it altogether it is a clumsy contrivance, and takes up a great deal of room. It is used for boiling, frying, and baking; appliances for roasting are not known except in a few of the elaborate kitchens of rich Russian gourmands. The *pech* is very much like a baker's oven, the whole arrangement being very primitive besides, consuming an inordinate quantity of fuel.

In the heating of a Russian stove, pine, fir, and birch wood are principally used; and it should be remarked that the embers play a most important part, for it is from the embers, not from the flame, that the stove is expected to derive its heat. So long as the wood continues in a blaze, whatever quantity may have been put in, the stove never gets thoroughly warm; it is only by means of the "viewshka," a sort of double

fine plate, that the passage from the stove into the chimney has been hermetically closed that the heat begins to be sensibly felt in the room. The Russian stove-heaters are extremely dexterous in all the details of their occupation. Tongs and shovels are unknown to them. Their only instrument is the "kocherga," a long iron poker, with a hook at the end of it. With this they keep up stirring the fiery mass, break up the embers, and pull forward the fragments of wood that are still burning, in order, by exposing them to a current of air, to accelerate their conversion. In every great house there is at least one servant whose exclusive duty is to look after the stoves, and he collects and prepares the requisite fuel. In general he builds up a pile of logs within each stove the evening before, that the wood may be well dried, and then he sets fire to it early the next morning, using for that purpose the tarry rind of the birch. If the "viewshka," or damper, be closed before the wood be completely burnt into embers, a poisonous gas is emitted by the coals, and fatal consequences may ensue to those who are exposed to its influence; the blue flame hovering over the bright embers is therefore carefully watched, and not until it entirely disappears is it considered safe to close up the stove. Accidents do occasionally happen, and it is nothing uncommon in Russia to hear of people who have been suffocated by the fumes of their stoves; but when the immense number of these stoves is taken into consideration, and that every floor and every part of the house has to be heated at least six months in the year, it must be admitted that accidents occur but rarely, and that an admirable degree of care is displayed in thus always selecting the proper moment for closing the "viewshka."

The attention of Russian specialists has lately been directed towards the discovery of means of effecting economy in fuel, which is an important and expensive item in every Russian household, the reckless manner in which woods have been destroyed causing no little anxiety concerning the future supply. When we consider that the winter lasts six months, and that, at St. Petersburg, where the climate, although somewhat modified on account of the proximity to the sea, the thermometer, in winter, often points to 55° of Fahrenheit, the imperative necessity for an improved state of things in this department is self-evident. At the Exhibition was shown a stove built, or rather cased in glazed tiles, with hermetical doors, adapted for burning coals, instead of wood,—a decided improvement. The price was 115 r. s. (14l. 7s. 6d.). Other stoves of the same kind were exhibited by a maker from Finland, for burning wood, at from 32 r. s. to 92 r. s. (4l. to 11l. 10s.). Each. Iron stoves, of various other constructions, were also shown; but it would appear that in no instance was it demonstrated that the main object had been attained,—the economy of fuel. There were steam-heating apparatus, hot-water apparatus, priced respectively 80 r. s. and 75 r. s. (10l. and 9l. 7s. 6d.); iron stoves, plain and ornamental, from 50 r. s. to 275 r. s. (7l. 10s. to 37l.); hermetical doors, iron, per pair, from 10 r. s. to 15 r. s. (1l. 6s. to 1l. 17s. 6d.); and frame of brass, from 22 r. s. to 30 r. s. (2l. 15s. to 3l. 15s.). As a novelty, may be mentioned a portable heating apparatus, heated by means of a "pulverising lamp," the latter consisting of an adaptation of the principle of the "pulveriser" used by hair-dressers, in which the minutest particles of liquid fuel are consumed, a blast being produced by means of an air-pump, which forms part of the apparatus. The merit of this invention consists in the celerity with which water can be boiled,—in two or three minutes.

Ventilation.—This essential condition of the sanitary economy of buildings has been ever neglected in Russia; and it is only lately that efforts are being made towards providing for this desideratum. It should be observed that the houses in Russia as early as October may be said to go into winter quarters. Double windows are affixed to every room; every aperture through which a little air might find its way is carefully caulked with tow, and then filled up with putty, or pasted over with slips of paper. Here and there a window is so constructed that a single pane may now and then be opened to let in a little air. In this close and confined atmosphere the family live and have their being till the returning May showers in the warm weather, and gives the signal that fresh air may again be permitted to circulate through the interior of the house. The Russians have a saying,—"*Par kostay ni lomit*,"—literally

"Steam does not break bones," meaning that heat cannot be injurious. This conviction is perhaps the reason why a temperature of 15° Reaumur (88° Fahrenheit) in the bedroom is in no way considered excessive or injurious. There can be little doubt that the lassitude and prostration often experienced during a Russian winter, notwithstanding the invigorating effect of out-door drives or walking exercise in sharp frosts, is attributable in no small degree to the excessive heat of the rooms and the insufficient ventilation. The only ventilator in use, a sort of Archimedian tin fan-wheel, in a case which is fitted into the window or flue. Among the appliances for heating, calorifiers erected in the basement of large houses, with a system of flues, have to some extent been adopted in the capital, but it is a question whether they are sufficiently economical to be applied for general use. The Gurney stove has found some favour in some of the larger establishments of the city. Here there is a wide field open for our countrymen. An invention that would combine economy of fuel with efficiency as to heating would be sure to meet with an enormous patronage all over the empire.

Like all large cities of Europe, the capital of Russia has introduced gas for lighting purposes. Three ineffectual attempts were made to light St. Petersburg with gas before the establishment of the present two companies. The first was during the reign of Alexander I., when, just as all arrangements were complete the buildings caught fire, and the plan was abandoned for some years. The second attempt was made after the accession of the late Emperor Nicholas. The high and ungainly building intended for the gas-holder was injudiciously placed near the Winter Palace, and formed so prominent a deformity that the emperor was glad, in 1838, to buy up the whole of the premises belonging to the company, for the purpose of pulling them down. The company then went to work again, and in the autumn of 1839, when people were beginning to look forward to light streets in winter, the whole illumination was opened and closed on the same day by a frightful explosion, by which the gas-holder was destroyed, a number of people were killed, and the money of the shareholders was lost. Shortly afterwards, gasworks were erected in the suburbs by an English firm, which was a complete success, and has continued so up to the present time. It is only recently that another company of the same kind has been formed: the work was also executed by an English firm. The coal is imported from England, and the price of gas per 1,000 about 10s. 6d. It must be admitted that the streets of St. Petersburg, wherever gas has been introduced, are better lighted than they are in London; the number of lamps is greater in a given distance; the burners and quality of the gas is better; the lamp-posts, also, better finished, and certainly ornamental, when compared with the regulation pattern of our metropolis. Gas does not find its way so readily inside the houses: it is confined entirely to the yards, staircases, &c., except in public establishments, shops, hotels, &c., where the fittings are always of the roughest description. Glass globes are never seen on the chandeliers. A short time ago an English company was formed in London,—the Moscow Gas Company,—who undertook the construction of works in that city. More than 40,000 lamps have already been erected. All the large factories and works in the neighbourhood of St. Petersburg have their own gasworks, and they have been introduced in the interior establishments of the same kind, as well as on manorial estates. England supplies nearly all the work.

From lighting we naturally come to paving. The ever-increasing traffic in the capital of St. Petersburg, has called for improvements in paving. Until now almost the only paving-stone known is the common boulder. Many trials have been made to substitute for the old material iron, asphaltum, granite blocks, macadam, resulting more or less in failures, owing to the action of the frost; as an exception, perhaps, may be taken the wood pavement, which consists of sexagon blocks laid on to 2 in. tarred planks, and secured together by wooden pins, tar being used as a cement. Over this the carriages roll as smoothly as on a tramway. This kind of pavement, however, has only been adopted in some of the principal streets, and necessitates constant repair, owing to the watery soil. The paving of the capital falls to the lot of the house proprietor, who is bound to provide the same opposite his house, and keep

it in order. Even the common pavement is dear, notwithstanding the low cost of labour, and of the material which is gathered in the vicinity, on the coast of Finland: it requires constant repair, owing to the marshy nature of the soil. The winter roads serve to mitigate the punishment inflicted on the traveller in the St. Petersburg streets. Nature has provided, by means of snow and ice, a more convenient road for man and horse than any that art has been able to construct; it is astonishing to compare the wear and tear of a sledge with a wheeled vehicle.

Latterly the introduction of tramways for the conveyance of passengers along the principal streets has proved a boon to the public of St. Petersburg, as well as a commercial success, and is likely to meet with considerable extension. The rails and some of the carriages were ordered from this country. Tramways have also been introduced for conveying goods from the quays to the custom-house.

Iron, as applied in this country for various architectural purposes, such as girders, house-railings, large bridges, &c., is but very little used in the capital, and consequently in all other towns, as an exception, may be taken the railings of squares and gardens. At the Exhibition there was only one girder exhibited by a Government establishment. The northern side of the Summer Gardens of St. Petersburg is celebrated for its iron railings with its fanciful garlands and arabesques, which, people say, an Englishman once travelled all the way from London to see, and make a sketch of, and then returned, satisfied with his journey, not deigning to cast an eye upon any other monuments of the city. However, it is a very elaborate specimen of iron-founding, and scarcely to be equalled anywhere.

There is only one iron bridge over the Neva,—a very fine sample of modern engineering. Another iron bridge is wanted further up the river, and plans for the same have already been submitted to the authorities. The communication between the two banks of the river is kept up to a large extent by means of pontoon bridges, one of these being three quarters of a mile long.

In a sanitary point of view, St. Petersburg, and, in fact, all Russian towns are in a deplorable condition. Drainage is unknown in the capital, except in the immediate vicinity of the river, which is a serious matter for a town containing something like 700,000 inhabitants, and which is proved by the chronic prevalence of Asiatic cholera. The houses, as a rule, are veritable whitened sepulchres; the effluvia from the latrines and dust-holes is horrible. The general and special smells of St. Petersburg in the spring and summer are hardly to be matched in any part of Europe. It is only within the last few weeks, on the outbreak of cholera, that stringent measures have been taken with a view to mitigate the evil to some extent by imposing fines upon the landlords. But all this is useless; and until a proper system of drainage is introduced, matters are likely to remain much in the same condition.

Some few years ago waterworks were established. Until then all the water had to be carried in huge casks from the canals and river. It would appear, however, that comparatively few have availed themselves of the luxury of Neva water brought into the houses, the supply being confined chiefly to the streets, where several public fountains have been erected, from which the houses in the vicinity are supplied.

With the extension of the system of railways the towns of the interior are beginning to wake up also. Finding a necessity for a constant and uninterrupted supply of water, they have introduced waterworks, for instance, in the towns of Vladimir, Saratof, Kharkof, Nijoi, and Novgorod. The construction of these establishments in Russia affords many facilities, on account of the numerous rivers, and at the same time great difficulties, owing to the action of the frost upon the pipes if not sunk sufficiently deep. The important town of Odessa is only now beginning to adopt the present system of water-supplying. Situated in a locality where there are neither springs nor rivers, it has until now depended entirely upon well, rain water, and a brackish water supplied from an aqueduct yielding about 300,000 gallons daily.

Among the innovations at St. Petersburg is the appearance of water-carts on the English principle. Appliances for gas-lighting and drainage were not shown at St. Petersburg Exhibition of 1870.

LITERATURE AND ART FROM THE DAYS OF QUEEN ANNE.*

LOOKING back, cursorily, upon the literature and art of Great Britain since the Norman Conquest, despite the complimentary title of Augustan Age conferred upon Queen Anne's reign, we should be inclined to declare that art, at all events, was never as so low an ebb before as at the commencement of the eighteenth century. Never, we should be inclined to assert, was British art so thoroughly undervalued or ignored, if not frowned away altogether, in the welcome of foreign importations, as in the early days of the House of Hanover. Art, in all its phases, it seems to us, was then as artificial in its aspect as the white-powdered hair of the beaux and belles. We turn to the country churches of that period, and find them little more than brick or stone boxes. We think of the gentlemen's houses of that date, and remember they were lean and hungry attempts to look Classic. There were no sculptors of higher attainments than those who executed the figures on Temple-bar. The painters practising in England were foreigners. The men whose portraits they painted wore pig-tails. Thinking of the costume of the day, we call to mind that womenkind, at least, affected, besides white hair, a false stature by means of cushions on their heads, and heels to their boots of several inches in height; and stuck patches on their faces,—not to hide blemishes, but to display such eccentricities in the forms of these patches as tiny outlines of carriages and horses and similar unaccountable objects. There was no National Gallery; there was no British Museum; there was no Royal Academy. Nevertheless, this barren period in the history of British art has now found an historiographer; and, what is more remarkable still, by dint of association with work executed before this time, and a gradual lead, or progress, up to the art of the present century, he has contrived to remove from this uninviting, sterile time much of its reproach. Perhaps it is because Mr. Graham, the historian in question, makes such good play with his best card—literature—that we do not feel the poverty of the rest of his hand so much as we might do.

Doubtless, in the matter of literature, Queen Anne's reign was Augustan; but Caesar Augustus, we are told, found Rome built of brick, and left it built of marble. Hence, architecture must have been in his every-day thoughts as much as the companionship of Cicero. We may be sure, judging from the testimony of the literary men of Queen Anne's time, that both the sovereign and her chief subjects entertained but one idea on the subject of English architecture and art generally, which was a conviction that they were utterly beneath notice, and incapable of cultivation into more worthiness. Addison, writing from Italy to Lord Halifax, declared that other countries might excel in architecture and painting, but it was Britain's particular province to watch over Europe, maintain the balance of power, and threaten presumptuous kings with war. Only portrait-painting seems to have been in any esteem; and this preference was due to personal affection, rather than to intellectual taste. Pope, writing to Richardson, on the day of his mother's death, to come and sketch her face before the "winter flower" faded, spoke of portrait-painting as "that obliging art." Towards the close of the century, however, matters had changed; for music, which Dryden called inarticulate poetry, was languishing in the favour of the wealthy, and painting rising in esteem. Goldsmith makes the citizen of the world write to Pam Hoam, first president of the Ceremonial Academy at Pekin, thus:—"Painting is now become the sole object of fashionable care: the title of connoisseur in that art is, at present, the safest passport into very fashionable society: a well-timed shrug, an admiring attitude, and one or two exotic tones of exclamation, are sufficient qualifications for men of low circumstances to carry favour. Even some of the young nobility are themselves instructed in handling the pencil, while their happy parents, big with expectation, foresee the walls of every apartment covered with the manufactures of their posterity." But he has another rub for art-patrons, whom, upon the supposition of the difficulty of serving two masters, he may have looked upon as scornors of literature. The Citizen of the World is passing through a picture-gallery, when the owner of 1.

points out an indifferently-executed painting as the best there. He asked where the beauties lay, and was answered, "Sir, the merit does not consist in the piece, but in the manner in which it was done: the painter drew the whole with his foot, and held the pencil between the toes. I bought it at a very great price; for peculiar merit should be ever rewarded."

Mr. Graham pencils in his sketches of the history of literature, architecture, painting, and sculpture, with a due regard to the well-known boundaries to which we have alluded. Literature is restricted to history, biography, fiction, poetry, the drama, periodical writing, essays, epistolary writing, voyages, and travels, leaving out of question philosophical, theological, political, and scientific works. The disproportion in popular estimation, in the last century, between literature and architecture, is evident in the amount of space devoted to each by the author. Literature is treated at length in two hundred and thirty-six pages, while architecture is dismissed in thirty-two pages. Painting, however, pervades a hundred and forty-three pages; but this good measure is somewhat neutralised by the brevity with which the sister handmaiden, sculpture, is treated. Scarcely more than forty pages are devoted to the British School of Sculptors, although it is traced from the day Sir Joshua Reynolds handed the first gold medal awarded by the Academy for sculpture to John Bacon, for his bas-relief of *Æneas* escaping from Troy, to that on which her gracious Majesty sat to John Gibson for the group, in the Princess' Chamber, in the Houses of Parliament. The productions of living authors are excluded, experience having proved, Mr. Graham thinks, that the "oscillations of opinion and taste require a few years to steady themselves." The paucity of information concerning architecture in the early days of the House of Hanover is the result, of course, of the barrenness of the land. Sir Christopher Wren and his pupil, Nicholas Hawksmoor, had engrafted a taste for Palladian architecture, of which Sir John Vanbrugh availed himself. James Gibbs, Colin Campbell, and William Kent carried it on. Sir William Chambers, Sir Robert Taylor, Robert and James Adams followed in the track they helped to widen out.

Neale's "Views of Country Seats," commenced in 1818, show, for the county of York only, twenty-three mansion-houses in the Palladian style, twelve more of Elizabethan mixed with Italian details, and three of modern Gothic. Italian façades were at first supplemented by Italian gardens adorned with architectural objects, fountains, balustrades, vases, and statues; but as time passed on fashion decreed that natural or English landscapes should supplant this artificial mode of treatment; and the celebrated Capability Brown was the instrument of the change. Meanwhile, attention was being turned, by architects, to pure Greek architecture instead of Palladio's version of the Roman manner of rendering it. In 1761, James Stuart and Nicholas Revett, aided by the Dilettanti Society, published the first of their volumes showing the monuments of Athens; and henceforth it became imperative for architects to study in Greece. The difficulties to contend against in the adoption of pure Greek plans, the ability shown in their adaptation, and the public appreciation of the classic mode of building, are described by Mr. Graham. Of the numerous edifices he enumerates, he gives the plan to St. George's Hall, Liverpool, as the only British example of Grecian art that can be mentioned with as much praise as the church of the Madeleine, Paris. He quotes, we may add, the park front of Bridgewater House, London, as one of the best of the recent façades in which the classic style has been used without a portion.

On the Gothic revival, Mr. Graham gives a pleasant if superficial chapter. He points out that it was Sir William Chambers who gave the earliest recognition, in modern times, to the merits of Gothic architecture, especially in the matter of construction. In his "Treatise of Architecture" he deplored that the dilettanti should waste their means in importing gleanings from Greece, and that the antiquaries of the day were content with publishing loose sheets, instead of encouraging persons, duly qualified, to undertake correct delineations of our cathedrals and other buildings called Gothic, before they fell to ruin. A publication of this kind, he urged eloquently, "would be of great service to the arts of design, preserve the remembrance of an extraordinary style of building now sinking fast into oblivion,

and at the same time publish to the world the riches of Britain in the splendour of her ancient structures." Horace Walpole did not wait for any of the publications that soon followed this indication of a market, before he commenced his villa at Strawberry Hill, and consequently he worked in the dark as to the true principles of the style. Architects, too, began to build Gothic designs in casual ignorance and similar unsatisfactory results. As Mr. Graham states, "in many parts of the country Gothic castles arose, uncomfortable as dwelling-houses, and unworthy of the name of fortified places; country squires erected priories, and London citizens rusticated in little Strawberry Hills." And then the author relates the appearance of the works of Britton, Pugin, Rickman, and others, and the effects they produced. If an expression of any bias can be discerned in favour of either Gothic or Classic architecture in this chapter, we should be inclined to believe that Mr. Graham thinks the Classic style admissible only in well-sheltered parks in the southern counties of England and Ireland; but that the Gothic style may be appropriately used in any portion of the United Kingdom.

Foremost, in the chapter on British painters, stands the name of Hogarth. In its introductory remarks, Mr. Graham ascribes equal originality to Sir Joshua Reynolds and Richard Wilson, as all striking out new paths for themselves; but he gives, as we have remarked, the first place to Hogarth. Sir Joshua follows, with his splendid *chaises* of sitters, his addresses, discourses, presidency of the Academy, delightful friends, and general good luck. Then pass across the page the other principal exhibitors during the first years of the Royal Academy,—Gainsborough, West, Dance, Barrett, and Angelica Kauffman. Romney never belonged to the body, and so falls into a lower place than he would do but for this accidental isolation; for, admits Mr. Graham, not only now, but in Sir Joshua's lifetime, Romney's pictures were highly valued by those who possessed them, and considered equal to those of Reynolds and Gainsborough in dignity, simplicity, and colour; and we know that Cowper and the Della Cruscanes extolled his works in the warmest terms. Wilson, Morland, and James Ward are next marshalled and scrutinised. Then we look through Stothard's works in company with the author, turning over his designs for broaded silks, and his illustrations to books, before we get to his pictures. Some prominence is given to the art of William Blake, which the writer finds to be so peculiar and unique as to be most difficult to describe. West, too, is accredited with the full merit of the revolution he wrought in art by means of his delineation of the figures on his canvases in modern dress instead of Classic costumes, and Sir Joshua's conversion to the wisdom of the practice is mentioned. But notwithstanding the service West rendered in this respect, and the royal favour he enjoyed for thirty years, the oscillations of opinion and taste, for which Mr. Graham has left such a wide margin, have made and havoc with his artistic repute. But he was the second president of the Academy, and thus comes chronologically into more prominence than would be otherwise accorded him. Copley, James Barry, John Hamilton Mortimer, the brothers John and Alexander Runciman, Fuseli, Northcote, and Opie, are the historical painters selected to bring up the rear; and Sir W. Beechey, Hoppner, Owen, Phillips, Jackson, Sir T. Lawrence, Sir Martin Shee, Sir H. Raeburn, Sir J. Watson Gordon, and Graham Gilbert, figure apart in a special chapter on British Portrait-painting. But this by no means exhausts the category: a chapter on later British Historical Painters points to the works of Haydon, Etty, David Scott, Sir D. Wilkie, Sir C. Eastlake, Sir W. Allan, Thomas Dancau, Dyce, and Macdise; another includes references to the pictures of life and manners by Mulready, Newton, Leslie, Egg, Müller, and John Phillip; and in another we are shown the landscapes of Constable, Turner, Collins, Bonington, Sir W. Calcott, Martin, Danby, the Nasmyths, Thomson of Daddingstone, McCulloch, Roberts, and Stanfield. We cannot agree with Mr. Graham, however, that the time has not come for a history of water-colour painting. If we are to have facts instead of conjecture, there will be no time equal to the present. The further we are removed from the first professors of the art the greater will be the difficulty of tracing their progress.

Nollekins, Bacon, and Banks lead off the little procession of British sculptors. Mr. Graham has not aimed, we must bear in mind, at bringing

* "An Historical View of Literature and Art in Great Britain from the Accession of the House of Hanover to the Reign of Queen Victoria." By J. Murray Graham, M.A. London: Longmans, Green, & Co. 1871.

light new facts in their lives; consequently, we must be satisfied if we find, with easy reference, the chief works for which they are well remembered. Hitherto, he infers, we should have to consult many a scattered notice to obtain a fair knowledge of what has been done in this as well as in other departments of art, which inconvenience he has endeavoured to remedy. We should not complain, then, if his work were not more than it purports to be,—a classification and condensation of facts connected with modern British literature and art. But he has been, over and above, little darts and flashes of criticism, for which people with no particular bias in their own on the subjects under consideration may be glad. As a rule, the opinions he expresses are those current in well-informed circles. Flaxman rightly occupies a high place in his regard. Eastmacott, Chantrey, Behnes, are also mentioned with great praise. Of the later British sculptors, Wyatt, Musgrave, L. Watson, Josephs, Mills, Peck, Gibson, Spence, Munro, and Macdowell are selected for commendation. On the subject of State-patronage of sculpture, to meet the difficulty of the great expenditure of capital and skilled labour that is involved in sculptural works before there is scarcely any marketable sale, Mr. Graham thinks that it may lead its way with considerable effect. Sculptural work, on a large scale, is so far beyond the means of private individuals that a general recognition of the need of State-patronage is considered by any thoughtful persons as desirable; but all is not smooth even when this is the case; and impartiality, on the one side, and discerning discretion on the other, will still be required. Although Mr. Graham handles literature more easily than he has depicted art, we miss a branch of it that is eminently worthy of notice, as characteristic of our own times. We allude to the establishment and maintenance of periodicals devoted to the spread of art-teaching and intelligence. A century ago the nearest approach to anything of the kind were the addresses and lectures of the Academicians. These powerful inventions of modern times for the promulgation of art, are surely of significant interest, and could have been mentioned in a history of literature and art brought down to the reign of Queen Victoria. As far as it goes, however, Mr. Graham's book contains a series of agreeable, truthful sketches, but sketches only.

AN ENGINEER'S IDEAS OF THE PROPER SITE FOR HOSPITALS.

The experiences of the late war in France and Germany have amply proved the evils of crowding the wounded together in masses, in great buildings in or near towns, merely because such buildings are to be had ready to hand and are only to be taken possession of. The objections to this, however, apply with almost, if not with as much force to what we deem a radical mistake, namely, the maintenance of great civil hospitals in the very midst of our huge, densely-crowded, and unwholesome cities.

The practice here began just upon the same pie-hazard basis as the making convents, churches, and stores into hospitals for the wounded. What brought our great Guy's Hospital to be set down in one of the most unhealthy spots in London, close to the Fleet Ditch and to the stench of Smithfield, and even now close to a great meat-market? Neither choice nor necessity, but simply that there pre-existed a decayed monastery, emptied of its lazy and useless inmates. What so easy as to make its big buildings available for the nobler purpose of a hospital.

And the same sort of antecedents applied to St. Thomas's, the City of London, the Middlesex, and to scores of our provincial hospitals. In those days there were few or no medical statistics, the idea of hygiene, and civic population was not packed up, herring fashion, as it is now. Moreover, travelling was for the healthy and vigorous only, and was a matter of labour and expense; there were no railways,—not even stage-coaches,—and at the date of the foundation of St. Thomas's, little locomotion except on horseback or on foot.

Nowadays, however, with the means on hand everywhere of getting miles away from City stinking and smoke in a few minutes and for a penny, we hold it as almost axiomatic that all our great hospitals should be in the open country, never within the miferiferous air of our crowded towns. For accidents, for sudden attacks, for everything standing in need of

instant surgical or medical aid, there must always be a certain amount of hospital accommodation within the dense area of our cities. This, however, should, as far as practicable, be confined to the above cases, and to receiving-houses, for the examination and classification of patients.

Every such establishment should be in direct communication with a line of railway coming into the premises, and going to the great hospital established several miles away in the country. Three or four trains, composed wholly of properly-constructed hospital-carriages, classified for accidents and the wounded, for contagious diseases, &c., should go and come each day, and, of course, the civic and the rural ends of the system should be in telegraphic communication. We cannot afford space to enlarge as we might on the working of this new hospital system; but we will venture to affirm, that by thus putting every possible patient out of impure, and into pure and wholesome country air at once, the average saving in time occupied for the recovery of every case, and therefore the abridgment of expense, proportionate to time in hospital, would soon prove, not only that this more expensive plan (as to outlay) was the cheapest in the end, but that it economised life itself even more than money. A large percentage of the civic population which crowds our city hospitals now, and only leave them walking ghosts, after needlessly prolonged confinement to the enervating atmosphere of the intramural ward, or never leave but when carried forth corpses, would quickly regain health and strength under the vitalising air of the country and the effects of treatment and good food combined with it.

If these views be well founded, or even partly so, can any more extravagant mistake be conceived than the planting down our newest and latest, our architecturally most pretensions, and in magnitude and funds, we believe, almost greatest of our London hospitals, the new St. Thomas's, upon the very edge, within 50 ft. of the turbid, and always of necessity to be more or less foetid, waters of the Thames, and, in point of level, not 10 ft. above high tide level?

In a tidal estuary, too, in which from the relations of temperature of the waters to that of the air and of its dew point, fogs must in spring and autumn be for ever inevitable; and where these not only obscure the vitalizing effects of light from the sick, but coming loaded with soot, putrescent dust, smoke, and sulphur compounds, as well as ammonias, are mortal to many pulmonary patients.*

One block out of the whole of this grandiose pile at its present site, as an instant-case hospital and receiving-house, with its line of railway joining the London and South Western, and all the rest of the architectural grandeur abandoned for plain useful hospital buildings some miles out of town, would, if we allow for the enormous difference in the value of the civic and for the rural sites, have proved as little costly in outlay; and, we shall not repeat, have been a far more potent and efficacious instrument for the recovery of the sick.

But the objections, no doubt, will at once be made,—Where is your staff of physicians and surgeons to be found,—how are your medical students to be taught,—if you thus move your great hospitals into the country? And we simply reply,—Move them too; and those of the staff that will not or cannot move by reason of their existing civic practice, let them move out of the way.

The great country hospital should be, in fact, a great medical and surgical college complete in itself. The hospital staff should be its professors, whose sole business in life should be to minister to the hospital and to teach the attendant medical students in such things as, by clinical instruction alone, they can be taught.

* The subjoined has appeared in the *Times* of the 28th of March, 1871. The "arsenical fumes" are imaginary; at least, there is no more arsenic in the coal burnt at Lambeth potteries than in London house-fires. The volumes of smoke weekly, as the kilns are being ignited and fired, are, however, a reality; and so is the prevailing south-west wind that must for ever send them rolling right over the entire length of St. Thomas's Hospital.—"The *Lambeth Potteries*—A surgeon writes to complain of the dense volumes of smoke rolling northwards from the Lambeth potteries over Lambeth Palace and St. Thomas's Hospital, occasionally almost obscuring those buildings from view. This so-called 'smoke' is, our correspondent says, for some reason, more dense on Fridays than on other days, and consists largely of arsenical fumes, which tend to irritate and wither up every living thing with which they come into contact. It is, he thinks, clearly the duty of the Metropolitan Board of Works to take whatever steps may be necessary to change this state of things."

All the preliminary knowledge, such as natural history, botany, chemistry, anatomy even, can be just as well taught in one place as in another; and in place of having professors of *all those* things attached to every great hospital, as now, this, and much more like it, should be taught in our colleges and universities.

With all that intellectual ballast already on board, then, let the medical student go to his hospital study and practice. Need we say that the hamlet of quiet lodgings for these young men that would necessarily establish itself in close proximity to each of these great country hospitals, with gardens and green fields beyond, would form a far healthier moral atmosphere, and one more conducive to study, than the vulgar fast life to which almost the necessities of city dwelling now tempt, if not compel, the medical student.

The real objection, or rather the real difficulty, that for long will probably hinder this obvious movement is vested abuse and vested interest. Great names on brass plates, in well-known medical quarters of the town, with reputed or real vast private practices, could no longer parade themselves as consulting this, that, or the other, to such and such big hospital. Private-practice surgeons or physicians must remain such. The hospitals should deal alone in realities, and possess absolutely and in truth their own physicians and surgeons, each staff with its great and eminent names, and all paid amply and adequately. Put an end to pluralism, titularity, pretension, and too often real neglect, on the part of the "big-wigs," while the obscurer man, who is carefully kept in *chiar' oscuro*, does the real work.

If such establishments, radiating by rail from all our great towns, were in existence,—every one, therefore, in the whole kingdom intercommunicating directly by hospital-train,—what an almost boundless resource would they not afford, in the event of our island being invaded, for the relief of the wounded; and what a vastly-enhanced power would be given to the healing art, if all these hospitals scattered over the land from north to south, were so affiliated in mutual understanding and support that any patient might be sent from any one hospital to any other. Thus, one whom a southern climate might just save from consumption, or death by bronchitis, might be sent from the piercing east wind of our northern and eastern counties, or the poor city-exhausted worker in the south might get new nerve under the bracing air of the Yorkshire or Lancashire woods.

The system of the railway "clearing-house" points at once to the means by which the mutual adjustment of accounts might be effected amongst all the hospitals for such interchanges of patients.

Wasted power is almost the characteristic of all we do as a nation. It is evident enough,—painfully so, too often,—in all that relates to the charitable relief of distress and the alleviation of sickness, or accident to health or limb. But a dogged adherence to customs and methods, when once established, is also one of our great national traits; and upon this latter ground we entertain but little expectation that, however soundly based what we have suggested may be, it is likely to be acted on,—though quite possible that it may call forth specious objections, ridicule, or such other weapons of controversy as are commonly employed by those who have the pudding, if not the truth, on their side.

ROBERT MALLEY, F.R.S.

INDIAN PRODUCTS AT THE INTERNATIONAL EXHIBITION.

The attractions of the International Exhibition will be increased, within a few days, by the addition of a new court, containing specimens of the products of India. The Indian Government did not fail to respond to the invitation of the Council of the Exhibition. Their contributions, however, were unavoidably late, and proved to be so large as to require separate and independent accommodation. The energy of Dr. Forbes Watson was equal to the emergency, and six weeks have been employed in the construction of a hall, with a series of side chambers, which are now being filled with Indian objects, and which, by novelty of arrangement no less than by splendour of contents, will form a striking feature of the Exhibition. There is no portion of the world of which the industrial products have a more weighty claim on the attention of England than our Indian Empire. The patient, enlightened,

munificent exertions of the Indian Government to popularize information on the subject have not been by any means duly appreciated. The India Museum, which is freely open to the public in a gallery in the new public buildings at Westminster, is one of the most complete and interesting exhibitions in the metropolis. The object of these displays is twofold. First, they point out to the English purchaser the source from which he may procure many objects of splendour, of curiosity, and of utility. Secondly, they show to the English producer what are the tastes and demands of tens of millions of possible purchasers. If the English manufacturer, instead of endeavouring to force articles of European design on the Indian market, will only take the trouble to learn what the dusky natives really require, and will then bend his effort to produce, by the aid of steam machinery, articles in accordance with their actual tastes and stereotyped habits, he will open a new and most remunerative field. In this case we shall have no more "gluts in the market." It is not over-production, but uncalled-for and inappropriate production, which checks the sale of English cargoes in India. It is, therefore, a matter of no trifling importance to our commerce and manufactures for those who cater for the public to become intimately acquainted with the actual products of India. We welcome the new court about to be opened at South Kensington, not only as a new feature in the Exhibition itself, but as a means of directing further attention to the parent and permanent exhibition at the India Office.

THE LATE M. TEXIER.

THE archaeological world has sustained a great loss in the death of M. Texier, one of its most distinguished members and one of the most amiable of men. M. Texier was born at Versailles in 1802, and was educated as an architect. In 1825 he was made "Inspecteur des Travaux" in Paris, and in 1826 was intrusted with the restoration of the ancient triumphal arch at Rheims. In 1827 the Minister of the Interior employed him to examine the harbours of Fréjus, in the south of France, known to the Romans as Forum Julii, and also Ostia, the port of Rome, in order to ascertain whether the level of the Mediterranean was the same in the ancient times as it is now. For these researches M. Texier received the first gold medals given for the study of archaeology in 1831 and 1832.

In 1833, he was sent by M. Guizot, Minister of Public Instruction, to explore Asia Minor. The results of his first expedition were the determination of numerous sites of ancient cities before unknown. Amongst others, of the city of Pessinus, which is the key to the geography of Asia Minor, and of the town and sculptures of Perium, at Boghaz Keui. His second expedition was directed to the southern coast, and while engaged in it he had the protection and assistance of a French ship of war, and during it he explored the ruined cities of Lycia and Pamphylia. His third journey commenced in 1836. His object this time was to cross the peninsula from Tarsus to Trebizond, following the course of the Euphrates. On his return to Constantinople, the Sultan decorated him with the order of Nishan Itikar, in recognition of his services in aid of geographical science.

When he reached Paris, to repose awhile after his arduous labours, the Chamber of Deputies voted a sum of 4,000*l.* for the publication of the results of his expeditions (which appeared in three folio volumes, with engravings from his drawings by the first engravers of Paris, under the title of "Description de l'Asie Mineure"), and a grant of 480*l.* to aid him in further explorations.

In 1839 the intrepid traveller started again, accompanied by the Comte de la Guiche and Comte Janbert. This time he traversed Armenia, Mesopotamia, and Persia, and returned by Babylon, Syria, and Egypt. This journey lasted two years, and on his return the French Government furnished funds for the publication of another fine work in two volumes folio, "L'Arménie, la Perse, et la Mésopotamie."

In 1842 he was again sent by the Government to excavate on the site of the Temple of Diana Leucophrène, and to transport the sculptures he found to Paris. The friezes of this temple are now in the Louvre.

In 1845, Marshal Soult made M. Texier Inspector-General of Works in Algeria. During his residence in the colony he visited all the settlements, and made drawings of the numerous

Roman antiquities that are to be found in them. He continued to occupy this position till 1859, when he returned to Paris, and was elected a member of the Institute of France.

In 1864, M. Texier published, in conjunction with Mr. R. P. Pullao, a volume on Byzantine Architecture, noticed in our pages at the time. In the same year he was elected honorary member of the Royal Institute of British Architects, and received the Royal Medal, which he always prized as the greatest honour done him in the whole course of his career. The Institute possesses a rich treasure in the present he made to the library of the series of original measured sketches and finished drawings of buildings in Greece, Turkey, Egypt, Mesopotamia, Persia, &c., contained in thirty-three portfolios!

For the last three or four years his health had been failing, and three weeks ago, while sojourning at Vichy, he had a stroke of apoplexy. He was removed to Paris, and died there on Saturday, July 1st. His memory will be long cherished by those who had the privilege of his acquaintance. His endearing disposition, combined with his cheerful and lively character, and his great erudition, rendered him a most agreeable companion, as many amongst us in England can bear witness, and his decease will leave a gap in the ranks of the *dilettanti* amongst literary men and artists which will not easily be filled up.

NOVELTIES OF THE MONTH AT SOUTH KENSINGTON.

OVERSHADOWED as the parent institution of the South Kensington Museum has been during the past two months by the vigorous growth of its offspring, the International Exhibition, it has not failed to give symptoms of healthy life. The estimates have just been voted, in spite of an economical growl on the part of a fraction of the House of Commons, and several very interesting objects will be immediately secured for the nation. One acquisition has just been made for the gallery of sculpture of a marble group, executed by Mr. Holme Gardwell, which has been presented to the Museum by Mr. J. Malcolm. The subject is the subjugation of Pan by Cupid; an original idea, which, if it be intended to indicate the repression of animal passion by the purer element of love, is a very graceful theme for the sculptor. The contrast between the coarse features of the sylvan god, and the delicate and intent look of the youthful victor, is very happy. The grouping is sculptural, although the action and attitude of Cupid are hardly sufficiently energetic and purposed. The satyr legs and figure of Pan are very characteristically rendered.

Another addition to the Museum consists of some specimens of old Fulham china, which will be found in the Ceramic Gallery. Three pieces of this rare ware have been purchased at the price of 16*l.* for one article, and thirty guineas each for two others. The larger one is the model of the bust of a sleeping child, the daughter of the artist; which, from the expression of the features, and the position of a bunch of flowers on the bosom, appears to be a mortuary memorial. As a specimen of English work it is probably unique. One of the smaller pieces is a bust of King James II., and the other is a statuette of a child, apparently the same model as the bust. In bringing these curious works before the world the curators of the Museum have illustrated a most interesting and little known branch of ceramic art. The Fulham statuettes may be regarded as English Della Robbia ware. The date of these objects is about A.D. 1673.

CHESHUNT COLLEGE BUILDINGS.

On the 103rd anniversary of the Countess of Huntingdon's College, at Cheshunt, some new buildings, which have been added to the college, were formally opened by Earl Russell. The foundation-stone of the new buildings was laid by the Earl of Shaftesbury last year. They are in the Domestic Gothic style. There is a lofty tower at an angle of the building, 100 ft. high, at the base of which is the entrance to the college, ornamented with carved work in stone. As far as completed, they provide accommodation for thirty students, and they contain two class-rooms. When completed in accordance with the designs of the architects, they will provide new domestic offices, a new library, three

class-rooms, and accommodation for forty-three students, twenty-nine of whom will be supplied with two rooms each. The buildings will be extended, if necessary, to accommodate in all fifty students. The entire cost is estimated at 10,000*l.* Messrs. Lander & Bedell are the architects, Messrs. Dove Brothers the builders, and Mr. Rook the clerk of the works.

The completed portion of the work consists of a rectangular block, 121 ft. long, 26 ft. deep, and three stories high, having slightly projected wings at each end. On the ground floor are two lecture-rooms and six students' rooms, all entered from a corridor stretching behind. There are ten students' rooms on each of the first and second floors. At the west end of this range of buildings is the tower, containing on the ground floor the main entrance and two students' rooms above. Behind this entrance is the lobby and the principal staircase. Thesize of the students' rooms averages 16 ft. by 11 ft. The material of the building is brick, with Bath stone strings, arches, plinths, and other enrichments.

PRIZES: UNIVERSITY COLLEGE, LONDON.

At the recent distribution the following received prizes:—Architecture, Professor Hayter Lewis, F.A.S., F.I.B.A. (*Dean, Arts and Law*). *Fine Art, First Year's Course*.—Prize. George Elkington, of London. Certificate, 2. Alfred E. Warner, of London. *Second Year's Course*.—Donaldson Silver Medal. George Elkington, of London. Certificate, 2. E. Square, of Plymouth. *Construction, First Year's Course*.—Prize. George Elkington, of London. Certificates, 2. William C. Field, of Peckham. 3. equal. C. H. L. Wilday, of London; G. H. West, of London. *Second Year's Course*.—Donaldson Silver Medal. F. E. Beles, of London. Certificates, 2. George Elkington, of London. 3. E. T. Perrot, of London.

Engineering, Professor Fuller, C.E. Prize. A. Hartzig, of London. Certificates, 2. W. J. Benham, of London. 3. V. Lassoto, of Moscow. *Geometrical Drawing, First Year's Course*.—Prize. H. Davy, of Penzance. *Second Year's Course*.—Certificate. A. Hartzig, of London.

THE SADBURY WATER WORKS.

THESE works, which are being carried out under the direction of Mr. Huenell, C.E., by order of the Secretary of State for the Home Department, are now in rapid course of completion. The works are situated in a field, on high ground, near the Melford-road, about a quarter of a mile from the town. The buildings, which comprise a well-house, engine-house, boiler-house, with square shaft, 44 ft. high, coal-store, and cottage for engine-man, have been built by Mr. George Grimwood, of Sudbury, builder. The well which is 6 ft. 9 in. in diameter, is 67 ft. deep, and before being lined with brickwork and cement, was puddled to prevent any leakage from the surface-water. After reaching a depth of 67 ft. a 12-in. boring has been made 208 ft. into the bed of chalk. The water-level is about 50 ft. from the surface, where a powerful lift pump will pump it up to some 11 ft. from the top of the well, and a second lift and force pump will then force the water through the rising main 350 yards into the reservoir, which is 50 ft. higher than the ground where the well is situated. The water comes up from the well by an artesian boring with great force, and is said to be very clear and pure. The reservoir, which is of large size, is placed at an altitude of about 115 ft. above the average street level of the town, and is partly in and partly out of the ground. It is constructed with solid concrete walls, lined with brickwork in cement, and will hold 300,000 gallons of water, yielding an estimated supply for two days, allowing 20 gallons per head per day for each man, woman, or child. The ordinary quantity for manufacturing towns is 20 gallons; for other towns, 15 gallons. The reservoir will be arched over with brick work springing from iron girders resting on iron columns. The water will have a pressure of 30 lb. to the square inch, and in the event of a fire the hose will be found sufficient without the fire-engines. There are five miles of pipes of different sizes, which will traverse over street and lane in the town; the Market-h being very wide, there will be two mains, one on each side; at every 100 yards a fire-hydra will be placed; there are also sluice-clocks

main points for turning the water off and on as necessary, though there will be a constant supply. The engine for the pumps, which is being made at St. Neots, Hunts, is a 15-horse power beam-engine with two single-flue boilers. Men employed in laying the pipes, making joints, &c., are experienced London men. At 100 yards of pipe a day are being laid, and anticipated the entire work will be completed by the autumn.

PREMIUMS: INSTITUTION OF CIVIL ENGINEERS.

The Council of the Institution of Civil Engineers have awarded the following Premiums. Papers read at the Meetings during the session just concluded:—

A Telford Medal, and a Telford Premium, in Books, to Gerard Samuelson, M.P., for his "Description of Blast Furnaces erected in 1870 at Newport."
A Watt Medal, and a Telford Premium, in Books, to Jules Gaudard, C.E., Lausanne, for his Paper on "The Theory and Details of Construction of Metal and Timber Bridges."
A Telford Medal, and a Telford Premium, in Books, to Alexander Beazley, for his Paper on "Phonic Coast Signals."

A Telford Medal, and a Telford Premium, in Books, to James Dawson Ridley, for his "Description of the Ordnance used in the Execution of No. 2 Contract of the Sea Embankment."

A Telford Medal, and a Telford Premium, in Books, to James Price, for his Paper on "The Testing of Rails, a Description of a Machine for the purpose."

A Telford Premium, in Books, to Walter Raleigh, for his Paper on "The Strength of Lock Gates."

A Telford Premium, in Books, to Sir Francis C. Price, Bart., for his Paper on "The Archimedean Screw Propeller, or Helix of Maximum Work."

A Telford Medal, in Books, to Hamilton Elie-Towle, New York, for his "Account of the Basin for the New Dock, and of the Marine Railways in connexion therewith, at the Austrian Naval Station of Pola, on the Adriatic."

A Telford Premium, in Books, to George Banks, for his "Account of Floating Docks, and more especially of that at Cartagena and at Ferrol."

A Telford Premium, in Books, to Arthur Jacob, for his Paper on "The Disposal of Town Sewage."

The Manby Premium, in Books, to Wilfrid Airey, for his Paper on "The Archimedean Screw for Raising Water."

The Council have likewise awarded the various prizes to students of the Institution.

ENLARGEMENT OF THE WORCESTER LUNATIC ASYLUM.

An addition has just been made to the County and City Lunatic Asylum of Worcester, by the erection of a new ward for reception of 134 male patients. The facade of the new building, which is connected with the south side of the establishment, is 228 ft. in length, and consists of two stories, a portion of the basement, owing to the inclination of the ground, being occupied by closets, lavatories, storerooms, &c. On the ground and first floors are a dining-room, 50 ft. by 32 ft., dormitories above of the same size; a day-room, 40 ft. by 30 ft., and dormitories above of the same dimensions; a kitchen, 23 ft. by 16 ft.; storerooms, larders, pantry, lavatories, single and double bedrooms, &c. There is an open framed porch to the new wing, entering a corridor, 112 ft. long by 12 ft. broad, communicating with all the apartments. The dining-room will accommodate patients at a time, and the kitchen is fitted with Messrs. Jones & Rowe's 8 ft. range, a high-pressure boiler expressly constructed for heating all the water which will be required by the new wing; it will heat 1,500 gallons. Bath-rooms are fitted with copper bathing, and a never-failing supply of hot and cold water. A neighbouring brook is the source of the water supply, being pumped up by steam tank on the tower of the establishment. Ventilation is provided for by flues arranged in the walls, roofs, and shafts for the purpose, there is an economical arrangement for heating, with hot-air chambers at the back of the building, and radiating valves communicating with the stories being divided externally by stone string-courses, and the eaves and cornices are of the same material. The roofs are of slate, and the chimneys are of brick, with tiled heads and bases. The new ward communicates with the old building by means of a covered way or cloister, and an electric bell system the means of instant correspondence in the centre of the building to its outer parts. Besides the new wing, a block of eight new rooms is in course of erection at the

left of the principal entrance, an addition to one of the old wards. The new works will cost the round sum of 8,000*l.*, and have been planned and superintended by the county surveyor, Mr. Henry Rowe; builder, Mr. Lovatt, of Wolverhampton; clerk of the works, Mr. Hogan, of London. The establishment will now accommodate between 700 and 800 patients.

CONVERSAZIONE OF THE INSTITUTE OF ARCHITECTS.

An agreeable evening was spent in Conduit-street on Thursday evening, the 29th ult. There was a considerable attendance of members and their friends (nearly 600, in the whole), and the rooms were full of tasteful things, the band of the Coldstream Guards discoursing sweet music in the lower gallery. A number of the buffets and cabinets, from Messrs. Gillow; Medieval metal-work, by Messrs. Hart & Peard; ecclesiastical embroidery, by Messrs. Brangwyn; and some capital paperhangings, by Messrs. Jeffrey & Co. were distributed throughout the rooms, works which had been, in many instances, produced from designs by Mr. E. J. Tarver, J. Talbot, W. Burgess, Owen Jones, C. L. Eastlake, and others. These, together with the Salvati Venetian mirrors and table-glass, Minton's majolica (lent by Mr. J. Mortlock), Coleman's art-pottery, Copeland's Parian statuettes, and the Oriental ware of Messrs. Farmer & Rogers, judiciously grouped in the various apartments, presented an attractive appearance. Among the works of ancient art were some very fine ivory carvings, lent by Mr. J. Peacock, F.S.A.; and specimens of Indian jewelry, by Mr. G. Aitchison. On the walls were drawings and paintings, by Thornhill, Turner, Roberts, E. W. Cook, R.A., Sir Digby Wyatt, Rossetti, Smallfield, Macallum, H. Moore, Croft, Cotman, Lear, Phené Spiers, Mrs. Marable, Miss Partridge, Miss Swift, and others.

ON STAINED GLASS.

At the annual meeting of the Lincoln Diocesan Architectural Association, which was successfully held last week, the Rev. H. Usher read a paper on glass-painting, from which we take a few paragraphs:—

The first mention of stained glass, as a window, is, as far as I am aware, in Lucianus, at the close of the third century. In the early centuries of Christianity, they were certainly in use in Byzantium, and possibly among the races further east. The probability is, that the Byzantine Greeks—cunning artificers in all kinds of decorative work—carried to Venice, to Marseilles, and to other trading ports, their coloured glass set in mosaic form. Windows of this kind are referred to as early as the fifth century. But the first reliable and authenticated instance of a stained-glass window is in the beginning of the ninth century, when it is said that Leo III. adorned the windows of the Lateran with coloured glass. Even then we are not certain that the glass was painted. The earliest definite notice of a painting on glass which I have met with, is an account of an embassy from the Emperor Constantine VII. to an Arab prince (Abder-hamman) at Cordova, in 949. Thenceforward painted-glass windows began to find their way into Western Europe. In the treatise of the monk Theophilus "De Diversarum Artium Schedula," written about the ninth or early part of the eleventh century, definite directions are given for painting on glass. We find a painted window in the abbey of Tagonsee, in Bavaria, in 999; 100 years later five other painted windows were placed in the same abbey. And in the year 1137 come the well-known windows in the apse of St. Denis, and there can be little doubt that painted-glass windows were introduced into England not long after; but the earliest known examples in England belong to the last quarter of the twelfth century, and it was not until the following century that such windows came into general use.

Glass-painting is essentially a conventional art, because you cannot get perspective distance and atmosphere without using a depth of paint; and you must not use a depth of paint because the material is translucent; for if you do away with translucency the eye says it is no window at all. I maintain that conventionalism is not, as some suppose, a dwarf-like standard of art, stunted in growth, but the high principle of adapting the representation of abstract form to the material worked upon.

Conventional art possesses the great quality of abstract form to which colour is applied. This principle in glass-painting is capable of expressing the highest poetry, the poetry of abstract form, intensified by the poetry of the abstract colour; a power of abstract and ideal expression in harmony with the greatest production of human genius—architecture. The ideal art of conventionalism is briefly this, the expression of the nature which we feel, as contrasted with the principle of naturalism, which is the imitation of the nature which we see.

But am I herein defending bad drawing? By no means. While on the one hand I would say, that those who suppose the artists of the thirteenth and fourteenth centuries could not draw, would be as far from truth as those who should say that they could not build; yet, on the other hand, bad drawing and bad execution prevailed then as now. Conventionalism does not mean that the blunders of antiquity are to be reproduced. It does not mean that our figures are to be put in exaggerated attitudes, and our limbs expressed as if without bone or muscle. It simply means that we are to reject all that savours of common life, and make much of that which is essential to the expression of idea; but in the name of the high art of conventionalism, I protest against the disfigurement, rather than the ornament, of our sacred buildings, by those caricatures, those dead and unmeaning copies of ancient art. Let us strive to reach to the excellencies of conventional art by all means; let us try to catch its spirit of simplicity, breadth, and repose; let us try to tell all its tale of abstract beauty; but a greater degradation of modern art cannot exist than the uglinesses of exaggerated archaism, deformities of drawing, insipidity of expression, mechanical execution, crude colouring, and ill-conceived composition, which often disfigure our sacred temples, offend the unskilled, and give pain to the educated eye. It is a mistake to suppose that the Medieval draughtsmen intentionally drew badly. Their charm consists not in their distortion of form, but in their real artistic feeling, and in their thorough conception of the ideal. Hence, church windows should be good in drawing, and pious in feeling.

In discussing the art of stained glass, I must say a word on the principles of colour. In a transparent medium, such as glass, in which colour is rendered brilliant, it may be legitimate to render it intense also; but the more intense, the greater should be the skill in using it, and the harmony to balance it. According to Field's chromatic equivalents, the primaries of equal intensity will harmonise and neutralise each other in the proportions of three of yellow, five of red, and eight of blue,—integrally, sixteen. Such is the prismatic balance of colour, and it is this principle which in all the compounds of colour, and however blended, should be aimed at in a coloured window.

I have to maintain that primary colours (whether in glass, or mural decoration) can never be vulgar or discordant when properly applied; but when they are thus used, in their intensities, it should be, as in nature, with a sparing hand, and in small quantities only; in the larger masses, the secondaries, and tertiaries, and other compounds, alone are admissible, which atone for their lesser brilliancy by their greater breadth and volume.

I must now leave the question of colour, to say a word about the texture of the glass, which tells far more upon the character of a window than is often supposed.

Instead of that thin, poor, watery, transparent glass of commerce which is now often used, we desire a glass which is horny and icelike in texture, a glass perfectly translucent but by no means transparent, a glass not dependent upon its superficial corrugation for its texture, but having a deep and mellow texture like the imperfectly fused glass of Medieval times, and maintaining that quality of texture throughout its entire substance. We long to see that texture of glass which will glow and glitter and burn like a jewel dancing in the rays of the sun. This is the material which the skilled artists of Medieval times sought and used, and it is the material which we lack, but yearn so much for now; but so soon as public taste and public money ask for it, we may rest assured that science and art will combine to produce it.

The Bishop of Lincoln, who was in the chair, in afterwards referring to the paper, said, with regard to the subjects suitable for stained glass windows, he thought there was one thing which needed very much to be revived, and that was

* Has previously received a Telford Medal.

treating Old Testament and New Testament subjects side by side. He thought stained windows ought to teach us great spiritual truths in the best possible sense, and great good would arise from having Old Testament historical subjects represented with their New Testament antitypes. Take, for instance, the subjects of Abraham offering up Isaac, and the Brazen Serpent, and associate with those the Crucifixion. The Old Testament should always be read by the light of the New; and then we should see that those historical events were prefigurative shadowings of great evangelical truths, and thus learn to read the Old Testament aright. He was persuaded that glass-painters might be excellent expositors of, and commentators on, Scripture. If, for instance, there were depicted the Ascension, connected with the translation of Enoch and the carrying up of Elijah into heaven, we should learn how to understand the history of Enoch and Elijah. If, again, Samson were represented carrying the gates of Gaza towards Hebron, or Jonah delivered from the whale in the sea in connexion with the Resurrection, and so on throughout the Old Testament history, we should have one of the best expositions of the Old Testament; and this, if followed out by architects, sculptors, and glass-painters, would do very much to rescue us from the rationalistic scepticism of the day, which was the same thing as was referred to by St. Paul, when he said, "The letter killeth, but the Spirit giveth life."

THE WATER SUPPLY OF THE METROPOLIS.

At the last meeting of the Metropolitan Board of Works, the subject of the water supply of the metropolis was again brought before it by a report presented from the Parliamentary Committee of the Board. The report detailed the course taken by the Select Committee of the House of Commons, to whom the Bill had been referred, and stated that since the second reading it had been so altered and emasculated as to completely destroy all that was valuable in it in reference to the interest of the consumers; and gave, instead, increased advantages to the water companies. The objections of the water companies had such weight with the Government, that it was determined to withdraw the original measure, and to substitute the present Bill now before the Select Committee. This Bill was practically reduced to one for the establishment of a constant supply, and even that was to be much less effective than was originally proposed, as the pressure was not such as to reach the tops of the highest houses, and the cost of all the fittings for the prevention of waste was to be thrown upon this Board. It was now proposed that the companies should make their own regulations, and that the Board should simply have the power of objecting and making suggestions to the Secretary of State, to whom the regulations were to be submitted for approval. All expenses connected with the preparation and passing of the Act were to be paid by the Board, which was quite unreasonable; and therefore the committee felt bound to take the course which they then reported to the Board. Mr. Newton moved the adoption of the report, which, after some discussion, was carried.

THE NEW WORKHOUSE FOR THE BRAMLEY UNION.

MESSES. C. S. & A. J. NELSON, of Leeds, the architects of the new workhouse now in course of erection at Armley-hill Top, for the Bramley Union, have completed additional plans for the construction of an infirmary and also of infectious wards contiguous to the main building, and it is expected that the work will be shortly commenced. The buildings are in parallel blocks, each about 150 ft. in length and 20 ft. in width, and they can, when necessary, be extended. There are windows on each side and fireplaces in each room. The infirmary is two stories in height throughout, but the elevation of the buildings devoted to the infectious wards is broken up by the extremities of the block forming one-story wings for the treatment of very foul cases, and the arrangements are such that these can be isolated from the rest of the patients. The administrative departments are in the centre, and ready access can be gained to all parts of the two buildings. These departments separate the wards (which are 12 ft. in height) for females from those for males. The

upper portion of each building is devoted to dormitories, which are reached by 7 ft. wide square stone staircases. There are earth-closets throughout, separate wash-houses, and a disinfecting apartment. It is estimated that the cost of the infirmary and the infectious wards will be about 3,000*l.*; that of the workhouse is to be about 9,000*l.* The cost of the land, which is 16 acres in extent, will bring the total outlay up to about 15,000*l.*

THE BUILDING ACT.

THE Metropolitan Building Act Amendment Bill, which has now passed both Houses, has for object to exempt the Foreign Cattle Market at Deptford from the operation of the existing Act. The propriety of such exemptions is very questionable, and calls for full consideration. The exemption granted to railway companies is fraught with danger to the public.

The new Building Bill is down for second reading on the 26th. It is unnecessary for us to say that it will not be proceeded with this session.

OPENING OF THE

"RELIGIOUS INSTITUTE," MANCHESTER.

THE "Religious Institute," Corporation-street, Manchester, of which we gave a view, with particulars, in our volume for last year, Aug. 6, p. 627, has been opened.

The contract has been carried out by Messrs. Swindells & Little; the carving being executed by Messrs. T. R. & E. Williams; the fittings in the large room and the board-room by Messrs. Sidebotham & Co.; and the gas lighting by Messrs. Harrison & Son. Messrs. Horton & Brighford were the architects; and the whole has been carried out under the superintendence of Mr. H. L. Forster, — all of Manchester.

The style of architecture is Italian, freely treated. The frontage to Corporation-street is 46 ft. 6 in.; side frontage, 66 ft. 6 in.; and height from pavement to top of parapet, 53 ft. The two principal fronts are executed in stone; that towards Corporation-street being divided into five bays in two orders.

The object of the building, as we have before noted, is to provide suitable accommodation for the local Bible and Religious Tract Societies, and offices for the City Mission.

ARCHITECT TO THE LONDON SCHOOL BOARD.

The election on Wednesday last terminated in favour of Mr. E. R. Robson, who was made architect to the Board, at a salary of 500*l.* per annum.

ATHENÆUM, CAMDEN-ROAD.

The first portion of the above building was opened on Saturday, July 1st, by Sir Sydney Waterlow. It consists of a hall, 60 ft. long, 50 ft. wide, and 35 ft. high, and under it a supper-room and platform retiring-rooms.

The second portion, which is to be proceeded with, will comprise reading and public rooms, each 32 ft. long, 27 ft. wide, and 18 ft. high; a library and other rooms to be used as offices, class-rooms, and retiring-rooms, besides keepers' residence, with spacious passages and landings. There will be entrances to a thorough passage, both from Camden and Park roads. The architect of the building is Mr. Frederick R. Meeson.

EGINTON, THE GLASS PAINTER.

JAMES EGINTON, one of the earliest revivers of glass-painting in this country, was born in 1737, and died in 1805. The threatened destruction of the little "White House" in Birmingham, where he resided, has led one who is always ready to speak for Birmingham or Birmingham men (Mr. W. C. Aikin) to print an interesting sketch of Eginton's life, part of which we gladly reproduce in our pages.

Eginton's first employment in the Soho manufactory was as a decorator of japanned wares. He must have been a "handy man," for he did modelling also for parts of objects of silver and plated metal, for which the Soho was famed. His princely employer, Boulton, anxious to raise the character of his Birmingham works, visited London frequently, in pursuit of examples likely

to give what were esteemed artistic features to his metallic productions. In a letter written to his partner, Fothergill, he singles out Eginton to copy, model, or take casts from some antique candlesticks, vases, &c., he had borrowed from the Queen. "I wish," he writes, "Mr. Eginton would take good casts from the Hercules and the Hydra, &c. I perceive we shall want many such figures, and therefore we should omit no opportunity of taking good casts."

Eginton we next find as a partner with Boulton in the production of copies of oil paintings, or "polygraphs." These reproductions, it will be remembered, and the discovery of a camera obscura in the possession of some one indirectly connected with the Soho, also a photograph found in the Soho Library, alleged to represent the old Soho House, led to the claim set forth, that photography was known and practised at the Soho in the heyday of that manufactory, and was a part of the process by which the "polygraph" copies of oil paintings were produced by Boulton. Hence the idea was originated that photography was practised successfully half a century there before it was elsewhere. The fame of the Soho may well rest satisfied on the inventions there made, without claiming those it did not make, and Mr. Aikin confirms our belief, that the claim in question is wholly untenable.

In 1784 Eginton commenced the business of glass-painter and stainer at Prospect Hill House, where he had erected also his workshops or manufactory, composed of the buildings of brick, tile covered, which may have been observed to the right of the residence or dwelling-house, and which are also now in course of removal. It is to the credit of Eginton that these workshops bear evidence of having been substantially and well built, and, for the period, well ventilated. In this particular he seems to have imitated his early employer at the Soho, — an old print drawn and engraved by F. Eginton, jun., in addition to the shopping still standing, shows a glass-house come in proximity to the workshops. Did Eginton make his own coloured glass? or did the cone serve as the chimney for his flue-glass mufles? The house itself in the print alluded to is different from what it now is. In the print the house has a wing of one story in height towards the road, and another on the opposite side; on the right hand, ascending Soho-hill, the remains of the right wing may have been observed. These one-story buildings were the show-rooms in which Eginton exhibited his stained glass to admiring visitors, — a visit to these show-rooms (which were considered one of the lions of the town or district) being considered the "correct thing." Either came Lord Nelson and Sir William and Lady Hamilton, on their visit to Birmingham on the 29th of August, 1802. On that occasion we have been informed that in order to do honour to the then great naval hero, Eginton selected some of the prettiest girls of Handsworth, and they, carrying baskets filled with flowers, strewed the path up to his house, trodden on that occasion by "the brave and the fair." If Eginton's success is to be measured by the number of works of stained glass, executed by him, and placed in important buildings, public and private, it must have been very great; but the treatment of stained glass was, at the period when he worked, as little understood as true principles of the working of metals, and the historian of Staffordshire (Shaw), in prefacing his notice of Eginton's Works, informs us "when painted glass was first introduced into this country, which I supposed to have been about the time of King John, it consisted of different coloured glass joined together in some sort of design, the design joinings forming the harsh outline. The designs were either mosaics, legendary tales, or Scriptural history, generally ill chosen, and worse executed, which, bad as it was, gave a solemn and venerable air to places of worship."

After alluding to the iconoclastic doings of the adherents of Cromwell, and stating that, until the present reign, i.e., that of George III, the art was thought to be lost, he triumphant appeals to the works of Eginton, as evidence of his superiority over the old glass-painters. "The state of the art at that time may be seen in inspecting works he alludes to as having been executed by Eginton." The so-called improvement consisted in the substitution of academical drawing; the adaptation of pictures by Reynolds, West, &c., executed on canvas, and transferred to transparent glass; the conversion of what was intended to be looked at to a material be looked through; and, in order to get the effect of the picture copied, opacity followed as

necessary result. The "Conversion of St. Paul" window in the church of that name in this town, illustrates alike the strength and weakness of Eginton. Even in the morning, with sunlight streaming upon it, the purples and blues are alone seen through; the rest of the window is but imperfectly made out. Contrast this window with those of the old, or with those executed by modern glass-painters, who recognise true principles—whose glass is held together by "lead joinings," the subjects being "legendary tales," or subjects taken from "Scripture History," and the error of Eginton, and of those who patronised him, is at once seen. They recognised in the quaint forms introduced only imperfect drawing; they forgot the conditions of the position of the window. They failed to see that the simple lines which define drapery-folds, &c., and the absence of shadow, were intended to allow the light to pass through the glass with as little obstruction as possible, in order to light, glid, and emblazon with many tinted hues the interior of the building in which windows so executed were introduced. It has been well said, "There is science as well as art in the arrangement of a stained-glass window, and the science and the art are equally separate from other provinces of the artist's dominion. However great the art may be, if it be employed to give effect to a science not its correlative, it must fail." Hence the unsatisfactory results of Eginton's windows, and of much of the glass of Munich, and the much over-praised "Dante window" of Bertini, of Milan, which excited so much attention in the Exhibition of 1851. All attempts to make a picture on glass serve as a window must result in failure; the painter's art is thrown away, and the window is unserviceable by the obstruction it presents to the passage of the light. Eginton erred in noble company; the error was that of his time, not of the artist. His conceptions were bold, and were carried out, doubtless in the face of difficulties arising out of the want of appliances, which he had to create and supply as the occasion presented itself, which we at present have little conception of. If his hermetic mabazons are scarcely quaint enough,—if his copies from Sir Joshua and other artists, on glass, are a little tame,—blame not the glass-stainer, but the material to which they have been transferred. The spirit which animated Eginton was a kind that of his old noble employer at theoho. It was that which animated the Boultons, Plays, Taylors, and other old Birmingham manufacturers, which has been kept alive through generations which have intervened, and lives in existing Birmingham men,—in the Chances, Winkingtons, Hardmans, &c., of to-day.

The most celebrated of Eginton's works are to be found in Arundel Castle. Beokford added to the glories of his romance in stone and lime, to Fonthill, by calling to his aid the Birmingham glass-stainer. The chapel at Powis-hill, that at Vardour Castle, the ante-chapel of the Magdalen College at Oxford, the churches at Shuckburgh, Hutton, Earthing, Outwich, Tewkesbury, and Llangollen; the east window of Salisbury Cathedral, and near the locality where he laboured, the east window of Lichfield Cathedral; windows at Canwell, the seat of Sir Robert Lawley; Great Barr Chapel; Aston Church; and the church of St. Paul, in Birmingham, tell of the works of Eginton and the distinguished patronage he received. His son, William Raphael Eginton (whose works compete in excellence with those of his father), was presented at Court, and made glass-painter in ordinary to the Princess Charlotte. A brother of Eginton (John) was celebrated as an engraver in stipple, and engraved the "Last Interview of Louis XVI. with his Family, on the Eve of his Execution" (a copy of which hangs in Aston Hall); also other works after paintings by William Hamilton, R.A., viz., "Calypso leading Telemachus to the Grotto," "The Departure of Æneas from Carthage,"—the class of prints then in demand; and he engraved these well, as examples still in existence prove.

PROGRESS AND WANTS IN BELFAST.

BELFAST, epitomised, is a model of persevering industry and enterprise. None can visit it without being impressed with a good opinion of its people and their surroundings; notwithstanding that, in a sanitary point of view, there are districts in the city behind the age. The public buildings of Belfast, in architectural design and taste, can compare favourably with those of other towns. Belfast is, however, un-

like every other city in Ireland, and it has a diversity of features, natural and moral, which are either quiescent or absent in other places. Finally, there is a strong Scottish element of thought, religious habit, and a hereditary fixity of purpose exemplified in the manners and customs and ordinary pursuits of the people of Belfast. Indeed, through the whole of the north of Ireland, these traits are observable, but a stronger embodiment and expression of it, so to speak, is to be seen in the capital of the north of Ireland. We are not going to discuss the subject whether religious teaching or a certain form of religion has ought to do with the existence of commercial activity, or whether one form of faith is more conducive to industrial enterprise than another. We will simply say, that for two centuries the Presbyterian element in Belfast exceeded by many thousands the Protestant and Roman Catholic population.

It is unnecessary now to describe here the various buildings to be seen in Belfast; they have been spoken of in these pages, from time to time, as they were completed. Some new buildings are at present erecting and in course of completion in Belfast, of a kind of red sandstone, among which are the new municipal offices and a large linen establishment and warehouse, opposite Donegal-square. Both of these structures will form prominent features in the quarter where they are situated. This red stone appears to meet with a favourable reception in Belfast. It is easily worked, and yields to the chisel in ornamentation with a pretty good effect. The Albert Testimonial or Clock Tower, at the junction of High-street and Queen-square, is satisfactory in design and workmanship, and reflects great credit on the public spirit of the town. The entire height of the tower is put down at 143 ft. The workmanship in the building crafts, either in masonry or carpentry, in Belfast, is in general equal to that in any city in the kingdom. Of all the marked improvements connected with the town, the port and harbour of Belfast exhibit the most remarkable, and during the last quarter of a century continuous improvements have been in operation, tending to improve the navigation of the river Lagan. New cuts have been made, channels opened, unsightly bonds in the river removed, docks and timber-ponds constructed, and land to such an amount reclaimed from both the action of the sea and the river, that it forms in the total a valuable acquisition to the wealth of the town and its progressive improvement. Belfast has done in this and other respects for itself what Dublin, Cork, and Waterford could have done if they had manfully tried, instead of frittering away both their corporate and public time in vain appeals to the Government for loans. Belfast, by improving its harbour, and affording accommodation to the increased shipping impulses of home and foreign nations, has increased its own revenue as well as the imperial one; and the city itself has quickened and grown to such an extent in commercial and manufacturing industry as to surprise not only the rest of Ireland, but England and the colonies.

To push itself forward, and to lift itself up to the position it now occupies, was rather at first a difficult task; but when Belfast found it could not obtain the necessary funds to improve its port and harbour, and thereby increase its trade, it set about borrowing on bonds secured by the actual property and the increasing revenues of the port. Capital was soon subscribed at home, and Belfast henceforth prospered. Is not this a lesson for the Corporate magnates of the Irish metropolis, who are always saying, "We have no funds" when any work is brought under their notice by the overtaxed public, which requires to be done? Belfast pledged the credit of its port prospectively sooner than beg further from the Treasury, and by a manly self-exertion has saved itself. But Dublin whines for a loan, Cork kicks at the balance, and Waterford waxes wroth, and so the Liffey, the Suir, and the Lee lie stagnant or roll sluggishly on a wild waste of waters not half utilised, sadly suggestive of national decay.

As a manufacturing town Belfast may be considered the first in Ireland, for the manufactures of this northern town may be said to comprise nearly the staple and native trade of Ireland. Flax and cotton spinning are the two principal branches of local manufactures in the town. Flax-spinning is now the most absorbing, and the one on which the greatest amount of labour and traffic is expended. There are numerous bleach-grounds in the neighbourhood of Belfast, a visit to which will afford a pleasing as

well as an instructive sight to those who are unacquainted with processes through which the manufacture of linen is passed. At the present moment the linen trade is experiencing a lull, which it is to be hoped will only prove temporary. There are some croakers, however, hinting that the linen trade of Belfast has already seen its best days.

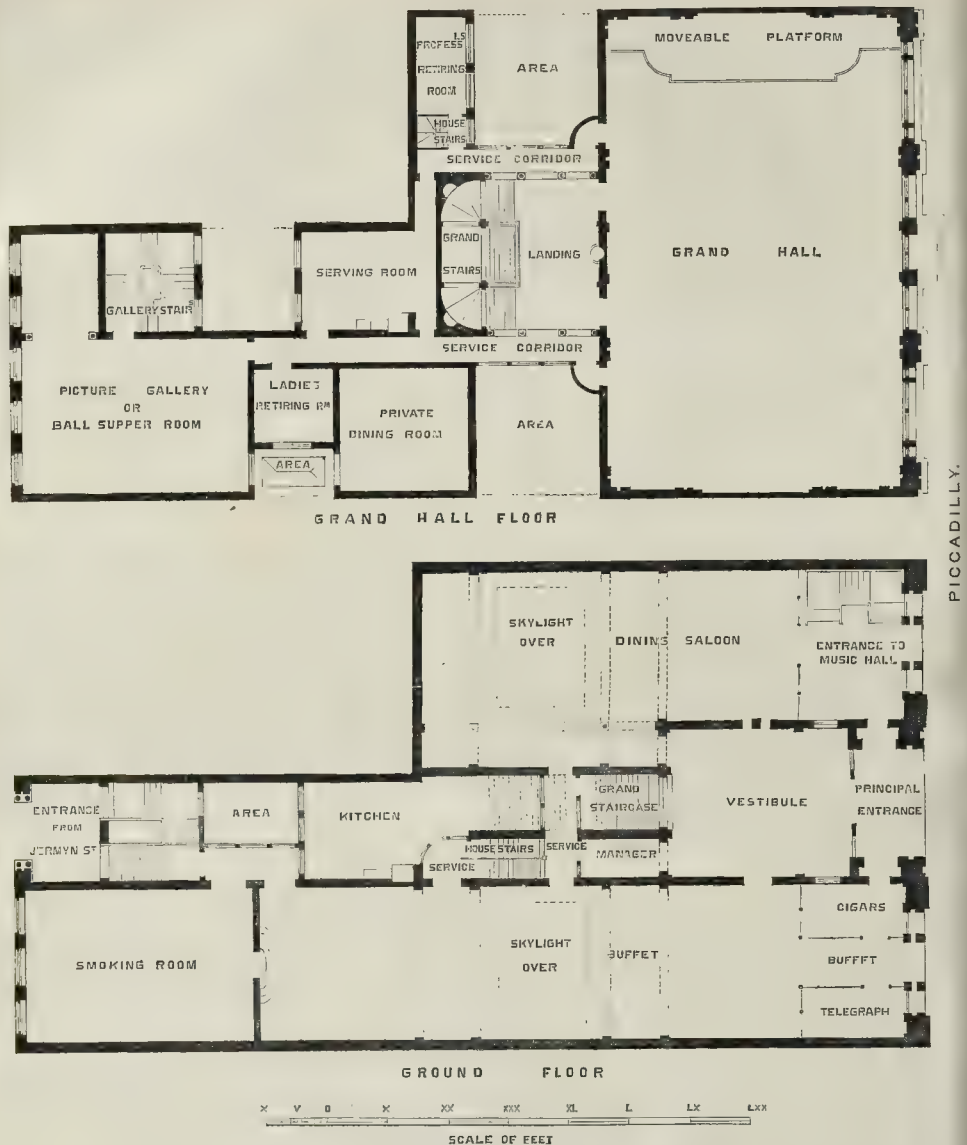
Belfast, as far as we have noticed and examined it, is not altogether depending on that trade from which it derives its greatest popularity. We have visited some foundries which appear to be in very brisk action, and we have noticed several tan-yards, saw-mills, chemical works, soap and candle manufactories, felt and hat, and a variety of other factories.

Ship-building is a trade which has long been carried on in Belfast, with alternate success; and lately iron ship-building has been established, and successfully prosecuted. There are records showing that ship-building in Belfast dates as far back as 1638, when some Presbyterian clergyman constructed one, of 150 tons. There was not, however, up to nearly the commencement of the present century, any proper place for laying down vessels; and we believe that the most of the vessels fifty years ago which hailed from the port were built either in England or Scotland.

Recently there were three iron ships on the stocks together, being constructed by the firm of Messrs. Harland & Wolff, successors to a previous firm, who were also much engaged in ship-building. Messrs. Harland & Wolff give employment to several hundred hands, and some of the screw-steamers of the royal navy have been built by them. In a few years more, if ship-building does not decline as a British trade, Belfast will likely afford greater and fuller facilities for ship-building, from its increasing harbour improvements.

In the matter of drainage, water-supply, sewerage, and other sanitary matters much yet remains to be accomplished in Belfast. There are some quarters of the town which we passed through, in a deplorable and tumble-down condition. For instance, up in the quarters of Garlick-hill, Mill Field, and about, the courts, lanes, and homes of the poor are in a very bad condition, and in summer weather an epidemic is always possible. Brown-street and Brown-square would better deserve the appellation of "Black," for here we found some sickness, much dirt, and numerous half-naked children,—yet without as joyous as young kids. Sackville-street is very unlike its namesake in London and Dublin. We could enumerate many streets and narrow courts where much dirt was visible, and where immediate sanitary measures are absolutely necessary. A great portion of the town of Belfast is low and hardly above the sea-level, so there cannot be too much care bestowed upon the sewerage and drainage of the town. The Blackstaff and Pound Bourn are not only open streams, but reeking open sewers, most filthy and foul, and if the closest accommodation of Belfast were perfect, the state of the river Lagan would be something awful, for most of the sewage that at present has any outfall is discharged into the harbour and river.

There are thousands of houses yet in Belfast and in Ballymacarret, which, though in the county of Down, are compressed into the district of Belfast—without closest accommodation of any kind approaching to civilised usage (or at all). There are many trades injurious to the health of the inhabitants still carried on in the heart of the town. The corporation have been very active in some matters of late, and the town of Belfast, architecturally and commercially, is improving decidedly, but sanitarily, matters move wonderfully slow indeed. Let the Lagan be purified at once; let the Blackstaff and Poundburn be closed over, or saved from pollution; let Ballymacarret have a proper system of sewerage; and let the sewerage and drainage operations, sparingly begun in Belfast long since, be taken up again with energy, and prosecuted to a completion. Until this most useful work is accomplished, the corporation of Belfast will be remiss in their most important duty. Public parks are valuable, public libraries and museums are useful, and public charities are worthy of every commendation; but the preservation of human life towers above all. Unvarnished air and undisturbed water are the most necessary requisites, for without these health is impossible of attainment, and all else that contributes to a city's honour or a nation's wealth is unenjoyable possession.



"THE CRITERION," PICCADILLY.—About to be erected for Messrs. Spiers & Pond.

"THE CRITERION," PICCADILLY.

OUR readers may remember that in our number for March 25th (p. 220) we criticised the designs submitted in competition for this building. We give now a view and plans of two principal floors of the first premiated design from which the building is about to be erected, under the superintendence of the successful competitor, Mr. T. Verity, architect.

The accommodation provided in this building will comprise first and second class public dining-saloons; private dining-rooms for parties of from ten to eighty; a grand buffet, 90 ft. by 25 ft.; smoking, reading, dressing, public and

private billiard-rooms, cigar divan, and telegraph-room; a concert-hall on the basement floor, to hold 1,300 persons; and a grand hall on the first floor for ball, dinners, and public meetings, with all the necessary retiring and dressing rooms. It will also include a suite of rooms which may be made available for a scientific or other club.

Dormitories for forty-eight servants are also provided in the upper part.

The chief study in the plan has been the convenient arrangement of the service department, which is placed in the centre of the building, in a distinct block, each class having its separate kitchen and serving-rooms.

The building will be warmed and ventilated by Mr. W. W. Phipson, on his principle of forcing in the air by means of revolving fans, and passing it over hot-water pipes placed in channels under the basement floor, and up flues in the walls to the various rooms, a system which has been successfully carried out by him in many large buildings.

The Criterion will have a second front in Jermyn-street. The materials of the Piccadilly front will be chiefly Portland stone and terracotta.

The tenders for the basements and rebuilding the party walls were opened on Monday last, the result will be found in another column.



"THE CRITERION," PICCADILLY.—MR. T. VERITY, ARCHITECT.

OPENING OF THE MANSION HOUSE STATION.

THE ENGINEER'S SPEECH.

THE new works of the Metropolitan District Railway, including the north junction with the London line, the enlarged station at South Kensington, and the extension from Blackfriars Bridge to the Mansion House Station, were formally opened on Saturday last, as we announced that they would be, in our last week's number. After the official opening, the guests, at 200 in number, took luncheon in the great dining-room at the Mansion House Station, the Earl of Devon, the chairman of the Metropolitan District Company, presiding.

Among the noblemen and gentlemen present were:—Mr. G. N. Currie, deputy-chairman; Lord Gort; Mr. J. S. Forbes, managing director; Mr. L. H. Isaacs and Dr. Wylie, doctors; the Duke of Sutherland; the Right Hon. W. B. Gladstone; Mr. G. G. Glynn, M.P.; J. Fowler, C.E., engineer-in-chief of the line; the Hon. A. S. Ayrton, M.P., Chief Commissioner of Works; Sir David Salomons, M.P.; John Rose; Mr. Thos. Chambers, Q.C., M.P.; W. Tite, M.P.; Mr. C. Vignoles, president of Institution of Civil Engineers; Col. Yolland, of the Board of Trade; Mr. Vernon Harcourt, M.P.; Mr. W. H. Smith, M.P.; Colonel Rogers of the Metropolitan Board of Works; Sir Lubbock, M.P.; Messrs. Kelk & Waring; Myles Fenton; Mr. B. Baker, assistant chief engineer; Mr. Cooper, resident engineer; Mr. J. Baldry; Mr. George Hopwood, secretary; &c. After the toast of "the Queen and the Royal Navy," the chairman gave "Her Majesty's salute," and referred to Mr. Gladstone as having taken a warm and unflinching interest in the progress of the works upon the District Company's line. Mr. Gladstone concluded a gracious speech by referring to the "Pleasures of the line," in which those who were shareholders of the line, as he was, were now privileged to alight. The list of toasts included "The Metropolitan Board of Works," proposed by Mr. Currie, and responded to by Colonel Hogg; "the Lord Mayor and Corporation of the City of London," proposed by Lord Gort, and responded to by the Lord Mayor, who concluded proposing "Success to the Metropolitan District Railway," which was acknowledged by Lord Devon. Mr. J. S. Forbes proposed success to the Metropolitan Railway, which was responded to by Mr. Parson, chairman of the company.

The noble chairman, in proposing the next toast, said that now they had reached so nearly the end of their undertaking, it would be almost unkind in them to forget a gentleman who had rendered them indispensable assistance, and valuable services, from first to last, in carrying them through the complicated and serious difficulties of a physical order with which they had had to contend. He referred to Mr. Fowler, the Company's engineer, whose health he had peculiar pleasure in promoting.

Mr. Fowler, in reply, said that he felt much gratified by the terms in which the toast had been proposed by his lordship and by the manner in which it had been received. The day was an important one for the District Company, in that it opened a section of the line that could not greatly to increase the traffic, and was almost a consummation of their undertaking. The day was also, if he might be permitted to say an important one to himself. Eight years ago, or rather more, when they were about to open the Farringdon-road Station, it had been said that nobody would travel upon the line. It had been previously prophesied that it was impossible to make it, what with the sewers and water pipes that had to be encountered. Eight years ago the Farringdon-road Station was opened, and since then the Moorgate-street Station, and to-day they had taken part in the opening of another City station. As regarded the traffic upon the Metropolitan line, every one knew how completely the prophecies of those who predicted failure had been falsified. He might be pardoned, responsible to the extent he had been, if the success achieved caused him any satisfaction. They had been carrying upon this line that had been said could not be used, and if made would not be used) about fifty millions of passengers per annum. Last year the Metropolitan Company carried, at very low fares, over two millions of working men to and from their work. Notwithstanding the great things that had been done, the maximum carrying power

on the Metropolitan system had not been reached. He felt certain that traffic amounting to 2,000,000 per mile per week could be carried with perfect safety. Commencing with 6000 per mile per week, rising to 1,200,000, as the system was extended, he saw no reason to doubt that they would attain to 2,000,000 per mile. What they had done they could do; and if the traffic came to them, they had the power to carry it. The engineering difficulties of the undertaking had been throughout very serious; but he was proud to say that he had all through these been sustained by the confidence and unwavering support of the directors. He had also been ably assisted by his chief assistant, Mr. B. Baker, and by Mr. Cooper, resident engineer. He was bound, in candour, to say that no small portion of his difficulties had been presented by the public bodies of London; but he was also bound to add that these had never been of frivolous or vexatious character, or affected by personal considerations. These bodies, or their representatives, had always acted, he believed, under a sense of public duty. The difficulties that had been presented, however, whether by these bodies or otherwise, had all been met, and successfully met; and, to all interested, this should be a cause of gratification. The works connected with the Mansion House Station had been of a heavy and complicated nature, and had been executed, within a space of time almost, if not altogether, unprecedented in the history of railway construction. This was attributable almost entirely to the great capabilities of the firm by which the works had been executed, and to their great resources. But even these would not have been enough to have achieved such triumphs, had they not been fully taken advantage of by their agent, Mr. Thomas Walker, whose powers of concentration personally, and of organization as regarded the means placed at his disposal, were above all praise. Mr. Fowler concluded by proposing the contractors, Messrs. Kelk, Waring Brothers, & Lucas, and set down amid hearty applause.

Mr. Kelk replied for the firm. He stated that in his experience he had never known of so much work being done in so short a time. He felt it due, on behalf of his firm, to say that the credit given by Mr. Fowler to their representative, Mr. Walker, was no more than that gentleman's due. Neither the company nor the firm could possibly have been more ably or faithfully served than they had been served by Mr. Walker, and now that he was entering upon new spheres of enterprise on his own account, he (Mr. Kelk) felt sure that every one who knew Mr. Walker and his great merits would heartily wish him much success.

The party, which had been some time decreasing in numbers, broke up on the conclusion of Mr. Kelk's speech, the entire proceedings having been of the most harmonious character.

The extension was opened for public traffic on Monday morning at five o'clock, the new engines and carriages of the Metropolitan District Company taking part in the five minutes' service each way.

SOME NOTES
ON EDUCATIONAL CHARITIES,
BY A WORKING MAN.

SIR,—A short time since a paragraph appeared in the *Times*, stating, Mr. Peter Cooper, the founder of the Cooper Institute, in New York, had determined to devote 500,000 dollars to alleviate the condition of the poor in that city; 100,000 dollars to be applied to the founding and endowing a free library for the city. On reading it, I said, I would there were one such citizen in London. The whole history of England abounds with instances of men who devoted large sums for educational and charitable purposes.—"The poor ye have always with you,"—and they desired to benefit a portion of the poor for ever; but as that is such a long time, their good intentions have been allowed to fail, and their good projects abused and misapplied; and in nothing are the selfishness and dishonesty of men more clearly shown than in the dealing with charitable trusts in England. Were a tithe of the funds left for the education of the poor put to its proper use, it would be more than sufficient to educate the people of England; and if the legislators, law-makers, and others, in this country had done their duty and given honest work for the people's money, there ought not to be either ignorance or educational destitution. The last report of the Endowed Schools Commissioners showed a

state of things which certainly never had an equal in any other country; and were we English only religious and intelligent, it would have disgraced that state of civilisation; but as we are not yet in that state, but only profess to be, why, of course, it is only in harmony with our other sham institutions. It is obvious to all that those who now have the management of charitable trusts still follow in the footsteps of those who have gone before, and they seem to think that a trust once misapplied is to be always so used, and that for the benefit of the well-to-do the poor are for ever to be robbed of their rightful inheritance, bequeathed to them by men who deplored their miserable and ignorant condition. The signs of the times plainly indicate that in this country a day of reckoning is coming. The old landmarks, supposed by many to be irremovable, are one by one being rooted up, and the most stable are being shaken. The crucible of experience is at work. The philosophers who are guiding and applying the fire are goaded on by the wrongs of years; crimes of centuries are being brought to the surface and compared with the doings of the authorities of to-day. The press call it revolution, and begin to wonder where it is to end; and it is apparent to thinking men that if those who are personally concerned in the retaining of abuses do not early put their house in order, and restore to their proper uses a portion of the trusts which belong to the people, they will have their reward by the people neglecting them in their day of trouble. It is said it takes years, almost cycles of years, to reform abuses in this country. Whenever a remedy is proposed, no end of vested interests crop up; claims are brought forward which have no foundation in right. And among the curiosities of our civilisation none are more strange than that there should be so many vested interests in abuses. The question of the abuse of endowments and charities has been talked about for years. Many eminent men have brought it to the notice of the Legislature. Governments supposed to represent the people have appointed commissions and commissioners, with salaries amounting to many thousands a year, to inquire, consider, and report; and at different times the results have been presented, but no notice of them has been taken, and the evils which were known to have been in existence fifty years ago have been allowed to grow ranker until the present day. The vast sums left for the education of the poor have not been used for their benefit; and the English working men are still lamentably ignorant, grovelling in all the evils which it brings, and are the laughing-stock of the more advanced portion of the civilised world. But what, perhaps, in connexion with education in this country, is the greatest disgrace of all, is the Education Act of the reformed House of Commons; for what has it done? And we might ask, what is it likely to do, but set all the machinery of the sects in motion, to the obstruction of education? The London School Board, the greatest of all, the one that was to lead and be the pattern for the others, has not yet done anything but quibble and quarrel. If a history of its proceedings were to be written out of the materials at hand, what a comment it would be on the practical and liberal ideas of the great men of England. The world has almost forgotten its existence. To stir it up, and let the folk know it is not dead, it has resolved there shall be another census for London. Wonderful England! wonderful men! and wonderful educators! If we have to wait until some definite plan is agreed upon, I fancy this generation will pass away, and the next will not see the light of education. I think some of the more practical men must have many times been disgusted with the proceedings, and have felt they were out of place in that august, religious, and dignified assembly; and, were I them, I would turn up the affair, and leave the sham to worse men. The *Athenaeum* a short time since shadowed forth something of the sort; and, for the sake of education, the sooner it takes place, and another agitation for national education is begun, the better it will be for the ignorant children of the ignorant and apathetic working men. Upwards of half a century ago an inquiry was made into the abuses which existed in connexion with endowments. It appears to have been a searching inquiry. Some of its results the late Lord Brongham embodied in a letter to Sir Samuel Romilly, M.P., inserted in vol. 13 of the "Pamphleteer," prefaced by an extract from the writings of Lord Kenyon, who

said, "Whoever will examine the state of grammar schools in different parts of this kingdom will see to what a lamentable condition most of them are reduced. If all persons had equally done their duty, we should not find, as is now the case, empty walls without scholars, and everything neglected but the receipts of the salaries and emoluments." Lord Eldon said, "It is absolutely necessary that it should be perfectly understood that charity estates all over this kingdom are dealt with in a manner most grossly improvident, amounting to the most direct breach of trust." The letter further shows that it is not only the minor, but also the major trusts and endowments that are misapplied. Much talk for a long time has been going on for university reform, and the abolition of tests. Lord Brougham states in the letter that "these great seats of learning were established for the benefit of the poor," but are now, and have been for centuries, monopolised by the rich. The endowed scholarships that are now enjoyed by the younger sons of peers and commoners, belong to the indigent. Instead of talking of reform, the question ought to be the restoration of the universities to their rightful owners. Lord Brougham, at that time Mr. Brougham, said "we were severely reproved for pushing our inquiries into establishments destined, it was said, for the education of the upper classes, while our instructions confined us to schools for the lower orders. Unfortunately, we no sooner looked into any of those institutions than we found that this objection to our jurisdiction rested upon the very abuses which we were investigating, and not upon the real nature of the foundation; for as often as we examined any establishment, the production of the charter or statutes proved that it was originally destined for the education of the poor." "One free school for the instructing, teaching, maintenance, and education of poor children and scholars," says the charter of the hospital, "and a free grammar-school in the Charterhouse." "*Pauperes et INDIGENTES Scholares*," say the statutes of Winchester College; "*Unum collegium perpetuum PAUPERUM ET INDIGENIUM Scholares et Boticie*," say the statutes which founded King's College, Cambridge, and Eton College; and they further require the scholars to take a solemn oath that they have not 5 marcs (3*l.* 6*s.*) a year to spend. The Westminster statutes expressly prohibit any boy being elected on the foundation who has, or at his father's death will inherit, a patrimony of above 10*l.*" He further alludes to Winchester College, to show that such endowments are not less liable to perversion than more obscure charities. The statutes require, in the most express terms, that only "the poor and indigent" shall be admitted upon the foundation; while they are, in fact, all children of persons in easy circumstances, many of opulent persons. The boys, when they attain the age of fifteen, solemnly swear that they have not 3*l.* 6*s.* a year to spend; and yet, as a practical commentary on this oath, they pay 10 guineas a year to the masters, and the average of other expenses exceeds 50*l.* Scores of other cases might be cited from the above and other reports. It appears to show one thing,—that the working classes are not the only immoral portion of the community. If perjury is permissible in some cases, if, of course, has an influence through life; or, if the laws and statutes are allowed to become obsolete after long years of neglect, the morality of those who now enjoy and administer the revenues cannot be of a very high order. Once wrong cannot be allowed for ever to be wrong; and as there now is a society in existence for the purpose of organising charitable relief and repressing mendicancy, and as many great names are on the list of the committees, and energetic officers are running after the mendicants who receive a single farthing from the public, and 2*s.* a week out-door papers are to be entirely suppressed; and as new brooms sometimes sweep wonderfully clean; could not they, just for consistency's sake, look after the rich mendicants and high superannuations, as by so doing they would confer great benefits upon the tax-paying portion of the working classes.

The above remarks are to some extent the result of the notice in the *Builder*, "On how to Spend Money for the Public Good." In the various suggestions I have not noticed any from working men; but that is no reason that we have not thought of the matter. I think the best way of helping the working men is to teach them early to help themselves. "As the twig is bent the tree is inclined," is almost a truism. I have but small faith in the reformation of the present

adult population. Habits early formed are but rarely eradicated; and what is more, the follies of ages seem to have reached their climax in this generation. Men run after shadows and neglect the substance; hag counterfeits as though they were pure metal; and as wise men do not build solid walls on rotten foundations, the proposals of most of your correspondents are mere palliatives of misery: they do not touch the source from which so many evils flow. What is wanted is the means of raising the moral and intellectual standard of the whole working body, by training them in the knowledge of the laws for the governing and rational enjoyment of life. The people of this country are lacking knowledge of every sort but the vicious. Their only place of resort is where low morals and worse beer and gin are retailed; and had I wealth to apply for the purpose of alleviating their condition, I would establish educational institutions in the shape of free libraries, lecture and reading rooms. I would endow village and town lectureships; the lecturers should be those who, in the opinion of the wise men, had made themselves the most proficient. The lectureships should last for a term, and be the means of promoting an emulation among the whole population of the district. I would add subscription dispensaries, so that the poor should, without pauperising themselves, have medical advice within their reach. I would, with the best advice at present to be had, establish sound benefit societies on the amalgamated principle, the institutions providing for the meeting-place. I would add to them a system of life assurances suitable to the means of the working men. Scholarships in moral and industrial science should be formed; the endowment need not be high, but sufficient to create a stimulus for something further. The honour of winning the prize, and the respect which it conferred among an intelligent people, would to some extent be the reward. Knowledge, the source of power, and, I also believe, of morality, would then no longer be beyond the reach of working men. The monuments of his joy, and which to all time will most perpetuate the name of the founders, will, I believe, in the future be such as those which Sir William Brown has founded at Liverpool. As long as time lasts that memorial of his generosity will be appreciated; future generations will, as education becomes more diffused, be able to appreciate more fully the good he has done. And he who can and is willing to confer the like advantages, only on a more extended scale, to his fellow-countrymen, would live in the respect of an intelligent nation; and, although he could not cover the whole ground, others might be induced to follow his righteous example. Let the beginning once be made, and a good concrete foundation be laid,—time, without doubt, will furnish the walls.

In the houses of charities nothing is more certain than the fact that the donors vested the authority for carrying out their wishes in too few persons. The first, or even the second, lot of trustees might have been energetic and fulfilled the intentions of the founder. Then a neglect began, one fell off, and his place was not again filled, and so it went on till everything got wrong. In the future the power ought by some means to be vested in all that had an interest, and thus the objects would be kept to their purpose. An annual elective system would be the best, and then endowed commissioners and all charity abusers would not have a chance for the exercise of their peculiar powers.

JACK PLANE.

THE CHRISTIAN ARCHITECTURE OF INDIA.

LOOKING at the architecture of India from the cooler climate of England, where neither the tiger's spirit of destructiveness nor the tingling sensation of the mosquito disturbs us, I am led to believe that architecture in India is not less dependent upon science than that in Europe. The best buildings in India are nothing better than penitentiary-like edifices, whilst many are wooden shells or cages built in flats, and called by the imaginative Parsee the "executive bungalow." The air in these cages is not "air thick with fragrance of spice," but so foul that the native servants leave the cage between twelve and three o'clock to lie in the shade, as bandicoots or hog rats are said to desert their quarters at the sound of the Highland pipes. We make our houses as dangerous to health as they can be made, without any display of common sense in

their internal economy. Instead of sending architects to India to build houses, we send young gentlemen, at a vast expense, who may be able to sport Greek, play in a tub under the pinks, and are ignorant of the inexorable laws of sanitation or the health of the people. Although the Hindoo in many parts walks nude in the sun, the English sahib, with his great powers of endurance, cannot live in a temperature of 145° without danger to health. He soon loses the suppleness of his knees, and never becomes proof against the fevers of India.

The churches are as devoid of every grace and refinement as the wooden cage; there is no combination of beauty upon which the eye loves to dwell fitted to stir the heart with devout adoration for Him who made the "gorgeous East" so fair; whilst the neat temples and idols' shrines are built of most enduring stone, with well-carved images of departed gods, for Hindoo worship, and where Vishnu is seated in a state of *nirvana* under the seven-headed snake which over-shadows him by way of canopy. The monuments to the British soldiers who gained victories under Gough and Clyde are squat extinguishers, of which the base is a parallelogram, with figures at the angles; but whether those figures represent the British lion, or Gannutti, the monkey god, a Darwin alone can tell.

It cannot be too earnestly impressed upon Government the necessity of sending architects to India free from the juggle of the "heads of departments," not because they know how many political "beams make five," but to build houses fit for habitation, and let the natives understand that, though they live in remote regions, "the world forgetting," they are not "by the world forgot," and shall not be allowed to add to the pain of disease the penalty of living in ill-erected houses.

Surely we ought, as Christians possessing that uniformity of belief and will which Christianity teaches, leave behind us some better memorials of our occupation than the executive bungalow, the wooden cage, and the water-wheel.

PIERRE ARTHUR.

INUNDATION OF MINES.

SIR,—Inundations in mines often prevent the escape of miners. Without warning the water silently rises at low levels to the roof; then it is impossible for the poor fellows to make their exit. Several of these sad occurrences latterly have horrified us. The same may happen again, unless some precautionary self-acting scheme be devised and adopted.

Mr. Editor, will you kindly spare a small space in the *Builder* for an explanation of a simple plan to denote timely warning to escape. A few sonorous bells (with spring and pendulum to each) fixed in the far-off workings, and a wire from each bell to a main wire run along to a ball valve in some low water-hole. The rising of the ball would detach the wire and set all the bells ringing for five or ten minutes throughout the mine. A few convincing experiments would give confidence to the men—

Who now work in dread
Of fire and water for daily bread.

B. T.

USEFUL INVENTIONS.

"The Deflector" Chimney Cowl.—A very strong testimonial from Germany made us think well at starting of this chimney-cowl and ventilator, which has been illustrated and advertised in our columns for some time, and this good opinion is confirmed by an examination into its principle. A gust of wind, entering the top of the cowl in a vertical direction, is turned aside from the flue by means of the cone in the interior, and deflected through the space formed by the two outer curves. Beyond this, however, as in most cowls more or less, wind, in passing the top of the main pipe, produces in it a vacuum, and the smoke (or vitiated air, if used for ventilating purposes) comes up to fill it, and so escapes. We feel confidence in recommending it.

Bickley's "Metallic Clips for Roofing."—The inventor forms a continuous horizontal bar, secured to the rafters or framework of the roof in one length, having a series of turned-over clips or catches into which the lower edges of the slates are slid. The underside of the bar is suitably grooved to house and receive the top edges of the next row of slates or lengths of glass. Each groove may be formed in the sec-

of the metallic bar, or may be cut as a plate in the rafters or framework of the roof. One of the clips or catches at intervals in the series are made to turn upon a rivet, centrewards, for the purpose of inserting the glass plates when required. The lengths of glass plates are arranged to slide and butt against each other, so that the one length overlaps the other, and so on throughout the series.

NEW THEATRE FOR DUBLIN.

On the 1st of July, the Lord Mayor of Dublin laid the first stone of the new "Gaiety Theatre," Dublin. We have already given some particulars of the undertaking. Mr. Phipps is the architect, and Messrs. Meade are the contractors. The works have gone on with considerable activity since they took possession of the site; and one can now trace the situation of boxes, stage, while the dressing and green rooms are risen to the third story, and the joists of the pit-floor have been laid. At the breakfast followed the ceremony, in reply to the toast of "The Architect and Contractors," Mr. Phipps said that he had been repeatedly questioned as to the practicability of finishing the theatre in the time proposed, namely, November 1st. He replied that what had been easily done in small provincial towns in England could be accomplished in such a city as Dublin. He said that nothing on his part would be done to make the new building as complete as possible.

THEATRE ARCHITECTS AND SURVEYORS.

Mr. Phipps—I wonder if it ever occurs to guardians of others, that by cutting down a fair remuneration, they usually cut their own throats; or, at least, direct must often mean 3 per cent. indirectly, with full liberty for the contractor to scamp to any extent. If Boards were asked for gratuitous plans and superintendence, they would be responded to at once, but no remuneration would be saved. AN OLD HAND.

Mr. Phipps—I know by experience that the practice of cutting the quantities taken out for the lowest tender per centage, is to be thoroughly considered, as having a decided tendency to make a surveyor keep the quantities very full. A man so working cannot afford to run any risk.

W. M.

COMPETITIONS.

Mr. Phipps.—In a limited competition for the design for the Daughters of Congregation Sisters, about to be erected near the Reservoir, Mr. Phipps, the designs sent by Mr. Edward Robins have been adopted by the committee, the accommodation required for 80 of the poorest 150 resident pupils is to be proceeded on at once.

Mr. Phipps.—Municipal Buildings Competition.—Following five designs for the new municipal buildings, Leicester, have been selected by the Corporation, which was called in by the corporation to advise them:—

No. 25.....	Motto 1,250.
" 27.....	" Fiat Justitia.
" 30.....	" Euge.
" 32.....	" Speramus.
" 28.....	" Delta.

THE TRADES MOVEMENT.

Mr. Phipps.—At a large meeting of joiners and carpenters, on Thursday last week, it was decided to strike for a reduction of the hours of labour to nine per day, and an increase of wages from 6½d. to 7d. per hour, and for the institution of piecework and arbitration. A general lock-out followed the withdrawal of men from one or two of the shops.

Mr. Phipps.—Something like eleven or twelve strikes have passed since the strike amongst the joiners of Newcastle and Gateshead began. From 350 to 400 men turned out, and now it is said that only some forty or fifty remain who are not either obtained employment in other ways, or been re-engaged by the masters on terms demanded.

Mr. Phipps.—English Workmen in Russia.—English artisans may be tempted by the offer of very high wages to go to Russia, but we well first to read of the harm which has been issued by the Board of Trade. Many cases have occurred in which

English workmen who were induced to go to Russia have been cruelly turned adrift as soon as they had instructed native workmen sufficiently well to enable the latter to take their places. They can obtain no redress from the law, and are dependent upon the charity of their countrymen for the means of subsistence. This is a grievance which will soon correct itself, as the Russians will shortly find out, to their own regret.

ASPHALTE PAVEMENT.

Mr. Phipps.—Your excellent article on asphalt in last week's publication came into my hand when I was making my complaint about the scandalous manner in which our street has been done (I mean Gracechurch-street). It is all covered with ruts at every place where the vehicles stand for a few minutes, some of them an inch deep. I observed yesterday opposite my door, during the great heat of the sun, a heavy wagon, the wheels of which, if it stood much longer, I think would have gone down to the concrete. It is well worth your notice, as the powder seems to be coming up every place it is cut. It is a complete failure: it is worse opposite my shop. Your remarks might make the authorities have it done properly, and not left in such a state. INHABITANT.

BUILDINGS FOR MUSIC.

Mr. Phipps.—There are some shrewd observations by your correspondent, "H. H. S.," but after stating what a concert-room should not be, and to avoid all future evils, it would be a great boon to architects and others to state what it *ought* to be (as I presume your correspondent is a musician) as regards dimensions, form of the room, and ceiling also, materials, &c. A few good practical hints would be of more essential service than all theory, if your correspondent would kindly solve the difficulty.

A SUBSCRIBER.

The recesses in Old Westminster Bridge were quoted only as a singular fact, but not for adoption.

LONDON STREET AND RAILWAY IMPROVEMENTS.

Mr. Phipps.—Under the above heading in your last number, referring to the proceedings in the House of Commons, on the 22nd ult., Sir W. Tite is reported to have said, relative to an application made by me to the Metropolitan Board, in 1870, that "The Board paid every attention to the application of Mr. Elliott, who became bankrupt in the meantime," &c.

I do not know whether Sir W. Tite was correctly reported; but this statement is utterly without foundation, and calculated to do me serious injury, and I must beg you to correct it in your next issue.

GEORGE A. ELLIOTT.

P.S.—On the general question, Sir W. Tite's remarks were rectified by the correspondence on the subject published in the *Standard* of the 24th of June.

CHURCH-BUILDING NEWS.

Winterborne, Monkton.—Messrs. Norman & Co. say they executed the whole of the carving and tracery throughout this church.

London.—The new north transept of London Church has been opened for divine service. The recent addition has taken the form of a transept as least calculated to interfere with the original plan of the church, and at the same time to harmonise to a certain extent with Bishop Stonywell's Chapel on the opposite side. The new transept is in the Early English style, having a roof of seven eaves, divided into three bays by principals, with curved braces resting on corbels. It is boarded on the under-side of the rafters. The transept is lighted on each side with two single-light windows, all of which are filled with painted glass; the north side having a centre window with two side-lights, and a vesica window in the gable. The first side-light contains the subject of Joseph and his brethren baring their father Jacob in the cave of Machpelah, and is given in memory of Henry, second Marquis of Anglesey, by four of his children. Another is given by Ellen, Marchioness of Anglesey, and contains as the subject Faith, Hope, and Charity. The third is in memory of Swainston Adamson and Elizabeth, his wife, of this parish, and is, "I am the vine; ye are the branches." The fourth is a subscription window, by parents to the number of fifty-five, in memory of children buried in the adjoining ground. The subject is Christ receiving Children, and the inscription "Of such is the kingdom of Heaven." The vesica window in the gable end is filled with the arms of the Forster family. The seats are pine, slightly stained and varnished. One hundred and fourteen seats are gained by the enlargement. The estimated cost was 1,100*l.*; but this has been largely increased by the necessity of erecting a new vestry, and of laying down hot-water pipes for the warming of the transept, the repair and alteration of the seats in the nave and of the reading-desk, and by numerous unlooked-for expenses. The stone labels of the windows inside and outside have

been decorated by Mr. S. Wood, of Lichfield, sculptor. The new pulpit, of Caen stone, has been executed by Messrs. Cox & Son, of Lambeth. The architect was Mr. A. Hartshorne, of Pinner, Watford; the builders being Messrs. Beckett & Thornloe, of Lichfield; and the clerk of the works Mr. Matthewson.

Darlington.—The plans prepared by Mr. A. P. Brevitt, architect, for the restoration of the parish church, have been unanimously adopted.

Sheffield.—St. Mark's Church, Broomfield, has been consecrated and opened for divine service by the Archbishop of York. It stands upon a prominent piece of land overlooking Sharrow and the Eccleshall district, and is in the centre of the best suburbs of the town. The site was given by the late Mr. W. Butcher, of Five Oaks, and the foundation-stone was laid on October 27th, 1868. The nave is 96 ft. long by 24 ft. wide, with north and south aisles, 14 ft. 6 in. wide; and the transepts project 17 ft. beyond the aisle-walls, being of a width of 24 ft. The chancel is 30 ft. long by 24 ft. wide, with organ-chamber on south side and vestry on the north side, with heating apparatus under. The tower and spire, which occupy a position in the south-west corner of the building, rise to a height of 160 ft. The tower is richly ornamented in its upper portions. Porches are placed, one on the north and the other on the south-western bay. The style of architecture which has been adopted is late Second Pointed. The windows being enriched with geometrical tracery and deeply-moulded mullions and jambs. The roof is lofty and open-timbered, and is shown to advantage by coped clearstory windows, connected on the inside with an arched support on octagonal shafts, with moulded caps and bases. All the seats are open, and of pitch pine, varnished. The site has been formed into three terraces, falling towards the south, a double flight of steps branching off right and left, giving access from the lower road. Amongst those who have fulfilled their contracts are Messrs. Chambers & Son, of Bishop Monkton, near Ripon. Mr. Chambers died suddenly, in London, just as the work was finished. He was greatly respected. His contract amounted to 7,000*l.* The edifice has, however, cost in its erection, 11,000*l.*, this including an extensive wall, surmounted by iron railings enclosing the whole of the premises. The reredos, font, and pulpit, and the sculpture throughout, are the work of Mr. Earp, of London. The metalwork and gasfittings have been executed by Messrs. Hart, Son, Peard, & Co. The church will seat 900 adults. The architect was Mr. W. H. Crossland, of London, under whose superintendence the whole of the arrangements have been carried out.

DISSENTING CHURCH BUILDING NEWS.

Wakefield.—The new Wesleyan Chapel at Eastmoor—the foundation-stone of which was laid in June last, has now been opened for public worship. The chapel faces Stanley-road. It stands 12 ft. back from the pavement; and this space is occupied by a broad flight of steps. From the landing, the lobbies of the chapel are entered, and on the left is arranged the staircase up to the gallery and down to the schoolroom. The inside dimensions of the chapel are 67 ft. long by 37 ft. wide, and 33 ft. 6 in. high to the collar. The schoolroom underneath is 47 ft. long by 37 ft. wide, and 15 ft. high. Three large class-rooms of the same height are placed on the level of the schoolroom. The chapel roof is of high pitch, externally covered with blue slates, internally the framed principals in view, and the timber work of the roof, which is stained and varnished, is arranged in square panels, each panel having stencilled in colours an ornamental centre and bordering. The building externally is of red bricks, with white brick string-courses, arches, &c., and stone dressings. All the interior fittings are of wrought deal, and are stained and varnished. Seats are provided for 400 adults, and 200 children. The site of the chapel is enclosed with iron railings and gates. The cost of the building is about 1,500*l.* The contractors were Mr. John Dunn for brick and stonework; Messrs. Harrison & Phillips, joiners' work; Mr. C. F. Ryoroff, slating; Mr. W. Woodhead, plumbing and glazing; Mr. T. C. Tattersall, plastering; Mr. S. Kirk, ironwork; Messrs. Fawcett & Parker, staining and painting work; and the heating apparatus by Messrs. Blake & Co. of Coventry. All the work has been carried out under the supervision and from the designs of Mr. William Watson, of this town, architect.

The foundation-stone of a new methodist chapel has been laid at Normanton Common; and it is intended to convert the old building into a school. The building is to be faced with red bricks, relieved with white and blue bands, arches, and stone dressings. The roof is to be high pitched and covered with slates. Internally, all timbers will be exposed to view. The fittings will be open stalls. All woodwork inside will be stained and varnished. The size of the chapel is 47 ft. 6 in. by 30 ft. and 32 ft. high to the collar beam. A vestry at the rear is arranged, about 9 ft. square; also an organ gallery of equal width. The edifice is estimated to cost 600l., exclusive of the site. The builder is Mr. Denison, of Normanton. The architect is Mr. William Watson, of Wakefield.

Cardiff.—A new Wesleyan chapel, situated at the corner of Castle-road and Roath-road, has been opened and dedicated to divine service. It is built of Newbridge stone with Bath stone dressings, and the south front has an ecclesiastical character from the tower at the side and the large five-light window in the centre. The architects were Messrs. Habershon & Pile, and the building was erected under the direction of Mr. Falkener, their local agent. It is estimated to cost, when complete, 3,500l.

Wallsend, near Newcastle-upon-Tyne.—The foundation stone of a Primitive Methodist Chapel and Temperance Hall, at Wallsend, was laid on Whit-Monday. The building, which has now made considerable advance in erection, stands on a plot of ground purchased from the Wallsend Co-operative Society, situated a little to the north of the Shields turnpike-road. The dimensions of the chapel are 51 ft. by 38 ft. outside. The style of the edifice is Early Gothic, and it is being built of red pressed brick, with stone dressings. The entrance to the Temperance Hall, which occupies the basement floor, is placed on the east side, in Blenkinsopp-street. From this entrance a few steps lead down to the hall, which will be fitted up with open benches, giving accommodation for four hundred persons. At the north end of the hall are two vestries; one for the purpose of tea meetings, fitted up with an improved gas boiler apparatus and serving window; the other is specially prepared for the meetings of the temperance committee, and will be also available for benefit societies and other similar purposes. Between the two vestries is the platform of the hall, which is approached by a separate entrance-door at the north-east angle of the building, which will also serve as a private entrance to the committee's vestry. The aim of these arrangements is to give the Temperance Hall all the advantages of a separate building. The entrance to the chapel is on the south front of the building, and the floor will be about 6 ft. above the level of the ground. The chapel is reached by two short flights of steps, part of which are outside, and the pews are arranged in three groups on the ground floor, with two passages between them. The height of the hall from floor to ceiling is 13 ft.; the height of the chapel is 13 ft. to the eaves, and 21 ft. 6 in. to the level part of ceiling. The roof timbers are shown in the chapel with flat and sloping plaster ceiling between them. The internal fittings are to be of pine, and all stained and varnished. The south elevation, which fronts on to the road leading to the old village of Wallsend, consists of a pointed doorway, with lancet-headed window on each side; over this, in the gable, is a wheel-window, to be filled in with coloured glass. On the east front is the main entrance to the Temperance Hall, being a pointed doorway. The hall is lighted by eight square-headed windows divided into two lights by stone mullions. The chapel above is lighted by an equal number of single-light lancet-headed windows, all having stone dressings, and to be glazed with lead quarry glazing, diamond pattern. The building has been designed by, and is being carried out under the superintendence of, Mr. Thomas Parker, architect, Newcastle. The total cost of the project is estimated at about 1,300l. or 1,400l.

Consecration of the Smithfield Martyrs' Memorial Church.—The Memorial Church of the Smithfield Martyrs, St. John-street-road, Clerkenwell, was consecrated and opened for divine service by the Bishop of London on Thursday in last week. For an account of this edifice, with view and plan, we may refer to our present volume (February 25th), pp. 145-7.

SCHOOL-BUILDING NEWS.

Falkenham.—The Congregationalists have a little chapel in this village; and a day-school being needed, members of the congregation set about raising the funds, and the memorial stone of a new building adjoining the chapel has just been laid. The work is being done by Mr. C. Fairhead, builder, Kirtton, from the plans of Messrs. Cattermole & Eade, architects, Ipswich.

Manchester.—The foundation stone of the Bradford Memorial Schools was laid on the 24th ult. These new schools will be known by the name of the "Bradford Memorial Schools" in memory of John Bradford, the martyr, who was a native of the place. The new building will stand in Haworth-street, having Cross-street at one side and another street as yet unnamed at the other side. The building (as shown by the plans prepared by Mr. John Lowe, of Manchester, architect) consists of a large room, 80 ft. by 30 ft., and two class-rooms, 20 ft. by 18 ft. and 17 ft. by 15 ft. respectively, and provision is also made for future extension. A lavatory and the usual offices are also provided. The rooms will be warmed by open fireplaces, and ventilated by means of openings in the ceiling communicating with ventilators in the roof, fresh air being admitted under the floors. The entrances to the school have double doors. The rooms will be fitted up with desks, benches, and galleries in accordance with the requirements of the Privy Council. The building will be faced with selected common bricks and white headers, and relieved by arches and string-courses of stock bricks. The inside walls will be also of selected common brick, prepared for paint. The roofs will be partly open, and the timbers thus exposed stained and varnished. The Haworth-street elevation is broken by a gable in the centre, containing windows arranged as a triplet. The cost of the building, including fittings and boundary walls, will be about 1,400l.; and the contract for the whole works is taken by Messrs. Neill & Sons, Manchester, under the superintendence of the architect.

Patricroft (Manchester).—The corner-stone of the new schools which are being erected in connexion with Christ Church, Patricroft, has been laid by the Bishop of Manchester, in the presence of a large concourse of people. These schools are being erected on ground adjoining the church, on a plot fronting into Vane-street and Nelson-street. The entrances are from Nelson-street. The building is set back from the line of the street, and is thus surrounded by the playgrounds, of which there are two. Owing to the restricted size of the plot, the building has been designed in two stories. The ground floor contains the infants' schoolroom, 60 ft. by 28 ft., with class-rooms, 24 ft. by 16 ft., adjoining. A boiler-room is also obtained by enclosing the space under one of the staircases. The upper floor contains a schoolroom for boys and girls, with a class-room, both of the same size as those on the ground floor. A lavatory is provided on each landing, and the usual offices. The schools will accommodate about 616 children. The buildings are of brick, relieved with string-courses and arches of stock bricks. The inside walls are of selected common bricks, prepared for paint. The upper floor and roof are supported on iron columns, and the roofs are visible as far as the collar-beams. The stairs are of stone, without winders, and of easy access. Ventilation is secured by openings in the ceiling, communicating with the spaces in the roof, where are ventilators to the outside. Fresh air is admitted by openings under the floor, and by the windows, all of which are open. The rooms are warmed by open fireplaces, of which there are three in each of the large rooms. All the rooms are fitted up with desks, benches, and galleries. The elevations are plain, and with no attempt at ornament. The class-rooms project from the Nelson-street front, and the staircases are in the angles thus formed. From the centre of the class-rooms' roof rises a tapering belfry. The building is being erected from the designs and under the superintendence of the architect, Mr. John Lowe, by Messrs. Wade, Brothers, builders, Miles Platting. The total cost will be about 1,300l.

London.—A new school is about to be erected in connexion with St. Peter's District Church, London Docks. The foundation-stone of the building has been laid by Earl Powis, in the presence of a large company.

Leicester.—The Trinity Church new day-schools are to be opened for the admission of boys and girls very shortly. The architect is

Mr. R. J. Goodacre, and the joint contractors are Messrs. T. & H. Horbert, and Messrs. Hewitt & Sons, all of Leicester.

Brassington.—A suitable site having been secured on the right of the Derby and Ashbourne roads, the erection of a new school-building has been commenced. A turret and bell, and (if the appeal to subscribers succeed) a public clock will adorn the entrance. The school is un denominational. Messrs. Knowles, of Brassington, are the builders. The sub-structure in the foundation having been made, five stones were laid without any ceremony.

VARIORUM.

"DIGGING A Grave with a Wine-glass" by Mrs. S. C. Hall (Partridge & Co.), is an excellent little story, with a purpose—a good purpose. The estimable authoress, who dedicates the little book, "To my sisters of all grades everywhere," "in the hope of their aid when and where it is needed," believes, with many others, that notwithstanding the alteration in the dining habits of the middle and upper classes, the destructive vice of drunkenness is on the increase, and that it is not unknown among her own sex. The story, while it shows how many dig their own grave with a wine-glass, is not all preaching, or all gloom: it is exceedingly interesting, and is well calculated to implant a horror of the vice against which it is directed. In *Temple Bar*, the author of "Come up as a Flower," begins a new story, titled "Good-bye Sweetheart!" It promises to be interesting. This magazine is a little overdone with serials, one, or at most two, should be the limit. *London Society* contains a brief history of the "Comédie Française" (not "Francois," Mr. Editor), which just now will be read with interest; but the mistakes in gender, repeated throughout, makes one doubt the fitness of the writer for the task. An interesting paper in the current *Art Journal* shows "How the Louvre was Saved." After steps had been taken, and successfully, as against the Germans,—

"The trial of fire threw its menace round this temple of the arts. When the contagious plumes were in general conflagration, and the adjacent Palais Royal was also delivered to the flames, what hope remained for the salvation of the Louvre? A very ominous incident seemed to involve it in the ruin impending over the whole of the Louvre. The Committee of the Commune intrusted upon its penetrability with the mission, for which there would seem to have been no reasonable grounds, to search in its range of vaults for supposed secret passages to the Champ de Mars or the Calvaire de Vincennes. In these dark receptacles of many diabolical members of society and canvases they descended, compelling Mr. Moran, a responsible member of the guardians of the place, to their guide, and, with pistols trustfully thrust against each side of his head, putting his eyes and ears to the test at each successive failure in their researches, which in the end proved but vanity and vexation. What a subject is here presented for some future picture,—historic illustration of times unprecedented in the speciality of horrors!"

Miscellaneous.

Palestine Exploration Fund.—The annual meeting of this society was held on Thursday June 29th, at the Royal Institution. The object was taken by the Archbishop of York. The report dwelt especially on the importance of completing a topographical survey of Palestine, which was shown by a plan distributed in the room to be imperfectly known. The receipts during the year had amounted to 3,175l., but sum of 1,500l. would be required to complete the survey. This great object, however, has been committed had determined to carry out. They had been aided by an independent association formed in New York with the same object, and while exploring the country east of Jordan, yet act in union with the English society. The Archbishop of York enforced the points set forth in the report, as did also the hon. secretary, Mr. G. Grove, Sir Henry Rawlinson, the Rev. Williams, the Dean of Westminster, the Rev. Dr. Barry, Dr. Birch, and others.

The Thames Embankment.—Mr. G. stone has nominated, and the Commons have agreed to, the Select Committee on the Thames Embankment, to consist of the Chancellor of the Exchequer, Lord J. Mansergh, the Attorney General, Mr. W. H. Smith, Sir W. Tite, B. Hope, Mr. V. Harcourt, Mr. Anderson, J. Locke, Mr. Laird, and Sir F. Hargrave. Power to send for persons, papers, and records. It to be the quorum.

Manchester and Liverpool District Building, Burslem.—This new building has just been completed from the designs of Messrs. Barker & Ellis, of Manchester, architects.

The building, comprising the bank and manager's house, is a detached block situated at the top of Newcastle-street. It is of Gothic order, with four frontages built of brick and mixed. The building to the Market-place Newcastle-street has ornamental iron doors mounted on a stone parapet wall. The entrance to the bank is at the south-east end, facing the Market-place, under a projecting stone arch carried on grey granite and surmounted by a stone moulded cornice perforated parapet. The vestibule to the bank is tiled, and there are two sets of glass doors to be passed before entering the banking-room, which is 43 ft. 6 in. long and 12 ft. 6 in. wide. There is a consulting-room attached to the banking-room, and a clerk's room, and a room, or safe, 12 ft. square. These are on the same floor level as the bank. The fittings are of mahogany, and have been specially designed for the building. The bank occupies the whole of the frontage of round floor towards the Market-place. The manager's house is attached to the bank by the principal entrance in Newcastle-street. There is a flight of steps to the house with perforated stone balustrade. The place in the corner, has a polished red stone shaft and carved capital, carrying the stone arches, and stone cornice, and stone parapet. There are gables to all the windows, and stone oriel windows, carried on stone, with perforated stone parapets at the top. The house windows have stone jambs, and square window-heads. The building is two stories high in Newcastle-street, and three stories over the bank. The roofs are high, of slate, with tile cresting. The manager's house contains entrance-hall, large dining-rooms, kitchens, scullery, bathroom, bedrooms, &c. The contractors were Messrs. Neill & Son, of Manchester. Mr. W. J. cabinet-maker, Salford, supplied the fittings. Messrs. C. de Bérge & Co., of Chester, have erected the safe. The total about 9,000l.

The Secret of Growth.—A discussion of some years ago in the *Builder* on the use of coloured glass in conservatories, experiments were afterwards made which have since assumed an exaggerated character in America, where it is gravely announced that the germ of all growth and life lies in glass. The "discoverer" learnedly sets to the public, in a pamphlet, that "he has a graperly vine of glass of a blue or violet, in five months 2-in. vines had grown 45 ft.; at any time grapes in startling abundance, covered a piggy with it: the three sows, the violet glass, increased 12 lb. in an ably short time, and a barrow pig increased more rapidly than this," owing to the "normal development of greed and viciousness, enabling him to seize on more than his share of animal food." After these successes, he put up an Alderney bull-calf just born, apparently dying, under glass of this mycoloured. In a few hours it got up and bled with vivacity: it began to grow next day and was "full-grown" in four months. The author recommends that architects be led to roof over houses with the life-providing violet hue; and if this practice be adopted he promises that "we can produce in the early maturity of the life and develop in the young a generation, physically and intellectually, which will become equal to mankind." A commentator remarks that the human race looks blue, they are poised to be just then in a very flourishing condition.

Sum for Diseased Dogs, Cats, &c.—Conditions necessary to the completion of the Trust by the University of London have been fulfilled. The University has been in possession of an excellent site, the *British Medical Journal*, and abundant room for carrying out the objects of the trust by founding an institution for the care and treatment of sick and diseased animals, which will afford invaluable facilities for the study and advance of our knowledge of animal diseases and their relation to man, a subject of scientific and importance.

The New Statue, Berlin.—The design by M. Albert Wolff for the statue of William III. of Prussia, unveiled during the recent triumph, was chosen in competition in 1860 out of twelve then submitted. The foundation-stone was laid on the 17th of March, 1863. The bronze statue represents the King on horseback wearing a general's uniform partially concealed by the long military cloak, and looking towards the palace, extending his right arm as if blessing his country. The *Pall-mall Gazette* gives the following particulars:—"The height of the statue is 19 ft.; that of the sandstone pedestal, 13 ft. The permanent bronze pedestal—which is to be completed by 1873—will, however, measure 21 ft. The statue weighs 190 cwt.; the other bronze work 420 cwt. The base has the shape of a cube, each of the four sides bearing an inscription and a sculptural representation. In front there are the words, 'To King Frederick William III., by King William. 1870.' Underneath, the Muse of History, kneeling on a pile of trophies, is engaged in engraving the inscription 'Frederick William the Just.' On the east side the popular rising of 1813 is allegorically represented. Borussia, arrayed in a martial cloak, raises her sword in one hand and a laurel wreath in the other, while her foot rests on some broken chains. The inscription is taken from the 129th Psalm:—'Many a time have they fought against me from my youth up, but they have not prevailed against me.' On the right of Borussia sits Father Rhine, on the left the Memel, the eastern boundary river of Prussia. On the opposite side the King's achievements at home are enumerated. The fourth side is devoted to symbolical representations of the King's religious forbearance and liberal-mindedness.

Window Gardening by the Working Classes.—The societies for the encouragement of this very desirable object continue to find promoters in the metropolis. An exhibition of plants has been held in the front court of the Royal Hospital, under the auspices of a society lately formed in Upper Chelsea, under the presidency of Lord Cadogan and the vice-presidency of the parochial clergy. Prizes were awarded to about sixty competitors. A band of the corps of commissioners played a selection of popular music. Lord Shaftesbury has presided over another meeting in the Dean's-yard, Westminster Abbey, for the promotion of window gardening, a purpose supported by the Lord Chancellor, the Dean of Westminster, Canon Conway, and others of the clergy and laity of the surrounding districts. Of 300 exhibitors, sixty were awarded prizes. Lord Shaftesbury, after giving all the prizes awarded, told the other exhibitors, amid great cheering, that though they had not won prizes, yet it had been determined to give them some "crumbs of comfort" in adding something for each. He assured them, however, that it was well to begin in most things with a failure, for success at starting made people "griggish" and "cocky," while a breakdown often led to renewed effort, and to a more certain and continuous success. The Dean of Westminster and Canon Conway spoke, and the meeting concluded with cheers for the chairman, and for the dean who is the president of the society.

Something like Leather.—A *savant* is said to have discovered with the microscope, in accordance with long-credited chemical theory, that when milk is poured into a cup of tea the albumen of the milk and the tannin of the tea instantly unite and form leather, or minute flakes of the very same compound which is produced in the texture of tanned hides, and which makes it leather as distinguished from the original skin. He consequently estimates that in the course of a year a tea-drinker of average capacity imbibes enough of leather to make a pair of shoes! The tannin, too, must have a tendency to tan the tender skin of the stomach into leathery undigesting refuse. The writer of this has long practised a mode of obtaining the tea without the tannin. The refreshing and volatile aroma is at once extracted, while the tannin requires a little time for its extraction. He therefore adopts the Chinese mode of limiting the time allowed for infusion to a minute or so, thereby obtaining a refreshing cup of tea without the astringent tannin, as the taste itself very clearly indicates. Long-infused tea is a dose of tannin far rather than a cheering cup of tea; and much of the volatile and refreshing aroma has fled by the time the "extract of tannin" is got. It is questionable, too, whether the water should be at the boiling point for the exclusive extract of the tea without the tannin.

Restoration of Boughton Church.—The contract for the repairs of this church has been signed, and the work of the restoration is already in progress. Six builders from the neighbourhood, by request, sent in tenders, with the following result:—Mr. Wilkins, Chatham, 1,570l.; Messrs. Judges, Boughton, 1,555l.; Mr. Wilson, Canterbury, 1,495l.; Messrs. Gaskin & Godden, Canterbury, 1,492l.; Messrs. Adcock, Dover, 1,444l.; Mr. Shrubsole, Faversham, 1,319l. The tender of Mr. Shrubsole was accepted by the committee. All the tenders, with one exception, were below the architect's estimate, 1,569l. Before the work was tendered for, it was considered, resting on this estimate of the architect, that 2,000l. would be required for the restoration of the entire fabric, namely, for the nave, &c., 1,569l. and 131l. for architect's fees and faculty; total, 1,700l.; and for the chancel (restored by the Ecclesiastical Commissioners), 300l.; making a total altogether of 2,000l.

The Metropolitan School Board Scheme. There is a main portion of the proper work of the School Board for which no provision at all seems to be made in this scheme. What is going to be done with the street children? These wretched little creatures, with their dirty skins, and clothing populous with vermin, cannot be placed side by side with the clean and wholesome children of the better working classes. It is not desirable that they should. We are more concerned about these friendless, foodless, shodless urchins than for all the rest together, who may, to some extent, help themselves; but these are sealed up for crime and the gaol, unless the redeeming hand of the educator snatch them from the fate that else awaits them. The Board will have done but the smaller and easier half of its duty as long as these children are unreached. They will require a scheme of their own; and a rate that shall rescue them and relieve both gaols and workhouses from their cost will be well spent.

The Berlin Cattle Market Company.—This company (limited), with a capital of 400,000l., in 20,000 shares of 20l. each, is formed for the purpose of acquiring the new cattle-market of Berlin, with all its buildings, abattoirs, railway, and accessories. The vendor will complete the works according to a specification already agreed to, and transfer to the company the entire property (subject to a mortgage of 150,000l.) for the sum of 375,000l. Of this amount 75,000l. will be retained by the company, to be paid to the vendor from time to time, according to the progress of the works. The works are to be carried out to the satisfaction of the company's engineer. The buildings when completed will afford accommodation on every market-day for 3,500 oxen, 8,000 pigs, 3,000 calves, 30,000 sheep; in all, 44,500.

The Government and Inventors.—The Committee of the Society of Arts appointed to examine the relations between Government and inventors have come to the conclusion that reasonable grounds exist for dissatisfaction as to the treatment which the latter have received. The committee have examined many witnesses, and they have passed a resolution to the effect that "the present system of dealing with inventors is unmethodical and unsatisfactory, and the obvious defect of the present system is the want of a suitable record of the invention submitted, and of the proceedings taken therein." The committee think that a report upon each invention should be presented by suitable persons, independent of the public department using it and of the inventor.

The City Architect.—At last meeting of the Court of Common Council, an application was read from Mr. Horace Jones, the architect, requesting the court to consider his extra services in connexion with the Meat and Poultry Market. The builder had already been paid 4,000l. for extra trouble, and the architect also had extra trouble. The request was referred to the Officers' and Clerks' Committee. The court have recently increased the salaries of others of their chief officers, but the architect's remains as it was 1,500l.

Sale of Timber.—A few of the oak-trees in Burghley Park, having shown symptoms of decay, were recently cut down, and were sold by auction on Thursday last. The size of the trees and the value of the timber may be inferred from the prices that were realised. One tree brought 72l.; a second, 61l.; a third, 54l.; and the whole, thirty in number, realised 900l.

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VOL. XXIX.—No. 1484.

Public Monuments.—Portrait Sculpture.



HE announcement that has appeared in the papers with respect to the erection, under Government direction and patronage, of statues of distinguished public characters in the immediate neighbourhood of the Houses of Parliament, will naturally excite great

attention, at least in the profession which will chiefly be employed in giving effect to the proposal. It may be hoped, however, that the general public may also be moved to take a more interest than it usually exhibits in art matters, and by so doing help to turn the fortuity to account, not only by more judiciously guarding against abuses, from ignorance or jobbing, that too often have prejudiced the management of our public works; but, while cherishing the real progress of art, may likewise insure both such a choice of subjects and a character of design as may do honour to the country. The idea is a good one; and if it be carried out with judgment and fairness, in conformity with true art principles, the department of Government to which the administration of public works in the fine arts is intrusted may deserve the thanks of the nation the movement it is originating.

Though, doubtless, some honourable exceptions may be made, it must be admitted that, as a rule, our public monuments are not of a kind to confer much credit on the taste of the country, the talents of the artists who have supplied them. This may be traced to various causes. In the preliminary stages, when designs of any pretensions are called for, quite as much as to the inability of the artists employed to carry out such works, that much of the ill-effects shown in our public monuments in sculpture may be attributed.

The department entrusted with the function of superintending public works should, either in itself, or by means of a council of properly qualified advisers in the respective arts, be really competent to fulfil the duties that attach to so important a charge. Experience has not shown that the interests of art have, hitherto, been so far.

There has never been a feeling of purity that a tribunal really qualified exists to advise and adjudicate on such questions; and decisions, when they have not been attributed to interest or jobbing, are for the most part supposed to be the result of mere chance.

It is at once to be understood that the encouragement of high-art sculpture is not here

contemplated. From the fact that the object is to commemorate individuals, the class of art will be limited to portrait sculpture. That the best of its kind is intended to be employed must be taken for granted, and credit must be given to the promoters of the scheme that the work will, to the best of their power, be entrusted to the most approved and competent sculptors to be found in the country. It is at this stage that a few practical remarks may be offered, first, on the subject itself proposed by the Government; and, next, on the mode, on which so much depends, of carrying out the scheme. In this will be included the manner of selecting artists to execute the works; and the instruction by which the sculptors are to be guided in the design, so as to preserve a species of harmony and consistency in each particular part in relation to the whole. This can only be insured by laying down some well-considered general instructions by which the several sculptors may be guided, without, however, interfering with their independent action in the artistic treatment of each work. There is nothing in such a suggestion that need wound the susceptibility of any real and earnest artist who desires to see sculpture taking its proper place in decorating public places. It is quite conceivable that some of the greatest works of antiquity were conducted on some such guiding principle, and it is only the less reflecting and the over-confident in their own powers who would consider themselves superior to such wholesome restraints.

A few words may be said on the subject of Portrait, as a class of Sculpture, *per se*, a distinction of considerable importance in the relation it bears to what is understood as high art. The classification involves no disparagement of an exercise of art of the highest value, whether considered for the historical interest that attaches to it, where it is employed in portraying the great and remarkable men of the age, or for the strong claim it has on our affections and sympathies in placing before us the traits of those who are dear to us. It simply professes to mark the strong difference between an art of fact and individuality, and one which owes its character and excellence to the opportunity it affords for the play of fancy, invention, and to the principle of displaying beauty of form in giving it its expression. The practice differs almost from the starting-point; the only common ground on which the two classes of portrait, and, so to say, ideal sculpture are founded, being imitation. It is in the conduct or treatment of this that their several distinctive courses are marked.

There is a peculiarity in regard to the commemorative sculpture of the ancients which is in rather striking contrast to modern practice. In their public monuments they dwell on the facts, or the service performed, leaving the individuality, and even the name of the actor in it, to the fame acquired by the value of the service. Thus the illustration of the great deeds attributed to the heroes of the Grecian mythology and history,—as the destruction of wild beasts, the removal of some plague or abuse affecting the well-being of the community; the conquest of enemies; the extermination of robbers; the righting of wrong,—all founded on facts, yet poetically clothed by the genius of the people in the various striking myths of Theseus and the Minotaur, the labours of Hercules, the battles of the Greeks and Amazons, of the Centaurs and Lapithæ, and similar subjects,—first make their impression in the representations of the events that have illustrated the national or local history. Tradition carried down the names of some of those who were believed to have conferred these benefits on the country,—as Heracles, Theseus, Jason, the Argonauts, and others,—but, except conventionally, no attempt was made to convey a likeness of the hero himself. Indeed, during the period of the best school of

Greek art, portrait, in the sense of accurate likeness, was not recognised as a fitting exercise of sculpture. Those known of ancient Greek poets and philosophers are purely imaginary and of a later date than their subjects.

And here, no doubt, may be found one of the causes of the superior character of the best ancient art, where the particular and the personal were always kept subordinate to the general scheme. Even where ideal beauty was not, as among the Greeks, the study of the artists and people, the same principle is found. The Assyrians and the Egyptians illustrated, as is seen in the sculpture and decoration of their temples, historical events of national interest; but, excepting by means of symbols or accessories, the king or hero cannot be distinguished by personal traits from others taking part in the scenes represented. In the modern practice, sculpture scarcely attempts the dramatic or scenic representation of any remarkable action. In erecting statues of public men, the purpose seems to be to individualise the actor without any distinct or intelligible reference to the special services rendered. It is to be inferred that he has deserved well of his country, and, therefore, that a statue has been voted by Parliament, and paid for out of the public purse; but what the distinct ground of the honour may be is left to be supplied by memory, or by reference to some printed record of it.

To proceed with our remarks on portrait. Portrait deals with the particular; high art with the general. The essence of portrait is to mark distinctly personal and individual traits, and to fix in special types the character of the definite man. High, or fine art claims to sink the individual, and to express Nature at large, or in her forms of normal beauty, as she is exhibited in her universal or catholic aspect. This distinct practice is not necessarily a lowering in value of the former exercise, even as art. The examples left us of the treatment of which portrait is capable, in the hands of men of genius who have also shown their power to produce works of the highest excellence in ideal art, will always assert a claim to distinction and honour as high-class portrait. No works may rank in a higher position than such noble productions in portrait as many of those produced by Raffælle, Titian, Tintoretto, Velasquez. The difference between the two classes is in kind; both may, in their several ways, be excellent; but one may be of a higher order than the other. It is true that the above reference is to the great works of painters. In considering the claims of portrait-sculpture, some important admissions must be made, to a certain extent, to its disadvantage. Compared with painting, it must, from its limited powers, necessarily hold a distinct, though it may not be an inferior position.

No doubt sculpture can do, in one respect, what painting cannot attempt. It can give the absolute or rounded form really and distinctly, of which the sister art can only give the appearance on a flat surface; but it can do no more, and form only will not always convey the impression, though it may the fact, of resemblance to the object imitated. A well-defined and striking character of features will be more easily portrayed, while the small, the delicate, and refined will, comparatively, be almost lost in marble or bronze. Painting will also be more popular, owing to the greater number of points of resemblance to its subject it is capable of offering. One of the most valuable of these is the great aid it derives from colour, in giving the tints of the complexion and the colour of the lips, the eyes, and hair; another is the arbitrary arrangement of light and shadow, by which the artist can secure and fix the effect he desires for his picture, whatever position it may occupy; and he derives another great advantage from the force or concentration he is able to give his work, from the fact of the portrait being seen

from only one point of view. The sculptor has no equivalent for these, even in the advantage of the multiplication of the aspects in which his work may be seen; for though his statue may be viewed all round, from every point of view, he has no means of managing artistically either the quantity or quality of his *chiar' oscuro*; and thus he never can be sure the (natural) light and shadow his works may receive may not, as, indeed, often occurs, be utterly ruinous to its proper effect.

Enough has been said here to show that portrait sculpture is not the facile exercise that too many, both so called judges and some artists, have imagined it to be; and we will hope the bearing of these remarks on the true interests of this class of art will be apparent as the inquiry proceeds.

Assuming, then, as is necessary, that portrait is to deal with the particular and individual, in contradistinction to the general or normal, it becomes a matter of immense importance how this may be done in modern sculpture, and not degrade its position, comparatively, in the scale of art. If it is to be simply a reproduction of the subject or person to be portrayed, under what conditions is the statue to be presented? Is it to be left to each individual sculptor who may receive a commission to execute a statue for this species of Walhalla to represent his subject just as his fancy may dictate? This is by no means an unimportant question. It must be remembered there are two antagonistic principles now dividing public opinion on the proper mode of conducting art. Both are supported by able argument, and both have had striking illustration in practice. One advocates the introduction of only the higher classes of form, modifying and repudiating where it is practicable all that is coarse and repulsive in the common aspect of nature. This view has in its support the practice of the greatest schools of art, ancient and modern. The other requires the realistic or naturalistic treatment of imitative art; that is, close and conscientious copying, irrespective of beauty. Without entering into a controversy on this long-disputed point, it does become a matter of importance to inquire how the artists are to be instructed in preparing their works for the proposed Government scheme. The advocate for ultra realism would represent his subject with every peculiarity, even to deformity, by which he had been familiarly known. If by an accident he should have been deprived of a limb, he would have the statue represented so mutilated: as is, indeed, seen in some portraits of eminent men who had suffered that loss in the public service. Here the only reference to the part Nature has had in the subject is necessarily confined to representing the face of the individual,—a feature not always offering an opportunity for the most favourable display of art.

Where the artist who truly feels that fine art has its requirements and obligations will know how to modify defects, and still preserve sufficient character and likeness, the realist will contend for the scrupulous reproduction of the most minute peculiarities. In painting this has been done even to imitating varicose veins, and similar unpleasant indications of physical infirmity, on the ground that such representation, however disagreeable, is "true to nature."

Sculpture wanting colour cannot proceed to quite the same lengths, and yet, in principle, it is to this that portrait sculpture seems now to be tending; and so coats, wai-coats, and similar details of the prevailing mode are considered to come under the term "naturalistic," when, so far from being "natural" they are only the accidents of a time of bad taste. To insist upon the imitation of such objects simply on the plea of truthful copying being the only true purpose of art, would excuse every enormity or offence against good taste that could be perpetrated under such a despotism. It would degrade all art to mere commonplace copying, and the most ordinary practitioner, with a moderate power of modelling and carving, would here be working quite on an equality with the best educated sculptor. There would be no choice allowed for selection or rejection; accurate imitation alone would be the test of an artist's accomplishment. This would leave room for every possible abuse. There is no example at present in England of a statue of a naval or military man, without his leg, or legs; but it would not be in worse taste to record this accident than it is to represent a man with only one arm, for the principle applies throughout. It is true it ignores propriety, beauty, art; but it is obedient to the naturalistic theory.

The ultra-purist, again, might on his side, contend for so much liberty in modifying the accidents and commonplace of ordinary nature as to lose all individuality in his system of generalisation; and faithful, even to prejudice, to his creed that sculpture should deal only with the beautiful in form, claim to represent his subject, after the examples of the Greek classical schools, in a tunic; or, as Canova represented Napoleon I. in the colossal statue at Apsley House, entirely naked. It is needless to enlarge on the absurdity and inconsistency of such treatment of modern portraiture. But, while it may not be easy to lay down any precise rule on the proper course to be followed, so as to preserve truthfulness and yet not make the work vulgar and commonplace, and, on the other hand, to give the impress of real refined art to a work which must, in order to fulfil its purpose, have the stamp of individuality, it may still be contended that some saving conditions may be insisted on if a work is to be classed in the category of fine art, and not be mere ordinary figure-making.

It surely must be in the power, as it is within the province of art, to treat a statue that may possibly require, for special reasons, the introduction of unartistic details or accessories, in a manner to divert attention from such minutiae, or, at any rate, to lessen their force; whereas it is too generally the rule now-a-days to give undue prominence to such objects, to the sacrifice of all the nobler aims of sculpture. No style, or rather class of practice, affords greater opportunity for such abuse, and consequent lowering of art, than does portrait sculpture; and as this branch of art is now widely employed, the remarks and warnings here offered are not out of place. We shall continue the subject.

THE PASSION PLAY AT OBER AMMERGAU.

We have been present at the second representation of what may well be considered one of the greatest wonders of the age. To justify such an assertion, let us glance at the place where this Miracle Play is enacted, and by whom, and in what way.

Deep in a lovely valley, surrounded by rocky heights, among which the highest is that of the oddly conical-shaped Kofelberg, lies a small village, of 217 houses, and 1,100 inhabitants. The houses are comparatively large, constructed thus for the benefit of the visitors who throng every ten years to see the Passion Spiel. The village is essentially a village. It has no market-place,—no market at any time of the year,—thus preserving its exclusiveness still more. The inhabitants are mostly carvers in wood, from the small toy-figures of animals and such like, of 6 pennig (about a halfpenny), to exquisitely carved copies of Rabens's "Descent from the Cross," and Leonardo da Vinci's "Last Supper," varying in price from 5*l.* to 15*l.* They export largely to Switzerland, the Tyrol,—to America even. With the exception of a very few articles, imported from Nuremberg during the months of the Passion Spiel, all is made in Ober Ammergau by the people of the village. They are of a simple, single-minded, deeply-religious character. Far removed from town-life, their calling confined to either land-labour or wood-carving, or both in one; their education well cared for; all their cares centred in their little village of Ammergau; with an intelligence far above the common run of German peasantry,—this little nest of peasants continues, entirely without any foreign aid, to carry out and bring, each ten years, nearer to perfection this wonderful realisation of the most mysterious and tragic event since the world began.

First, let us tell how this little spot can be approached. From the north from Munich, by two hours' train, one reaches Weiheim, whence by carriage the village is reached in seven hours. A variety in the journey may be made by journeying by train to Saruberg only from Munich, and thence by steamboat on the Saruberg lake to Seshaupt, whence by carriage the same road is joined as from Weiheim. Both lead to Ethal, the renowned moratorium, founded early in the fourteenth century, formerly occupied by nearly a hundred Benedictine monks.

Coming south, a long drive of sixteen or eighteen hours is requisite from Innsbruck. Each way is beautiful. From the north, the grand, now deeply snow-capped mountains of

the Bavarian Highlands form a background equal in beauty to any view in Switzerland or the Tyrol. Coming from the south, the beauty of the scenery surpasses that from the north. Paresenkirchen, a town four hours' drive from Ober Ammergau forms a good resting-place, and is well provided with inns and dwelling-places. Arrived at Ober Ammergau, the night previously to the "Passion Spiel," the quiet village has lost its character. Vehicles of all kinds are arriving from every point, bringing strangers from all lands.

Those already arrived, more prudently the day before, occupy seats outside the houses to see the new comers enter. All are greeted by the villagers with a polite earnestness to oblige. Those whose sleeping-rooms are already secured find their abode; the less fortunate are directly cared for with the utmost kindness. All intending to visit Ammergau must secure both rooms and tickets some weeks previously.

We are there, and we learn the origin of this Mystery Play. In 1584, the village and its neighbourhood were devastated by a pestilence that decimated its people. The monks of Ethal, to those who had the care of the souls of the people, counselled that a vow should be taken that every ten years they should represent the sufferings of our Lord, that by such means their minds might be elevated, their hearts made more grateful for their own exemption from those sufferings that had overtaken their plague-stricken relatives.

For the first fifty years the monks presided over these representations, which were coupled with all the horrors and repulsive additions of the mystery plays of the Middle Ages. The devil, with his court, held a conspicuous part, and Judas's end was displayed with too minute a reality.

The carrying out of this vow was nearly suspended at the beginning of this century, and one of the oldest of the players appeared at Munich, before the King Maximilian Joseph, and as the simple orator explained how they had sought only, by the display of the sufferings and death of the Saviour, to produce a deeper feeling of gratitude, and more holiness of life among their people, the king relented, and dismissed the old man with a permission to continue the Passion Play, and thus its existence was preserved.

The Monastery of Ethal had suffered from the French invasion, and in the beginning of the century its possessions fell into the hands of the State. Dr. Otmair Weiss, a Benedictine member of Ethal, who had remained and gained a living as teacher in a neighbouring school, residing still in his cell at Ethal, came to the help of the people in 1843, and assisted them in weeding the play of what had been deemed objectionable, re-editing the text of the version, writing it as nearly verbatim to the Scriptures as possible. This has been again altered and curtailed. Originally the words spoken were in blank verse; they are now in prose, edited by one of the schoolmasters of Ammergau. The music is also the composition of one of the people. The whole arrangement of theatre, decorations, tableaux vivants, orchestra, dresses, all are carried out by the villagers themselves. A committee of six persons assist at the posing of the whole of the scenes and tableaux. Including the orchestra of forty, and singers numbering nineteen, above 500 of the villagers are employed in the representation. Following the example of the Mystery Plays of the Middle Ages, which were copied from the old Greek plays, they have their chorus or genius of the play, with their speaker in the midst to introduce the scenes of each scene. The previous evening, at the "Benediction," in the church, we heard some fine music; and after all had left the church, the orchestra marched through the village, playing some gay march. The whole night through the villagers, from all parts, in holiday costume, flocked in. At 5 a.m. all the country people arrived, and were sunbathing about to visit their friends. At 8 o'clock commenced the Passion Spiel. The theatre is erected at the end of the village, at the foot of a green sloping hill. The proscenium, open to the sky, is about 80 ft. wide, and, before the scene, 20 ft. deep.

The drop-scene, about 20 ft. wide, represents the city of Jerusalem. On either side, a folding-door and balcony above represent the houses of Annas and Pontius Pilate. On each side, beyond, are well-perspectived streets of Jerusalem. For the audience, from each side of the orchestra, and beyond, for 100 ft., are graduated benches for the "parterre" ticket-holders,—prices ranging

a 30 krenzers, or about 10d., to 1s. 6d.,—all, and about 5,000 in number. There are then 26 500 places covered,—prices from 1½ golden gulden each: these mostly occupied by figures. The music, which is solemn, plain and impressive, began punctually at eight o'clock; then entered the chorus, clad in very hot but harmonious array, and stood in line before the scene. The speaker delivered the prologue in a recitative tone, ending the end for which the Saviour died, and while the chorus joined in the strophes, they retired from the centre, and scene rose to present a tableau of Adam Eve being driven from the Garden of Eden. Throughout the whole, the chorus delivered, in native or song, the subject, and retired from the scene while the tableaux lasted, and the proscenium entirely when the moving scene was being enacted. Each New Testament scene was preceded by one or more tableaux from Old Testament typical of the subject.

Then followed the Entry of Christ into Jerusalem, introducing at least 300 persons on the scene. The young man presenting the Christus a simple dignity of mien, joined to a grace and majesty in every movement, and an almost line expression of countenance that is most striking. In each scene, from first to last, not action, not a movement was overdone by him. The same self-command, self-dignity was upheld throughout. The actions, the supposed bearing of the Lord on earth, were so thoroughly grasped and so perfectly realised by him, that doubt of the man's inner deep feeling and intuition of the sacred character he was labouring to depict left the mind.

As the stern rebuker of the sellers and buyers in the Temple; as the tender son taking leave His mother to do His appointed work; as the friend of Martha and Mary; as the holy institutor of the Last Supper, the humble washer of His disciples' feet; as the man bowed down on the mount of Olives with the knowledge of forthcoming suffering and desertion of His followers; the bold, brave supporter of insult at the hands of his accusers; His dignified bearing under the high priests; His meekness in bearing tortures from the soldiers; and lastly, that so wonderful of scenes, His death,—all were æsthetic realisation never seen before on any painted scene. We cannot call it acting,—it is so real, too perfect. We have taken the principal character, the best; but that of Judas is a little inferior in its completeness.

The action never flagged, never altered. Each characterised his prototype as none could be wished altered. The dresses were archaic, the colouring most artistic.

The tableaux vivants were really living pictures. As far as could be, the woodcuts of Albrecht Dürer's twenty-four scenes from the life of the Saviour were depicted, both in the moving scenes and the tableaux. Among the latter the scene of Abel, in which the statuesque pose Cain was most admirable. The Shepherds led by the Angel, Abimelech and Esther, the scene in the Wilderness, Joseph sold to his brethren, his triumphal entry, and the Sacrifice in the Temple, if one may make an invidious distinction among so many admirable pictures, are peculiarly artistic. The scenes enacted, the clearness of delivery of the text, the natural feeling, if we may make use of such an expression, were perfectly astounding. It is so much to be regretted that there should be a drawback relate to so almost perfect a production; but women introduced in the moving drama are at drawback. The Mary is good, quiet, well-mannered; but the Magdalene and the other women are ill chosen, ill posed; the angel also is out of things. These, we hear, were, in consequence of a severe criticism, done away with by the committee. The length of the music and drama might, we think, be wisely curtailed. The performance lasts from 8 a.m. till 11:30. A pause of one hour, and from 12:30 to 5, comes the second part.

We will not here enter into the subject of how far it should be permitted to depict so minutely and vividly the last sufferings on the cross of our Saviour—the crucifixion itself. We have that the enactors themselves do it in the spirit in which it was meant, and for the end intended. We never heard a doubt whispered on the subject. The sacred drama is more thrilling, more heart-stirring, than pen can describe.

That a small nest of villagers, hidden among the mountains, can produce so highly æsthetic, artistic, so refined, so unique, so elevating a drama, is itself a miracle. The Christus

returned the next day to his wood-carving. The dignified Pontius Pilate to his work. All to their labours in the workshop or the fields, for the hay is being made, and each has his bit of land to himself, as his own property, in this well-to-do village. The children to their school, all pursuing their work, but intelligently, and to the best of their powers. And again they will put on the dresses of their appointed characters, which they retain as long as they can, and again astonish the comers from all parts of the world for several more representations this summer.

The distance is great, the fatigue much to undergo; but let each one, before condemning the Passion Spiel, if possible be present to judge for himself. There is nothing contrary to our Reformed rendering of the Scriptures introduced, save the imprint of the face of our Saviour on the handkerchief of the Sra. Veronica—not effectively done: it might pass unobserved by many.

The solemnity and length of time, nearly twenty minutes, during which the painful and vivid scene of the crucifixion is taking place, is what is most solemnly witnessed. Not a movement, not a whisper, is heard; nought but the efforts to suppress expressions of feeling. It should be seen once in a life, and no more.

The representations were interrupted last year on account of the war. Six of the villagers were killed and eight wounded.

The proceeds, which amounted last year to 45,000 gulden (3,750*l.*), were, after paying the expenses incurred, spent in improvements to the village, repairs of the church, help to the needy, repairs and improvements of schools, and the rest was divided among the actors.

The remaining representations will take place on the 9th, 16th, 25th, and 30th of July; 6th, 14th, 20th, and 27th of August; and 3rd, 9th, 17th, and 24th of September.

THE INDIAN COURT AT THE INTERNATIONAL EXHIBITION.

THE art, the industry, the social institutions, even the architecture and scenery of India, are amply illustrated in the new annex to the International Exhibition, which was opened, for a private view, on the 6th inst. Private, indeed, is a comparative term; for the crowd within the gaily-decorated hall was not less dense than that which renders movement through the other galleries of the series by no means easy, as the day wears on. The Indian Court deserves honourable mention, in a style peculiar to itself for the present year, in the matter of catalogue. The French Court, the last opened, as our readers will remember, had, *tout bonnement*, no catalogue at all. Of the irregularities and deficiencies of the General Catalogue, published in two parts, enough has been said in our pages, faintly as they have echoed the general grumble of the public. It is, therefore, a matter for joyful surprise to find, on the very day of the private view, before the sounds of the hammer are well silenced, a neat, trim little book, in a respectable brown cover, containing 183 pages, and describing 2,938 articles, attainable for the reasonable price of 6d. The descriptions contained in this catalogue, as may be properly expected, are printed on slips of paper, and serve as labels to the objects. In the domestic pottery, an important collection of some thousand articles, the labels are as yet unattached; and this slight exception to the generally perfect order in which the Exhibition was opened, is sufficient to show how much the public are indebted to the perseverance, energy, and skill that have effected so much in so short a space of time.

The Indian Department of the International Exhibition of 1871 is not, indeed, like a certain Chinese exhibition which we remember being opened in London more years ago than it is necessary to count, the introduction of a veritable slice of India into our capricious climate. We are not ushered into halls carefully sheltered from the light, as well as from the heat, of a tropical sun, and opened, by all sorts of contrivances, for the admission of air, to the exclusion, however, of fatal thorough draught. We do not peep through unglazed windows upon Indian scenery. But if the stage scenery be absent, there is enough to give every serious investigator ample information. The amount of knowledge that may be attained as to the products, and thus as to the requirements, of this vast peninsula, is surprising. The exhibits are divided into twelve classes. The first consists of paintings, drawings, and enamels. It is divided into five sections, respectively com-

prising paintings on talc (a special Indian art); paintings on ivory; paintings and drawings in water colours; decorative painting on wood; decorative painting on papier mâché; and enamel painting. Class II. consists of mosaics, sculpture, modelling, carving, and chasing in different materials. Its sixteen sections are,—gold work silver work, jewelry and enamel ornaments, brass and other metal ware, Kooftigari work, Bidree work (which two local adjectives we will forthwith explain), mosaics in marble, inlaid work, carvings in marble and stone, carvings in soapstone, carvings in jade, agate, rock crystal, &c., carvings in blackwood, ebony, stone, &c., carvings in sandalwood, carvings in ivory, figures modelled in clay, and Indian fruits modelled in clay.

The Kooftigari work, we must interrupt our summary to explain, is the manufacture of steel inlaid with gold, which is carried on principally in Goojerat and Sealkote, in the Panjab. That of the latter place is distinguished by higher finish. In former days, we are told by Dr. Forbes Watson, the director of the department, the Kooftigari work was principally employed in the ornamentation of arms; but it is now extended to a variety of fancy articles of personal decoration, such as brooches, brooches, and earrings. The work is produced by drawing the pattern, with a fine steel probe, on the surface of the metal to be ornamented. When the pattern is complete, the article is heated over a charcoal fire, and fine gold wire is hammered into the lines traced by the probe. The surface is then polished with an agate rubber, cleaned with lime-juice, and burnished. The beautiful steel cabinet, caskets, and other objects, which have been produced by Signor Cortelazzo, of Vicenza, and some of which are exhibited among the Italian objects of art, are apparently executed in a somewhat similar manner.

The Bidree work, to explain the second local title, is a species of pewter plate, principally executed at Bidree, in the Deccan. The pewter is, in the first instance, shaped upon a form made of cow-dung and clay. A design is cut upon it, and the silver is then applied in leaves, and hammered on over the incised parts, where it is cut by the process; when borders are required a silver wire is introduced. Hooka bowls and chibukans (the pipe part of the hooka) are principally decorated in this way.

The third class of exhibits contains three sections, viz., engravings, lithographs, and photographs and photo-zincographs. Class IV. consists of architectural designs; Class V. contains the most costly and precious of the exhibits, under the two sections of hand or loom embroidery, and Cashmere shawls; Class VI. comprises designs for decorative manufacturers; Class VII., reproductions of ancient works of art; Class VIII. is devoted to pottery; Class IX. comprises three sections, namely, woollens, raw wools, and carpets and rugs; Class X. consists of educational works and appliances; Class XI. of scientific inventions and new discoveries; and Class XII. of miscellaneous articles of Indian manufacture.

The paintings on talc, of which eighteen are exhibited, will be familiar to many of our readers as a special Oriental form of art. They in no respect resemble paintings on glass, except in the fact of the perfect transparency of the ground. While there is no attempt to produce that graduated perspective and deceptive imitation of natural scenery which is the aim of European art, and while there is an equal absence of that bold imaginative indication of nature which is proper to the artists of Japan, a very good notion of Indian costume, habit, and life may be arrived at from these paintings. No. 2 is "Dole-jatra," a holy procession of Hindus, by a native artist, from Patna. A suttee, or widow burning, and a Hindoo marriage ceremony, are also from Patna, and there are other scenes from Bengal.

Among the paintings on ivory, special notice is due to the portraits of Eastern celebrities, by Ishmael Khan, of Delhi, which are exhibited by the Government of the Panjab. This artist is very skillful in copying pictures, and in reproducing portraits on ivory. The ivory used is obtained from the wild elephants of the Nepal valleys. The fine glue which covers the paintings, giving them the effect of enamel, comes from Aleppo, and is ground and polished into oval shapes at Delhi. The portrait on ivory of the three sons of the Jaghirdar of Arnes, by Palikat Singha Perumal, of Tanjore, is exquisite in its finish, and highly characteristic in execution. The portraits of Mahomed Ali, Nabob of the Carnatic, and of Colonel Lawrence, are

hardly inferior, although it is observable that the artist renders the expression of his fellow-countryman with far more vigour and truth than the lineaments of the European. There is also a carved black cofret, with ivory carvings set in the lid, by Ishmael Khan, of great beauty.

Among the water-colour drawings is a collection of eighty common pictures, executed by natives, in the Calcutta bazaars, and used by the poorer classes for the adornment of the mud walls of their houses. These are chiefly interesting as showing the large demand which seems to exist for pictures amongst the poorest natives. There is one series of mythological drawings, by native artists, and another of sketches of the craftsmen of North-western India, by Mr. J. L. Kipling, of Bombay, illustrating fifty-six distinct industrial processes. There are also ten pictures by a native artist of Umrisar, in the Panjab, representing industrial and mythological subjects.

In the illustrations of decorative painting on wood, great use is made of lacquer, both black and red. There are two boxes painted with antelopes and other animals in imitation of inlaid work, from Bombay, which might well be thought to be wood mosaic. A tray ornamented with a design in relief, painted on lac, is worthy of remark. There are boxes of split bamboo, lacquered and painted, of which the process of manufacture is thus described:—The box is formed into the shape required in fine bamboo basket-work. It is dipped into lacquer, and buried for five or six days, until the wood oil is properly set. This process is then repeated. On the lacquer thus produced, the intended pattern is traced. A red pigment is then rubbed over the whole, but bites only where the tracing has been made. After a few days the superfluous red pigment is rubbed off. A yellow pattern is subsequently produced by a similar method. The patterns are free-hand, traced with an iron style. When the decoration is complete, the box is placed on a lathe, and polished with fine charcoal.

The paintings on *papier mâché* comprise some very beautiful objects. No. 100 is a pair of round trays, decorated by native artists of Cashmere, exhibited by the Earl of Mayo. No. 108 is a tray, with jug, cups, and saucers, exhibited by the Maharajah of Cashmere; card-boxes, glove-boxes, tea-caddies, cigar-cases, "goglets" or water-bottles, a teapot, an arm-chair, and other objects are contained in the section.

Under the head of Enamel Painting will be found a fine drinking-cup and cover, with a saucer, in parcel gilt enamelled silver, of elaborate workmanship, from Aurangabad, in the Deccan, exhibited by the Hyderabad Government. There is also a portrait of the Maharajah of Cashmere, enamelled on gold.

The collection of gold-work contains objects not only of industrial interest, but of high intrinsic value. The goldsmiths of Western India are either Marwaris, Gujaratis, Kutchis, or Dekanis, by birth. They generally work on ornaments worn by their caste men and by people of their own country. The usual practice is for the intending purchaser to find the material. The artisan charges from 3 annas to 2 rupees per tola (from 1½d. to 4s. for about four-tenths of an ounce in weight), according to the simplicity or richness of the design. These people, who have been goldsmiths for many generations, possess, like their fellow-craftsmen in Italy and elsewhere, secret methods of working and welding the noble metals, which they guard with great jealousy. The Governor of Bombay exhibits a tray of gold ornaments, including a pair of earrings, brooch, and two female head ornaments. There is a remarkable head ornament, and a delicate pair of chains intended to hang from the ears, exhibited with other articles by the Maharajah of Vizianagram. A still more elaborate head ornament, a gold "jalabadi," comes from Madras. A cup and cover in chased gold, from Cashmere, is exhibited by Lord Mayo. A gold cup, from Mandali, is sent by the Rangoon committee. These cups are first roughly hammered into the shape designed, and then filled in with melted shell lac. When the lac has cooled, the design is hammered upon the cup with punches of various kinds. The workmanship may be considered as the reverse of the European *repoussé* work. A vinaigrette, a brooch, and a pair of earrings, formed of tigers' claws set in gold, which are valued as amulets as well as ornaments, are exhibited by the Bengal committee. There is a hand-pike, with

mounts of gold, from Gwalior, sent by the Maharajah of Scindia; and a sword, with gold mounts, exhibited by the Maharajah of Jeypore, remarkable for its perfect simplicity,—plain gold and plain steel.

The silver work comprises some of the most beautiful objects in the Exhibition. It is very remarkable to see features that have passed away from among ourselves reflected from the unchanging East. Thus, in a dozen table-spoons, from native designs, executed by the Madras Industrial School of Arts, we recognise the very form of our old christening gift, the "Postle Spoon,"—a many-handled Indian deity being substituted, in some instances, for key-bearing Peter, or sworded Paul. A parcel gilt claret-jug, of Lucknow work, is exhibited by the Government of Onda. A set of ornaments in silver filigree, consisting of a brooch, bracelet, earrings, and necklace, exhibited by the Government of the Panjab, closely resembles the delicate work produced at Genoa. A tea-pot and drinking-cups, in chased silver, from Cashmere, are exhibited by Mr. R. Chapman, and are enough to excite the envy of the lovers of old silver. There is also a lovely tea-service, comprising teapot, sugar-basin, and cream-jug,—each of the later two articles about the size of an orange,—from Kutch; exhibited, together with delicate rose-water bottles, and ostrich eggs mounted in silver, by the Governor of Bombay. Quaint adaptations of animal forms are not absent. There is a powder-flask, from Rajpootana, in the unexpected shape of a fish. The bracelets and brooch of silver and "Roodraksh" beads, from Poonah, form an elegant set of ornaments. And there is actually a chignon, exhibited by the Nagpoor Committee, as requiring, or required by, a silver head ornament. Let our fair readers know that it is of coarse and by no means dear hair, and that it is called a "Chowrinrudee." It resembles the mane of the Warthog at the Zoological Gardens. A large chased steel-box, and a cup in *repoussé* work from Rangoon, are of great beauty; and so are four pairs of mufflers, from Kutch. Then we have a coffer, or biscuit-box, in enamelled filigree, from the Deccan, exhibited by the Hyderabad Government; and specimens of weapons, ornaments, table utensils, and other objects, richly and elaborately executed in this noble metal. We must give another article to the remainder of this Court.

TO, AT, AND FROM BERLIN.

HAVING become possessed by an irresistible desire to witness the triumphal entry of the victorious German troops into Berlin, we started off at short notice, a week before the eventful 16th of June, 1871. We had taken the precaution to send two telegrams to pave the way for a favourable reception, to the former of which the reply came that there was not a room to be had in all Berlin for love or money; but the latter brought us for answer that beds were reserved for us, and the windows belonging thereto were also at our disposal, at a certain price. Of course we gladly closed with this offer, exorbitant though it was; but, once arrived, we found that had we only known our ground, we could have concluded much more advantageous arrangements on the spot. So large a provision for spectators had been made, that excellent seats were sold at last for about as many shillings as we gave pounds. However, we were sheltered from the expected rain, and were shaded from the actual sunshine, the painful effects of which we saw afterwards on many an otherwise fair neck and throat, for parasols were, of course, not allowed to be used.

Though just now "the Entry" is the all-important topic, yet the journey itself to Berlin need not be passed over in silence. Starting from London, a very nice French family were our travelling companions; papa, mamma, and a fair-haired, merry Bébé, of some three years old. They were returning to Paris, after an absence of ten months, and told how that their home was near the Arc-de-Triomphe, the most cruelly bombarded quarter, and that they had lost everything! They appeared very subdued and sad; seemed pleased to have an interest taken in them and their *pauvre pays*; and grateful for kind wishes that they might find things better than they expected. Of course we were careful not to speak of the Berlin Entry before them.

War has made the passport nuisance more rampant than ever. Passports were taken at Calais, and each owner had to rush and reclaim

his precious document just as the train was on the verge of departure; and they were re-examined on the Belgian frontier. Then at Blondain, half an hour afterwards, there was the turn-out from the train and the turn-in to the Donane, though the luggage was "booked through" to Brussels.

Our steamboat had managed to miss the express train, so we found ourselves at fault all day long. At Tournai we waited an immense time, and then had to be sent round by Ghent. The bridge over the Scheldt at Tournai, many will remember, is a picturesque structure, with a large round tower at each end. Perkin Warbeck owned himself the son of a Tournai Jew. Henry VIII. took the town in 1513, and presented Wolsey with the see; but, in 1518, Francis I. bribed him by a promise to obtain him the papacy, to relinquish it, and also to sell him the town. Chilperic died here; Clovis was born and resided here; and Childeric I., father of Clovis, died here, 482. He founded the cathedral, though the greater part of the present building, dates no farther back than the twelfth century. His coffin was opened in 1655, when, amongst other relics, the golden bees from his robe were found, which were afterwards adopted by Napoleon I. In 1581 a noble lady, Princess Christine d'Espinoi, defended the town against the Prince of Parma. In the townhall is Gallait's picture of the Counts Egmont and Horne. The swords with which they were beheaded are preserved at Belleil, six miles from Ath. They were executed on the Grande Place in Brussels, 1568, by order of the cruel Duke of Alva.

At Courtrai, charming public gardens, walks, and avenues on the border of the River Lys, run parallel with the railway. It is noted for its fax and its damask table-linen. Under its walls, as some readers may like to be reminded, the "Battle of Golden Spurs" was gained in 1302 by 20,000 Flemings, chiefly weavers of Ghent and Bruges, under the Count of Namur, over the French, headed by the Comte d'Artois. After the battle 700 gilt spurs were gathered up. Four miles from Waereghem Station lies the village of Roosbeek, near which Philip van Artevelde, the brewer of Ghent, was defeated in 1382 by the French, and perished with 20,000 of his countrymen.

One quarter of an hour at Ghent, and then on to Brussels, but only time enough allowed there to dine and wash: both equally necessary operations, considering it was twenty-two hours since we began our journey. On the route to Brussels an amusing incident occurred. Two gentlemanly young Belgians, who were very friendly with us, but, for some reason or none, gave each other the "cold shoulder" (one who was a bit of a dandy possibly looking askance at the other because he was so decidedly "in *multa*"), were led by the accident of asking an address, to discover they were fellow-townsmen; that "multa" had a brother in Brussels with whom "dandy" was on most intimate terms; and that, moreover, he had for some time corresponded with "multa" who resided in London, and had had numerous business transactions with him and his firm. Of course, they now became fast friends, and walked off arm-in-arm. Who is it that says, "Always treat your enemy as if he were destined to be your friend, and your friend as though he might some day become your enemy?"

At Verriers a drenching storm made descending from, and remounting to, the much-sheltered carriage an unpleasant experience. At Herbesthal, the first Prussian station, many French soldiers were waiting to be carried back to France: men, mostly very young, looking very shabby, and their soiled uniforms showing that, among them, they represented pretty nearly all branches of the service, and many of the regiments. They seemed on good terms with the Prussians, and appeared neither saddened by their captivity nor elated by the near prospect of returning home.

At Aachen, Charlemagne was born, and he died here in 814. A recent and very interesting paper by Professor Donaldson tells the mode of his interment and the subsequent opening of his tomb, 1165. At Köln we arrived at ten o'clock at night, after having been thirty-one hours en route. The handsome railway station was decorated inside and out, with garlands, wreaths, flags, coats of arms, and shields bearing the name and date of various victories gained over the French during the late campaign. Here several of the renowned spiked helmets were seen; and on the bare boards

de the station, soundly sleeping amongst all noise and bustle of arrival and departure of travellers and baggage, lay a large number of men, soldiers, very dusty and travel-stained, tired and accoutred, their arms beside them. The spacious apartment, though ordinarily airy and open enough, smelt and felt stiflingly close. At would it be by the morning!

At the comfortable Hôtel du Nord, where we stayed for the night, the principal things that attracted attention were the elegant toilettes of our countryman, Minton. His pleasant and generous-sized were appeared also Berlin; and Copeland's heavier, less agreeable manufacture, at Frankfurt. It seems as if the mans, weary of the Englishers' constant out-against the "pie-dishes" that were given to everywhere in Fatherland by way of wash-basins, had out the knot of difficulty by hing over for them their own rational, and aral, washing apparatus; and great is the fort thereof!

At the morning we had to be up before five, a mean time, which is here some half-hour than London, and leave the hotel about an o'clock to catch the 7:30 train. A glimpse assant was all we could obtain of the pro-ising cathedral. The handsome new railway ge over the Rhine is ornamented with etrian statues and Prussian eagles on the piers. Düsseldorf was passed at 8:15. The try all along, though dreadfully flat and interesting, looks prosperous, if new buildings ng up everywhere are the test. Rehme has, a tiny little station—Oeyenhausen, decorated a flowers, and good terra-cotta busts, heads imals, and so forth, on medallions, let into walls. It is a favourite spot with invalids, come here to take baths of brine. The salt rises from an artesian well, and is made ickle over large square, neatly-built piles of ois, some of which are seen to the left of the ay, which causes evaporation, and renders e for boiling. The well is 3,220 ft. deep.

At Wehegebrige rise abruptly from the bly flat plain, and are very bold and pic- nce. A wide rent in the ridge, formed, less, by the River Weser which flows igh, is called the Porta Westphalica, and it the railway, the carriage-road like- pass. At Minden, hosts of French prisoners ounge about their encampment, close to railway, guarded by Prussian soldiers; a large area, reminding one of Alder- covered with rough wooden huts, and ar temporary and fragile-looking erections. rob of the stone bridge here was blown up e French, 1813, and is still replaced by one od. "Pity," say I, "the Prussians did not e their present French prisoners rebuild it."

A Minden to Hanover, the Wesergebrige bound horizon. This portion of the journey was et the only pretty bit of country we had seen landing. At Hanover, two pleasant English elling companions left us. The younger of the a good German scholar, had a fine head for ightor, reminding of the Antinous,—almost ation, in the full, heavy outline of mouth and Brunswick Station has prettily-laid-out nds on each side. It is large, spacious, and er classic in design. Circular windows, in row, high up, filled in with puce and orange red glass, have a good effect. Platform, as l the stations, crowded with loungers; and clean, well-dressed waiters brought out to arriage-doors trays of excellent coffee, with y of hot milk, which was most acceptable; also s, ham and bread, and caviare on bread. Food the mind, likewise, is plentifully supplied by itable Brannschweig,—fine pictures, and ng them Rembrandt's Grotius and his Wife, gh, I think, was lent to either the London or Manchester Exhibition; some of Gerard e Teniers, and Albert Dürer, besides a won- al carving in steatite by the latter; Cellini eliefs, in silver; Limoges enamel; the cop ecusko, carved by him when in prison; missals, and so forth. Spohr, the composer, born here, 1784; and Lessing, who died, is buried here.

At Wolfenbittel are kept relics of Luther,—Bible with autograph notes, marriage-ring, on, doctor's ring, drinking-glass, and portrait ranceh; also a misal illuminated by Albert e. The afternoon of both this and the ous day was very wet. Much land was r water, and we had plenty of fog and mist gh not agreeable for travelling, rainy ther was a welcome occurrence just then, as ight lay some of the Berlin dust, which, we told, is usually abominable.

Magdeburg,—clocks departing more and more from London time. Passed through the fortifica- tions and over the Elbe, here a wide, brimming river. Again, a large but, this time, ugly, station, its wide, long platform crowded with people. Lafayette and Carnot were imprisoned in the citadel, which is used as a state prison, and is built on an island in the Elbe. Baron Trenck was confined for a long time in the Star Bastion. In 1629 Wallenstein besieged the town for seven months. Tilly, the ferocious, took it in 1631, sacked it, massacred 30,000 people, and be- headed the commandant. On the house in which he lived can still be traced the inscription, "Remember the 10th of May, 1631." Only 139 houses were left standing. In 1806 Magdeburg surrendered to the French, and in 1813 and 1814 it endured a long and obstinate siege, also by the French. The cathedral was shamefully injured by them, being turned into a stable and warehouse, but it has since been restored. The lower part dates from 1209. It is full of archi- tectural and artistic beauties, among the latter a fine monument in bronze, by Peter Vischer, of Nuremberg. Luther went to school at Magde- burg, and relates how he used to sing before the houses of the great folks, to earn a scanty pittance. If I remember rightly, the late lamented Henri Leys, as well as a living English painter, adopted this incident for the subject of one of his clever pictures. When Carnot was driven out of France by the Bourbon restoration, he returned to this scene of his former captivity, where he obtained an asylum. He died in 1823, and was buried in the churchyard outside the Krakenhof.

Brandenburg has a cathedral and several churches of great interest, containing monu- ments in terra-cotta. St. Catherine's has immense screens of baked clay, with statuettes in niches; also an altar-piece of richly-carved wood, and a brass font by Morner, date 1440.

Passing over miles and miles of land all under water, looking terribly mournful and unwhole- some, we reached Potsdam station, where trees began to present themselves at intervals; but flowers seem scarcely known all along this route. Late in the evening we arrived at Berlin, and took up our bespoken quarters at the Hôtel St. Petersburg, on the shady side of the famed Unter-den-Linden, and within a stone's throw of the Lust-garten and its many palaces. Berlin was in despair. "Nothing but rain, rain, rain, for more than a week past; and if we should have a wet day for the Elztag!" So said Berliners; but to our English eyes, possibly more experienced in changeable weather than theirs may be, there was a certain gleam in the sky, and a rising-up of the leaden clouds, which encouraged hope; so, prophesying bright sun- shine to the desponding folks, we betook ourselves to our much-needed repose." R. F. H.

LEICESTER MUNICIPAL BUILDINGS COMPETITION.

SQUABBLE as usual. "Dispute," "Disappoint- ment," "Waste of our time," are the expressions which predominate in the little bundle of letters we have received on the subject, and all founded on the circumstance that the referee, Mr. Street, has placed first on his list of five a design which, however satisfactory the elevation may be, does not give the required accommodation. In fact, it is beyond criticism in this respect, and simply cannot be carried out. Some of the com- plainants say with truth that what the Leicester people want is primarily and positively a set of convenient and fitting buildings; these, of course, are to have an external case of sufficient dignity and elegance, but unless the town get commodious offices, the desired end is not answered.

In respect of plan, the choice appears to rest between "Fiat Justitia" and "Speramus." Of the first the referee writes:—

"Most of the municipal offices are well placed and planned; the accountant's rooms, however, not being good, and some of the committee-rooms being badly lighted. The Courts of Justice are so planned that the bar, judge, jurors, and witnesses may be separated from the general public. The hall for the public outside the courts is not large enough, but the room marked on the plan as an ante-room, between the mayor's parlour and the second court, might be opened to the staircase with an archway, so as to remedy this defect. The police offices are all very dark, and the parade and master room especially so. The counsellors' entrance, and that for the judge and bar, are too narrow, but might be enlarged."

Of the plan of "Speramus," Mr. Street says:—

* To be continued.

"The plan is extremely good and accurate. The municipal offices are very good, save some rooms for the town clerk and accountant, which are not well lighted. The business and general public may be well separated from each other in the courts, and the access to the galleries of the courts is good. The architect appears to have made his building about 2 ft. longer than the site will allow."

Mr. Street points out that he cannot pledge himself, "in the slightest degree, to the possi- bility of executing any one of the designs for the sum of 25,000*l.*,"—the sum named. The probable cost of such a building would be "not less than 30,000*l.*," or "26,000*l.*, exclusive of any allow- ance for towers." It is quite clear, from the tenour of Mr. Street's report, that the proposed site has weighed heavily on the minds of the competing architects. Having regard to the site, and the funds to be expended, the referee is of opinion that more accommodation has been asked for than ought to have been. "As regards the site itself, I regret very much that it is so inconveniently-shaped and so confined. I have been obliged, in my award, to deal with it as it is, and not to allow the possibility of practically enlarging it by building up to its western boundary, and taking light from the property on that side. But in every plan, without exception, I see that the ingenuity of the architect has been taxed to the utmost in order to secure anything like tolerable light and air, and that if the site is not enlarged, the convenience of the various courts and offices will be seriously impaired, and the means of access to them will be very far from complete or satisfactory."

BIRMINGHAM CORPORATE BUILDINGS COMPETITION.

On Tuesday last the Town Council proceeded—

"To consider that part of the report of the Estate and Buildings Committee presented to the Council at its meeting on the 23rd May last, relating to the plans for Corporate Buildings, and ordered, together with the reports of Mr. Waterhouse upon the several plans, to be printed and circulated among the members of the Council; and thereon to award the premiums to the authors of the selected designs."

Mr. B. Smith read five resolutions, which he proposed to move. The first was for the awarding of the premium of 200*l.* to the author of the plan marked with a Maltese Cross in a circle; the second, for the awarding of the premium of 100*l.* to the author of the plan marked "Perseverantia"; the third, for the awarding of the premium of 50*l.* to the author of the plan marked "Forum"; the fourth was to authorise the chairman of the committee to certify to the finance committee for the pay- ment of the premiums; and the fifth was to authorise the committee to treat with the author of the plan sent in without a motto, for the acquisition of the said plan.

These having been moved and seconded,— Mr. Cornforth moved as an amendment "That the premiums for the three best sets of plans for law courts, judges' lodgings, and municipal buildings be awarded as follows:—The first premium of 200*l.* to the author of the design signed 'Perseverantia'; the second premium, of 100*l.*, to the author of design signed 'Forum'; and the third premium, of 50*l.*, to the author of design signed 'In Uno'; and this having been seconded, was ultimately carried."

The envelopes having been opened, the result was declared to be as follows:—"Perseverantia" (1st award), Mr. Yeoville Thomson, Bennett's Hill, Birmingham; "Forum" (2nd award), Mr. W. H. Ward, Curzon Chambers, Paradise-street, Birmingham; "In Uno" (3rd award), Mr. L. de Ville, R.I.B.A., 3, Duke-street, Adelphi, London.

AMERICAN INSTITUTE OF ARCHITECTS.

A LETTER lately addressed to the foreign honorary members of the American Institute, signed H. A. Sims, secretary for foreign correspondence, gives the following interesting account of the first organisation of the archi- tects of the country:—This took place in the city of New York, in the latter part of 1836, under the style of the American Institution of Architects. The association aimed at being national in its character, and drew within its folds the practitioners of a number of our cities. Owing, however, to the great distances which separate our cities, and consequently the mem- bers, it was soon found impossible to keep up the meetings with any degree of regularity. The association held its second meeting in this city in 1837, and soon after, for the reasons assigned, went quietly to sleep.

In 1857, the second attempt was made towards associating the architects together. The name of the former organisation was retained very nearly, and a few of the former members. The new organisation, however, was made upon the different basis of a permanent location in New York. Under this arrangement the former difficulty was overcome, and meetings were held at stated periods, but at the sacrifice of the national character of the association, for it became almost purely local. In the United States all institutions such as this experience a difficulty, growing out of the fact of there being no city of such metropolitan character that all parts of the country look up to it, as England does to London, and France to Paris. The reason for this is, not that no one of our cities possesses in itself the proper qualification, but because of the vast extent of territory covered by these United States, and, to a certain extent, because of the division of the country into separate States. We have many cities of large size possessing those characteristics, which in more circumscribed territories would give them the influence of metropolitan cities. Situated as they are, however, they exercise these attributes only over the States or the immediate localities in which they are situated.

In 1866, the idea was conceived of rendering the Institute more national in its character, by delegating to local societies, or chapters, as they are termed, the duty of drawing together the local architects, and generally forwarding the cause of art, in the cities in which they were formed. These chapters are local architectural societies, admitting to their membership amateurs and patrons of art generally, together with professional architects. The Institute, as the central or parent body, is a society of architects, exercising a superintending care over the chapters, and generally over the profession throughout the country.

As soon as the system was arranged, a chapter was constituted in New York, but nothing further was done until the idea was more matured. This was effected during the latter part of 1868 and early part of 1869. Late in 1869 the Philadelphia Chapter was organised, and still later in the year that in Chicago. Early in 1870 the chapter in Cincinnati was instituted. A local society of architects had existed in Boston for several years, and in the latter part of the past year it became a chapter of the Institute. Early in the present year the Baltimore Chapter was formed. It is hoped that, before the close of the present year, several other cities will be numbered in the list.

The Institute is composed of Fellows and Associates, all of whom must be professional architects, and honorary members, who are generally distinguished foreign architects, or writers on the art. The controlling power is in the hands of the Fellows. The Institute, as a body, meets annually in November. During the year, the various matters of routine are superintended by the board of trustees, which meets monthly. Elections for Fellows and honorary members, and in some cases of Associates, are conducted by ballot. Printed tickets are prepared with the names of the candidates for election, and sent by mail to the Fellows, in different parts of the country. "Yes" or "No" is written against the names given, and the ballots are returned under double cover to the secretary, and they are opened and counted by the board of trustees. The board meets in New York, and at present the president, secretary, and treasurer are resident there. The presidents of the chapters are *ex-officio* the vice-presidents of the Institute. All the officers of the Institute are honorary, and in all cases are practicing architects.

LAYING THE FOUNDATION STONE OF NEW GRAVING DOCK, GREENOCK.

On Thursday, the 6th inst., the foundation stone of the capacious graving-dock now in course of construction at Garvel Park, Greenock, by Mr. John Kirk, of Woolwich, contractor, for the Harbour Trustees of that port, was laid with full Masonic honours, and great success.

This graving-dock being the commencement of a series of docks rendered necessary by the increasing trade of Greenock, the Harbour Trustees and other municipal bodies, together with the various professional, trades, and societies, determined to give *début* to the ceremony of laying the foundation stone, by assembling on the esplanade at the west end of the town, and thence marching, accompanied by

bands of music, to the works at Garvel Park, which is situated at the east end of the town.

Soon after one o'clock the whole procession, being in readiness on the Esplanade, marched for the scene of operations, a stalwart body of police going first to clear the way. These were followed by about 150 mounted carter, in divisions of greys, browns, and blacks, preceded by a handsome bay horse, with curled mane and rosetted tail, which won the first prize at the recent cattle show. Most of the carters sported sashes and rosettes, and some wore the large Kilmaronock blue bonnets, with red top and ribbons, and looked the *beau idéal* of Burns's hero of Alloway Kirk. Next came the Volunteer Artillery, 100 strong, followed by twenty-seven rows of riflemen, and thirteen rows of killed Highlanders, four deep, each corps being headed by its band, and the Highlanders by their pipers.

Such was the fine solidly bearing of these men, that, should they or their like ever be called upon to show their prowess, at Dorking or elsewhere, there need be no fear of the result. The fire-brigade came next, mounted on their engine "Gryfe," drawn by four spirited bays. These were followed by a large number of joiners, carrying wands and banners, and displaying models of workshops, of stacks of wood, of doors and windows, and of circular stairs. The spinners and dyers came next, bearing a handsome banner and emblems of their trades in coloured wool and yarn. Then followed the potters, eighty in number, displaying huge cups and saucers, jugs and basins, and a model of a kiln in which the wares are baked. Next came the painters, carrying banners and various emblems of their trade. Following these were the iron-moulders, bearing models representing their productions. After these came about 400 stevedores and harbour laborers, clad in blue pea-jackets and caps, with rosettes, and carrying many banners and models of crowbars and hoisting-crabs, and accompanied by a car drawn by horses, in which was a boat containing representatives of Neptune and his wife. These were followed by the masons, 200 strong, carrying banners, plumb-rules, squares, straight-edges, compasses, mallets, hammers, and chisels. Next followed the shipwrights, with a host of emblems, among which were models of the *Leander* frigate and a yacht. Then came the coopers, 300 strong, with emblems of coopers making barrels, &c. Then followed the rope and sail makers, displaying miniature sails, and a mainmast fully rigged. Following these came the good Templars, among whom were many women wearing badges. The Foresters came next, headed by two mounted men representing Robin Hood and the Shepherd, in characteristic costume. These were followed by the Odd Fellows. Then came the harbour trustees and harbour officials, the town-councillors, the police commissioners, collectors of Customs and of Inland Revenue, merchants, shipowners, and shipmasters, headed by a carriage drawn by four horses, containing the provost, &c. Next came the Freemasons, 475 in number, representing twenty-six lodges, clad in black, with white gloves and neckties, and nearly all wearing valuable jewels. Following these came the officers of the Provincial Grand Lodge of West Renfrewshire Freemasons, preceded by the clerk of the harbour trustees, carrying a sealed glass vase containing coins, documents concerning the works, newspapers, &c., to be deposited in the cavity cut in the stone. Then came a body of police, who closed the procession, the whole of which took more than half an hour to pass any given point.

As each section of the procession arrived at the eastern entrance to Garvel Park it halted, and opened right and left to allow the authorities and the Freemasons (who were now headed by the bands of the artillery and rifles, playing the Masons' March) to pass through their ranks down into the dock near to the foundation-stone. This consisted of the key or centre stone of the large inverted arch at the inner entrance to the dock, the ceremony of laying which was then performed most successfully and impressively by the officers of the Provincial Grand Lodge before mentioned, the practical details being conducted by Bro. W. R. Kinipple, engineer of the works, assisted by Bro. Thomas Shaw, and Bro. John Phillips. On the completion of the ceremony the Freemasons gave three lusty cheers, which were taken up by the immense multitude of spectators who thronged the works and grounds. An able speech was then made by Provost Morton, who highly eulogised both the engineer, Mr. W. R. Kinipple,

and the contractor, Mr. John Kirk, and thanked the Freemasons, volunteers, and trades, for their splendid turn-out and services. Three cheers were then given for the Queen, three for the Freemasons, three for the Provost, three for the Volunteers, and three for the ladies who graced the scene of the ceremony. In the evening, in response to invitations by the Harbour Trustees, a large and influential company sat down to a well-furnished dinner in the Commemorial Hall, Provost Morton occupying the chair.

The following description will give a fair idea of this undertaking, in connexion with which it is intended to form a large acreage of dock accommodation:—

The graving-dock will for the present enter the river by a dredged channel, but will eventually open into a tidal harbour of some magnitude. The dock, with pumping machinery, caisson, channel way, &c., will cost about 70,000. The works were begun in April, 1870, and are expected to be finished in two years from that time. The dock will be 535 ft. long over all, 80 ft. wide at coping, 70 ft. wide between the vertical side walls, with a depth from coping to floor of 27 ft. 6 in. next entrance. The sides will be taken down for 12 ft. from coping in three steps or altars, 3 ft. deep and 1 ft. 3 in. broad. The remainder of the walls being vertical will give greater width of floor, and provide more light to workmen under the bilge of a vessel than usual. In the vertical faces iron ladders will be placed in recesses 31½ ft. apart, and three stairs and timber slides on each side will be carried down from the coping level behind the altars, and enter the dock through the vertical faces. The side walls and entrances will be faced with Dalbeattie granite, backed up with rubble, all set in Portland cement. The floor of the dock, 40 ft. in width, will consist of three layers of whole timbers (bolted together), laid on the excavation, the spaces between the timbers being filled in with cement concrete, and the whole overlaid with rock elm planking, 6 in. thick, having a round up in the centre of 6 in., and an inclination of 1 in 400 between the entrance and the head, with a gutter-plank on each side leading to receivers connected with drainage-pump. The remainder of the floor on each side will be of sloping granite pitching, three widths, edged by granite kerbing, all laid on cement concrete, and grouted with cement. The dock may be used as a wet-dock as well as a graving-dock. As a wet-dock it will accommodate two vessels of 3,000 tons, and from four to six ordinary-sized timber vessels. The entrance will be closed by a caisson carried by trolleys running on rails, which will save the cost of heavy swinging bridges and expensive opening and closing machinery. The caisson, with its deck or bridge, will be opened by drawing it into a covered recess by an endless pitch chain, one man, the engine driver, being sufficient to set the machinery going to do so. The caisson may be readily disconnected and floated away and repaired, or it may be run against a second step nearer the entrance, to allow the recess, rails, and invert face-quoins to be examined and repaired without a coffer dam. The caisson deck will be supported on uprights, with counterbalance tail-weights, as the caisson begins to open, the meeting-plate of the platform will be released from the abutment-plate in the quay-face, and the deck will fall of its own gravity. The displacement of the caisson being always the same, it may be opened or closed at all times of tide. The entrance caisson will also be arranged so that the water in the dock may be retained or pumped out, any level. The engine-house and pumping machinery will be below the coping level of the dock on the south side of the entrance, and, when required, the level of the water inside the dock may be raised, and vessels placed on high blocks.

ALBERT DÜRER FÊTE AT MEISSEN-ON-THÉ-ELBE.

ON Sunday, the 25th of June, took place, at Meissen-on-the-Elbe, a *fête* to celebrate the four hundredth anniversary of Albert Dürer.

A society of artists, literary men, &c., from Dresden at eleven a.m. by boat to Meissen. Assembled at the old castle, once the porcelaine manufactory, they proceeded in a procession to the old church, where some splendid sacred and classical music was given. The whole of the town was decorated most artistically. Picturesque scenes from the life of Albert Dürer adorned the streets and banqueting-hall in the Schloss.

was a banquet was given in the hall. Speeches were delivered by Professor Hübnor, of Dresden, director of the Gallery, and Professor Gruner, of same; the former inciting the young artists to the present day to imitate the careful work-life study of the great man they that day saw. And in the evening was given a short entertainment by the artists, called "Albrecht's Birthday," in which Maxmillian figured, of course, Dürer's wife. The play was lent by one of the artists from the well-known drama, and excellently played by the actors. A dance and music ended the fête, in return to Dresden mid showers of rain was only damp on the enjoyment of the day.

KING'S COLLEGE, LONDON.

On Thursday in last week "Commemoration" was celebrated. A sermon was preached in the curious wooden chapel of the College, at two o'clock there was a luncheon in the hall, at which a large number of guests were present. Dr. Barry, the principal, presided, supported by the Archbishop of York, the Bishop of Winchester, the Master of the Temple, Lord Ave, the Earl of Harrowby, the Rev. Dr. Jelf, &c. Dr. Barry made a very interesting speech, explanatory of the working of the college, and other speakers succeeded. At four p.m. followed the presentation of Associates of the college, and the distribution of the chief prizes to all the several departments, over which the Archbishop of York presided.

It is generally known that nearly as many sons (about 1,400) are receiving education from King's College, as in Oxford. The social position is not what it ought to be, heard it asserted, in the course of the day, as much as 60,000, was needed to put straight, and that money intended for emendations had been unavoidably swallowed up in the ordinary expenses of the establishment, is this true?

On selected drawings of the students exhibited the entrance-hall, free-hand and mechanical, a less satisfactory than might be expected. The water-colour landscapes amongst them, a head from a well-known copy, would not muster at a Clapham girls' school.

DRAINAGE OF THE CITY OF CANTERBURY.

THE main drainage of this city, which is on the "sewerage system"—i.e., by excluding surface-water—and comprising about thirteen miles of brick and pipe sewer, with tanks, filtering-beds, &c., having been completed, the corporation, having allowed some time to elapse before the compulsory powers of the Public Health Act in force, that as many as were willing should of their own accord connect their houses with the new system of sewers, have lived upon carrying out with vigour the house connections, and abolishing all cesspools and drains at present existing, and thus completing the system of drainage according to plans prepared by Mr. James Pilbrow, C.E.

The whole of the above works were executed under his immediate supervision and to his satisfaction by Messrs. Dickinson & Oliver, contractors, who have received instructions from the corporation to proceed at once with the further necessary measures for carrying out the sewer-drainage and other sanitary work in connection therewith, Mr. Pilbrow being retained as consulting engineer.

In performing the work already done, the contractor and contractors had to contend with many difficulties, such as passing under the river or no less than four times, and through gravel, sand, and marshes surcharged with water. A large sum has already been expended in the above drainage works, although completed within estimate. The works about to be performed estimated at upwards of 20,000, but the same will not be completed until all the drains above referred to are cleared away, it is expected that the inhabitants will now be eager to assist in making Canterbury one of the best drained cities in the world.

St. Dunstan's, Stepney.—The restoration of the ancient Church of St. Dunstan, Stepney, in which so many interesting events are related, is contemplated. The cost of the restoration and new organ will exceed 3,000l.

BUILDINGS FOR MUSIC.

SIR,—“A Subscriber” thinks that after saying something about what concert-rooms ought not to be, I should say what they ought to be. I must reply that such a question is only to be at all fully and adequately answered on a basis of systematic experiment and investigation for that special purpose.

I am not, I may explain, a “musician” in the professional sense, but an architect: circumstances and taste have led me, however, to have more to do with music and musicians than, perhaps, the majority of architects have. My object in writing was to urge the fallacy of the very common idea amongst architects and engineers, that very resonant or sound-reflecting materials are the best for a music-room in all cases; and to show that this depends on circumstances—the size of the room and other matters. I also wished to draw attention to the fact that music is an essentially different thing from acoustics; and that people who are well versed in the science of acoustics are not necessarily the best judges as to whether a room is suitable for music or not. An “acoustician” (if I may use the term) listening to one of Beethoven's symphonies in a large concert-hall would be very well able to judge whether there was an echo or not, whether he heard the sounds more loudly in one part of the hall than another, &c.; but unless he were also something of a musician, he would not know whether he heard all the music as it ought to be heard, or what delicacies of detail might have been lost without his being aware of it. And (obvious as it may seem) it is comparatively seldom that musical and acoustic knowledge are found combined; the very temperaments which leads a man to take delight in the art of music is just that which would tend to give him a natural distaste for the dry science of sound. And, therefore, when scientific men are ready to vouch for this or that big concert-hall being an admirable place for sound, architects had better not take their word for it on the ground of their scientific knowledge: let them ask a man who understands music whether he hears his favourite works there as he wishes to hear them: that is a better test. I will mention one or two points which, I believe, it would be desirable to bear in mind in building large concert-rooms.

It should be the object, I think, to throw the sound forward into the room as much as possible from the orchestra. Hard and non-porous substances reflect sound decidedly; soft and porous ones have a tendency to absorb it. Therefore let there be no curtains or upholstery near or at the back of the orchestra to deaden the sound, but only hard substances which will reflect it; and in all probability a concave curve in the wall at the back of the orchestra will generally be advantageous in concentrating the sound. But in the auditorium (I am speaking of a large hall) it will be well not to have very hard reflecting substances predominating; on the contrary, large curtains and hangings may be very advantageous in preventing a confusing degree of echo, if this be not sufficiently obviated by the dresses of the audience.

A flat, or nearly flat, ceiling is the best form for a large music-hall. It breaks up and assists in destroying echo, while a semicircular vault collects and focusses it.

Boarded flooring is better than tiles, or substances of that nature. A wood floor is a capital sound conductor, without promoting echo.

In a large building, where there is a perceptible echo, the presence of a crowded audience is advantageous to the effect of the music, by diminishing the echo: in a small room it is prejudicial. In a room too small to allow space for an echo, the more reflective the surfaces and materials the better; always keeping, if possible, to the wooden floor, which I believe to be decidedly the best.

As we cannot alter the velocity of sound, it seems to me that the building of very large concert-rooms, such as the Albert Hall, is in the main a mistake, and should be discouraged. When a room gets beyond a certain size, echo there must be, and no contrivance will entirely get rid of it. And it is quite a mistake to suppose that, because the effect of 500 performers is satisfactory in a room of a certain size, therefore 2,000 performers must produce an equal result in a room four times as large. Putting disturbing echo out of the question, there is a limit to the power of clear definition of music in such cases. When there are a great number of performers in a very large space, very grand and broad effects may be realised, but

there will always be a sense of indefiniteness; and want of brilliancy of effect; of the employment of very large means without an adequate result; the music seems to come to you through a cloud instead of each “part” striking the ear with the sharpness and clearness which it does from a smaller number of performers in an ordinary-sized room. When the Albert Hall was opened, Professor Tyndal, in his gratification at being able to hear the Prince of Wales distinctly, wrote a congratulatory note to Col. Scott, and said the next thing would be to try chamber-music in the hall. Now it is impossible that chamber-music (“string” quartets and such things) could be done justice to in such a place. The sound might be heard, very likely; but not merely would the nuances of expression be lost, but even the harmonies played by such a weak body of instruments in a large place lose their character and elude the ear in a most curious manner: so that harmonies which would sound rich and effective when played in the small class of room for which they were written, fall quite tame and flat on the ear in a larger place. Even St. James's Hall is too large for much of the music which is played there at the Monday Popular Concerts; but it is better that such music should be tolerably heard by the public at a low price than that a large proportion of them should be debarred from hearing it at all by high prices in a smaller room. All these things musicians take into account, and “acoustic” men generally do not.

It appears to me that it would be quite worth while for the Institute of Architects, or even for the Government (only our Government never troubles itself about such trifles!) to appoint a commission of scientific men and musicians to draw up a report, founded on experiment and on an examination of the principal music-rooms here and on the Continent, as to the best form and construction of room for music. Music is essentially the art of modern times, and demands new and special provision. H. H. S.

SIR,—With reference to the subject of buildings for musical purposes, possibly you may think admissible the following attempt to bring to bear arithmetical calculation upon it.

In your article, “The Royal Albert Hall and Buildings for Music” (see ante, p. 440), St. Paul's Cathedral is admitted to the highest rank as regards sonority. Doubting whether all will concur in this opinion, I must admit that the effect of one particular performance, as it remains on my memory after the lapse of so many years that I do not feel certain of the occasion of it, is entirely in confirmation of your dictum. The music was the “Dead March in Saul,” played on Father Schmidt's beautiful old organ, reinforced with muffled drums. I did not dream of timing the performance then, but I find that at the present day it occupies me more than six minutes to go through the thirty-two bars, according to my sentiment of the piece. Six minutes and twenty-four seconds would allow one second and a half to each quaver of time. Quaver rests repeatedly occur, during which, in the cathedral performance, the reverberations are heard with thrilling effect; and (omitting ornamental notes), the harmonies do not change at any shorter interval.

Now, taking into consideration the section of St. Paul's, while bearing in mind the principle that “the angle of reflection is equal to the angle of incidence,” it may be found that sound issuing from the organ in its old place, impinging upon the inside of the tambour of the dome, thence reflected to the cavity of the dome, and returned to the pavement below, may arrive at the listener's ear, after a course of not more than 500 ft. He will then hear what I will call the “echo-in-chief,” or of first rank in the church. But in $\frac{1}{2}$ second, or a quaver of time, according to Sir Isaac Newton, sound will travel 1,713 ft., more than three times 500. Thus there would be time for repeated sets of echoes to be heard in the pauses; and the chief echo would not blur the whole, but only less than a third of any accented note, when a quaver; less than a sixth, when a crotchet; even where there are no pauses. But how about more rapid music? Without departing from the oratorio style, I will select the chorus, “Awake the Harp,” from the “Creation,” not merely because its time is vivace, but because its fugal subject, at the words “Heaven and earth,” includes a strongly-marked interval of a seventh, where the interference of an echo would be most mischievous. At the metronomic rate, “104,” I reckon the accented leading note at the word, “earth,” to last about

of a second of time. Now occurs the question, How much overlapping of one harmony by another is admissible, where a composer neither intends any pause on the one hand, nor would admit of a continued dead pass on the other? It is a seeking to define indefiniteness: something like "Over what proportion of the disc of the sun must the moon intrude itself, before an unwarned spectator begins to discover that there is an eclipse?" Claiming not to be an authority, but to be a pioneer in a hitherto untrodden path of investigation, I will suggest that only one-fourth of the leading note to the word "earth" in Haydn's chorus may be allowably eclipsed. Then ought a sensible echo to last only $\frac{1}{4}$ of a second? Then, at the Newtonian rate of 1,142 ft. in a second, the distance of 158 ft. ought to be the utmost difference between the direct distance of the auditor from the fountain-head of sound, and the circuitous distance which it comes by means of an echo. Thus, let a concert-hall be 158 ft. long. Let the average place of the orchestra be 20 ft. from one end. Take a point half-way along the hall, viz., 79 ft. from each end. To an auditor at that point the sound would travel 59 ft. in a direct line. Should any echo reach him from the further end, it must travel 59 ft. + 79 ft. $\times 2 = 217$ ft.: difference between direct and reflected sound, 158 ft., or $\frac{1}{4}$ of a second. So that the echo would be injurious to those auditors within 59 ft. of the orchestra; for the difference to them would be greater than 158 ft.; but it would be beneficial to those within 79 ft. of the further end, for the difference to them would be less than 158 ft., or $\frac{1}{4}$ of a second.

Therefore it would be proper to construct the further end of the hall of an apsidal form, with coved roof (on principles as familiar 100 years ago as at present), such that the focus of its echo should be some 30 ft. from the wall, and enable those auditors at the furthest part to monopolise it all to themselves, while the echo should be withdrawn from all within 59 ft. of the orchestra, who would enjoy the direct sound at first hand, in compensation.

If the music to be considered were Haydn's delicate instrumentation rather than one of his subjects for a vocal fugue, the numbers 158 ft., or $\frac{1}{4}$ of a second, would require to be reduced much smaller; and so also the focal distance of the apse.

If the music-hall were wide as well as long, it would seem well to make several recesses instead of one, at the further end, for fear of the focal distances growing too great. A fan-shaped building (either more or less than a semicircle) with an apse at the end of each fan-stick would also seem good. A coved back to a moderate-sized orchestra would be good; for there need not be more than say $\frac{1}{10}$ of a second difference between the direct sound and the echo: but the same thing could not be said for a monster orchestra.

"H. H. S." (p. 469, ante) will perceive that my figures illustrate and enforce his principles.

G. M.

NEW FREE CHURCH OF ST. BRIDGET, WAVERTREE, LIVERPOOL.

On the 21st day of September, 1868, the late Rev. Augustus Campbell, M.A., rector of Liverpool, laid the foundation-stone of this church, which event was duly noticed by us. The building is now rapidly advancing towards completion, and will be ready for consecration in a short time.

A commodious church being required in the present instance to meet the spiritual wants of a new neighbourhood and increasing population, it was considered necessary to extend the area to be devoted to the congregation as much as the limited dimensions of the site would allow. To this end a deep chancel was discarded, and only a small portion of the ground east and west allotted to the apse and narthex, the choir occupying the easternmost bays of the nave. To reduce as much as possible the evils attending the introduction of that obstructive yet beautiful feature the nave column, it was determined to design the nave of more than ordinary width and consequent height, the aisles being made narrower than usual. With these increased dimensions a Medieval open-timbered roof, without tie-beam, would have necessitated unusual strength and thickness in the supporting walls. It was thought doubtful also whether the church so carried out would have resulted in successful acoustics. After some deliberation, the architect decided to adopt and adapt the proportions and

style generally of the early Christian churches or basilica of Italy, at the same time endeavouring to infuse into the architectural details, enrichments, and sculpture throughout much of the pure and refined spirit to be found in the best periods of all art, more especially in the Greek, without rendering the work too archaic.

The designer of the church under notice has long held the opinion, and wisely too, that a thoughtful adaptation of the simple and convenient arrangements exemplified in the old basilicas, not treated in an antiquarian sense, but in a living and vigorous spirit, might be made to meet all the circumstances and requirements of modern worship.

The church is constructed of hard grey brick, with facings of picked bricks, and bands of six courses of red and blue bricks, alternated with bands of two courses of blue bricks, this system being adopted throughout, from the ground to the belfry-stage of the campanile. The cornices, parapets, panels, and other dressings are executed in local red sandstone, and polished. Four square panels are built in the external walls, containing heads of SS. Matthew, Mark, Luke, and John respectively. They are of heroic size, and carved in circular lunettes, the corners or spandrels bearing appropriate symbols. A still larger panel contains a bust of our Saviour, with hand uplifted, in the act of blessing, and is fixed over the entrance, forming an important feature in the design, and around which will run the following:—"Enter into His gates with thanksgiving, and into His courts with praise," inscribed on the archivolt in large Roman characters. The height of the entrance is 22 ft.; it is 11 ft. wide in the opening, and is provided with a pair of massive gates.

The campanile is 110 ft. high, and has accommodation for six bells. The cast-iron cross surmounting the tower weighs nearly 6 cwt., and is gilded.

On account of the almost universal adoption of open-timbered roofs in churches at the present time, the architect had to overcome a considerable amount of prejudice before deciding upon an inner plastered ceiling; we are informed, however, that now the work is carried out it receives general approbation. The nave ceiling is deeply coffered in twenty-seven square panels, with the cross and circle introduced at the junction of the beams throughout, producing an original feature in the wall cornice, by intersecting it after the manner of the so-called "Oxford frame." It will be seen that this method was necessary to form a perfect cross around the walls. The aisle ceilings are elliptic in section, reflecting the sound towards the centre of the church. The narthex ceiling is flat, like that of the nave. All the ceilings are sunk in panels and moulded. There is nearly one mile of enrichment in the nave ceiling, and about the same quantity in the other ceilings.

The columns, eighteen in number, stand upon single blocks of blue Whitley stone, 3 ft. high, which allows the whole of the moulded black marble bases to be seen above and clear of the sittings. The shafts are of red Kilkenny marble dashed with white. All the marble is polished. The capitals are carved in Burnley blue stone. The west end of the nave is divided by marble pilasters into three bays, similar in design to the north and south sides, forming an uninterrupted sweep of twenty-one arches, superimposed by the clearstory, containing recessed arches of like number and proportions.

The whole of the twenty-one clearstory windows are filled with stained glass, executed from the architect's designs, by Mr. Gibbs, of Marylebone-road, and comprise a chronological series of statuesque and symbolic portraits of the prophets on the south side, with the apostles on the north side. Our Saviour (having St. John the Baptist on his right) occupies the centre of the west end. Elevated upon enriched pedestal (perspective being eschewed), and exceeding life-size, these figures form a prominent feature in the church. The treatment of the glass is uncommon, if not quite new, and consists of a combination of various delicate hues selected for the draperies and pedestals, surrounded by a margin of white opaque glass, 6 in. wide, filled in with conventional flowers in black. The windows vary in design throughout. They are protected on the outside with thick plate-glass.

The wall between the nave and narthex contains a Venetian dipteral window, with Doric columns and pilasters, the centre light receiving a stained glass memorial, clear plates being used for the side lights. A view of the interior of the church will be obtained from the street.

The chancel apse is lighted by seven lofty windows, the centre one being already filled with a memorial of the late Rector Campbell, which is also the work of Mr. Gibbs. Over this window the architect had no control.

The space for the reredos occupies an area of about 800 superficial feet, being 16 ft. high by 52 ft. in length, divided into three portions by enriched architraves.

Paintings of the "Nativity" and "Crucifixion" are proposed for the north and south sides respectively, the centre and longest panel being appropriated to the "Last Supper" of our Lord.

The domed ceiling is constructed a few feet within the outer roof, and covered with lead laid on cross boarding, and otherwise arranged to prevent the destruction of a painting of the "Ascension," proposed for this space, should the outer roof get into disrepair. To prevent damp passing through the walls, vitrified bricks, 12 in. long, have been introduced, to bond the outer with the inner brickwork, forming a cavity wherever decoration is to be introduced.

The "Judgment" occupies the spandrels over the chancel arch. It is also contemplated to embellish the ceiling and other portions of the interior. The floors of the nave and aisles are pitch pine; those of the chancel and two easternmost bays of the nave being laid with marble of eleven varieties. The choir is reached by three steps of white marble, three more steps of black marble leading to the sanctuary.

The table, which stands upon a red marble plinth, is of Dantzic and pollard oak, 7 ft. 6 in. long by 3 ft. 2 in. wide, and is divided all round into eight panels by twelve pilasters, filled in with alto-reliefs in ebony, representing corn, vine, passiflora, oak, lily, yew, apple, palm, fig, holly, olive, and pomegranate; each panel contains a cross, carved in holly, inserted into a sunk circle, enriched with tulip-wood; the centres of the crosses have monograms P. F., S. S., &c., in ebony. Tulip-wood and ebony are further introduced in the mouldings and carvings. The table is isolated, being placed beneath the eye of the dome. The red velvet apron-front is simply embroidered with white lilies, applied with the usual deep fringe surrounding the table.

The benches (all to be unappropriated) are of pitch pine, the doors and other joinery being carried out in Dantzic oak. The pulpit, as shown in the engraving, is not yet provided, an inexpensive one being in temporary use.

The church is artificially lighted by a series of gas burners, arranged in triplets projecting from the cornice over the nave arches, midway between the floor and ceiling. A corona was intended in addition for the chancel apse, but found unnecessary, as small type can be read with facility in any part of the building.

The proportions of the nave are 10:5:3, and it contains 145,000 cubic feet. It is described to us as successful in point of acoustics.

The architect is Mr. Edward A. Hefner, of Hope-buildings, South Castle-street, Liverpool. The contractors are Messrs. Nicholson & Ayre, of Toxteth Park. Messrs. Stubbs have supplied the marble-work; the sculpture and carving have been executed by Mr. Rogerson.

REFERENCES.

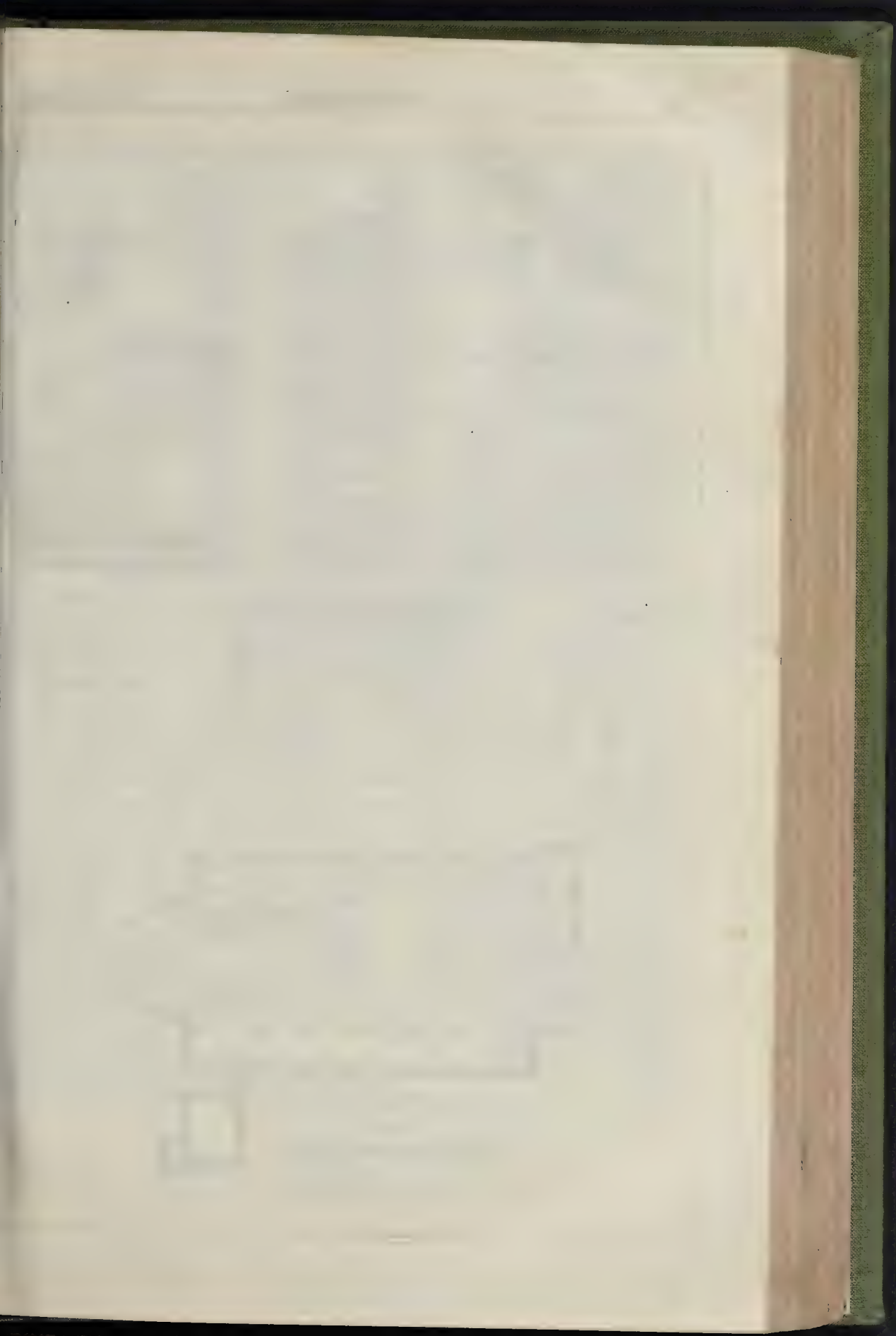
- I. II. Capitals of Nave Columns (alternately).
- III. Duto of Plasters in Clearstory.
- IV. Duto of Chancel Arch.
- V. Section of part of Nave Ceiling.
- VI. Plan of ditto.
- VII. One of the Clearstory Windows (the complete set being):

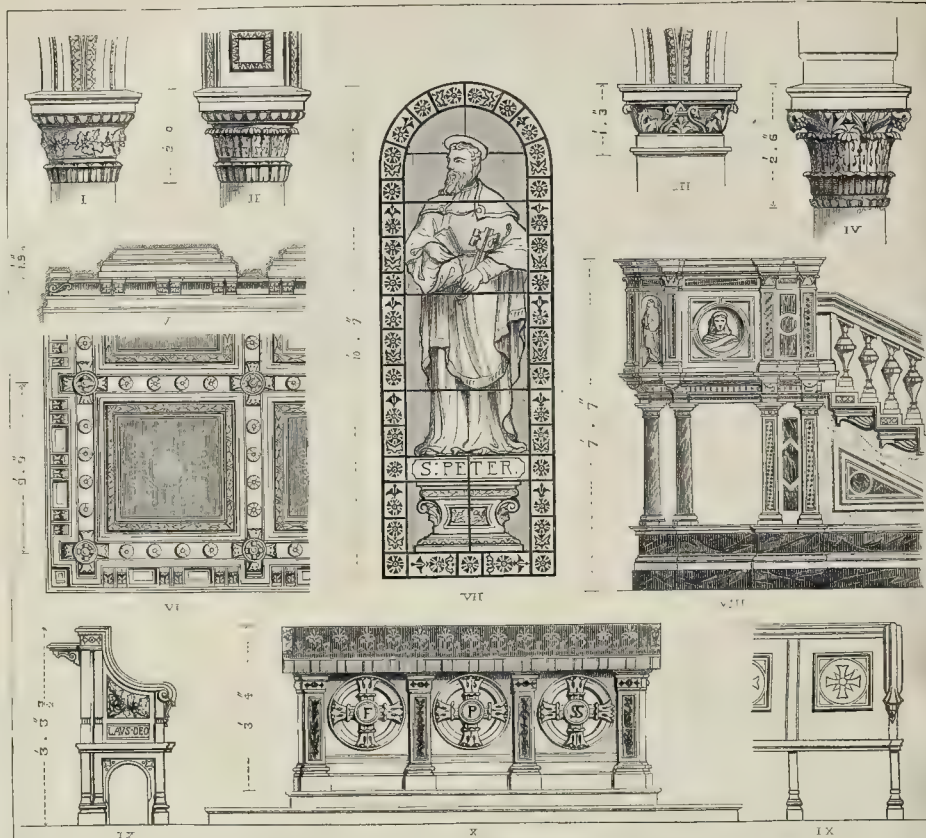
1. Hosea.	6. Daniel.
2. Isaiah.	7. Obadiah.
3. Nahum.	8. Ezekiel.
4. Jeremiah.	9. Malachi.
5. Habakkuk.	
10. St. John Baptist.
11. I.H.S.
12. St. Peter.
13. St. Paul.
14. St. Andrew.
15. St. James Great.
16. St. Thomas.
17. St. James Less.
18. St. Philip.
19. St. Bartholomew.
20. St. Simon.
21. Matthias.

- VIII. Pulpit.
- IX. Choir Stalls.
- X. Communion Table.

REFERENCES TO PLAN.

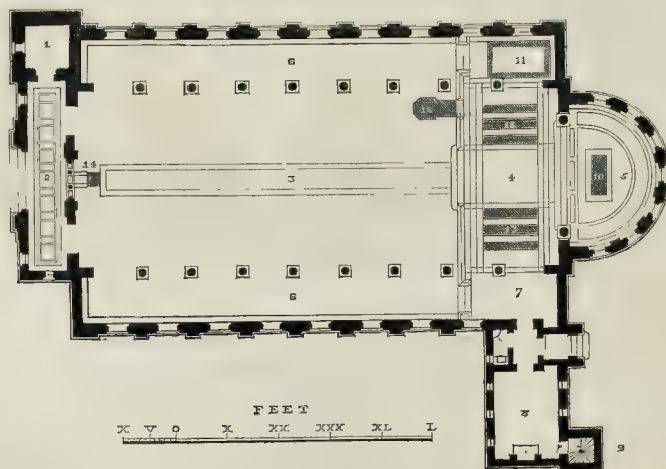
1. Tower.
2. Narthex.
3. Nave.
4. Choir.
5. Chancel.
6. Aisles.
7. Ministers' Vestry.
8. Choristers' street.
9. Turret Stairs and Smoke-shaft.
10. Table.
11. Organ.
12. Pulpit.
13. Choir Stalls.
14. Font.





CHVRCH OF S. BRIDGET WAVERTREE LIVERPOOL.

P L A N





CHVRCH OF S. BRIDGET
AT WAVERTREE LIVERPOOL



EDWARD ARTHUR MEFFER
ARCHITECT MDCCLXXI

* Two interesting articles on these very curious
ritiques, by the Hon. R. Lytton, will be found in the
February and March numbers of the *Fortnightly Review*,
and an earlier account in the first number of the *Victoria*
Magazine.

The demand for a theatre which should be recognised as the home of the higher literature of the drama is a question of long standing. That there is a large portion of the more earnest and intelligent play-going class who would be delighted to find a resort where they could cultivate their better tastes need not be disputed. That establishment of such a place would entail a loss upon a manager who embarked in the experiment is scarcely to be doubted. How a very desirable effort can be safely made is the problem to be solved. Without some such security as the subscription list raised on behalf of the

The feeling is evidently widely spread, widely reading, that our theatre is not what it should be, that it might be rendered more so, and that a attempt should be made. Burlesque and *à-la-bouffe*, when well done, are very amusing; but their universal reign is not desirable. Hundreds, thousands of persons fond of the drama keep away from the theatre because they find no opportunity to see such plays represented as suit their taste and wants, no opportunity to see the noble dramatic works which belong to the country properly set forth. At any rate, they cry, we have one theatre where the classic glories of our stage may be enjoyed, where a new poetical play, or a high prose, thoughtful work may be properly presented, where actors of ability may be fostered and developed, and where our children may hear their own noble language properly spoken, and be aided in their appreciation of it as refined and elevating.

We truly believe that in thus waging war against sub-contracting and piece-work, workmen are closing the door against their own advancement, blocking up the road by which many of their class have found their way into the ranks of employers, and we solemnly assert this belief in the hope that it may induce some of them again to think the matter over.

THE OWNERSHIP OF THE LAND OPPOSITE THE ADELPHI TERRACE.

DRUMMOND AND OTHERS v. SANT.

THIS case (Court of Queen's Bench) was heard at the sittings after Term, and Mr. Justice Blackburn declared it to be of so much importance that it was necessary to take time to consider the judgment. It was a dispute as to the ownership of some land reclaimed from the Thames opposite the Adelphi, and it arose thus. In the middle of the last century, the trustees of the late Duke of St. Albans had the fee simple of a place called Durham-yard, abutting on the Thames, and the plaintiff, Mr. Drummond, now had the estate of the trustees. The trustees, prior to 1769, had made an agreement with the Messrs. Adams Brothers, afterwards builders of the range of houses called from them the Adelphi, to grant them building leases of houses they might erect there. The agreement was merely oral, but the Messrs. Adams began to build, and in 1769 got a building agreement under seal, by which the trustees were to grant leases for 99 years. It was found necessary to reclaim land from the river by way of embankment, and in 1771 an Act was passed to allow of this, enacting that the land reclaimed should belong to the owners of the houses adjoining, according to their estates. There could be no doubt upon the facts (as the Court stated) that at this time the houses were built, and the Messrs. Adams had a right to call for leases. The leases had been granted without any expression of the reclaimed land, and at the expiration of the leases in 1869, a question arose between the bankers, who represented the trustees, and the defendants, Messrs. Sant, who possessed the interest of Messrs. Adams, as to the right to the reclaimed land. The case was argued by Mr. J. Brown, Q.C., and Mr. Manisty, Q.C.

Mr. Justice Blackburn now delivered judgment for the plaintiff, Messrs. Drummonds. The Messrs. Adams, he said, had held the reclaimed land only as entitled to leases of it from the trustees, and therefore the Statute of Limitations did not run against the latter. The leases had been carefully drawn, and not one of them included any portion of the reclaimed land now in dispute. This was no oversight. The object of Messrs. Adams was to sell, and the object would have been defeated if the plaintiff had been the land reclaimed as comprised in the leases. The Statute of Limitations was no bar to the plaintiffs' claim, and they were therefore entitled to recover.

Judgment for the plaintiffs.

SANITARY CONDITION OF THE LONDON POOR.

At a recent meeting of the Charity Organization Society, Mr. Bosanquet read a paper on "The best means of improving the sanitary conditions under which the London poor live." The reader said,—"I need not dwell on the extent of the evil. It is notorious to all of us here that a large proportion of the poor of London are crowded into single rooms, and that a large number of houses occupied by them are not only ill-suited for being let in that way in single rooms, but are so placed as to have insufficient air and light, and are defective in water supply and other sanitary arrangements. The agencies to which I look most hopefully to improve this state of things are (1) private enterprise, (2) sanitary law, (3)—and I speak of this third agency less confidently than of the others, as it is not in actual existence,—a body of Metropolitan Improvement Commissioners."

After discussing each of these points, Mr. Bosanquet continued,—

"What, then, to sum up, can district committees and members of district committees do to improve the sanitary conditions under which the poor live? To follow the order of my paper, they can assist to improve and increase existing accommodation, by sending information to Dwelling Companies and to improving builders, of houses, or sites coming into the market, and individual members may invest some money in such undertakings. I am disposed to think that if they never make as less lucrative or more hazardous investment, they will do well. But the committees are more deeply concerned with my second agency—sanitary law. They ought to be in free communication with the vestries, the medical officers of health, and their inspectors of nuisances, just as they are with the guardians, the parish doctors and the relieving officers. Suitable candidates for election to the vestry may be found and supported; information as to sanitary defects may be sent to the medical officers of health; and the formation of an intelligent public opinion outside the vestry, on sanitary matters, may be promoted. As the offices become the centres of charitable organisation, which we hope to see,

visitors amongst the poor, even though not directly connected with the committees, will, no doubt, be glad to use them as channels of communication with the sanitary authorities, as well as with the guardians. Above all, we may hope, in proportion as we are able to promote intercourse between rich and poor, and as we acquire influence with those who are already visiting amongst them, to call the attention of the poor themselves more and more to the great laws of health, to encourage them to make the best of their circumstances, even when they are disadvantageous, and to be able to inform them of their rights as to the removal of dust, for instance, as well as in other more important matters, and help them to enforce them."

LIVERPOOL ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY.

THE scene of the annual excursion of the Liverpool Architectural and Archæological Society was this year Lancaster, and, with the efficient aid of Mr. E. Sharpe and Mr. E. G. Paley, proved particularly satisfactory.

The Ripley Hospital for Orphans was the first place to which they were conducted. From the top of the tall clock-tower, the visitors were afforded a magnificent view of the town and of a vast expanse of surrounding country. Leaving the Ripley Hospital, the party proceeded to view the Royal Albert Asylum for Idiots and Imbeciles of the Northern Counties. Built on a commanding site, this large Gothic building, with its fine central tower, presents a very imposing appearance. It was designed by Mr. Paley; and the admiration which its outward architecture and interior arrangements elicited from his brethren must have been peculiarly gratifying. It is not yet fully completed, but is already partly occupied. When finished, it will be capable of accommodating 500 patients. The next building visited was the Roman Catholic Church of St. Peter, also built from the designs of Mr. Paley. The party returned, at five o'clock, to the County Hotel, where a dinner was laid. The chair was taken by Mr. Vale, president of the society, and the vice-chair by Mr. D. Barry. Mr. Farr (governor of the castle), Mr. Sharpe, Mr. Paley, and his partner, Mr. Austin, were of the party.

REPORT ON SANITARY CONDITION OF LIVERPOOL.

DRS. PANKES and Sanderson have presented the first instalment of their report on the questions referred to them in December last by the Town Council of Liverpool.

In reference to the composition of the cinder-pits, they say they selected from six places samples of the deposited refuse. The greatest part is really cinder or earth, and is quite innocuous; but there are some vegetable and animal matter and organic road debris which gradually decay. It may be concluded that about two years and a half or three years suffice to produce a considerable purification of the soil.

With respect to the influence of this cinder-refuse on the health of persons inhabiting houses built on it, the evidence is very defective. The refuse has only lately been used, and as it certainly does not produce any one special disease, it would be impossible, without very prolonged and careful comparison of the health of those living on it and of classes of the same rank and occupation living on other soils, to give an opinion. But there can be no doubt that from a soil formed of such cinder-refuse and gradually decomposing, some effluvia must be given out which would be likely to pass into houses placed on the soil; and, therefore, that on the general principle of requiring and insuring purity of air, such a soil is objectionable—at any rate, when first laid down. Accepting this view, and looking to the analysis of the cinder-refuse, the commissioners advise the adoption of certain rules.

The commissioners next discuss the practice of filling up with chemical refuse land intended to be built upon. They say:—

"Some portions of the town are built on the refuse of the chemical manufactories (of carbonate of soda), which formerly was largely used for filling up. Sulphuretted hydrogen and carbonic acid are liberated by acids; but in the two samples obtained by us no disengagement of sulphuretted hydrogen takes place from the action of the acids. From the personal inquiries we made, it appeared to be clear that in some of the houses built on ground made of this refuse the smell of sulphuretted hydrogen is distinctly perceived, and is a source of great

discomfort. On inquiry, we found that the gas entered the houses from the sewers, and did not pass up from the ground below, and this was confirmed by finding that the air in the ventilating sewer shafts contained a large quantity of sulphuretted hydrogen."

While advising the corporation to persist in the prohibition of the use of chemical refuse for foundations, the commissioners are of opinion that in those parts of the town in which the houses are built on chemical refuse the public health is not likely to be injuriously affected by the fact.

The commissioners sum up their recommendations on the question of the sewerage in the following sentences:—

"1. We recommend that a complete and exhaustive inquiry be made as to the existence of deposits in the sewers, and that in all cases in which such deposits are, in the opinion of the borough engineer, dependent on defective construction, defective inclination, or insufficient supply of water, the works necessary for the remedy of these defects be immediately commenced. 2. In those cases in which the foul condition of the sewers appears to be unavoidable—e.g., in those sewers which are affected by the tide—we recommend ventilation. For this purpose, we think that spacious and lofty shafts afford the only effective means. 3. We do not recommend the adoption of any general system of ventilation, entirely agreeing with your borough engineer in the opinion that for well-constructed sewers of good inclination, with sufficient supply of water, it is unnecessary. 4. We recommend that a complete report be made as to the quantity of waste water discharged into the sewers by manufacturers, with a view, first, to the prevention of its introduction into the sewers in a warm state; and, secondly, to its being, if possible, utilized for surface-cleaning and sewer-flushing."

Without expressing any abstract opinion as to the respective merits of the water or dry method of removing fecal matter, the commissioners do not think it desirable to make any change in the present system of removing excreta.

In conclusion, the commissioners express the opinion that if all Mr. Newland's plans had been carried out, there would have been no necessity for the improvements they have suggested.

REFRESHMENT PAVILION, WIMBLEDON.

FROM the designs of Mr. W. Young, architect, Exeter Hall, the refreshment pavilion to which we have before alluded has been erected by the Rifle Association's own workmen. It is of wood, and covers an area of upwards of 50,000 superficial feet. It comprises a bar, 200 ft. long by 40 ft. wide, first and second class dining-rooms (capable of accommodating upwards of 1,000 persons), besides waiting and retiring rooms. The kitchen department is situated in the centre of the building, and is fitted up with cooking apparatus, bakehouse, &c., on an extensive scale. Along the front of the building runs a verandah supported by interlacing arched ribs springing from upright pillars. At either end of the front elevation is an octagonal turret, and in the large arch in the centre are painted shields bearing the arms of England, Scotland, Ireland, and Wales. In the centre of the side elevations is a square tower, and flags of various nations float from its summit and from other conspicuous parts of the building, and above them all the Union Jack unfurls itself from a lofty flagstaff over the central arch. The walls are made in sections of a uniform size, each part interchangeable and capable of being easily handled by two men. The whole is put together with bolts, which have only to be unscrewed when the building is taken down. By a different arrangement of the various parts the building can be put up in a variety of forms, and can be accommodated to a much smaller area than that which it now occupies.

THE TRADES MOVEMENT.

Newcastle.—A number of delegates of the engineering trade have sent in an invitation to the various organised trade bodies in London, requesting them to co-operate with the engineers in aiding and supporting their fellow-workmen in the North of England for a reduction of the hours of labour. The invitation having been very generally responded to—most of the London trades having promised their support—the delegates of the engineering trade have convened a general meeting to devise means of forming a central committee for the purpose of obtaining subscriptions throughout the London district, in order that the men on strike at Newcastle and elsewhere in the North may "stand fully and stoutly against their employers, and so gain fully the object for which they struck." It is stated that promises of pecuniary aid have been tendered by several of the London trade societies.

Manchester.—Two brickmakers, John Rogers and William Manning, who were captured by the police at Lower Broughton, Manchester, while endeavouring to set fire, by means of paraffin oil, to some houses which had been built with machine-made bricks, have been committed for trial. A third brickmaker, named John Atherton, was committed to the Assizes charged with attempting to set fire to a house the same night in Higher Broughton.

Lincoln.—The strike of masons has terminated by the masters conceding the shilling per week advance and two hours and a half on Saturday afternoon.

Sheffield.—A strike of the steel converters at the Bessemer Works, Carlisle-street, Sheffield, has been settled by a compromise. The firm agree to allow extra assistance, to compensate for the extra work entailed by the new system. The whole of the men, therefore, except those committed by the magistrates for intimidation, resume work.

THE METROPOLITAN BUILDINGS BILL AND THE TIMBER TRADE.

THE Buildings Bill is down for second reading on July 26th, and we are urged very strongly to refer to one portion of it, by which it is believed the building trade of the metropolis is likely to be materially affected. It must be obvious, as we have already stated, that the Bill cannot be proceeded with this session, so that comment is almost supererogatory. Still, in deference to an important interest, we feel bound to state their case, though briefly.

By Clause 120, all timber placed in yards where sawing is done must be separated from such machinery, or building containing such machinery, by a wall, without openings, its entire height; and no timber is to be piled or re-piled on the same premises with steam or other machinery; so that all the mills will be deprived of the advantage of a yard of any extent, as they must effectually divide it from their mill by a proper fence wall its whole height. The effect of this, it is argued, would be that all the mills must draw their daily supply, and deliver the same, along the streets of London. At present, very much of the timber is conveyed up the river, or along the City Canal, and piled in the yards thousands at a time. The further obstructions in the streets by the passing of wagon-loads of a hundred of deals, each, say, 16 ft. or 18 ft. long, with their four horses, will be no slight augmentation of their terrors. It is thought too great encouragement will be given for the further extension of the foreign trade in manufactured joinery, not on account of its price, but on account of the great difficulty of using machinery in its construction here. Further, that many artisans are likely to be deprived of their usual means of occupation.

We have before now dwelt on the necessity for some control over the timber-yards in the metropolis, the risk which adjoining property is often made to run, and we cannot but recognise the right motive which is at the bottom of these clauses. We would suggest, however, that precautions less stringent would suffice, and we trust that, during the recess and before the Bill is again brought in, further consideration will be given to the question; and that the clauses will be modified.

CHURCH-BUILDING NEWS.

Bodelern.—The church here, before some recent repairs and additions were undertaken, consisted of a parallelogram, the eastern portion of which was devoted to the altar, and at the west end the minstrel gallery and small robing-room under it were placed. There were also a bell-turret on the west gable, a south porch and north door opposite, which, with the minstrel gallery, have been reconstructed and repaired, and form part of the present building. The increased space required in the edifice has been secured by the erection of a chancel and north transept intersected by arches at their junction with the former walls. The relative extent of the chancel and nave are further defined by a buttress on the south side. This extension of area allows room for at least 300 persons. The prevailing style of the architecture of the church being Perpendicular or Third Pointed, the additions have been designed adopting the features of the same period. There are three new windows in the north transept. In the chancel there is one

new window of three lights, with segmental head, which is to be filled with stained glass by Messrs. Lavers & Barrard. The former eastern window, the three compartments and tracery of which are also filled with stained glass, has been re-erected in the east wall of the new church. The former windows in the nave have been lengthened and repaired, and four new ones inserted, the whole of the walls having been raised about 4 ft. 9 in. The old oak roof of the church has been restored. The timber-work of the chancel and north transept has been carried out in pitch pine timber. The present minstrel gallery and robing-room beneath have been remodelled out of the spare oak fittings. The seats are of pitch pine slightly varnished, and in some old cedar-work carvings, formerly in the chapel of Jesus College, Oxford. The altar-rails, which are of decorative ironwork, were manufactured by Messrs. Brawn & Co. of Birmingham, and the encaustic tiles will be furnished by Messrs. Maw & Co. The works have been carried out by Mr. Joseph Hughes, of Linsantfrid, Glan Conwy, builder, under the direction of Messrs. Kennedy & O'Donoghue, of London, Bangor, and Glasgow, at a cost of about 1,000l. Mrs. King, of Presaddfed, has presented a corona for the chancel.

Horswell, near Market Weighton (Yorkshire).—The church here has been re-built in memory of the late Sir Charles Slingsby, bart., and reopened for divine service. The old church, which was in a very dilapidated condition, having been taken down, the foundations were found to be deficient and unsafe. Consequently new excavations were made, until a good sound clay base was found; concrete to the depth of 2 ft. was then introduced. In the erection of the new walls the old masonry was used. Nearly the whole of the corbels are again introduced, and other Norman masonry has been refixed. The windows have been constructed in the same style as the ancient doorway. A new porch has been added on the south side, and a new vestry on the north. The roof is covered with red flat tiles, supported on an open timbered roof, the rafters being stained, and the intervening spaces in plaster. At the west end a wooden bell-turret is erected, surmounted by a spire covered with oak shingles. In the interior the seats are open. A reredos is placed at the east end of the church. It is surmounted by a stained-glass window. The church throughout is of a very unpretending character. The works have been assigned and carried out, under the direction of Mr. James Fowler, of Louth, architect, by Messrs. Simpson & Malone, of Huddersfield.

Folkestone.—St. Peter's Church recently underwent considerable enlargement and improvement, following which is the erection of a new altar and reredos just now completed. The altar is built of oak (with the slab of Portland stone), and is highly decorated in colour and gold. The front is formed into double panels, with detached columns between, making a range of ten panels, each of which bears a figure in a devotional attitude. The reredos, which is built of Caen stone, has in the centre a deep recess for the crucifix, covered with a projecting canopy, supported by marble columns, and the back filled with mosaic. On each side are three shallow niches, with marble columns supporting the canopies over each niche, being filled with the figure of a saint, executed in Caen stone. The altar decorations were executed by Messrs. Leech, of London and Cambridge; the stone figures by Mr. Phylfers, of Pinlipo; and Mr. S. Slingsby Stallwood, of Folkestone, is the architect, from whose design the work has been executed.

Stradbroke.—Efforts have been made by the Rev. J. O. Ryle for some time past to bring about the restoration of this church. Before 1823 Stradbroke Church was full of carved benching and screen work, but in that year they were all ruthlessly swept away, and not a vestige of them remains. Pews of uncomfortable and ugly form were substituted for the oak seats, and the chancel roof was reconstructed out of some old rough timbers, and to hide its defects common thin deal panel boarding was put under them. The nave and aisle roofs remain, and the former is in sufficiently good order to allow of its being restored. The latter, however, were so far gone, having been ironed up at nearly every joint, that entire new roofs are necessary. With the consent of the parish, Mr. Ryle called in the assistance of Mr. Phipson, the architect, who reported generally upon the state of the church, and estimated that nearly 3,000l. would

be required to put it in good order. Mr. Ryle collected subscriptions, and obtained nearly 2,000l. from his friends before he called upon his parishioners for contributions. The contract is taken by Mr. Grimwood, of Weybread.

Kidderminster.—St. Barnabas's Church, a new chapel-of-ease to Kidderminster, has been erected at the suburb of Franche. Messrs. Chamberlain & Martin, of Birmingham, were the architects, and Mr. Richard Thompson, of Kidderminster, the builder. The church, which is in the Early Decorated style, is built of red brick, faced with stone, and consists of a chancel, vestry, nave, porch, bell turret, and spire. The west window consists of three large lights. The windows at the east are of the lancet form, surmounted by another light. An organ of 14 stops, 2 manuals and containing above 400 pipes, and valued at 250l., has been built by Messrs. Cramer & Co., and erected by Messrs. F. Rothwell & E. Wedlake.

Barton-le-Street.—The parish church of Barton-le-Street, near Malton, has been re-opened for divine service. It has just been rebuilt at the cost of the late Mr. Meynell-Ingram, M.P., whose recent death, at the completion of the work, gave a melancholy interest to the proceedings. On razing the old church numerous specimens of eleventh-century work were found embedded in the walls, used in fact as walling stones. The whole of these have been made use of in the new church. About 300 ancient stones, carved, have been worked into the new structure. The chancel arch had been destroyed, but a specimen of an elaborately-worked arch was found in the walls, and is now re-erected. The new sculpture requisite to fill up gaps has been adapted, as far as was possible, to the old style. The new church is in the Norman style. The designs were from Messrs. Perkin & Sons, of Leeds, architects. Mr. John Thorpe, of Slingsby, was contractor for masonry, Mr. John Tomlinson, of Leeds, carpenter, plumber, joiner, and slater; Mr. Charles Mawer, of Leeds, was sculptor.

Hallitwell, Bolton.—St. Luke's Church, Hallitwell, which has been completed some months, is now to be used for Divine service. The church is situated on the western side of Bolton on the Chorley Old-road, about a mile from the market place. There is a gradual ascent the whole of the way from the town up to the church. The site sloping deeply, as it does, required very deep foundations. These were put in by Messrs. Isaac Pilling & Son. The contract for the church itself was taken after these preparatory foundations had been finished; and, including walling to a depth of 2 ft., and in some cases 4 ft., below the floor-line, amounts to about 4,000 guineas. The church will accommodate 800 persons. On approaching it from Bolton the lofty apsidal chancel, rising high above the intervening houses, first meets the eye, and, as we advance, is the belfry, which stands over the chancel arch. At present this is the only belfry. A tower is an essential portion of the design. The lower story of it has been built, and is now to be used as the main entrance to the church at its north-west corner. The builders are Messrs. Robinson, of Hyde, and the architects, under whose immediate superintendence everything has been carried out, are Messrs. Medland & Henry Taylor, of Manchester.

Swinton.—The foundation stone of St. Andrew's Church has been laid by Lady Burdett Coutts, who was accompanied by her private secretary (Mr. Hasard), the Hon. Miss Suggs, and Mr. Brown. The new site is between the National Schools and the Maple-road, given by Messrs. Coutts. The architect is Mr. Arthur Blomfield, of London. The church will be built of ordinary stock bricks, relieved with bands and patterns of red, and of white Gault brick. A few lines of Staffordshire blue bricks will be introduced. The roofs will be covered with Broseley tiles. Stone will only be used where a brick would be more costly or less sound in construction. The materials necessitate the adoption of an extremely simple style; effect, therefore, sought rather by massive treatment and lofty proportion than by ornamentation. The plan of the church consists of a nave, 90 ft. long by 53 ft. wide, with narrow side-aisles 23 ft. wide, 23 ft. by 22 ft. at the east end, a sanctuary, 21 ft. 3 in. wide and 11 ft. deep, open to the nave with an arch 46 ft. in height, and chancel is formed in the eastern bay of the nave by a raised platform, surrounded by a low screen of stone, leaving a free passage on either side. The organ-chamber, 14 ft. by 10 ft. 3 in.,

12 ft. high, is on the east side of the north transept, and the vestry in a corresponding position on the south side. At the west end is a baptistery, 17 ft. by 13 ft. 9 in., opening with an arch to the nave, and having an entrance-porch 4 in. each side. For acoustic reasons the building is ceiled internally with a polygonal ceiling of wood, the principals and intermediates showing. The height from the floor of the nave to the ridge of the roof externally will be 62 ft., and to the ceiling 52 ft. From floor to wall-plate, 34 ft. The contract for the western half of the church (2,741l.) has been taken by Messrs. Jamson, of Patney; their tender for the remainder being 2,480l., making a total of 5,221l.

Chislehurst.—The foundation-stone of Christ Church, Chislehurst, has been laid. There was a large assembly of the principal residents of the neighbourhood. The Viscount Sydney laid the stone. The site in Camden Park on which the church has to be erected has been presented by Mr. N. W. J. Strode, of Camden Place. The church will be of Gothic architecture, and is estimated to cost 4,000l. Of the 525 sittings provided, one-third will be free. In addition to the cost of the church, it is estimated that a further sum of 2,600l. will be necessary for the purposes of an endowment and repairing fund, and for laying out the ground, and forming a road and approaches, making a total of 6,600l., towards which the sum of 3,000l. has been already promised. The design for the church is in the Early Decorated style. The architects are Messrs. W. G. Habershon & Pite, of London.

Derby.—St. John's Church, Derby, has been re-opened. The alterations that have been made consist of the removal of the east gable originally standing between the two turrets, in which was a large traceried window in cast iron, locked up, however, to the springing of the arch with a lath and plaster screen. The nave has now been extended, and a chancel formed, having an octagonal termination with three single-light traceried windows. One of these is stained-glass window, representing the Ascension of our Lord; and has been inserted as a memorial of the late Mr. J. B. Massey. The work has been executed by Mr. Clutterbuck, of Ratford, Essex. A new pulpit has been placed in the north side, and sittings for the clergy and choir are provided on either side of the chancel. The remainder of the walls within the chancel are diapered in colour. The new wood-work is in pitch pine, varnished. The writing and decorations have been executed by Mr. Atwell. The floors are laid with Maw & Co.'s flag and the steps are of stone. The works have been carried out by Messrs. J. E. Wood, of Derby, under the direction of Messrs. Giles & Clutterbuck, architects, all of Derby.

Swansea.—The foundation-stone of a new church has been laid here. The site of the proposed edifice is on the Oystermouth-road, nearly opposite the House of Correction, and was given the two years since by the Corporation, upon application of the vicar. Swansea is indebted to this new place of worship to Mr. John W. Ark, who undertakes the whole cost, estimated at about 2,500l. The architect is Mr. Thos. Holson, diocesan architect, Hereford; and the elder Mr. Thos. Gough, also of Hereford. The church will be in the Gothic style of architecture, and will contain about 600 sittings.

Books Received.

Handbook of Practical Telegraphy. By R. S. CULLY, C.E. Fifth Edition. This is a revised and enlarged edition of the handbook of Practical Telegraphy by the Engineer-in-Chief of Telegraphs to the Post-office, and which is adopted by the Post-office authorities, and by the Indian Telegraph Department. It is chiefly for the use of members of a telegraph service, and those interested in telegraphy; and relates more especially to the practical laws upon which the system depends; the methods of discovering faults; the practical management of apparatus; the construction of lines, and the leading principles of submarine telegraphy. Scientific terms and formulae are, as far as possible, avoided, especially in the earlier portions of the work.

VARIORUM.

'Transactions of the Woolhope Naturalists' Club held for 1870. Printed at the Times Office, Hereford.' Societies with far more ambi-

tious titles often issue far less interesting and goodly volumes of transactions than the Woolhope Field Club. The volume is illustrated by numerous engravings, and a series of photographs, chiefly of noted trees in Herefordshire. It is the Woolhope Field Club who are reproducing the Hereford Mappa Mundi. The whole of the lithographic stones are said to be in a forward state, and one-third part of the facsimile was completed in September last; but the principal artist engaged was killed at Sedan, and the lithographer, at Bruges, suffered much by the loss of his workmen, and the bombardment of his Paris establishment. Meantime the editors of the volume of descriptive letter-press, are at work with their difficult task of giving a full and learned account of all the legends and places mentioned on the map. Unfortunately the undertaking has not yet received a very liberal support, only fifty to sixty copies having been secured by subscription, but it is believed that many copies will be sold at the higher price when the work is completed, as it is expected to be in another year.—"Casell's Technical Series: Model Drawing. By Ellis A. Davidson. Casell, Peter, & Galpin." This small volume treats of the elementary principles of drawing from solid forms, the method of shading, and patterns for making drawing objects in cardboard. It is illustrated with diagrams and sketches. Mr. Davidson is the competent author of various other books of a kindred order, recently mentioned in our pages. One object which he holds in view is to encourage drawing direct from the object, instead of from copies; for, as he rightly remarks, to learn drawing for the sole purpose of copying other drawings is as absurd as the idea would be of learning writing in order solely to copy other writings.—"Power in Motion. By James Armour, C.E., with numerous illustrations. London: Lockwood & Co." In this little treatise the general laws that govern power in motion are exhibited in simple form to meet the known wants of practical men engaged in engineering works that require the employment of hoists, hoists, block and tackle, wheel gearing, and long and short driving bands, of wire rope or of leather.—"The Appraiser, Auctioneer, Broker, House and Estate Agent, and Valuer's Pocket Assistant, with Prices for Inventories. By John Wheeler, Valuer. Third edition, revised, rewritten, and extended, by G. Norris, Surveyor, Valuer, &c. Lockwood & Co." This pocket volume contains a large quantity of varied and useful information as to the valuation for purchase, sale, or renewal of leases, annuities, and reversions, and of property generally, with prices for inventories, and a guide to determine the value of interior fittings, furniture, and other effects.—"The Theory and Practice of the Metric System of Weights and Measures. By Professor Leone Levi, F.R.S., &c., Barrister-at-Law, Griffith & Farran, successors to Newbery & Harris, St. Paul's Churchyard." Professor Levi is an influential advocate of the metric system; and he thinks it may be useful to give some account of its theory and practice. In addition to his own competent knowledge of the subject, he has availed himself of the large amount of information gathered by the Metric Committee of the British Association and British Branch of the International Decimal Association; and has also made free use of standard works in French. Teachers will find this work useful under the new educational code.—"Messrs. Chapman & Hall, holding the copyrights of all the works of the late Mr. Charles Dickens, have commenced the issue of a Household Edition, at such prices, weekly and monthly, as place them within the reach of all. For the first part, which contains a considerable portion of "Oliver Twist," the demand has been very great.

Miscellaneous.

Rochester Cathedral.—The Dean and Chapter of Rochester are about to undertake the restoration of their cathedral, which, in some parts, is in a very bad state. The work has been entrusted to Mr. Gilbert Scott, and will shortly be commenced. The restoration will be effected in sections, the first part to be effected being the replacing of the clearstory windows in the nave. Some portions of the exterior of the building are at present in a lamentable condition, the ancient stonework being patched by brick. Mr. White, of Vauxhall Bridge-road, London, will do the work. Mr. White is also engaged at Salisbury and Wells.

Norfolk and Norwich Archaeological Society.

—One of the most numerous attended meetings of this society was held last week, the source of attraction being in the fact that the president, the Very Rev. the Dean of Norwich, was to read a paper "On the Restoration of the Bosses in the Roof of the Nave," and also to give the members and their friends an opportunity of personally inspecting, as well as hearing a description of, the work of restoration now being carried on in Jesus Chapel and other parts of the cathedral. Both the paper and the dean's commentary upon the bosses, read from a work of his in the press, were listened to with much interest, and parts were much applauded. The ladies and gentlemen were about to accompany the dean to inspect the work of restoration, completed and in progress, when the Rev. Precentor Symonds brought under the notice of the meeting the contemplated demolition of East Rudham Church. He read a letter from Mr. Hakewill, architect to the Church Building Association, in which that gentleman protested in the strongest terms against such a proceeding, maintaining that all the church requires is restoring and not rebuilding. A resolution was unanimously adopted to the effect that the letter of Mr. Hakewill should be laid before the Chancellor, with a respectful request to him to postpone his decree until the bishop returns, when the matter would be brought before his lordship. Before the party visited Jesus Chapel, which is now in the course of restoration, at the expense of the dean, the dean begged visitors to remember that the work was not yet finished, and that a great alteration would be made in the appearance, when the east window was completed. No doubt the colour would appear offensive to many eyes; but his object was not to produce that which was pleasing, but simply to restore. The dean then read a paper prepared by Mr. Spanll, the restorer. The party next proceeded to the presbytery, to see the arches which have already been opened out, and to inspect the work of restoration. The dean entertained the greater portion of the members at luncheon.

Strength of Steel.—The tests fixed for the strength of the cast-steel work to be employed in the construction of the great bridge over the Mississippi specifies that the steel shall be crucible cast-steel. The staves comprising the tubes will be required to stand a compressive strain of 60,000 lb., and a tensile strain of 40,000 lb. per square inch of section without permanent set. They must stand a tensile strain of 100,000 lb. per square inch without fracture. The modulus of elasticity shall not be less than 26,000,000 lb., nor more than 30,000,000 lb. This variation shall be avoided if possible; in which case the lower amount will be preferable. The steel pins will be required to stand without permanent set a tensile strain of 40,000 lb. per square inch, and an ultimate tensile strain without fracture of 100,000 lb. Rode, bolts, eye-washes, rivets, &c., will be required to bear an ultimate tensile strain of 100,000 lb. per square inch without fracture, and 40,000 lb. per square inch without permanent set. Such parts of the work will not be tested in tension beyond 40,000 lb., sample-pieces only being subjected to ultimate tests. The 4-in. plate steel for enveloping the staves will be required to have a resistance to compression and tension without set equal to 40,000 lb. per square inch, and an ultimate tensile strength of 100,000 lb.

A Climax to the Mad Doctrine of Parallax.

Mr. John Hampden, the upholder of the obviously erroneous doctrine that the earth is a flat and not a sphere,—and against whose unbecoming language as to his loss of a bet of 500l. with Mr. Alfred Wallace, F.R.S., president of the Entomological Society, on the question, we had occasion to remonstrate with him when he wrote us lately,—has at last got himself within the grasp of the law, on a charge of sending threatening and scurrilous letters as to Mr. Wallace,—one of them to his wife! This wrong-headed person was sentenced by the bench of Stratford magistrates to find two sureties in 50l. each, and himself in 100l. to keep the peace, failing which he was removed in custody.

Worth Church, Sussex.—The completion of the works at this church was celebrated last week. The Bishop of Chichester preached, and week. The Bishop of Chichester preached, and a large party afterwards partook of luncheon at the Rector's. But for the pulling down of the chancel, which we did our best to prevent, we should have much to admire.

Metropolitan Drinking-Fountain Association.—At the twelfth annual meeting of the Metropolitan Drinking-Fountain and Cattle Trough Association, the report stated that the committee have now 160 troughs and 145 fountains under their care, within an area bounded by Hornsey, Hampstead, and Highgate on the north; West Ham, Barking, and Woolwich on the east; Lewisham, Streatham, and Sydenham on the south; and Putney and Barnes on the west. The cost of the water for some of the troughs exceeds 30l. a year, and the consumption at several of them 4,000 gallons a day. An experiment is about to be made for rendering the water-ports of cab-stands available for drinking purposes, and other extensions are contemplated, but the society has yet to obtain the recognition of some parishes, and notably the authorities of St. Mary, Islington. The ordinary donations for the year amounted to 1,237l., as against 1,645l. in the preceding year; and, but for an unexpected anonymous gift, there would have been a gross deficiency on the year of 638l.

On Colour.—At a recent lecture in Bristol, on this subject, Professor Church advised all those who took an interest in it to study some of the beautiful drawings of Turner, Hunt, and many they might see year by year in the Royal Academy and other exhibitions, particularly two pictures in the Royal Academy this year, one of all shades that they could imagine of blueish green, and the other of all shades they could imagine of greenish blue. The pictures were Battledore and Shuttlecock, by Albert Moore; and when they looked at them, they might be quite sure, many new, beautiful combinations of colour, interesting in themselves, yet remained to be discovered. Painters were too fond of putting reds, blues, and yellows into their works; but let him ask them instead just to mix with those primary and secondary hues some of those rarer tints they might see trembling on the leaves of the aspen, or bathing the depths of the autumn forest, or shining at eventide from the cloudy yet splendid pavilions of the sun.

The Archeological Association of Ireland.—The July meeting of this association has just been held. Eight new members were elected, and various objects of interest were exhibited or described, and other business transacted. The Rev. J. Graves, the secretary, read a portion of a letter which he had received from Lord Courtown, in which his lordship mentioned that he had heard from the Hon. Mr. Dillon (son of Lord Clonbrock) that a large portion of the Round Tower of Kilmacduagh had fallen, and that the rest of the structure was in a perilous condition. Lord Courtown asked, "Could further damage be stayed by an appeal to the public?" The meeting expressed much concern at the intelligence, and requested Mr. Graves to communicate with the Hon. Mr. Dillon, in order to ascertain the exact extent of the damage, and what course might be taken to stay any further injury. Mr. Prim read a paper on the Kilkenny "Mysteries," or "Miracle Plays."

St. Andrew's, Holborn.—We have received a strong protest against what the writer calls the contemplated waste of money at this church. The writer continues,—"The most absurd proposal of all is,—and if carried out will destroy the character of the style of building,—namely, to restore and bring out some Gothic details, viz., side tower arches and a west window (small), and make the principal entrance at the west end, which Wren never intended to do. What, sir! are we not always abusing our Classic for churches? But to jumble up and restore Gothic to an Italian church with tower like St. Andrew's is doing a most wanton injury to the fabric. It will be much more to the credit of the rector and churchwardens if they spend some of the 7,000l. to prevent the plot of ground on the west of the church, against the tower, from being used for building purposes, and so preserve the view of the tower."

The Church Steeple, Newent.—Mr. Frith has commenced operations for repairing the steeple of the church of Newent. Having let out his kite and connected the necessary apparatus with the tower, he ascended in his usual style, the proceedings being very similar to those used at All Saints, Hereford. The ascent was witnessed with much interest by a crowd of spectators. After inspecting the masonry, and resolving upon the course of operation, Mr. Frith descended. Next day he re-ascended and began the necessary repairs.

Indian Civil Engineering College.—According to the *Athenaeum*, the alterations at the Indian Civil Engineering College are making rapid progress. The house, when bought from Mr. Albert Grant, contained 110 rooms. These have been subdivided so as to make 104 more. Another building, with above 100 rooms has been put up, and the poles are in the ground for the first of the five villas for the professors' houses. Some of the professors have already engaged houses in the neighbourhood. Above 100 acres of land, and very fine grounds, gardens, stables, &c., belong to the place. The college is charmingly situated on the edge of the Bagshot sands, overlooking Rameade, the Thames, and its valley, to Harrow and the northern chalk on the left. It lies just beyond the spot where Denham, the author of "Cooper's Hill," with its "river winding at its own sweet will," lived. The *Times*, of Tuesday last, gives the names of the successful candidates (fifty) in open competition for admission to the college.

The Damage from Recent Thunderstorms.—The lightning this year resembles, in frequency and fatality, that of the year preceding the great earthquake. Human beings and the lower animals have been struck in numerous cases throughout the country, and damage has been done to various buildings. One of the last of these casualties to buildings was the demolishing of a pinnacle of the tower of St. Ann's Church, Burton, when the stones fell through the roof, and wrecked the organ, damaging also many of the pews. A number of painters were stunned by the electric shock, and thrown down, but not otherwise injured. In another case, that of Gromer Church, Norfolk, a pinnacle of the tower was cut in two, and had to be pulled down. The clock was struck and damaged. At the R.C. Chapel of Slieve, County Kilkenny, Ireland, a large hole has been made in the roof, and the side altar damaged.

Social Science Association.—The annual business meeting of members of this Association was held on the 7th inst. —Mr. Edwin Chadwick, C.B., in the chair. A report of the business transacted during the year was read, to which was appended the financial statement. Sir John Pakington, bart., M.P., was elected president of the Association for the ensuing year. Mr. Edward Baines, M.P., was elected president of the Education Department; George Godwin, F.R.S., president of the Health Department; and Mr. William Newmark, F.R.S., president of the Economy and Trade Department. Vice-presidents and other officers and the standing committees were also appointed. The annual congress will be opened at Leeds on the 4th of October.

Manchester and Salford Building Trades Institute.—The results of the recent examinations by the Science and Art Department are highly satisfactory to the members of the above highly satisfactory to the members of Manchester and Salford Institute. In the district of building construction and drawing; they also stand first in the second grade art, practical geometry (of the schools examined at the Mechanics' Institution), and second in plans and solid geometry. Theirs is the only institution in this district that has taken in building construction a first-class in the advanced stage, and a first-class in the elementary stage. In all, eighteen certificates have been gained, and three Queen's prizes.

The Free Library and Literary Institute, Wallingford.—This Institute has been opened. The building, which originated through the liberality of the Hon. Auberon Herbert, M.P., is of red brick, with stone facings, from the design of the late Mr. Gae, of Andover, and stands facing St. Leonard's-square. The reading-room is capable of holding 300 persons. The bookshelves are of oak, and of a design suggested by Sir Sydney Waterlow, and towards which that gentleman contributed 50l. They contain at present about 1,000 volumes.

Workington Harbour.—On Saturday last a new entrance channel, cut straight seaward from Broom Perch, in Workington Harbour, was opened for the use of vessels, and the old channel was closed. The making of the new one was commenced about two months ago by Mr. Blain, of Workington, contractor.

The Architectural Association.—The closing meeting of the Architectural Association was held on Friday, the 30th ult., when officers were elected for the ensuing year, and Mr. George Atchison read an instructive paper "On the Strength of Materials."

Factory Acts (Brick and Tile Yards) Extension.—The following is the Bill introduced by Mr. Mandella for the protection of women and children working in brickyards:—A Bill to amend the Factories Acts Extension Act, 1864: Be it enacted by the Queen's most excellent Majesty, by and with the advice and consent of the Lords spiritual and temporal, and Commons, in this present Parliament assembled, and by the authority of the same as follows:—1. So much of the Factories Acts Extension Act, 1864 (in this Act referred to as "the principal Act") as excepts from the operation thereof the manufacture of bricks and tiles, not being ornamental tiles, shall be repealed. 2. The provisions of the principal Act shall as regards the factories in which the principal Act is extended by this Act, be modified as follows, viz.: (1.) No female or child under ten years of age, shall be employed in any such factory. (2.) Male young persons of the age of sixteen years and upwards may, between the 31st day of March and the last day of the following October, in any year, be employed on any days except Sunday and Saturday, for a period exceeding three days, for which they might under the principal Act be employed, provided that:—(a) They are not so employed for more than three days in any one week; and (b) They are not so employed before six in the morning nor after nine in the evening on any day on which they are so employed; and (c) They are in addition to the other times allowed for meals allowed a further half-hour for an extra meal at five in the afternoon of each day on which they are so employed.

Bishop Gilbert's Memorial, Chichester.—The works for the restoration of the Lady Chapel of Chichester Cathedral as a memorial of the late Bishop Gilbert, are still proceeding in the hands of Mr. Marshall, the contractor, and under the superintendence of Mr. G. Scott. Mr. Marshall's contract for the restoration of the stonework and other repairs amounted to 1,350l., and this part of the work is now approaching completion. The external walls have been underpinned and secured, the cost of the being covered by a contribution from the Duke and Chapter; and the requisite permission having been given by the Duke of Richmond, whose family vault is underneath, the floor of the chapel has been restored to its original level. The east window was then taken in hand, and now the whole of the stonework of the eight other windows has been restored and fixed, and the glaziers have commenced to fit them with plain glass. The workmen are engaged in some internal repairs; and details have just been received from Mr. Scott for the sedilia. The only work yet to be contracted for is the paving.

Restoration of Crich Cross.—For several years the old Cross of Crich has been in a ruinous state, and it was taken down two weeks ago, to be re-erected by public subscription, after a new design. Nothing was found to remain to gain any idea as to how many years it had been built. It is supposed to have been erected as a beacon to guide travellers across the wilds, when no other building or human habitation was to be seen around. The work was done by Mr. J. Pettes, of Fritchley. The new cross has a square base, which reached on either side by three steps. In the centre of this base is a receptacle, in which is placed a bottle, containing coins, and an appeal to the supposed age of the parish church, to the poem, by J. W. Lee, on the restoration. On a block of stone is placed, on which the cross stands, 9 ft. 6 in. high. On the side of the column is a bas-relief, with the words "Restored 1871." On the top of the column is a design of the cross on one side, and the Archangel, with his sword through the dragon's neck, on the other. The cross is 17 ft. high from the ground.

"The Criterion."—In our plan last week we marked the approach to the Concert Hall, the basement, "Entrance to Music Hall," strictly correct; but the term "Music Hall" has obtained a meaning of its own, which is told, is not to apply here. Read, that the Entrance to Minor Hall. In Private Dining Room, on plan of Grand Hall Floor, three doors into area and a door from service-entrance should be shown.

The New Assize Courts, Bristol.—Some of the officials are complaining loudly of want of convenient arrangement in these

Masonic Hall, Swansea.—The foundation of a hall about to be erected in Caer-street, for the use and occupation of the members of the defatigable Lodge, No. 237, Swansea, has been laid, in accordance with Masonic rites, by Mr. Theodore Mansel Talbot, of Margam Park, R.W. Provincial Grand Master of Freemasons of South Wales, Eastern Division. The site of the new Lodge is where the old Greyhound Inn stood, one of the oldest hosteleries in Swansea. Mr. Thomas Davies is the architect; and Mr. Thomas White is the builder.

Exeter Cathedral.—The restoration of this ancient edifice is advancing satisfactorily. The work now in progress, which will cost 50,000*l.*, is confined to the choir, side chapels, and side aisles. Last Sunday the morning service was held in the nave instead of the choir, which will be closed until the completion of the restoration. Messrs. Farmer & Brindley have taken the contract for the woodwork of the stalls at 6,000*l.*. A new reredos and a new pulpit are to be provided for the choir, and the massive oak throne and canopy desk are to be thoroughly renovated.

Christ Church, Victoria Park-road, South Hackney.—The Bishop of London has consecrated this church, the foundation-stone of which was laid in August last, by Lord George Hamilton, M.P. It is situated at the corner of Grove-road, Victoria Park-road, South Hackney. There is little attempt at ornamentation. The edifice is composed of coloured brick, with plain stone facings. It will afford sitting accommodation for about 700 persons, and a large proportion of the seats are free.

Self-support of Prisoners.—Capt. Mitchell, Governor of the Lancaster county prison, appears to have accomplished the task of making the prisoners maintain themselves. At the Salford Hundred Quarter Sessions, the sitting justices stated in their report that the large-sheet of prison earnings for the year ending the 31st of March last showed a net annual profit from remunerative labour of 84*l.* 13*s.* 6*d.*, exclusive of bad debts amounting to 16*l.* 2*s.* 4*d.*

Fall of a Railway Bridge.—On Monday evening a portion of the large viaduct of the Newcastle and Yorkshire Railway crossing the river Calder, near Healey Mills, about a mile from Dewsbury, fell into the river, and the consequence was that all traffic for Wakefield was suspended. The arch that fell was a very large one, built of brick, and it collapsed just after a heavily-laden goods train had passed over it, owing the metals and sleepers suspended on the main portion of the supports.

The Peabody Gift.—On the 1st of next week will be formally opened another block of dwellings, Peabody-square, behind a row of houses at the lower end of the Blackfriars-road. There are two quadrangles of buildings, relieved by a cluster of tenancies in the centre of each square. The two quadrangles afford accommodation for 320 tenants, occupying one room at 6*d.* a week, two rooms at 4*s.*, or three at 5*s.*, at these rates the whole building is a ready sale.

Female Students in Art.—In the national competition of Schools of Art nine gold medals have been awarded. These are assigned to various subjects of study or design, and the painting has been gained by a lady, Miss Anne E. Stanton, of the Strand School of Art. 24 silver medals seven have been won by ladies, who have also carried off 21 out of 65 bronze medals, and 31 out of 95 Queen's prizes books.

A Drinking Fountain for Cardiff.—A new bronze drinking-fountain is being fixed in a crossing near the Cardiff Arms, on the Victoria-road, Cardiff. The fountain will be heated by three lamps at night, and stand on a solid pedestal, access to which is obtained by a flight of stone steps.

Additions to Fulham Infirmary.—At the weekly meeting of the Fulham Board of Guardians, the tender of Mr. J. Hanks, of Amersham, was accepted for the alterations and additions to the Infirmary. The tender was 3,130*l.*, and was the lowest which had been put in.

Francis Eginton, the Glass Painter.—An overlooked misprint in our notice last week of this early reviver of the art of glass-painting, he was called "James." It should be read with a pen to Francis.

Salt-Water Baths for Southport.—Public salt-water baths, erected at a cost of about 36,000*l.*, have been formally opened at Southport, by Lord Skelmersdale. The occasion was celebrated by a series of *fêtes*. An observatory has been presented to the town by Mr. J. Fernley.

TENDERS	
For minister's house, Newcastle-under-Lyme. Messrs. R. Scrivenor & Son, architects:—	
Sutton & Meadon	2815 0 0
Barlow	665 0 0
Bailey	540 0 0
For additions to Wyehdon Lodge, Stafford. Messrs. R. Scrivenor & Son, architects:—	
Wood Brothers	2880 0 0
Barlow	840 0 0
For Egeiton Dock Warehouse, Birkenhead, Liverpool, for London & North-Western Railway Company:—	
Bailey	231,944 0 0
Thompson & Co.	29,983 0 0
Warburton	28,180 0 0
Farrel	27,842 0 0
Ross & Wolfenden	26,574 0 0
Parker & Son	25,632 0 0
Kirk & Parry	25,378 0 0
Banks	24,370 0 0
Johnson	23,016 0 0
Vernon & Capper	23,155 0 0
Pearson Lee	22,942 0 0
Holme & Nicol	22,505 0 0
Beaumont	22,164 0 0
Hugh & Co.	21,720 0 0
Parnell	20,991 0 0

For new vicarage-house, Sparsholt, Berks. L. H. Reichel, architect. Quantities by the architect:—	
Cowland	22,995 0 0
Wheeler, James	2,036 0 0
Wheeler, George	2,557 0 0
Williams	2,428 0 0
Kemp	2,385 0 0
Williamson & Bruntis	2,384 0 0
Dover, Dovel, & Wills	2,361 0 0
Machin	1,980 0 0

For redecoration of the two public-houses, "The London Appreciation," Old-street-road, "King's Arms," Bech-surest, Barbican. Mr. J. H. Rowley, architect:—	
Heaps	2342 0 0
Main	409 0 0
Nind (accepted)	465 0 0

For the erection of the Clerkenwell and Smi field branch of the London Joint-Stock Bank, at the corner of St. John-street and Charterhouse-lane. Mr. Lewis H. Isaacs, architect. Quantities supplied by Mr. L. C. Riddett:—	
Hill & Son	212,364 0 0
Adamson & Sons	12,259 0 0
Luce Brothers	11,700 0 0
Perry & Co.	11,172 0 0
Elkington	10,875 0 0
Bertraver & White	10,712 0 0
Brown & Robinson (accepted)	10,610 0 0

For the Dover National Schools (Girls). Mr. C. T. Whitley, architect. Quantities not supplied:—	
Bourne	21,380 0 0
Parke	1,160 0 0
Ascock & Reed	1,144 0 0
Clarke	1,120 0 0
Richardson (accepted)	1,096 0 0

For schools and residences at East Thurrock, Essex. Messrs. Elmist & Fray, architects. Quantities supplied by Messrs. Northcroft, Son, & Neighbour:—	
Dumfries	21,160 0 0
Heath	1,100 0 0
Rooney, Brothers	1,076 0 0
Rivet	1,048 0 0
Blake	947 0 0
Bleas	853 0 0
Crook & Wall	775 0 0

For alterations and additions to the Battersea Lammam Hall. Mr. Stephen Steadman, architect:—	
Turrell	4398 0 0
Jones	385 0 0
Roberts	275 0 0
Fisher	259 0 0
Colwell	262 0 0
Stevens	247 0 0
Sawyer	240 0 0
Rooney Brothers	233 0 0
Baker	213 0 0
Linton & Goff	2 0 0
Dowler	212 0 0
Lashby Brothers	202 0 0
Gooding	164 0 0

For house and shop at Eltham, Kent. Mr. Thomas Chester Haworth, architect:—	
Peacock & Taylor	2800 0 0
Cowdron & Cowie	683 0 0
Rooney Brothers	655 15 0
Powell	685 0 0
Mason & Briny	615 0 0

For the erection of new premises, 108, Bishopsgate-street, for Messrs. Gordon & Co. Messrs. Francis, architects. Quantities supplied:—	
Dave Brothers	28,375 0 0
Myers & Sons	5,779 0 0
Fish	5,346 0 0
Hill, Kell, & W. W. W.	5,337 0 0
Merritt & Ashby	5,239 0 0

For the erection of Infant Schools, Tilehurst, Berks, for the Rev. J. W. Routh, Messrs. Wm. & J. T. Brown, architects:—	
Grover	2840 0 0
Boxall	894 0 0
Wells	830 0 0
Wigmore (accepted)	487 10 0

For re-building three houses on the north side of High-street, Kensington. Messrs. James Broadbridge & Josiah Houle, architects:—	
Stimpson	£3,285 0 0
Foster	3,287 0 0
Cowland	3,089 0 0
Temple & Forster	3,440 0 0
Langmead & Way	2,995 0 0
Servener & White	2,983 0 0
Cooke & Green	2,905 0 0

For new premises at Huddersfield, for Messrs. Pickford & Co. Mr. Geo. E. Isborn, architect. Quantities supplied:—	
Parker	£2,075 0 0
Booth, Ellingworth, & Co.	2,050 0 0
Fawcett	1,850 0 0
Graham	1,943 0 0
Graham & Sons	1,901 6 8
Christie	1,747 0 0
Radriffe & Sons	1,689 8 0
Mallinson & Co. (accepted)	1,688 0 0
Ditto (for additional works)	687 15 0

For the erection of schools at Gosport, for the Rev. Thomas Doyle, Mr. Henry John Hanson, architect:—	
Rapley & Son	320 5 0
Cole	297 6 0
Lane	249 15 0
Laws & Son	225 10 0
Garrett (too late)	225 0 0
Cooper (accepted)	224 15 0

For additions and alterations to Corvill-house, Darnleyshire, for Mr. William Johnston. Mr. Walter F. K. Lyon, architect. Quantities supplied by Mr. Clement Dowling:—	
Johnston & Anderson	£5,614 0 0
Thomson	4,323 0 0
Macartney	4,267 0 0
Ker	4,216 0 0
Thomson	4,164 0 0
McEwen	4,147 0 0
Halliday (accepted)	4,069 0 0

For the erection of Clapham-park House, two lodges and stabling, for Mr. James Howards, M.P. Mr. John Usher, architect. Quantities supplied. The contract includes fire-proof floors:—	
Dover, Dovel, & Co.	£9,767 0 0
Day	9,008 0 0
Capell & Co.	8,918 0 0
Munro	8,938 0 0
Colls & Sons	8,822 0 0
Pattinson	8,679 0 0
Young & Hulton	8,659 0 0
Escount & Co.	8,445 0 0
Twelve trees	8,375 0 0
Spencer	8,198 0 0
Hobson & Taylor	7,983 0 0
Foster	7,493 0 0
Watson, Brothers	7,168 0 0
Waterson & Co.	6,949 0 0

For building additional class-rooms to the National School, Tilehurst, Berks, for the Rev. J. W. Routh. Messrs. W. & J. T. Brown, architects:—	
Borall	£286 0 0
Barnicot	260 0 0
Wigmore	234 0 0
Darner	232 0 0
Grover	227 0 0

For the erection of coffee-shop, Abbey-square, Reading, for Messrs. Sutton & Sons. Messrs. W. & J. T. Brown, architects:—	
Strong	£493 0 0
Woodroffe	488 0 0
Matthews	430 0 0
Sheppard	435 0 0
Barnicot	410 10 0

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The Builder.

VOL. XXIX.—No. 1485.



On Style.

Offered, in a recent number, some remarks as to the meaning and value of what is called expression in architecture; one of those qualities which are more easily perceived than defined, but the importance of which is not to be on that account underrated. As we laid stress at the time on the existence of a marked distinction between *expression and style* in architecture, a few remarks as to the nature and distinctive characteristics of this latter quality can hardly be said to be

propos de rien. As in the case of a good many terms in common use among us with regard to art, we have, in speaking of style, to clear away a certain amount of ambiguity of meaning before we can even arrive at a clear understanding as to what we are talking about. Style is a word very loosely used even in regard to architecture; still more so in its application in connexion with other branches of art. We recognise, in a broad sense, various "styles" of the art of painting; but we speak also of the "style" of a particular artist in a much narrower sense, and with reference generally to distinctive peculiarities of manner. In speaking of literature the word is used exclusively in this narrower sense, as indicating not the school of thought to which a writer belongs, but the distinctive characteristics of his mode of expression. The word as used in these two relations means in fact very much the same as we mean by "character" or "manner" in architecture. But in regard to the latter art we commonly use the word "style" in a wider sense, as the distinguishing name for differences between schools rather than between individual architects. We include under the general title of the "Gothic style" buildings in which the manner, or what we may term the handwriting, of the various designers is as distinct as possible. We formerly applied the term to all buildings with pointed arches; we have more recently perceived that what made Gothic a style lay deeper than that, and the meaning of the term has been somewhat extended, to the length of becoming perhaps rather too vague. But inasmuch as we all recognise style as something distinct from expression, and are constantly making use of the word with more or less precision of meaning, we may contribute to a rather more definite idea on the subject by considering for a moment what "style" is,—what makes a style in architecture, as distinct from mere character or expression.

There are necessary conditions for fulfilling the idea of a style which are not very easily definable, though they are easily apprehended in a general way by the eye and mind, and would almost naturally occur to any one giving a thought to the subject,—we mean such things as the harmony and mutual fitness and suitability of the different decorative features in a building. We feel instinctively when this suitability does or does not exist. We should at once feel a sense of discord and unfitness in seeing such an ornament as the square Greek fret placed on a building in conjunction with or in proximity to a band of carved foliage in the Gothic style; but looking at the two features superficially, it is not so easy to point out wherein they are so discordant, what special qualities render their joint employment an anomaly. To arrive at this we must come to a broader generalisation; we must look, not merely at the ornament, but at its relation to the whole structure and to the principles on which the latter is put together. If we ascend from ornamental detail to larger portions of the structure, we feel equally the incongruity that would result, for instance, from placing a pointed Gothic arch between two bays and lintels from a Greek temple, or merely springing a Gothic arch, with the usual mouldings and chamfers, from a Classic column, although the column would carry it just as well, structurally, as would the orthodox clustered pier. It might be urged that the anomaly in this and the former case was merely the result of long association of ideas. Perhaps we need hardly say that we do not admit this. Our opinion is, that architectural style, properly so called, consists mainly in unity of construction and constructive expression carried out, not only in the main structural features, but imitated and repeated in a lesser degree by the smaller decorative features; which latter, however, in proportion as they recede from structure and become purely decorative, in that proportion escape more or less from this structural influence and come under the regulation of another artistic law which we shall refer to.

As to structural unity of principle as an element of style, that has been several times insisted on as a condition by architectural critics. So far as the main constructive portions of a building are concerned, the employment, in a building of any size or architectural importance, of one form of construction, trabeated, arcuated, domical, whatever it be, is not a new principle, in theory at least, and is practically illustrated in most of the great historical monuments of architecture. But the formation of a consistent architectural style requires also that the main motive of the construction be carried out and exemplified in the detail of the building, a point which has not been so clearly recognised. This may be, indeed, must be done in two ways,—in regard to the main lines formed by the constructive portions of the building, and in regard also to the material used, and the method of treating it. In the Greek Doric style we see both requirements carried out nearly in perfection. Nearly the whole of the ornament (the sculpture is an accessory, not an architectural ornament) repeats, in its squareness, hardness, and rigidity of line, the square, heavy form of the pillar-and-beam construction. It is only when we get to the small finials or acroteria on the apex and spring of the pediment that we find any flowing lines, and those are arranged with a certain stiffness and precision to harmonise with the character of the whole building. Anything less rigidly conventionalised would be felt to be out of place at once. So, of course, with the Gothic, where every one knows how, in the full development of the style, the pointed arch is regularly carried out into even the smallest details; and even where the arch does not appear, the distinctive feature of the *point* is seldom lost sight of, and gives a crispness and sparkle to the

smaller details closely allied to the treatment of the whole edifice. In the Saracenic style, again, the light form of the bulging and pointed dome gives, as it were, a licence to the wild and elegant luxuriance of ornament which characterises the details of the style, where again not only is the appearance of lightness and pliability of material kept up in the details, but even the marked characteristic of the bulged dome, of the arch returned inward past its springing line, re-appears in the horse-shoe arches and sub-arches which abound in its fanciful arcades and wall-decorations. We are glancing here at the relation between detail and structure in regard to mere line and form; we must look at it, however, as hinted just now, in regard to treatment of material and relation of design and detail to the material. This establishes a relation between structure and detail in regard to some classes of detail which, if we restricted our attention to mere outline, might seem to escape from this law. Such things, we mean, as sections of mouldings, plans of points of support, &c. What is it which really makes the incongruity in the case we supposed just now, of a Gothic arch springing from a Classic column? It is mainly the contrast between the deep, heavy mouldings and chamfers of the arch, and the shallow, delicate flutings of the column. We are here again brought round to constructive unity of design; for in every true and naturally developed style the mouldings and the surface treatment are the result of the consideration of the nature of the material. Greek architecture is essentially a marble style, Gothic architecture a stone style; a distinction which even now is scarcely appreciated, but which, if it had been suspected fifty or sixty years ago, would have saved us a host of now meagre, desolate-looking, starved, would-be Greek erections, conceived and built in the vain idea of achieving in a comparatively dull, soft, and coarse material what could really only be effected in the bright, fine, hard marble in which the style originally rose into life. Deep sinkings, rounds, and hollows have no place in marble; they not only involve ruinous labour and expense, but lose the opportunity of showing the material in its most beautiful and perfect use, as capable of receiving and retaining the most delicate curves and contours, and the sharpest edges, and of preserving the effect of ornament more delicate than could be executed in any less hard and durable material. In dealing with stone, on the other hand the Medieval architects felt that they had under their hands a coarse granular material, incapable (especially when exposed to the weather) of retaining a sharp arris or a delicate surface ornament; and they worked it accordingly into deep hollows, and took off by chamfering the edges which must soon have chamfered themselves. Marble and granite and such materials have no affinity with these expedients,—a fact which is felt intuitively by modern masons; for who ever saw a polished granite pilaster with the arris chamfered off? We know better, even in the present day, than to despoil the material of the hard, sharp edge, which is one of its best characteristics. And viewing the relation between material and design in this light, do we not fairly establish the structural origin of style, even in regard to the sections of mouldings, when we look at these as taking their form and character from the nature and quality of the material, which in fact was the most important influence in determining the general structural design itself? We think so little of the nature of our material in these days; we are so apt to treat it at random in some preconceived manner, instead of in the manner best suited to "bring it to an excellent work," that we scarcely realise the intimate connexion subsisting, in all unsophisticated and unforced architectural styles, between material and design. The recognition of this would go far to give something more

like a consistent style to many of our modern buildings.

We alluded to another principle to which purely ornamental detail, in a consistent style, must bend, in proportion as it escapes from the dominion of structural considerations and structural form. There are generally to be found, in buildings of all styles, small details which seem so purely arbitrary and ornamental, that they may appear to have little or no dependence on the general style or structure of the building which they decorate. But even such details are bound by this law, that they cannot approach nearer to nature, cannot leave the conventional form of strictly architectural design, except in a ratio strictly consistent with the degree of conventionality subsisting in the general design. Small details may approach nearer to natural forms than can be suffered in the larger features of a building; but they must not be allowed to transgress disproportionately far in that direction. A Doric temple, for instance, is in a highly conventional style of architecture, and accordingly even the lightest and most unfettered of its details must be kept within the most artificial limits, and not suffered to approach in any way near to the irregularity of nature.

Imagine the effect of a Gothic pinnacle, with its budding crockets and flowering finial, on the apex of a Greek pediment, and our meaning here will be obvious. Such an object, in such a situation, would appear simply ragged. But the Gothic and Saracenic, and some other styles, approach much nearer, in their general treatment and outline, to the picturesque forms of nature, and accordingly these styles will admit of ornamental detail which in proportion approaches still nearer to, and even very closely imitates, the form of natural vegetation. And this is the true æsthetic reason for the incongruity of appearance which would be presented by the supposed juxtaposition of the Greek fret and Gothic foliated carving, alluded to at the commencement of our remarks. Independently of their variety of form and character, they would not accord with each other because they are, if we may so speak, on different planes of departure from natural form; the Greek being very far, indeed almost entirely, removed therefrom, while the Gothic approaches much closer to it. So we see in all genuine architectural styles, that the principles only of nature being followed in the main design, the facts of nature are allowed to be approached by regular gradation as we descend from the whole to the parts, and the more so as we go from details, which are partly constructional, or closely bound up with construction, to those which are purely ornamental; provided always that even in these latter an approach to natural fact is only warranted in proportion to the nearness to or distance from nature of the main design; that when the latter is purely architectonic and conventional, only a distant approach to nature can be permitted even in small details, and that this must be in regular gradation; i.e., we cannot permit any one class of detail to assume an undue approach to natural form, out of proportion to what is allowed in other details in the same style, unless it be openly avowed as an addition to, and not a part of, the architecture (as in high-class sculpture applied to architecture). With this reservation, everything which approaches disproportionately near to natural form is an excrecence and an impertinence, and will not be found in connexion with any true and consistent style.

Comparing theory, then, with the facts presented to us in the monuments of what we all agree to consider as among the most perfect architectural styles of the world, we are led to the conclusion that architectural consistency of design, which we call style, depends in the first place on structural consistency, in the employment throughout a building of one main principle of construction applied equally to the main structure and to the smaller structural details; secondly, on the carrying out and repetition of the main lines and structural treatment of material in all the smaller parts of the building in which structure is not entirely lost in decoration; and thirdly, in the principle, which controls every portion down to the smallest decorative feature, of consistency of treatment in regard to imitation of nature, which provides that the same building shall not present to us features strictly conventional combined with others which approach nearly to the irregularity of natural form, except just in that fit and proportionate gradation from the architectonic to the natural which is allowable, and even desirable, as we

descend from the structural whole to the decorative portions. And here, then, it is evident wherein expression, which we treated of a few weeks back, differs from style. The latter is concerned with the treatment and relation of the architectural features which form the integral part of our design; expression is concerned with the proportion, the variety, the position in which we use these materials. There may be, in other words, a dozen buildings in the same style, all with equal purity of detail, and in which all the main facts of the detail are the same, but they may be arranged and grouped in so many different ways as to produce buildings with a dozen perfectly distinct expressions. That we should be led to such a conclusion from a logical process of examination is a result which may be consoling to those who think we can have no originality of architectural design without the invention of what they term a "new style." Any style worth the name is capable, in competent hands, of almost infinite varieties of expression, if our definition of "expression" in There may be, we may add, buildings with a great deal of expression and character, though without purity of style; and purity and consistency of style and detail may occasionally be found almost entirely devoid of expression, except that kind of set expression of dead immobility which belongs to Egyptian sculpture. But the position of the two qualities is broadly this: style deals with the principles on which we are to invent and combine our materials for architectural design; expression is the result obtained by the varied manner, proportion, and juxtaposition in which such materials are used in special cases and by special minds.

In all probability, we shall not see a single national style invented and universally adopted, in this or any other civilised country, as the Pointed style was in the Middle Ages. Modern education has given such variety and extent to our sympathies, that it is scarcely possible that the whole nation and the whole architectural profession could be again found to tread, by one consent, in the same steps, architecturally. Progress in this direction points rather to the adoption and maturing of two or three or more separate types of style, each with its own varieties of expression. Such types will, we believe, only be consistent and satisfactory if they adhere to the principles which have governed former true and consistent architectural styles, and which have been, we believe, in the main, as hinted at above. Not that we have the slightest idea of the possibility of any architect or body of architects theorising a new style into existence, out of the depths of their internal consciousness, on these or any other principles. Architectural styles never have been, and never will be, made out and dried in that way. But it does not by any means follow, we submit, that therefore the subject is not one of interest in itself, and worthy of thought and consideration, which may prove suggestive in one way or another.

THE INDIAN COURT AT THE INTERNATIONAL EXHIBITION.*

Or the jewelled and enamelled work there are only six examples; but these are notable ones. One of the most remarkable is an "Ankus," the small sharp hook used by the driver of an elephant as a goad. This implement is richly set with rock crystal and uncut rubies. It is exhibited by the Rajah of Jeypore. The finest enamel work of India is produced in the state of Jeypore, and it is considered to possess great artistic merit. The enamel is very fine, and is only applied to gold and silver. The process is kept a sacred secret by the artists, being handed down from father to son. All articles manufactured are purchased and liberally paid for by the State.

Together with the gold, silver, and jewelled ornaments exhibited from various parts of India, is to be seen a collection of imitation ornaments, manufactured in Bombay. These have rather an ethnological than an artistic value. The art of sham, applied to personal decoration, has reached a pitch in modern Europe that shames the industry of the Hindoo. The metal work in brass, exhibited in Section D, is also principally interesting as reflecting the habits of the people. Implements and ornaments of all sorts, of native design and execution, are here to be seen, and to be compared with the product of

Indian skill, applied under European direction, as in the case of some models in bronze, and a collection of small bronze objects in imitation of *Articles de Paris*. The result of these is, to show that the Indian artificer is altogether unlikely, for many generations, to excel in any but works of purely Indian design. Even the examples of die-sinking from the Calcutta mint are miserably poor and bald; the best exhibit being an ivory relief, representing either "Commerce," or "India," but so turned out from the lathes as to look like one of a set of draughts.

The Koofgari work, above alluded to, is principally devoted to the ornamentation of arms and armour. A complete suit of armour, consisting of breast-plate, leggings, armlets, and helmet, inlaid with gold, such as is worn by the Sikh horsemen who were our foes in the Panjab and Sikh campaigns, is exhibited by the Government of the Panjab. A tray (371), a large casket (380), and an inkstand (392), displayed by the same exhibitors, are among the most beautiful specimens of this fine workmanship. Two curious forms of daggers, the "Jambia" and the "Bichwa," richly mounted and inlaid, are exhibited by the Mahajah of Scindia. The Bidree work is exhibited by the Bengal committee, the Government of Bombay, and that of Hyderabad. It is not of a nature likely to be imitated in Europe, although ingenious, and possessing capability for improvement. With this work we leave the admirably illustrated metal-work of India. The mosaics in marble are but poor, when compared to the elaborate and highly-finished productions of Florence.

The inlaid work of Bombay is a local speciality of extreme interest and beauty. It is said to have been imported into Bombay from Persia, and to have originated at Shiraz. It has not been practised in Bombay for much more than half a century, having been introduced into Scinde about a hundred years ago, and having more recently spread to Surat, Baroda, and other places. The trade is now merely imitative, and new geometrical combinations are not attempted; the workmen simply copying the original Persian forms. There are about a hundred and twenty artificers engaged in this work at present in Bombay. The materials used are as follows:—Ivory, which is always unstained; Samba horn, which is stained green by steeping in an acid solution of verdigris; sandal wood, of the natural colour; ebony; patang, or saffron wood, which is of a rich burnt Sienna colour. Tin is employed in these designs instead of silver, which it equals in colour and lustre, and far exceeds in resistance to oxidation. In the original Persian work, vermilion is employed instead of patang, and brass instead of silver. The tin is purchased in wire, and passed between rollers, which give it a triangular form. The materials are glued together into various geometrical forms, consisting of circles, hexagons, squares, rhombs, and triangles. The cement used is Ahmedabad glue, dissolved in alcohol. The length of the pieces glued together is about 2 ft., and these are cross-cut into sections of from a fifteenth to a twentieth part of an inch in depth by delicate saws. These patterns are inlaid in sandal wood or ivory either in solid objects, such as paper-knives, or in veneers. A collection of thirty-four tools used in this delicate industry is exhibited, together with two trays of specimens illustrating the process of the manufacture. Among the examples of the work itself we call attention to (453) a work-box in carved and inlaid sandal-wood, C. Surat work, a card-basket and box (465 and 466) of carved sandal-wood, inlaid with ivory work, two pincushions (485) of inlaid ivory work, and a book-stand, paper-weight, and paper-cutter, of carved ebony, inlaid, exhibited by the Bombay manufacturers (505, 506, 507).

Nothing specially worthy of note appears to represent sculpture in marble and stone. The carvings in soap-stone are very noticeable: especially Nos. 525, 530, 581,—an inkstand, two boxes, and a paper-weight, executed at Agre. The articles in jade, agate, blood-stone, rock crystal, &c., have a special value due to their imperishable character, no less than to the enormous labour required for their production. A collection of moss agates, from Bundab, includes specimens of wonderful beauty. There are some superb tablets of brilliant aventurin. Some of the agate cups and saucers, from Cambay, are really exquisite. The white agate squares for an agate and blood-stone chessboard from Bombay, are of unusual and delicate

* See p. 639, ante.

eauty. There is a collection of handles of jadoor whips, canes, and sticks, exhibited by the Government of the Panjab, together with personal ornaments, crystal cups, a rosary, and other articles in different kinds of quartz, which represent an enormous amount of patient industry.

Among the carvings in black wood, ebony, and horn, special admiration is due to the magnificent chiffoir, davenport, and sideboard carved by Messrs. Naojee Shapoorjee & Co., of Bombay. If these are, as we take them to be, the same objects that were exhibited at the Workmen's International Exhibition, the low prices attached to such beautiful pieces of decorative furniture are positively wonderful. A pair of snuff-boxes, carved out of bail-fruit, are exhibited by the Maharajah of Vizianagram. Among the sandal-wood carvings, a superb walking-stick and a pair of chowries, or fly-whisks, from Mysore, are exhibited by Earl and Countess Mayo. A work-box of Ahmedabad work, carved with bold and delicate foliage, by a Bombay artist (617), and a writing-desk and work-box 519 and 620) of Coompta work are remarkably old and well out. In ivory-carving, a peculiar style of vertical piercing, like that of the perforated marble used for windows, is shown in the paper-cutter (635) from Umrirur. The statuette of the Indian Apollo, from Sangree, in the South Mahratta country, is admirably out. It is remarkable for the mode of heightening the effect of the sculpture by the sparing introduction of black lines, as in the eyes, and gold. A set of basemen, from Shahpore, will also attract notice. The statuette (633) stated to be carved from photographs and engravings, are only a sort of bastard work. Generally speaking, the attempts to induce Indian artificers to imitate European work are as unsuccessful as they are ill-judged. No graver mistake can be committed than the introduction into India of the method of educating Europeans.

The figures modelled in clay will be regarded with interest, not so much from their artistic merit as on account of their admirable illustration of the customs, crafts, and trades of Bengal, Jude, and Western India. In the model figures 362) executed by the Madras School of Industrial Arts, in imitation of French bronzes, may be seen an example of one of the most successful attempts to destroy national industry, and to algarise Oriental trade, that it is possible to conceive. The Madras School has sent the schoolmaster abroad with a vengeance. Such execution is positively abominable. With four collections of models of Indian fruits and vegetables we take leave of Class II.

Of Class III., containing engravings, lithographs, and photographs, it is unnecessary to speak in detail, as the contents, although admirably illustrative of Indian scenery, habits, and architecture, cannot be called the product of Indian art or industry. The architectural designs composing Class IV. are only eight in number. The copies and reproductions of ancient works of art comprise casts from temples in Bengal, and from Amherst Temple, Bombay. These casts are worthy of study, though there is nothing among them to be compared to the magnificent reproduction of the Sancti Topi, in the Eastern Gallery. The pottery, Class VIII., forms a large and important collection, illustrating the implements of domestic use; the tiles, bricks, lozels or hollow tiles used for vaulted roofs, the perforated tiles used for windows, the clay, sand, colouring materials, and, in a word, the entire potter's art of India. The attachment of labels to these different objects is a great desideratum.

Educational works and appliances, Class X., form a subject into which we cannot now enter, except to repeat a protest against the system which seeks to train the subtle brain and nimble fingers of the Hindoo child down to the most pestilent vulgarity of English "fancy-work." Neither have we space to speak of Classes XI. and XII.—scientific inventions and miscellaneous articles. In Classes V. and IX., containing embroideries, and cashmere shawls, and woollens, wools, and carpets, are to be found some of the most splendid of the contents of the Exhibition, and specimens of the utmost interest to our home manufacturers. The splendour of the kinobos, or manufactures of gold, or gold and silver, and silk, is extraordinary. We have noted, among the brilliant contents of the glass cases containing these costly fabrics, No. 1,186, a gold ground, with dispersed red and green conventional flowers; No. 1,190, a table-cover, gold and silk diaper; No. 1,197, a

saree, of red silk, with a gold stripe, the silk border remarkable for its decoration in flat treatment; No. 1,215, in which letters are adopted as a means of ornamentation, a species of manufacture used for mortuary purposes; No. 1,221, a "lappa" of silk warp, and gold and crimson wool; and 1,207, a "dapetah," or shoulder-cloth, in which a variety of tones in the gold produce the most beautiful effects, and even an entire change of colour according to the play of light on the texture. This specimen, moreover, is remarkable for the introduction of "Judson's dyes," by no means an improvement on the older colours. From Kutch are sent shoes so richly embroidered in gold and silver that they recall the expression of John Bunyan as to Religion walking in her silver slippers. Among the shawls we note especially (1,072 and 1,073) a red and a black cashmere, with gold-embroidered border; (1,062) a shawl of the Cashmere cloth, embroidered with silk, from Dacca; (1,066) a specimen of loom-embroidery, in white-flowered silk; (1,075) a black scarf, with gold border, from Cashmere. There are also very rich loom-woven broadsides, in gold and silver thread and silk, from Benares; superb saddle-cloths, in red and green velvet, heavily embroidered with gold, sent by the Maharajah of Benares; a piece of white silk, with silver-dotted pattern (1,087); turban-pieces, of red and purple, embroidered with gold; a black net shawl, embroidered with white floss-silk, from Delhi; and a black-and-red gold-embroidered shawl, and a red "pushmina" shawl (1,093 and 1,097), also from Delhi. The Cashmere shawls exhibited by the Maharajah of Cashmere (1,334, 1,335, and 1,336) and by the Cashmere Shawl Merchants' Company, are, we apprehend, the most costly articles exhibited in this splendid display. One of these pieces of laborious needlework, which was presented by the Maharajah to Her Majesty, cost 1,000l. The woollen goods which are worn by the labouring classes of the Western presidency, the collection of raw wools, and the carpets and rugs which adorn the walls of the gallery, or are spread to tempt the loiterer in the little alcoves at the side, will attract many a purchaser, and should receive the careful attention of our manufacturers.

The directors of the Exhibition, no less than the Indian Government, are to be congratulated on this comprehensive and well-ordered display. Among the names to which honour is due in the matter, the chief place must be accorded to that of the indefatigable and courteous director of the Indian department, Dr. J. Forbes Watson.

THE WANT OF OPPORTUNITY.

"EDUCATION," in its widest and most universal sense, is now engaging so much of public attention that there can be no necessity of apologising to the readers of the *Builder* for occasionally, as opportunity offers, recurring to it, especially in its artistic aspect. At first sight, it would almost seem as though the subject were well-nigh exhausted, so much has been said and written about it; but the subject, when you look a little below the mere surface of it, is quite new and fresh, and it is soon perceived how very little indeed the modern man of to-day, full of the ancient ideas, is competent to deal with it,—he has so much himself to *unlearn*: but without at present going into this difficult matter, let us call the attention, particularly of the architectural reader and "designer" to one thing connected with "education" not a little interesting to them, and not before noted anywhere, as far as we know: it is this,—the proportion between the educated for any special vocation, and the non-educated; and as to whether society, or, to narrow the question, the trade of the country, is really suffering so much from the paucity of the "educated," as from the fact of those who are already educated having no opportunity of exercising their acquired capacities. This is a momentous question; for we are constantly being told, both in Parliament and out of it, at public meetings, and in all sorts of ways, that other nations are distancing us consequent on our need of technical education and artistic education, and that we have no capable designers, and artists, and original inventors, and educated men among us, to do the work that is needed, and thus enable us to compete fairly with other nations, or even to provide adequately for our own wants. We cannot go all this way. We believe that there is in London alone a considerable number of able and educated, if that

be the word, draughtsmen, and designers, and artists, who need not more "education" to do the work that is needed, so much as opportunity. Let us, to make the matter quite clear even to those who have not given it any consideration, take the single item of common household furniture. We instance this, because it has just been asserted in an influential quarter that one of the deficiencies of the system of art education at South Kensington is, that the "antique" takes up too much of the time of the students, and that it would be better to turn the attention of the pupils to more common things, as common furniture; and that, until this is done, no great improvement is to be looked for in the common furniture and objects about us. Now, what are the real facts as they exist, and as they may be evidenced to the satisfaction of anybody who really desires to know a little about it?

We begin by saying that the real "National Museum" of a country is to be found in its shop-windows. It is not in the British Museum, or the South Kensington Museum, or in any special yearly exposition, that the true current ideas of a people are to be found, and weighed, and measured, but in the ordinary and every-day open shop-windows. Take our present subject, furniture,—tables, chairs, bookcases, curtains, carpets, and so on. In the South Kensington Museum will be found an ample stock of these things, both ancient and new, only just manufactured; but if they be looked at attentively, the new articles will be found to be purely exceptional things, and to be found nowhere else, and, indeed, whatever their merits, to be inapplicable to the usual and common purposes of life, its means, and its rough usages. To find what is wanted, and in universal request, we are compelled to go to the shop-windows, and in them to note, not only what is in universal and popular demand, but to find out *how* they are all brought into existence, and then to come at the "state of education" of those who design and make them." And here it is to be observed that it matters but little whether the very expensive or the very cheap are selected for examination, whether Bond-street or the New Cut be ransacked for specimens; for the main process of manufacture is pretty much the same; the patterns differ but little; the materials and putting together may be more or less rare and expensive; but the main result is nearly or quite the same. The fashionable and the common chair and table would seem to be cut out from the same drawings or models, and the most costly of hearth-rugs and the smallest and cheapest apology for one would almost seem to be copies of each other. It is in the shop-windows, therefore, that the real state of the country as respects its designers and draughtsmen is to be found; and they, in reality, are the "thermometers" by which to measure the degrees of art-power of those who produce the objects which fill them. No one needs to be told what modern every-day house furniture, as seen in the shop-windows, looks like, or what its artistic value is. It is simply artistically frightful; and no one pretends that there is anything in it which can be dignified by the name of thoughtful design. We do not, of course, mean that no original drawing is ever made by which to work out a new piece of furniture; for every well-to-do firm has its draughtsman and designer, always ready for all sorts of work; but it is mostly done by rule and measure and routine, and according to "book" and "pattern"; and if when, at first sight, a little new, it will be found, when looked at in detail, to be made up of well-used patterns, and the same details peer out in different articles made for widely different purposes. But all this while, and it is the purpose of these few hints to call attention to it, the draughtsman, or designer, or even foreman who sets out the work, may be and frequently is a very competent and clever person, and well able to do not only better things, but things altogether different. It will be found that it is not more "education" that he needs, but permission and opportunity to make use of the education he already has: in short, that he wants but the chance to work as an artist, instead of as a machine, or part of a machine; and that no addition to his artistic or technical education would be of any kind of advantage to him or even his employers, for he could make no use of it. What he *has* lies all waste and useless; what he could further gain would and must alike be useless. It is melancholy to think of the mass of good talent there is in London alone at this moment lying thus dead and useless, with no chance whatever of rising out of its death-like

sleep. The shop windows are the test of it, as it is; and the education it indicates how little of public satisfaction there is in it; but we contend that more education, or even technical education, will not of itself alone help it.

But let us go a step further, and admit for the sake of argument that no one designer or draughtsman as at present engaged in the production of the special article of house furniture is competent to his work, that they are one and all unfit for the work they have to do, and that the real reason of the nothingness of modern furniture, as seen in the shop windows, is to be put down to the account of those who, as a professional class, now design it; then strenuously contend that there are others able and ready to fill up the void. Nothing seems to us more unfair than the present charge against those who do the artistic work of the time; it is perpetually said of them that education is their great and crying want, and that it is in some way or other their own fault that the deficiency is not supplied; but we must contend that as a class those who do the designing and drawing work of the world are industrious and earnest students, and are always in some way or other educating themselves. All our royal academies, art departments, institutes, associations, and schools are filled with them, and no kind of knowledge hardly comes amiss to such; they are always learning, and are most of them under the impression that more and more education is yet needed, and are perpetually striving to get at it, to make themselves as they suppose thoroughly efficient. Taking these as a class we must contend that this is not an exaggerated but a simply true statement, and we think that no one will be inclined to deny it who has gone to a little trouble to come at the truth of things. But what follows? Why, this: that supposing the present furniture designers, to instance them, are all unfit for their work, which we deny,—but, supposing they are,—here is a class of earnest and educated men ready for the work, could they but get at it. If but the opportunities offer, here are they who are fairly competent to the work, and ready to go to work and design the new modern furniture, and could they but get a fair chance, any further education that could be thought useful would be speedily acquired. It is not wholly education, but opportunity, that is needed to improve modern furniture; in short, it is the present system of art-manufacture that is at the bottom of artistic shortcomings. While the world is under the fatal impression that art, whether in furniture or pictures, can be manufactured, there can be no hope for it or for those who produce it: it must all end in nothingness and failure and disappointment, and no amount of increased education will or can, by any possibility, help it; for education, to be of any practical use, must touch the actual working artist; but if he work only as a machine, or part of a machine, his added education can avail him but little, for he is not free to use it in his own way, i.e., in an artistic way, or as an artist.

We have confined our remarks to the draughtsman or designer, and have said nothing of the actual workman; for it has been mainly the "drawing" man who has come in for the weighty condemnation of those who have sought for the cause of the present nothingness in things artistic. It must never be forgotten that modern art is essentially manufacturing, and that there are always three elements in it: the master designer, as we may call him; the draughtsman, who realises, or tries to realise, his design; and the actual executant, or workman. In the old and highest art all these three were one,—the designer, the draughtsman, and the workman were usually united in one individual; and it is in such a man only that real education can fully avail. All he gets in addition to his present stock he can use, for the whole work to be done is before him personally, and he can apply his added knowledge where he thinks it is needed. But passing by these advanced theories, we would urge upon those who are now engaged in such strenuous efforts to add to the education of those who fill the shop-windows, the great thought that there are, as it is, those who are quite competent to better work than any that now exists, and that the great artistic want of the time is opportunity, and a better or another system of art action. What is now much needed is that the designer should be recognised as such, and that the design should be acknowledged as his.

There is yet one other fact so curiously illustrative of the proposition that opportunity is

necessary by the side of education, that it is well worth record as a fragment of the history of art in the nineteenth century. Furniture, it is to be observed, is not only manufactured wholesale, but in bits and details as well. Whole streets in the East-end of London are devoted to the manufacture of distinct parts of furniture, as legs and arms of chairs, legs and tops of tables; and many small firms do nothing but make, by a process of perpetual repetition from the same pattern, the same detail of furniture. The whole process is as perfectly and completely mechanical as the making of the spokes of a wheel. We met not long since a well-informed youth who had taught himself a good deal of drawing in the face of the most grinding poverty, and whose whole time, from early morning to late at night, was occupied in the sole work of carving what is called an "acanthus leaf" on an ogee bracket, about 3½ in. high by 2½ in. broad, and about 1 in. thick. What does the educated reader suppose he boasted of? Nothing could possibly be duller or more stupid than those brackets, which, by the way, may be seen everywhere on cheap furniture; or duller or more monotonous than his work. Brains he did not need; and this, indeed, he boasted of, and pointed out that his work was as good as a man's work, and that he defied anybody to detect any difference between one bracket and another: constant work on the same thing, and the perpetual movement of the hand in the same way over and over again, compelling all these wretched things to be mathematically alike. He said, "I could do it all blindfold!" We felt sure of it; wondered what education, including the understanding of Homer, could do for him, or how he could turn it to account; and thought that even Mr. Darwin himself would look surprised at the metamorphosis which the graceful acanthus undergoes when transferred to the soil of a narrow court in Bethnal-green!

TO, AT, AND FROM BERLIN.*

Our first day at Berlin was devoted to seeing the town; driving about in the first instance, to get a general idea, and then on foot, making closer investigations. We were fortunate in obtaining the services of a travelled, well-read *valet-de-place*, or guide, but he was a firebrand democrat, to whose opinions it was nevertheless interesting to listen, as—according to his showing,—they were those held by a large mass of his countrymen. The most noticeable thing to strangers visiting Berlin is the enormous size and amplitude of all its buildings. The palaces are indeed palatial, and are much ornamented; the size is the more remarkable, because they are mostly built of brick, stuccoed, stone being procurable only from a long distance off. A peculiar feature attached to many of the large residences is a long colonnade without a roof, but with beams placed across for the support of the wild vine and other climbing plants intended to form a leafy screen and afford a cool, shady place of resort during the hot season. This year the cold, ungenial summer had not suffered the plants to grow up, so that to our eyes these roofless colonnades looked sadly ruinous and neglected. When attached to semi-suburban abodes, these with-drawing apartments take the form of kiosks or summer-houses, and are always placed high on an angle of the boundary wall, so as the better to allow of looking out on to the public life below; and, strange to say,—at least, strange to Englishmen, who prefer privacy,—the most open side of the erection is always towards the road. Frequently a mound is raised on which to build the indispensable kiosk; and constantly also the carriage-drive in the garden, in front of the house, is laid at a steep elevation facing the entrance-door. This latter feature likewise obtains before some rather old houses in the streets of Berlin itself, where it is singularly inconvenient and out-of-place.

The apartments of the State Palace were closed, on account of the Fest preparations going on there. The exterior is grand and massive. Before it stand the bronze horses presented by the Emperor Nicholas, similar to those, with their attendant grooms, on the Monte Cavallo at Rome. The Berlin wits have nicknamed them *Gehemter Fortschritt* and *Beförderer Rückschritt*—"Progress stopped" and "Retgression promoted,"—the energetic manner in which the aforesaid grooms are forcing back their

steeds, especially when it is remembered that the horse is regarded by some persons as symbol of the understanding, is naturally suggestive of Russian home policy, and singularly justifies their new appellations. A handsome and gigantic group of temporary statuary was in course of erection in front of the palace, of which more anon; but it was particularly interesting to see the way in which it was being built up, the huge plaster arms and legs being fixed on to foundations of straw and plaster.

Near to the Royal Palace stands that of the Crown Prince and his consort, our Princess Royal. In it Frederick the Great lived while Crown Prince; and King Frederick William III. lived and died there. These two buildings, with the Opera-house and the palace of the present Emperor, William I., and, beyond all, the Schloss-Brücke, with its eight groups of marble statues, form a remarkable range of handsome edifices. They are on the north side of the Lust-garten; the cathedral stands at the west end; and on the south side is the museum, in front of which stands an enormous basin, 22 ft. in diameter, cut out of a block of granite, a solitary boulder, which lay at Fürstenwald, about thirty miles from Berlin. Near to this is now erected the equestrian statue of Frederick William III., uncovered on the day of the Entry. On the east side of the Lust-garten stands the well-known grand monument to Frederick the Great: an equestrian statue by Rauch, on a granite pedestal, around which are placed four groups in high relief of bronze figures, life-size each one being a portrait of one of Frederick's generals or statesmen. Three names connected with art and science also appear,—those of Graun, Lessing, and Kant.

While speaking of statues, I may mention that a fine bronze one of Blücher stands opposite the Grand Guard-house; and facing him are marble statues of Sobornhorst, who reformed the Prussian army after the battle of Jena; and Bülow von Dennewitz, who gained the battle of that name, September 6th, 1813, defeating the French at taking 10,000 prisoners; thus saving Berlin from falling into their hands. The cannon and mortar behind the Guard-house were brought from Paris in 1816; the former came from Lübeck, and was carried off by the French in 1806; the latter was cast in France, and are the fellows of the one at our St. James's Park.

Here the fine avenue—road—street, for it is all three combined, called the Unter-den-Linden, begins and extends in a straight line for about three quarters of a mile, when it is terminated by the Brandenburg Gate. This noble entrance to the city consists of gigantic fluted columns supporting appropriate frieze and cornice; above rises a long, low base, surmounted by the car of Victory which Napoleon I. carried off to Paris a trophy; it was recovered by the Prussians after the battle of Waterloo. The gate is said to have cost 75,000*l*. The space inside the gate, the Pariser Platz, is surrounded by handsome houses, one of which, the French embassy, is closely shuttered and still as death, looking singular and sad amongst all the signs of life and joying around it. Outside the gate is another square, from the left of which stretches the Königs-Strasse; and facing it lies the extensive and delightful Tiergarten, two miles long, one mile broad, planted with large trees,—some of which are of great size and age,—with shady walks and drives stretching in all directions, occasionally crossing ornamental bridges, skirting charming little lakes and streams.

We had small time to devote to pictures, too many for mention here are marked in a catalogue when we paid our hurried visit to the Old Museum, as it is called, though only finished in 1830. Schinkel was the architect. It is built on piles driven into a dried-up arm of the Spree. To the right of the noble flight of steps stands Kist's well-known bronze group of an Amazon combating a tiger; and within the great colonnade are frescoes executed under the direction of Cornelius, from designs by Schinkel, which have an extremely rich effect. The New Museum, connected by a covered bridge with the Old, is very rich in Egyptian and other antiquities. A noble feature of this building is the grand staircase, which is comprised in a spacious hall, and rises in one broad flight steps from the ground floor to a wide landing, then divides into two flights, one of which runs each side wall. They terminate in a small gallery leading right and left into other apartments. The walls of this staircase are covered with large "water-glass" pictures, three on each side, by pupils of Kaulbach, after his designs.

* See p. 549, ante.

All the various apartments in the Museum have their walls elegantly and effectively decorated, to harmonise, both in design and colour, with their contents, and are well worth studying by those who make such matters their business or pleasure. The statuary in this museum does not consist of sculptures, properly so called, but only plaster casts; yet, as such, they form a remarkable series, both interesting and instructive, being the largest and most complete collection yet made.

Here also is to be seen the Hildesheimer Silberchatz, of Roman period, found by some soldiers, October 17th, 1863, while conducting a shooting-house in the neighbourhood of Hildesheim. The historical collection contains many most interesting relics, particularly those relating to the national history, such as the last of Frederick the Great's face, taken after death; a wax likeness of him, clothed in the early uniform he wore on the day of his death; his books, walking-cane, and favourite flute;—a black one. Likewise the stars and orders belonging to the first Napoleon, which were captured after the Battle of Waterloo, when he had to make so precipitous a retreat that he even left his hat,—also here,—behind him, with the treasures, in his carriage. The Pomeranian statue, a wondrous specimen of jewelled metal-work, made at Augsburg, in 1617, for Philip II., Duke of Pomerania, stands near; and in another apartment will be found Baron Trenck's drinking-cup, engraved by him while in prison; and another's enormous beer-mug.

The new Town-hall is a large, imposing building, with a lofty square tower. It is of brick, and is elaborately adorned with terra-cotta mouldings, bas-reliefs, statuettes, and other enrichments. The exterior is particularly pleasing, being very handsome, and extremely novel. The interior is not so satisfactory. The mouldings of the windows, when seen against the light, are mean and unsuitable; and many of the forms, both of construction and decoration, are equally to be deplored. There is some very good metal-work, both in brass and iron; much excellent woodwork, and some charming wood-inlay. Unfortunately, the latter is mostly displayed on the *bores* to the bookcase in the library, which said bookcase is an abomination, utterly taking away the character of the apartment, inasmuch that we were obliged to ask what room it was. In a library we naturally expect to see books, not to have them looked up behind opaque doors. A very handsome spacious banquetting-hall, bedight with much gilding and artificial marble, rounded the floor of our democrat-guide. "Why should people come there to dine at the expense of the nation? If they want a dinner, let them pay for it," and so forth. In one council-chamber the seats,—ordinary chairs, placed in close rows,—were covered with machine-made tapestry,—Berlin arms, in colours, on chocolate ground, which looks extremely well, and contrasts with the light, simply-carved oak of the frames. Beneath the town-hall are long ranges of cellars, or rather subterranean luncheon apartments, which are lighted by gas, and supplied with chairs and tables like a *caf  *. It being mid-day when we walked through, they were crowded with gentlemen, and also a few ladies, who were partaking of outlets, or bread-and-cheese and beer, and whose myriad tongues created an indelible hubbub. The scene was most peculiar and very startling; it is decidedly one of the least sights of Berlin.

Another thing to be seen is the Aquarium. Those persons who visited the Paris Exhibition of 1867 will remember the one there; but that was on a very small scale as compared with this of Berlin. Besides fish, the collection is rich in reptiles, zoophytes, serpents, and small birds and animals, all so well arranged as to be useful in an educational point of view.

The new B  rse, or Exchange, is a handsome building, with a long colonnade, in two stories, along the river. The spacious and lofty interior is divided into two large halls by a partition that extends about halfway to the roof; above and upon it is a short wide passage, or gallery, that joins a similar gallery running all round the interior of the building. The roof is supported by tall monolithic columns of Silurian granite, on white marble base; but the strength of the fine columns is apparently weakened by the gilt and bronze mouldings being of a smaller diameter, and cutting into the columns.

An excursion to Charlottenburg, produced little to interest, save the pleasant drive through the beautiful Thiergarten; for the palace could not be seen because the old queen-dowager was here, and ill. A walk through the Kensington

Garden-like grounds, led to the monument—a Doric temple, erected to the memory of the beautiful Queen Louise, and her husband, Frederick William III., who are buried here. Their effigies rest on separate altar-tombs, and are by Rauch. Later copies sculptured by him, are said to be superior to these, which is well; for though there is, of course, much to admire in the beauty of face and elegance of drapery, the queen is made enormously long, and the arm, which rests on her body, could scarcely have remained in that attitude in sleep, and certainly not in death. The king has also a meretricious smile on his features, unsuited to the grand repose of the last long rest.

Rauch was a footman of the queen, and she having by chance discovered his great natural talent, had him instructed, and established him as a sculptor.

A delightful day was spent at Potsdam, but here there is too much to see, so that though we were up and off very early, yet we were sadly hurried. Potsdam lies on the right bank of the Havel; it was founded by the great Elector of Brandenburg, but it owes all its grandeur to Frederick the Great. The Royal Palace was in course of construction from 1660 to 1701. It has little claim to attention, excepting for the memorials it contains of its illustrious occupant. The rooms inhabited by Frederick remain as he left them, but the trundle bed he used has been removed, to preserve what exists of it from the depredations of relic-hunters. It stood behind the silver balustrade, which separates the bedroom from the cabinet de toilette. These rooms are fitted up with light blue satin damask and silver. From the dressing-room the renowned private dining-room opens out, in which the table rises and descends by machinery, so as to avoid the presence of attendants: it is still in working order. In the dressing-room a table, with glass top, contains and displays various relics of the great Frederick: the snuff-box, which once saved his life, by resisting a bullet, and of which it bears the mark, while the ballet itself lies, flattened, beside it; his white ivory flute and watch; in the drawer beneath are the last boots he ever wore, long riding ones, of thick black leather, with remarkably small feet. In another apartment is shown the sofa on which he fed his dogs, bearing on its satin seat the greasy mark of the plates. The satin is very rich, plain, and was rose-coloured, but is now faded to a dirty grey. One room is fitted up with green and gold; another, which is very elegant, with blue and silver, the wood-work of the furniture being also silvered; and another is decorated with garlands and wreaths of carved flowers, standing out from the walls, and painted in natural colours. The chandelier in this room is of porcelain to correspond, and has a charming little male figure, in picturesque costume, seated amongst the garlands of flowers. In one of the apartments are seen his writing-table, blotted all over with ink; his inkstand, music-stand, piano, and music composed and written out by himself.

The Nicolaikirche, built by Schinkel, 1830 to 1837, contains fresco paintings, on gold ground, of the twelve Apostles, by the first artists; and in the Garrison Kirche Frederick the Great is buried, as is also William I., in a dark chamber below the elaborate pulpit, which is overcrowded with sculpture. William reposes in a black marble sarcophagus; Frederick in one of bronze, of singular shape. To show that it was of metal, our guide rapped smartly on the lid with the large key he held in his hand. The noise startled and somewhat shocked me, and I thought, "If the great hero were to answer loudly from within, 'Herein!' how frightened you would be, and how rightly served for your impertinent temerity." The sword of Frederick the Great formerly rested on his sarcophagus, but Napoleon I. was so mean and heartless as to carry it off to Paris with him, and all trace of it is now lost. However, the eagles and flags taken afterwards from the French by the Prussians now hang beside the pulpit, and thus above the tomb, which is a well-deserved piece of retributive justice. The names of Prussian soldiers who distinguished themselves, and perished in the war of liberation, together with their medals and date of death, are displayed in glazed frames on the walls of the church. King Frederick William III. and Alexander von Humboldt were both born at Potsdam. The river Havel enriches and beautifies every view, and in its windings and the leafy freshness of its banks and woods, reminds one of the Thames at Richmond.

Sans-souci—name difficult of pronunciation by German mouth—was built by Frederick the Great from 1745 to 1747, and was restored and refitted by Frederick William IV. It stands on the highest of a series of terraces, with a marvellous flight of steps leading up to it and them. To the left of these terraces are the graves of Frederick's dogs, and that of his favourite horse. He wished to be buried with them, and had arranged his place of sepulture in anticipation; but it was thought improper that so heathenish a proceeding should be allowed, and accordingly he was entombed in the Garrison Kirche as above mentioned. The bedroom where, and the bed on which, he died are shown. At the foot of the latter stands his arm-chair. In this apartment are likewise seen the clock he always wound up with his own hand, and which stopped at the moment of his death; and a cast in wax of his face and hands taken after death, and which represents him as he lay in bed. Voltaire's room, curiously decorated, during one of his winter absences, by Frederick's special directions, with pictured sarcasms on his failings and peculiarities, will not be passed over by the guide.

The Raffaella Saloon, in the new Orangery, is a noble apartment, well filled. The lofty Belvedere is worth all the trouble of mounting to its summit for the sake of the grand panoramic view obtained over many miles of distant plain and the near hills of Potsdam,—the latter covered with rich woods and verdant lawns, among which the glistening Havel winds its bright course, spreading fertility and beauty on its way. The Pompeian villa, Charlottenhof, is a very complete representation, but (as in England, so in Prussia) it is impossible to keep these out-door and semi-open-air erections in perfection and good repair; and Charlottenhof, though belonging to royalty, and only built by Frederick William IV., looks decaying and melancholy. The "historical windmill" must not be forgotten. As is well known, the Great Frederick was most desirous to obtain possession of the mill, so that, by pulling it down, he might enlarge the gardens of Sans-souci by inclosing the site. Ahab-like, he made various offers to the owner; but the miller was a second Naboth, and would not relinquish his patrimony. The irate Elector threatened to eject him by force, when the miller brought an action against his noble oppressor, and gained it. When Frederick heard the result of the trial, he exclaimed, "Lucky thing for them; for if they had given their verdict in my favour, I would have hanged every one of them." There still stands the mill, close upon the palace, a proud memorial of the ultimate triumph of justice over inclination, in the mind of a prince who was strong enough to have his own way if he had chosen to go against law and right.

Delicious walks and drives, through shady avenues, lead from one to another of these numerous palaces, of which the New Palace, the country residence of the Crown Prince and Princess of Prussia, and Babelsberg, the modern castle of the King, now Emperor, and built by Schinkel, have still to be noticed. The former contains a suite of state apartments, fitted up in similar style to those of the Royal Palace at Potsdam; and, in addition, there is a very spacious hall, supported by large piers, all the surfaces of which are incrustated with enormous quantities of shells and minerals collected from all available countries; many of them are presents from various potentates. Just in front of the palace, we met a riding party of some eight persons: three of the royal children, with their attendants and servants. Babelsberg, with its beautiful grounds tastefully laid out, its terraces, fountains, vistas terminated by the gleaming Havel, and wooded slopes; its apartments fitted and adorned with the most perfect taste and refinement, and filled with evidences of daily occupation by elegant and cultivated inhabitants, is a delight and refreshment to the eyes and the mind, and we felt it both a grace and privilege to be allowed to stroll through. Of the rich furniture, wonderfully fine vases, and beautiful decorative objects of all sorts with which many of these palaces are adorned, it is impossible to do more than make collective mention; a week instead of a day might be pleasantly passed at Potsdam. A copy, by Rauch, of his statue of the beautiful Queen Louise, the result of fifteen years' thought and study, and very superior to the one at Charlottenburg, is to be seen in the antique temple, close to the New Palace.

We found little Potsdam, on this same 14th of June, in a flutter of excitement, flags, garlands

triumphal arches, and such-like decorations; it had had its "Einzig" on the previous day, and with pardonable energy had endeavoured to surpass its great rival Berlin in the grandeur of its welcome to the returning troops. With less pardonable vanity it flattered itself it had done so; but that was before the memorable 16th had come and gone.

Here ends our pleasant day at Potsdam: pleasant indeed, though we were suffering a small martyrdom from the venomous stings of wretched, wicked mosquitoes, as numerous and, apparently, as delighted to catch an Englishman as were our winged tormentors in Verona or Venice, on a former occasion. A long waiting on the crowded railway platform, the tediousness partly beguiled by watching the various groups, — in which gay uniforms abounded, and an occasional Geneva brassard appeared, — and then a slow, hot journey back to Berlin, sent us to bed physically tired and weary, but mentally enriched with delightful memories for future enjoyment.

R. F. H.

ARCHÆOLOGICAL EXCURSIONS.

The Bedfordshire Architectural and Archaeological Society.—This excursion began with Luton. The party made their way at once to the old parish church, St. Mary's, where they were received by various gentlemen, who assisted them in their inspection, and furnished interesting information respecting the former state of the building, and on other points. Upon leaving the church, some of the party were escorted to the new Plate Halls, and then took train for Dunstable. Here they were greeted by a merry peal from the eight bells of the Priory Church, and found many ladies and gentlemen assembled. After having made a cursory inspection of the west front, the company were invited by the rector to enter the church. Luncheon was provided at the White Hart Hotel. After this repast, Dr. Pryor read his paper "On Dunstable and the Watling-street." The company then took to carriages, and were driven past the site of the Cross, one of the resting-places of the body of Queen Eleanor, in 1290. The visitors were driven along the Ickneild Way to the plateau between the high hill on which are the Five Knolls,—round sepulchral barrows,—and the escarpment by Sewell. Here they alighted, and proceeded to the spot called Maiden Bower, which is an ancient camp, with a nearly circular area of about 9 acres, inclosed by an earth wall almost perfect, although much lowered from its original height. After an examination of this interesting site, the company took their seats on the grassy bank of the camp, to listen to a paper upon the origin of the camp, by Mr. Wyatt. The company then proceeded along the Downs, about half a mile to the earthworks known as Totternhoe Castle. Mr. Wyatt here addressed the party. His conclusion was that the great earthwork at Totternhoe was in succession a British camp, a Saxon settlement, a Roman camp, and a Norman settlement.

Cumberland and Westmoreland Antiquarian and Archaeological Society.—This society held its first meeting for the present year at Keswick. The proceedings of the day commenced at eleven o'clock with a business meeting held in the Keswick Hotel, the Rev. J. Simpson presiding. The Earl of Lonsdale was re-elected president of the society. Mr. C. J. Ferguson presented a report of the results of the effort made by the committee appointed by the society last year to take steps to preserve the remains of a Roman mile castle, then just found in lowering Pike-hill, on the road from Lanercost to Birdoswald. Mr. J. Clifton Ward next proceeded to read a paper upon "The Druidical Circle near Keswick," premising that his paper was rather an outline of the chief points of archaeological interest in the immediate neighbourhood of Keswick. Some conversation ensued upon some of the points raised. An opinion was expressed that with the so-called "Druidical circles" the Druids had nothing to do, being earlier than the Druids; but as we know little about the Druids themselves, and still less when they originated, or who preceded them, we cannot see how it is at all made clear that the Druids had nothing to do with the stone circles, especially as the Druidical rites had a good deal to do with circles generally. It was pointed out that one great object to look for on these stones was a circular mark with a peculiar line striking from it at an angle of about 45 degrees. Such a mark, after several visits, had

been discovered at the "Long Meg" circle. At Maughanby some years ago a circle had been found. Within it was a smaller circle or chamber, and within the chamber the remains of bones. On one of the stones the circular mark was found. Several members mentioned places where circles are to be found,—Eskdale Fell, Birkby Moor, Hartsopp Hall, Millom, and Carrook. Passing by Greta Hall, the residence of Southey, and almost under the very shadow of Skiddaw, the party arrived at Crosthwaite Church—St. Mungo's or St. Kentigern's,—and entering the porch, admired for a while Lough's marble monument of Southey before scattering themselves over the church to investigate its architectural peculiarities. A paper was read by Mr. J. F. Crosthwaite, in which he drew attention to some of the chief points of interest. Carriages were brought round, and the party proceeded along the old Penrith-road to what is locally known as "The Druid Circle," on "The Castles." These mysterious circles, in this instance, consist of some forty-eight stones of various sizes.

Suffolk Archaeological Society.—The excursion day was not a good one, but the weather was not considered a sufficient obstacle, and a fair number of members and friends found themselves at Needham Market railway station, under the presidency of Lord John Hervey. Thence they proceeded by omnibuses, wagonette, &c., to Barking church. From Barking, the party returned to Needham chapel, where the Rev. W. Sewell, of Yaxley, read an interesting paper on its history and antiquities. Creeping St. Mary was the next place on the programme, after which came Stonham Aspal, Mickfield, and Stonham Parva. But the most important church visited during the day was Earl Stonham. In the new schoolroom at Earl Stonham there had been collected a good series of antiquarian remains, mostly obtained in excavating a field of about half an acre in the glebe. Mr. Custley thought that Stonham was the *Sitomagus* of the ancient Romans, and that the 9th tier of Antonine passed through the village. The quantity of Roman remains which had been found in various parts of the neighbourhood had been immense. Mr. Dewing expressed his opinion that Dunwich was the *Sitomagus*, and said that the mileage agreed with this idea. The party then left for Creeping St. Peter. A hasty visit to the church at Stowmarket brought an interesting but overcrowded day to its close.

Northumberland and Durham Archaeological Society.—The second meeting of the Architectural and Archaeological Society of Durham and Northumberland took place at Beley and Stamfordham. In the morning a number of the members left Newcastle by carriages, and proceeded to Ponteland, where they inspected the church and the remains of the castle, which now form part of the Blackbird Inn. From the last-named place, where some ancient heraldic stained glass was examined with much interest, the members went forward to Beley Castle, the seat of Sir Arthur Monck, bart. Some of the members walked on from Beley to Bishopfield, where there exists a curious old tower and ancient house, both of which were inspected, as was also Stamfordham Church. The members dined together at the Bay Horse Inn, Stamfordham.

ARCHITECTURAL EXCURSION TO ELY AND NEIGHBOURHOOD.

THE Architectural Association have arranged another excursion, under the guidance of Mr. Edmund Sharpe, M.A. It will commence on Monday, July 31st, in Ely, when Mr. Sharpe will illustrate the cathedral. Lynn, Wisbeach, Boston, and the churches in the neighbourhood will be visited, and the party will return on Saturday evening, August 5th. Mr. Sharpe tells us that although the excursion is nominally by the Architectural Association, his invitation is general. All pupils of architects are admissible; and no one, in fact, who is really interested in the study of church architecture, is excluded. The cost is slight, for no expenses are incurred but those of lodging, boarding, and carriage, which are already bargained for at terms that will limit the maximum of the cost to each member for the week to 4*l*. We cordially advise young architects to join the party; and in order that they may do so, they must send their names immediately to Mr. Quilter, at 9, Conduit street. The first excursion of the kind was eminently successful.

OFFICIAL REPORTS ON THE INTERNATIONAL EXHIBITION, AND A POPULAR GUIDE TO IT.

A PROPER examination of the different sections of the International Exhibition is a work of some labour; the buildings being spread around a large central area of ground, considerable distances have to be travelled. Moreover, the arrangement adopted has not tended in all cases to make the work easier. The cheap "Popular Guide," by G. W. Yapp, just now published, will enable many to see the cream of the collections, or to get at what they specially wish to study with much less loss of time than has been the case heretofore, while the Official Report of the issue of which has just commenced, will serve as Handbooks for those who wish to know what to admire.* Two of the latter are before us, and belong to the Fine Arts Division. Part I. includes Painting in Oil, by Sir Coutts Lindsay; Painting in Water Colour, by Mr. S. Redgrave; Miscellaneous Painting, by Sir Digby Wyatt; and Mosaics and Stained Glass, by Mr. Gambier Parry. We have given our readers so many reports of our own on the various sections, which we have others in type or preparation, that we must content ourselves at present, at any rate with little more than naming the official documents. Sir Digby Wyatt, we may mention, evidently not at all satisfied with the award prizes that has been declared in the case of the Fan Competition, and does not scruple to say to Mr. Gambier Parry makes an assertion as MacIver's fine pictures at the Houses of Parliament, Waterloo and Trafalgar, that will startle many. He says, without qualification, that they are already rapidly perishing. We are not prepared at once to accept this dictum, but certainly the matter must be inquired into. We take a short passage from his report which deserves attention:

"Artists should be half mechanics. They think a too little of construction. They are apt to think the mechanism and construction are things of prose, and art aspires alone to the realm of poetry. We can only hope for a future of better things and better understandings. Unless a designer of monumental art can seize and master, in one mental grasp, the poetry of structure and the construction of poetry, he had better leave that noble art alone."

Orchestral harmony owes its charm to the many voices of its instruments. It is not enough that they be tuned together or maintain their parts; but it is that each, singing out its own poetry, in its own sphere, in its own voice—discreet, unselfish,—combines to make so perfect.

Thus, too, there is a harmony, pure, complete, true, as much needed by the eye as by the ear, the cautious discipline of the orchestra is no less needed in its perfection than it is by those many-voiced instruments of art which make the music—silent though it be, and the more sublime—of monumental architecture."

The other Part (III.) consists of reports on Engraving, Lithography, &c., by Mr. J. L. Marshall; Engraving on Wood, by Mr. T. G. Gullish; Photography, by Lieut.-col. Sir W. W. Wortley; and Architectural Designs and Drawings, by Mr. T. Roger Smith. Mr. Smith has discharged his duty with evident care and impartiality. To a passage in the report on Engraving, the general editor (Lord Houghton) has added the following note,—more important than it may appear to some at first sight:—

"There seems to be every probability that line engraving will soon be one of the lost arts. It is assuredly a duty of every true amateur to do his best to prevent its extinction. At the present moment in this city the work of engraving in this department—which at one time alone recognised as high art in engraving—is in the hands of one art-publisher, and depends for existence on liberality and sense of duty to his profession. This is a course, apart from the limited, though large, a decrease of the Art-Union [of London], whose efforts in this direction deserve all applause and encouragement, but which, too, may be tempted into cheaper and more popular processes."

We have no difficulty in recognising the publisher referred to as Mr. Henry Graves, and we can mention a fact that will serve to illustrate this remarkable, and we must add, distressing, state of things. The committee of the Newspaper Press Fund have received from a munificent friend, as a donation in aid of the fund, a finely-engraved plate, after a portrait by an ancient master. It would scarcely be believed, but is nevertheless true, that one but the gentleman in question even proposed to have the means of publishing this, or other similar plate, with the slightest probability of success; and that, if the committee thought it best to sell the plate, there is no one else whom they could offer it.

The Official Reports of the Exhibition undoubtedly have a wide sale.

* All are published by J. M. Johnson & Sons, 63, Fleet street, Holborn, and are sold in the building.

THE SHAKESPEARE MEMORIAL.

A MEETING was held on Monday last in the rooms of the Society of Arts to decide what should be done with the balance in hand, 285*l.* Mr. William Tite, C.B., presided; and Messrs. Donaldson, Westmacott, Hepworth Dixon, Halliwell, Godwin, Chatain, Gruncisen, Cousins, Dixon Croker, and others, took part. It was stated by the chairman in his address, that there were subscriptions to the amount of nearly 900*l.* that had not been applied for. A large sum of money had been spent unsuccessfully in the previous occasion in advertising and other endeavours. After some discussion it was resolved unanimously on the motion of Mr. W. Hepworth Dixon, seconded by Mr. Godwin:—"That he be referred to the executive committee to endeavour to get in the outstanding subscriptions, and to receive further subscriptions, for the purpose of carrying out the original object for which the fund was subscribed; that the executive committee do have power to add to their number, and to appoint any officials whose places may have become, or may become, vacant."

Colonel Richardson-Gardner said if there was determination on the part of the committee to carry out the object for which they were appointed, and erect a statue to Shakespeare, he would undertake to get subscriptions to the amount of 200 guineas. Mr. Cousins said he would also undertake to raise 200 guineas, and Mr. Dixon undertook for 100 guineas.

There seems no reason at all why, without further fuss or expenditure, some 1,500*l.*, or 600*l.* should not be raised, and one of our best sculptors be set to work to produce a worthy memorial. It will not be so important and costly work as was originally contemplated; but it will surely be better to put up a single statue, if it be a really fine work, even without accessories, than to let the whole affair die out without result.

If some of our readers should be moved to follow the liberal example set by Col. Richardson-Gardner, the pedestal may at once be made worthy of the purpose and the age; if not, we would suggest that the design should be such as would allow of additions hereafter. Whatever is one must be done at once: there must be no further delay, and no more paid canvassers and organisers.

THE LATE MR. JAMES NEWLANDS, C.E.

We mention with great regret that Mr. James Newlands, borough engineer of Liverpool, died in the 15th inst., in the fifty-seventh year of his age. At a late meeting of the Liverpool town-council to relieve Mr. Newlands of some of his duties, he was appointed consulting borough engineer, at a salary of 800*l.* a year, instead of 1,500*l.*, and Mr. Davies, deputy borough engineer, at a salary of 600*l.* a year, instead of 450*l.*, which he had previously received. The rest from the harassing duties of his office came too late. The disease continued to make progress; and, though Mr. Newlands seemed somewhat better on Friday, rapid change for the worse set in during the night, and he died on Saturday morning about three o'clock, at his residence, Abercrombie-gate.

Mr. Newlands was a native of Edinburgh. His early studies were conducted in the High School of that city, and were continued and finished in the Edinburgh University. On leaving the university he embraced architecture as a profession, pursuing his studies in that direction and in practical surveying and civil engineering under the late Mr. Thomas Brown, city architect of the Edinburgh corporation. On completing his course of professional study there, he began life in his own account in Edinburgh as an architect and civil engineer, and had obtained a firm professional foothold when the creation of the office of borough engineer of Liverpool, under the provisions of the Liverpool Sanitary Act of 1847, turned his life into the current down which it has since glided to its close. Mr. Newlands, who was the first borough engineer of Liverpool, commenced with a salary of 700*l.*, which was increased as his labours extended and accumulated, until it reached 1,500*l.* a year. One of Mr. Newlands's first important works was his report, which was published in 1848, as to the best means of improving the sewerage of Liverpool. Mr. Newlands laid down a complete and comprehensive scheme of sewerage for the borough and out-townships, including deep main and intercepting sewers, with subsidiary drains, to an aggregate extent of nearly 300 miles. The town-council approved the recommendations

embraced in the report; and the great system of sewerage which has since been in process of development and perfection, with other sanitary operations, was commenced in that year (1848).

Afterwards came other important and arduous labour upon Mr. Newlands in the preparation of plans for carrying out the Sanitary Amendment Act of 1864, containing the long demanded and much required powers for opening out enclosed courts, and clearing away other obstructions to ventilation in densely-packed parts of the town, widening narrow streets, and giving power to the medical officer of health, on the presentment of the grand jury, to carry out other sanitary reforms. The preparation of the requisite plans involved in this work devolved upon Mr. Newlands, in addition to his ever-accumulating work in the discharge of the routine duties of his office. He had also had the preparation of plans for the new public offices; plans for the public baths in Cornwallis-street and Margaret-street; and plans for model working-men's dwellings. Super-added to his other work, he had for some time to undertake the duties of water engineer, until the amalgamation of the various water-works under the corporation, when the council wisely appointed to that office his former assistant in that department, the late Mr. Thomas Duncan.

During the Crimean war Mr. Newlands was summoned to the English camp, where his engineering skill helped to lift the sanitary department of the army out of the muddle into which it had fallen, and which at one time almost threatened the destruction of the entire force.

Mr. Newlands published in 1850, "The Carpenter's and Joiner's Assistant," which was reviewed in our pages at the time.

ASPHALTE AND SUNSHINE.

THE spell of hot weather graciously vouchsafed to the City of London within the last few days, however beneficial it has been to various interests, has not served the prospects of portions of the asphalt pavement, as any visitor to the neighbourhood of Lombard-street or Gracechurch-street might have discovered for himself. The condition that is expressed in the words "as cool as a cucumber," is just that state of weather that agrees with the constitution of our asphalt roadways. Should we be favoured with a continuance, or an accession in intensity of the summer heat, the watering-cart or hose will be as necessary appendages for maintaining the solidity of our new roadways as they are in laying the dust on our old ones. A plastic asphalt surface is in nowise desiderated or coveted for vehicular traffic, and it would be an unfortunate event if, after all the cost, obstruction, and delay that have attended the introduction of our latest, and still most useful road material, to find that it fails in some of the most useful essentials, viz., the retention of its hardness and body, under all conditions of the atmosphere. After all, the hot weather may not have come in vain, if it gives us a good and timely opportunity to benefit by its occurrence, in the improvement of our road construction, and in the better selection and manipulation of the present and similar material for the future. Experience teaches, it is said; but the right of way is often blocked by vested interests, which neither shower nor sunshine has been found to materially affect. In the present instance perhaps the power of the sun will turn men's minds nearer to a conviction of the truth than the power of the pen, and those who are more immediately interested will improve and profit accordingly. We need scarcely say that our remarks are not made in disparagement of the asphalt pavement, but as a hint to further practical efforts for the direction of improvement.

ALEXANDRA PALACE AND MUSWELL HILL ESTATE TONTINE.

THE prospectus for the Alexandra Park Tontine will be found in our advertising columns. It is needless for us to repeat arguments which are familiar to our readers as to the importance of keeping open spaces for health and recreation in the vicinity of our great towns, and especially in that of the metropolis. A large circle of from four to five hundred acres, situated on the northern ridge of the hills that gird the metropolis, and, happily, at the present

time clothed with magnificent timber, is a site the preservation of which is a matter of as much public importance as Hampstead Heath itself. The property has been the subject of a dispute, almost as long, and probably as costly, as the Trojan war. It is therefore a matter for sincere satisfaction to find that all these old quarrels are so far at an end that the proprietors of the property are in a position to come before the public as vendors, if their terms are carried out.

We shall not be expected, at this moment, to enter into an examination of the prospectus. It is in sufficient detail to enable its readers to form their own opinion as to the advantages which it offers. The scheme presents many features of novelty. But the kernel of the whole is, that it is not intended to weight the enterprise with the burden of a dividend-paying capital. If the shares are fully taken up, no interest will be chargeable against the capital. The executive committee will thus have the power, of which, no doubt, they will gladly avail themselves, of making such liberal and far-sighted provision for the amusement and instruction of their visitors, as no other public institution can even attempt. The irritating method of inviting visitors by a nominally low rate of entry, and then driving them to pay a second fee by shutting out all convenient places for seeing and hearing from those who are not willing to be thus mulcted, will have no excuse for its adoption in the Alexandra Park. While, then, the peculiar advantages of locality and access will be likely to render this noble palace a favourite place of resort for all London north of the Thames, the advantages offered by the mode of raising capital are such, if duly improved, as render the place unrivalled in the character of its attractions.

LEICESTER MUNICIPAL BUILDINGS COMPETITION.

Our readers know that the referees in this competition, Mr. Street, recommended five designs as distinguished for special merit, and at the monthly meeting of the Town Council, last week, it was resolved to award premiums to three of them, reserving for future consideration the question as to which should be carried out. The premiated designs are as follow:—First premium, 200*l.*, Messrs. Barnett & Smith, architects, Leicester; second premium, 100*l.*, Messrs. Goddard & Spiers, architects, Leicester and London; third premium, 50*l.*, Messrs. Innocent & Brown, architects, Sheffield.

STATE OF THE DUST-BINS.

WE have made many a crusade against the dust-bins in our time, but the evil still exists. Dr. Whitmore in his last report from Marylebone, says:—

"I regret to have occasion again to refer to nuisances existing in this parish for which many of the wealthy classes are responsible; I allude to the filthy and most offensive state of their dust-bins. One cannot walk through any of our aristocratic streets without being continually annoyed by a disgusting effluvia coming up from the street; it arises from the reprehensible practice of throwing into receptacles which ought only to contain dust and ashes, all sorts of animal and vegetable refuse. The decomposition of this animal and vegetable matter is undoubtedly injurious to the health of those persons who are compelled to pass the greater portion of their time in the basement of houses where such nuisances are permitted, and many cases of sickness from diarrhoea and even fever have come to my knowledge which I could not attribute to any other cause."

BUILDINGS AND SOUND.

SIR,—The question of the best form of building for giving proper effect to music having engaged the attention of your readers for some weeks past, I venture to state two facts which I took a note of, and which may throw some light upon the subject.

Some years ago, I attended service at a new church built in the form of a cross; the nave had aisles and clearstory, the transepts were without aisles, and the arches of one span. The chancel was not unusually deep. At the intersection was a tower open in the interior to a considerable height above the other roofs. The organ stood in the south transept, close to the chancel. The effect of the music was most distressing to the audience in the nave; and the voice of the preacher, whose position was at the opposite side to the organ, was hardly audible. I understand that these defects have now been almost remedied by the roof over the intersection being lowered to the same height as that of the nave.

Another church I know of, and of about the same dimensions, consists of a nave, with aisles, clerestory, and chancel, the choir and organ being accommodated in the latter. At the west end is a tower and spire; the tower is open to the church by a lofty arch, and the bell-ringers' floor is visible at a considerable height above. In this case the effect of the music is admirable, and the voice of the preacher is distinctly heard. The sound seems to travel along the body of the nave, ascend into the tower, and lose itself there.

I do not pretend to any scientific knowledge of the subject, and, indeed, the science of acoustics seems yet undeveloped. It is only by an accumulation of facts that a foundation for a proper theory can be arrived at, and therefore it is that I place those I have gathered at your disposal.

Probably some others of your readers may have similar experiences to disclose, and it would be well if they did so. S.

RELATION OF THE STAGE TO FINE ART.

At the Society for the Encouragement of the Fine Arts, last week, a very interesting lecture was delivered by Mr. Henry Neville, of the Olympic Theatre, on the "Relation of the Stage to the Fine Arts, its Origin, Influence, and Present Position," in which he showed the great importance of the drama as a fine art, and regretted that there was now too much "bread-and-butter" acting, which did great harm to the true development of all that is noble and great in the drama. He dwelt upon the importance of a recognised school, to which the public, as well as the artist, would look up, and pointed out the many advantages to be gained by the establishment of a "National Theatre," where the legitimate drama would be produced, under the management, not (as modestly assumed by the opponents of this movement) of a "disappointed author," or "unsuccessful actor," but of an artist and gentleman, of whom there are many in the profession. Mr. Tom Taylor, who presided, Mr. Walter Laoy, and Mr. Ward made some appropriate remarks at the close of the lecture.

"OLD MAPS OF LONDON."

SIR,—My attention was attracted by the article under the above heading in the *Builder* of the 24th ult., and recalled to my recollection two old maps of London in my possession, which I have since turned up, and with your leave will now give you a short description.

The one of latest date is entitled "A New Map of the Cities of London, Westminster, and the Borough of Southwark, together with the Suburbs as they are now standing. Anno Dom. 1707."

On a shield at the upper corner it bears "Printed for R. Chiswell, A. and J. Churchill, Tho. Horne, J. Nicholson and R. Knappock."

The space included in the map reaches from "Ask's, or Haberdashers' Hospital," Hoxton, on the north, to "St. Mary Magdalen's, Bermondsey," on the south, and from Stepney on the east (within 550 yards of which is shown "Hang Man's Acre") to "Buckingham House" on the west.

From the "Horse Ferry" opposite "Lambeth House" to "Ratcliff Dock" and the "Globe Stairs" opposite, the wharfs and stairs appear to be marked pretty much as the map in Mrs. George's collection. On London Bridge four bars or gateways are shown, three of them near the Southwark end and one near the centre. From a reference letter, b, on the margin, what is now known as the Seven Dials was called "Cock and Pye Fields." The course of the City wall, with the various gates, is also nearly complete, and the Fleet Ditch is shown north nearly as far as "New River Pond."

The churches and principal buildings are shown isometrically, conspicuous among them being Westminster Abbey and St. Paul's. The Monument on "N. Fish Str. Hill" is also shown. In St. James's Park the "Canal, Decoy, and Rosamond's Pond" are shown. The cardinal points are given, and a scale up to 800 yards.

The other and more interesting map has no scale attached, but appears drawn to much the same as the one already described, although the river is shown considerably wider; and it is not simply a plan, but a bird's-eye view. The following is the title, enclosed within a shield at the bottom of it, and in the centre,—A Plan of

London, Westminster, and Southwark, with the River Thames, as they were surveyed and published by Authority toward the latter end of the Reign of Queen Elizabeth; or about the year of our Lord 1600, which being compared with the New Map of London, the prodigious increase of Building and other alterations of the City Names and Situation of Street, &c., in this last SENTRY will plainly appear. On either side of the foregoing, and on the same line, is a Latin description, land-tory of London and its commerce.

To begin with the Tower, besides its ditch, it is shown to be defended by two walls, having circular towers at the corners, and with square ones at intervals. Near the north-west corner is marked a "postern-gate," at which point the City-wall begins, with a ditch outside, and runs north to "All Gate;" thence north-west to "Bishopsgate;" thence inclining a little more to the south successively to "Moor Gate" and "Cripple Gate." A short distance beyond this it is direct south, until it reaches "Alders Gate," which is the last gate named. It then runs south-west as far as the line of Gilt Spur-street; then south to Ludgate; from this west to the Fleet, about the point where that prison stood; then along that rivulet to the Thames at "Blak freres." The whole of the gateways are shown large and lofty structures like the Bars in York; and the curtain between them was strengthened by semicircular bastions and square towers. To the north of "All Gate," and outside the walls, is marked, "The Gunne-founders h," and within the enclosure a castle the name of which is not very legible, but reads like "Beudin Castle." Opposite Lambeth Palace a rivulet empties itself into the Thames; and at this point is the "Slaughter-house." At Westminster Hall we have marked the "Stehar Chamber." Between Charing-cross and Westminster the street is crossed by three bars, or gateways, two of them being very lofty. Opposite Whitehall, in what is now St. James's Park, two stags are shown. To the west and north of Charing-cross there is nothing but open country, except "St. Giles in the feldes," on the line of the Oxford-road, consisting of five or six buildings in an oval-shaped enclosure. Horses and cattle are shown in the fields. From Charing-cross eastward the Strand is built on both sides, the houses all having gardens in the rear. On the line of "Howburn" are a few straggling houses; Clerkenwell is outside all the other buildings, and also the Charterhouse and Barbican, which are surrounded with masonry walls. Bishopsgate-street is built farthest out, but stops short of Shoreditch, and the Spital-fields are wholly unbuild on.

On the Southwark side a short distance above London Bridge and near the river side, are "Bowl bayting" and "Beare bayting" rings, structures of considerable size, and an attempt is made to show the animals engaged inside, with men looking through openings from the outside; and along the boundary walls of the enclosed spaces dogs are seen straining on their chains. At the bend of the river opposite Whitehall are shown the Lambeth Marshes, with ditches out through, forming fields, in which horses are shown grazing.

The various roads and lanes are shown, and footpaths through the fields are indicated by dotted lines.

JOHN BAIRD, Architect.

ACCIDENTS.

Brasted.—Mr. Wells, builder, of this place, with some of his men, were at work on a scaffold, at the residence of Mr. W. Tipping, Brasted-place, when from some unexplained cause the scaffold gave way, and Mr. Wells and a labourer were thrown to the ground, a distance of about 25 ft. Both were seriously injured.

Leamington.—A house in Mons-terrace, Leamington, has fallen. It was a new house, but the foundation was being altered in consequence of having encroached on a public sewer. The workmen had left, and the occupants of the house escaped, but the furniture was destroyed. The adjoining house partly fell.

Brighton.—At the Grand Hotel, the night porter accompanied four gentlemen and a chambermaid in the hydraulic lift to the fourth floor. The gentlemen got out, and the porter followed them; but as the lift had not been effectually stopped, it continued to ascend, so high, in fact, that the woman could not get out. The porter endeavoured to stop the ascent of the

machine. He clung to the rope to make it descend, but was gradually drawn towards the ceiling, and, in dropping down to avoid his hand being crushed, he lost his footing and fell down the shaft into the hall of the hotel, a distance of 70 ft. He was immediately picked up, and a surgeon sent for, but he died in about twenty minutes. The coroner's jury returned a verdict of "Accidental Death," remarking that there ought to be some contrivance to secure the lift when it arrived at its destination. The accident, it appeared, was occasioned by deceased getting the rope out of a groove, and this was done by pulling in an oblique direction instead of perpendicularly.

THE TRADES MOVEMENT.

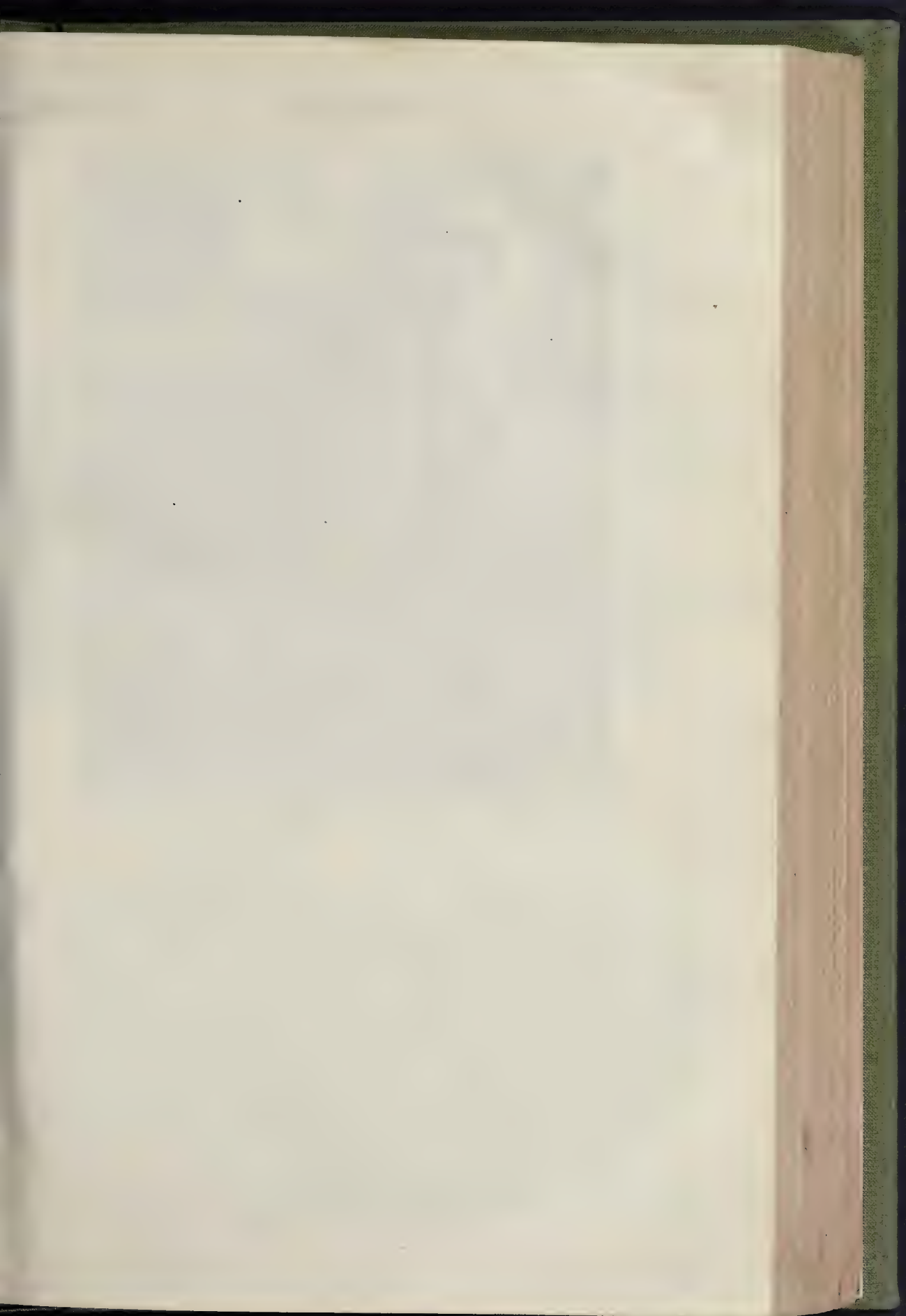
Gloucester.—The carpenters here are on strike. They ask that their wages shall be advanced 2s a week, from 25s. to 27s., and that they shall leave work on Saturdays at one instead of two o'clock. The masters, as we understand, are not indisposed to make an advance in the pay of their men, but refuse to allow any alteration in the hours of work, chiefly on the ground that if the carpenters leave at one, masons and bricklayers must leave also.

The Remedy for Strikes and Lock-outs.—Lecturing on "Masters and Men," at the Theatre of the Royal School of Mines, London, Mr. Rupert Kettle said, "Attention has been directed too much to the laws which govern production, and too little to those which relate to the distribution of wealth. The only remedy which can be sufficient and permanent, in a national sense, is, in which rests upon the sound basis of economic law. Our remedial policy must be constructive and not destructive. Our first duty is to provide some means by which the modern organisation of productive industry can be made to work between masters and men without causing those wasteful and irritating strikes and lock-outs which we all so much deplore. The prevalent means Mr. Mundella and myself have suggested must be so familiar that I will not weary you by going over the subject of boards of conciliation and arbitration. It is the best plan yet devised for adjusting the relative rights of masters and men, under the present constitution and action of their joint productive power. A second expedient I would suggest is that, to reduce the risk of waste from idleness, both for masters' capital and men's labour, they should, wherever it is possible, and even at some sacrifice, if it may be, make bargains to endure for a fixed period so that both parties may know a reasonable time beforehand the terms upon which they must depend. Thirdly, I recommend workmen to carry out most systematically the principle of insurance against loss by want of employment. At present their trade societies only guarantee a minimum to men out of work. I believe this with proper checks against fraud, and confined to the legitimate business of assurance, action of their association in this direction might be usefully extended. What the individual workman has not the means to obtain may be obtained by combining the means of many workmen together. A little self-denial, a little economy of consumption, would soon enable the great body of our artisans, by combining the resources, to share with the middle class the wealth that they now enjoy."

OLD LONDON.

SIR,—There is in the British Museum a quantity of rare engravings, by the Antiquary Etching Club (A.D. 1849-54), including "Three Pigeons" Inn, at Brentford; several fonts; Kit's Cocky House; the Lanyon Cromled portraits of Styrpe, Leland, Grose, Stakole, Pennant, Browne Willis, Edward Cave, and Steele's Cottage (now destroyed); the "Rose," in Fenchurch-street; Nisan Hall, Heri St. Kevin's Oratory and Chapel; and various other sketches of interesting places. I should like to see another series published of similar objects of antiquarian interest, especially London views. In the *Builder* of June 24, p. 41 it was stated truly, "all the relics of old London are gradually disappearing." So they are; and it is most desirable that all remaining objects, architectural and antiquarian interest,—especially those not hitherto engraved,—should be etched for preservation. I believe that many supporters of such a work would be found.

C. C.





STAIRCASE, IPHOVEN CHURCH, NEAR NÜREMBERG.

IPHOVEN CHURCH, NEAR NÜREMBERG.

RECENTLY, we spoke of two curious staircases in the parish church of Iphoven, and illustrated one of them.* We now give a view of the second. This leads from the nave to the western organ-gallery, and to a chamber built against the wall of the aisle of the church, below which is the small cell which is shown in our illustration. It is probable that these small chambers or cells formed the lodging of some anchorite or hermit attached to the church. A very similar arrangement is to be observed at Faversham Church, Kent. Although the round arch is used in this staircase, it is evidently a late work, and probably dates from the latter part of the fifteenth century.

In addition to these staircases, the church contains several other objects of interest, amongst which we must mention the iron door leading from the chancel into the sacristy, covered with heraldic devices, wherein the Imperial split-eagle and the lion of Bavaria are conspicuous (see A in illustration). Attached to the vaulting shafts of the chancel are some good iron candle-brackets, of one of which we give a sketch (see B in illustration). These brackets are not beaten, but cut out of a flat sheet of iron.

The door leading to the organ-loft has a figure of a bishop, life-size, painted upon it; probably it formed originally a portion of a triptych.

* See p. 518, ante.

THE GASCOIGNE PLACE SCHOOLS, MILE END NEW TOWN.

THESE new schools, situated in Church-street, Mile-end New Town, are being mainly built from the funds received from the Baroness Countess for the schools existing in Gascoigne-place, Shore-ditch, required for improving the approaches to Columbia Market, and are to accommodate about 500 children.

The buildings consist of a boys' school, 58 ft. by 29 ft., and of a height of 15 ft., with a classroom, 21 ft. by 15 ft., of equal height the main schoolroom having an additional area of 26 ft. by 8 ft. in the front portion. This school is approached by a distinct entrance, and the boys have a separate play-yard in the rear.

The girls' school is on the first floor, and consists of a schoolroom, 58 ft. by 29 ft. by 12 ft. to the wall-plate, and 25 ft. to the underside of the ridge of roof, two class-rooms being attached, one 21 ft. by 15 ft., by 14 ft. high, one 26 ft. by 14 ft. by 12 ft. high. This room is approached by a passage and stone staircase on the different side of the building to the boys' entrance. There is also a play-yard in the rear.

Accommodation is provided for washing and for the service of the establishment in the basement and rooms on the second floor for the caretaker of the building, as also a clock-room.

Care has been taken to get light and ventilation both from the street and across the school-

rooms, air-channels also being supplied under the eills of the windows, with bit-end-miss ventilators, escape-flues near the top of the rooms and flues for heating the fresh air to be admitted behind the stoves.

The building will be constructed of brick throughout, but with the introduction of Bath stone piers, mullions, hood and other mouldings to the front in Church-street. The first floor is carried by three wrought-iron boiler plate girders, so as to avoid columns, supplied by Messrs. R. Moreland & Son.

The rooms throughout will be lined to a certain height with matched and beaded boardings, with cappings, and the walls plastered above. The roof over the upper schoolroom will have timber timbers exposed, but between the same will be plastered, and the roof felted.

The whole of the large windows have timber upper parts made to swing on centres, the casements in the front being of iron. The latrine for each school will be accessible from the open air from the level of each schoolroom.

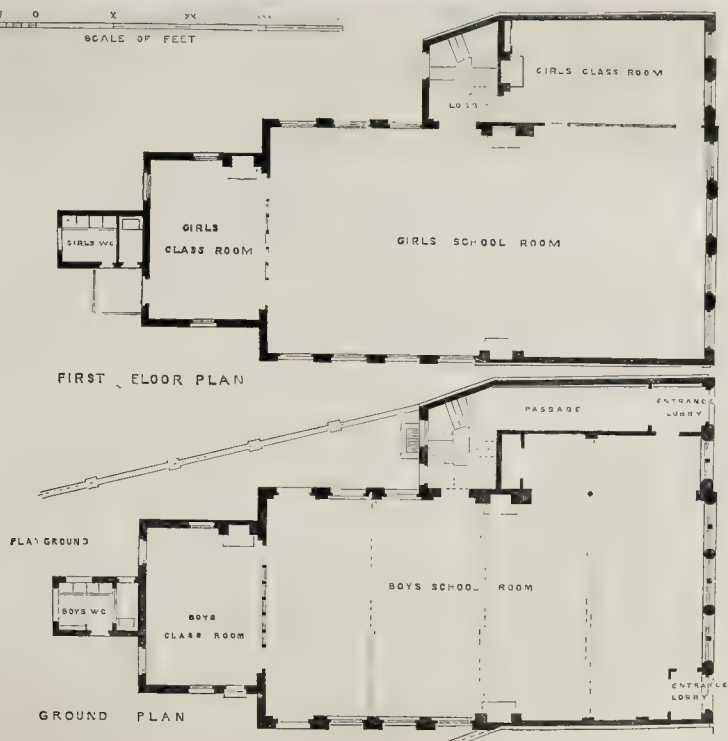
The building will be fitted with a clock, a gift of Sir James Tyler, placed in such a position with a striking bell as to be of use to the neighbourhood.

The schools have been designed by Mr. Thomas Chatfield Clarke, architect; the work being executed by Messrs. Hill, Keddell, & Widdam, at about 2,300*l.*, and they are to be ready for occupation early in the fall of the year.

SCHOOLS, CHURCH-STREET, MILE-END NEW TOWN.—MR. THOS. CHATFIELD CLARKE, ARCHITECT.



SCALE OF FEET



THE LONDON STREETS TRAMWAYS.

The success (peculiarly considered) attending the operations of the small quantity of tramways belonging to the North Metropolitan Tramways Company, seems confirmatory of the correctness of the views of those who, two or three years ago, when the local opposition to tramways in the streets of London began to give way under the accumulated pressure of able opinion in favour of their introduction, ventured to tell that a large revenue would be obtained from the profits of the tramway traffic, and legitimately applicable to municipal works generally, and urged—to the ringing about of that end,—that the Metropolitan Board of Works, as the chief municipal authority, should seek for the powers to lay down the permanent ways, and work the traffic of a tramway service for all London; the surplus profits to be applied to the carrying out of public improvements to the easement of the rates leviable for that purpose, and to this effect the important entries of St. George's, Hanover-square, and St. James's, Westminster (the latter as far back as the autumn of 1869), memorialised the Board.

The Tramways Act of last year gave powers to the local authorities—that is, the Vestries and District Boards of Works,—to lay down trams in any of the streets under their jurisdiction, and grant the user of them on rent. But considering that these local authorities are forty in number, and that a streets tramway of some four or five miles run would have to pass through parts under the jurisdiction of perhaps half a dozen or more of these authorities,—and bearing in mind the proverbial difficulty of getting anything like unity of action in these bodies to any common object,—it is not to be wondered at that no tramway system was practicable by that village.

It was, however, but a reasonable suggestion, under the circumstances, that the Metropolitan Board, as the central representative authority of all these Boards, should take up the undertaking on behalf of these forty bodies for the general benefit. But in the Board of Trade report to Parliament, relating to tramways (Metropolis), it is stated that the Metropolitan Board have distinctly and repeatedly refused to accede to the proposal that the Board should undertake the construction and direct the working of a London tramway system: an intimation conveying the inference that the Metropolitan Board may have had the concession for the whole of London, and they desired it. The local authorities thus failing to act in the matter, or the Central Board in their behalf, the alternative provided by the Act takes effect, by which the privilege to supply be wanted becomes open to joint-stock company enterprises, to whom Parliamentary powers are promised, conditional on obtaining consent of the local authorities, and in addition a "provisional order" by passing the ordeal of examination by the Board of Trade. And, promising as the thing is of large profits, promoters of no less than a dozen different companies have been scrambling for concessions of various of the usual omnibus routes.

The Metropolitan Board, although declining themselves to take the responsibility of the population attending the introduction, appear to have taken a general view in favour of the policy of facilitating communication between different parts of the metropolis, and readily responded to the call of the Government (the department of the Board of Trade) for advice and assistance in the selection of the most meritorious of the host of London tramway schemes for which provisional order grants were being sought, the difficulty of selection being intensified by schemes showing in some instances more than one set of applicants seeking for powers over the same roads, and necessarily on lines identical, and in other instances interlacing each other, producing an impenetrable entanglement. In extrication from this dilemma, the Metropolitan Board's projection of London partitioned into thirty-one sections, for so many routes of tramway, each section forming one route in itself complete and independent, the aggregate length being about 100 miles, would seem to have been adopted by the Department. And thus, instead of any of the several sets of promoters getting their provisional orders for the particular lines one in for, the nine sets remaining in the field, the Board of Trade had decided, were to have the thirty-one routes above referred to apportioned among them.

["The London Street Tramways Company," failing to get the consent of the St. Marylebone and the St. George vestries in the instance of the route from Shepherd's Bush to Holborn Bars (the Oxford-street line), and, anxious of course to secure possession of this golden nugget, went to Parliament for it by private Bill. The organised opposition of Oxford-street to the measure, however, succeeded in throwing out the Bill on the third reading, on the 20th ult., the discussion on the occasion in the House of Commons disclosing the fact of the prevalence of a misgiving there as to the policy of the proceedings which the general Tramway Act of the last year inaugurated. Alarm at the precipitancy and unconsideredness with which sanction was being given for tramways in the metropolis seems to have suddenly seized a number of its influential members, the feeling manifested being that London ought not to be dealt with in this piecemeal way by Bills for short lines through the great leading thoroughfares, or by provisional orders relating to particular routes; but that the requirements of the metropolis as a whole ought to be deliberately considered by Parliament, and provided for in one comprehensive, complete, and harmonious scheme.

The set in of this reaction in the House of Commons, the going up for third reading of the Bill for the sanctioning the Board of Trade provisional orders for a batch of routes engaging a great part of London, had to meet on the 6th inst., the result on the occasion being that further consideration by Parliament of tramway projects for the internal metropolis is deferred to next session; the reason for that course (as intimated by the President of the Board of Trade on the occasion), being to give opportunity for full inquiry before a committee of the House, or perhaps a joint committee of both Houses, into the three questions,—viz., 1st. Whether tramways should be introduced into the internal parts of the metropolis; 2nd. Who should have the management of these tramways; and, 3rd. What should be the particular streets of the metropolis in which tramways should be established.

And thus London is rescued, as it were accidentally, and at the eleventh hour, from the infliction on it of street tramways on an imperfect principle, and which, howsoever intolerable any may have proved, would nevertheless have been fixed for twenty years; and, furthermore, possibly an enormous revenue rescued from passing into the hands of Joint Stock Companies, which same—bearing in mind that the surfaces of the streets, the source of its gain, are the property of the ratepayers—ought instead to be made municipal revenue.

Notwithstanding that provision has been made for the various promoters whose applications are postponed having the liberty of resuming operations in the next session at the point now left off at, it cannot but be seen that the route system has fairly broken down; and enough has been seen of the feeling of Parliament on the subject to infer that—if it decide that the tramwaying the interior of London shall be proceeded with—it will insist on the principle of complete centralisation for the metropolis, both as respects construction and working. This may be by investing the power in the companies amalgamated, or in the Metropolitan Board of Works, or perhaps in a newly-created Tramway Board for the Government itself, to which latter achievement the success attending the taking of the telegraphs, coupled with the certainty of a large revenue to the Imperial Exchequer, offers tempting inducement.

By this turn in the tramway affair another opportunity is presented for the Spring-gardens Board (if that body could be induced to think more favourably of the propriety of the undertaking) to go in for the concession. It cannot but be admitted that the experience already obtained by observation of the success attending the various bits of tramway in operation in different parts of

London,—for instance, the four miles example referred to below,—throws a new light on the matter, and dispels the idea of the tramway undertaking being an enterprise of "speculative character."—the Metropolitan Board's allegation for declining the practical engaging in it,—and certainly puts the Board in a different position in reference to the pecuniary consideration, to that in which it stood at the earlier period of the streets tramway agitation.

A Bill at the hands of the Metropolitan Board embracing a general scheme for the metropolis, such as the Board could now—after the fresh ventilation the subject has undergone both in and out of Parliament—produce, and embracing the taking powers to purchase the undertakings of the companies either compulsorily or by agreement, [as also a recouping the promoters of matured schemes incurred expenses, and perhaps something additional, would no doubt find favour with the House of Commons.

The following little calculation, based on fairly reliable circumstances and existent facts, will give some idea of the value of the prize which the Spring-gardens Board, by going in for—and no risk involved in the venture—might win for London.

The North Metropolitan Tramways Company has got a run of four miles finished and in operation. The weekly traffic returns on the four miles, taken on an average of seven weeks ending June 17, shows 77,474 passengers, and receipts 704l. on the week for the four miles; that is, 176l. per mile per week, averaging 2½d. per passenger, and upon this the computation here offered is based.

Although there are in the metropolitan area numerous lines of greater thoroughfare than Mile End-road, yet the average traffic of the 100 miles of main lines proposed to be trammed would probably fall under that of Mile End-road: hence, for the purpose of this calculation, and in order to secure its presenting an under estimate rather than an over one, the average traffic is taken at 40 per cent. less; that is, at the rate of 100l. per mile per week, instead of the 176l. adduced above.

The ordinary calculation of 50 per cent. of gross income to cover working charges, which is usually applicable to the locomotion system, and that of the stage-coach also, will (although unquestionably excessive, as applied to the working of the tramway system by horse-power, where two horses draw fifty passengers) be made use of for the calculation here presented.

The official estimate of the Metropolitan Streets Tramway Company (as quoted by Mr. Scott, surveyor to the St. Pancras Vestry, in his elaborate report to his vestry concerning proposed tramways affecting that parish) for the construction, and every preparation for the commencement of traffic operations, for a route consisting of 4½ miles, for which that company had obtained an Act, including the cost of 80 cars, 300 horses, the erecting of stabling, and an item set down for contingencies equal in amount of the contract estimate for construction of the permanent way, was 150,000l., giving, in round numbers, 30,000l. per mile for all purposes.

Had the tram-works and plant for such a section been provided by the Metropolitan Board with borrowed capital, the first charge on revenue, after working expenses, would have been the reduction of the capital loan. Thus, supposing the 30,000l. borrowed for the purpose on the terms of repayment by equal annual instalments, spread over, say, thirty years, gives 1,000l. for every year.

Again, interest at the rate of 4 per cent. will average 2 per cent. per annum for the whole term, giving 600l. for every year. A balance-sheet formed of the deducted items of the foregoing would stand thus. In order to the figures being better carried in the memory, approximate round numbers in all the items are used:—

Probable average annual Profit per Mile of a London Street's Tramway System.

To fifty-two weeks of traffic receipts at 100l. per week	£5,200 0 0	By annual instalment in repayment of Loan of 30,000l. carried over thirty years	£1,000 0 0
		By interest on loan of 30,000l., less every year by the instalment paid, giving the rate of 2 per cent. per annum average on the whole term	600 0 0
		By working expenses, taken at 50 per cent. on receipts	2,600 0 0
		Balance, and which represents the profit on the year per mile of tramway	1,000 0 0
	£5,200 0 0		£5,200 0 0

Thus taking the probable average profit at 1,000l. per annum for every mile of the 100 miles completing the London Tramway system, there remains, after defraying all expenses, and providing for the total liquidation in thirty years of the entire cost of the works, a total net profit on the working of 100,000l. per annum, equal to 2d. in the pound on the rates all over the metropolitan area.*

In challenging a refutation of the foregoing statement, it is suggested that it will be a less difficult effort to show it is under- than an overdone estimate; for, looking at the enormous population of London, and the necessity under which so large a proportion of its inhabitants lie of travelling, and the stimulus to locomotion which, by the improved facilities, a perfect tramway system would afford,—as was the case when the rail succeeded the stage-coach,—it is by no means improbable that the traffic-working of the London Tramway system, at the penny a mile fare, would yield a surplus income far in excess even of that which appears on the foregoing sheet.

With a permanent indirect income of anything like this 100,000l. a year devoted, supplementary of the rates for public improvements, London might, in the course of another generation or so, be made the handsomest and most convenient, as it is now the wealthiest and most populous, city in the universe. But it is quite evident that, unless the Spring-gardens Treasury falls into some revenue from a source other than from rates, improvements at the hands of the Metropolitan Board will henceforward proceed but slowly. To make rates for mere improvements there is the most manifest unwillingness in the Board to do: and the reason is obvious; for it is the opinion of most of the persons on whom the duty of levying rates falls, that metropolitan local taxation has reached its utmost tension.

F. C.

"POST MORTEM."

At the united meeting of the Northamptonshire and Leicestershire Architectural Societies, briefly reported in the *Builder* of the 17th of June, a paper, headed "*Post Mortem*," by the Rev. Geo. Ayliffe Poole, was read, of which we give a portion:—

Can we hope to discourage pretentious monuments, and to encourage the use of simple memorials for the poor? I think we may; and, if we may, we should. A graduated scale of fees, the lowest lower than the usual one, and the rest rising till they become practically prohibitive, in proportion to the height of the stone, might do much. I have found it so myself; but I ought to add that I have pledged myself to give all churchyard fees to the improvement of the church, so that no selfish motives can be attributed to me in raising the fees for more costly stones, and, of course, no one objects to the lowered fees. Something may be done by speaking on the subject as occasions seem to offer; something by putting good designs into the hands of the mason; something by example. But more than this might be done by directly encouraging the erection of very simple memorials for the poor. We may find out for them the least costly, and, at the same time, the most tasteful and appropriate memorials. Where there is some excuse for it, the clergyman might himself erect a head-stone over some poor man's grave, which might serve as a pattern and encouragement to the friends of others; and so, little by little, and by many ways, a better taste and feeling might be introduced.

The material is the first question. And we will take stone first, as perhaps the best; but observe I do not include slate, which is, perhaps, all things considered, the worst.

Now, I have ascertained that for from 4s. to 7s. 6d. a mason should supply a stone some 20 in. high and 12 in. wide, with a cross, and the initials and date engraved on it,—in short, such a stone as is often used as a foot-stone. This, I think, ought to satisfy us; and I suppose it is almost never used, partly because it is not sug-

gested at the right time, and by the right person, and partly because the fee would generally be the same as that for a larger stone. Both these hindrances it is within the power of the incumbent to remove.

The cost of a simple cross of wood ought to be very small, unless it is of oak; and it has the great advantage that it may be made by the village carpenter.

Iron has many merits, and cheapness is one of the greatest. Mr. Johnson, of Leicester, supplies little crosses of cast-iron, with initials and date, for 2s. 3d. I have suggested to Mr. Johnson that he might do wisely to provide a greater variety of patterns and sizes, and to make it a speciality of his business; but this, of course, is for his consideration, and not yours or mine. The only churchyards that I know of where they are used are South Kilworth, Ashby Magna, and Bulwick. I think to see them would be sufficient to make any one wish for their wider use.

Finally, there is terra cotta, which has, I believe been scarcely used at all. Some years ago I got Mr. Blashfield, of Stamford, to make two little crosses after my own design, with name, date, and text. I hoped these might be multiplied from the same mould, or might suggest others; but the hardness of the terra cotta made the lettering too costly. I found, however, that the forms might be laid aside unbaked, and out at any subsequent time while soft, and that the difficulty would by that means be obviated. Mr. Blashfield treated me so handsomely in the costly experiment, that I did not like to press him further; but I still think the plan would succeed, and that it would afford crosses scarcely inferior in any respect to stone, except in expense. I should like to see the mason, the carpenter, the ironmonger, and the master of terra-cotta works engaged on the subject, purely, of course, on their part, as a trade question; and the clergy of the several parishes encouraging the poor to utilise the endeavours of all to supply them with appropriate and tasteful memorials at a very small charge.

And will you let me suggest some forms appropriate to the several materials?

I assume throughout that the design will either be or embrace a cross. The simple cross of Calvary suggests itself very strongly to our religious feelings. It is the cross, one may say, under the shadow of which we would wish to rest. And such a cross of stone, or, still more, of white marble, is certainly very suggestive, from its purity and simplicity. But, unfortunately, a plain cross cannot be made of stone or marble without ignoring their essential characteristics. They are brittle, and their fracture is granular and transverse; and we have an intuitive perception of this; and, consequently, a simple cross of stone is, and appears to be (which is almost as unfortunate), liable to be broken off at all the four arms. The structural properties of wood are just the reverse. Its fracture is longitudinal and fibrous; the arms, therefore, suggest no insecurity. But then the cross of wood must be a real cross, and not cut out of a large block, as if it were stone. This, in the first place, must be hugely more expensive; and, in the next place, the fracture is ignored, and even the opening of the grain with exposure to the weather, soon threatens the separation of the arms from the upright beam. It would seem to be needless to mention this, but, in fact, the mention of it has been suggested by the state of some wooden crosses, in themselves very pretty, in the making of which these considerations have been forgotten.

Cast iron follows stone in its requirements as a material. Its fracture is granular and transverse. Wrought iron follows wood, with the farther advantage of being flexible in all directions and much less susceptible to injury. Here, so far as the question is purely mechanical, you may be as light and fanciful as you will in your design, and you may even, if you please, give the curves and contortions of natural tendrils and foliage to the flourishes of the cross. The danger, indeed, would be that one might be enticed into mere prettiness by so facile a material.

The Chelsea Embankment.—It has been resolved, on the recommendation of the local Works Committee, "That the works of the Chelsea Embankment be inaugurated by the laying of a foundation-stone, that the chairman of the Board be requested to lay the stone, and that it be referred back to the committee to carry out all the necessary arrangements for the ceremony."

CLERKS OF WORKS.

Sir,—The letter of your correspondent, Mr. Thos. Cook, working stonemason, criticising Mr. Pain's conclusions on stoneworking, requires reply. He attributes the practices of face-bedding stone, making a vertical joint in the apex of a pointed arch, want of squareness and truth in the bedding and jointing of stonework, and, indeed, nearly all the evils of bad workmanship to the existence of carpenter and joiner clerks of works, whom he holds in the greatest contempt. With your permission I will ask him whether he is so ignorant of the history of his trade as to be unaware that clerks of works have not invented these ways of working, as he implies, but that they were adopted by the Freemasons in the Middle Ages, as their surviving works testify. If he will examine the old work in any of our old cathedrals,—Chester, for instance,—he will find the bulk of the ashlar face-bedded, and the window and door arches, as at Carlisle, jointed in the middle. This being so in modern works, Mediaevalist architects, who copy faults with excellencies, often insist on their reproduction, overlooking a clerk of works, be he mason or joiner, who suggests that it is wrong.

With regard to the other questions raised in this letter, I must protest against the assumption prevalent in some quarters that no person can superintend masonry except he has been brought up at the banker. According to such a theory, every architect who has not served an apprenticeship to a mason is unfit to inspect his own work, and is in a worse position than his joiner clerk of works, who has doubtless, in his journeyman days, when working with masons, seen many a dodge practised, and application of the "bottle" made, which is at all times carefully performed in the absence of the clerk or architect.

If masons desire to become clerks of works (and I fear there are not a great many who do), they must get a good deal more knowledge of building generally than the average number of them now possess. Turn over the lists of students in the science schools, and you find very few masons in the practical geometry, building construction, geology, or applied mechanics classes; they rather spend their leisure at their club. Few desire to emulate their fellow mason, Hugh Miller, in his knowledge of the history and properties of building stones, few become clerks of works; and fewer still architects. I wish it were otherwise.

E. G.

LONDON CENTRAL RAILWAY.

On Thursday afternoon the Committee of the House of Lords on Private Bills, over which the Earl of Meath presides, passed the Eastern St. Pancras, and Charing-cross Railway Bill for effecting a working junction between the London and North-Western system at Euston, the Midland at St. Pancras, and the Southern Eastern at Charing-cross. The line when made will be known by the more handy designation of "The London Central Railway." Associated with this scheme, it may be remembered, is the project to open up a street, 60 ft. wide, between Leicester-square and Oxford-street, the southern end of Tottenham-court-road, with continuation of equal width, round by the back of the National Gallery to St. Martin's-lane.

WEYMOUTH CONGRESS.

BRITISH ARCHEOLOGICAL ASSOCIATION.

THE proceedings of the Congress will commence on Monday, August 21st, and include: Address of the President, at 3 p.m.; visit to the Roman Pavement and Bridge and Druidical Circle at Preston, and to Osmington; inauguration dinner at 7.30 p.m. at the Assembly Rooms. 22nd. Excursion by carriages to Maiden Clench to the Druidical Circle, Winterbourne; thence to the Hellsstone and other Cromlechs, and to the ruins of the Monastery of Abbotsbury. 23rd. Examination of objects of antiquity at Weymouth; the Town Regalia of Weymouth; a Melcombe Regis; excursion to the Isle of Portland to see the ruins of Portland Castle, the Roman Camp at Southwell, the Quarries, and the Chesil Beach. 24th. Excursion to Egardon Hill by railway, thence to Maiden Newton; thence by carriage to Cor. Abbey and the Cerne Giant; afterwards to Weymouth House; then to Dorchester; examination

* The North Metropolitan Company has just opened a piece of 1½ mile run on another of its conceded routes,—i.e., from Moorfields-street to Ilford-street; and practical operations here so far bear out the suggestion made as to the comparative degree of traffic to which the different leading lines are subject; and are in other ways instructive on the subject here under consideration. The traffic working of this piece shows on the three weeks a mean of (in round numbers) 65,000 passengers, and receipts 480l., or a rate of 300l. per mile; but as the 2d. fare paid clears a ride of 2 miles, the calculation must be made on the line being of 2 miles, which gives a rate of earning on this line of £225 per mile per week.

apse. On the north side of the chancel an arcade of three arches opens into the organ-chamber and vestry; an arch on the side of the organ-chamber opens into the north aisle. A tower, in course of erection, of which the lower stage only is at present completed, is placed at the south-west angle of the church, and an entrance is obtained through it. The principal entrance, however, is at the west end, from a narthex or porch, extending across the building, and from which doors open into the contracted and two side passages. The nave roof is constructed of red deal, and is divided into six bays by arched roof-trusses. The chancel roof is also of red deal, and has a vaulted ceiling of wood, subdivided by moulded ribs. This roof has been decorated with colour and gilding, by Messrs. Clayton & Bell, of London. The nave is lighted by six plate tracery windows on the north, and five windows of the same kind on the south side, and by a wheel-window, 14 ft. in diameter, at the west end. The chancel has ten lancet windows, with cusps in the heads. The style of architecture chosen for the building is that of the transition period from Early English to Decorated Gothic. The exterior of the building is very simple. A range of gables over the windows on each side elevation breaks the outline. At the west end, leading into the porch, is a large doorway, with central shaft and carved tympanum, surmounted by a canopy and cross. The chancel is covered with brimble tiles, in bands, and has at the apex a wrought-iron cross. The site upon which the church is built was found to have a very considerable fall towards the east, and advantage has been taken of this, and under the chancel is constructed a crypt, which is fitted up complete for daily prayers and occasional services, with communion-table, choir-stalls, organ, and font. The windows throughout are filled with painted glass; those in the chancel with scenes from the Passion to the Ascension of our Lord. They are also the west and tower windows, are by Messrs. Clayton & Bell, of London. The nave windows, each bearing the late bishop's monogram, are by Messrs. Powell & Son, of London. The floor to the chancel and sanctuary, and their respective steps, are of marble, as are also the shafts to the chancel and roof vault, the table, reredos, and screen. The whole of this work has been executed by Mr. Hall, of Derby, who has also the memorial font in hand. The altar-table is of oak, gilt, divided, as to the front, into three arched panels, with spandrels, filled with carved angels bearing scrolls. At the angles are carved figures of St. Peter and St. Paul. It has been executed by Messrs. Sheppard & Son, of Derby. The gasfittings and other wrought metal work are being supplied by Mr. Skidmore, of Coventry. The church is heated by patent air-warmers, supplied by Mr. Jobson, of the Derwent Foundry. The whole of the stone and wood carving throughout the church has been executed by Mr. Albert Chambers, of Derby, assisted by Mr. Frederick Cox. The ironwork for the doors, &c., was done by Mr. Haslam, of Derby. The organ, a portion only of the permanent instrument, was built by Abbott, of Leeds (for twenty years with Hill & Son, of London), and contains fourteen stops.

DISSENTING CHURCH BUILDING NEWS.

Darlington.—The Wesleyan Methodists have laid the foundation stone of a new chapel of large size, adjoining the Durham-road, at some little distance beyond the Shildon Works. The chapel will hold 1,600 persons. There are also to be seven rooms, consisting of class-rooms and vestries. The total cost of the new building is estimated somewhat above 3,500l. The main part of the chapel is 72 ft. by 60 ft., and around three sides are large galleries, carried on iron columns supporting wooden arcading. The contractors are, — Messrs. J. Atkinson & Son, slaters; George & Robert Hornsey, bricklayers and masons; M. Arncliffe, joiner; James Wilson, painter; Thomas Fishman, plumber; and W. H. Davison, ironfounder. The chapel will almost closely adjoin the new Church of England, which is in process of being built. The style of the new building will be of the Romanesque order. — A new Baptist chapel has been opened for divine service in the Grange-road. Above 3,000l. out of 4,150l. required to complete the building, have been promised. Mr. W. Peachey is the architect of the new building, the foundation-stone of which was laid last summer. The style of the architecture is Italian, and the

edifice is built entirely of Foreest stone. There is a porch paved with Staffordshire tiles, and the aisles in the chapel are of the same material. The interior appearance is light, and a gallery passes round three sides, the front of which is ornamented. The seats throughout are open, and of stained pine. The dimensions of the chapel are 56 ft. by 44 ft., and accommodation will be afforded for about 600. At the rear of the buildings are a lecture-room, a class-room, and a minister's vestry, passing over which is a large room for the Sunday-school, and calculated to hold about 200 scholars, whilst underneath in the cellar, a boiler and other accommodation for tea on public occasions are provided. At the east end of the chapel is a stained-glass window. The chapel is lighted, at night, by two sunlights in the roof.

Belper.—The managers of the old Independent Chapel have accepted tenders for the erection of a new church. The designs, which are in the Gothic style of architecture, have been prepared by Mr. George Woodhouse, of Bolton, architect. The building is estimated to accommodate about 600 persons. The tenders for the erection of the chapel were as follows:—Mr. G. W. Booth, Gosport, 4,800l.; Mr. Glossop, Ambergate, 3,919l.; Mr. E. Thompson, Derby, 3,915l.; Messrs. Boreford & Wheelton, Belper, 3,824l.; Messrs. Walker & Cash, Wirksworth & Duffield, 3,403l. The tender of the last-named firm has been accepted. It is intended to commence the building at once.

Hali-fax.—The corner-stone of a new Unitarian Chapel, to be erected on the site of the old building at Northgate End, has been laid by the President of the Poor-Law Board, Mr. Stansfeld, M.P. In 1870 the old chapel was thought unsafe on the east and north (the only remaining portions of the original building), in consequence of which it was resolved to take down the whole to the foundations, and rebuild on the same site an enlarged building in the Gothic style, with school-rooms and other desirable accommodations, to meet the improvements around, and add to the comfort and convenience of the congregation. It is estimated that the new building will cost upwards of 3,000l. Mr. J. A. Davies, of Leeds, is the architect.

Books Received.

From "My Summer in a Garden," by C. W. Warner, we get an expressive testimonial of the philosophical character of American plumbers. Some of our own may justly claim a share in it:—

"Plumbers are the most agreeable men I know; and the boys in the business begin to be agreeable very early. I suspect the secret of it is, that they are agreeable by the hour. In the driest day my fountain became disabled: the pipe was stopped up. A couple of plumbers, with the implements of their craft, came out to view the situation. There was a good deal of difference of opinion about where the stoppage was. I found the plumbers perfectly willing to sit down and talk about it, and talk by the hour. Some of their guesses and remarks were exceedingly ingenious; and their general observations on other subjects were excellent in their way, and could hardly have been better if they had been made by the job. The work dragged a little—as it is apt to do by the hour. The plumbers had occasion to make me several visits. Sometimes they would find, upon arrival, that they had forgotten some indispensable tool; and one would go back to the shop, a mile and a half after it; and his comrade would wait his return with the most exemplary patience, and sit down and talk, — always by the hour. I do not know but it is a habit to have something wanted at the shop. They seemed to me very good workmen, and always willing to stop and talk about the job, or anything else, when I went near them. Nor had they any of that impetuous hurry that is said to be the bane of our American civilisation. To their credit be it said, that I never observed anything of it in them. They can afford to wait. Two of them will sometimes wait nearly half a day while a comrade goes for a tool. They are patient and philosophical. It is to a great pleasure to meet such men. One only wishes there was some work he could do for them by the hour. There ought to be reciprocity."

"Designers' and Draughtsmen's Handbook of Ornament" (Dean & Son), is a poor and common affair. We mention it simply to express surprise that such rubbish should be published. — A pile of interesting books await notice, but the demands on our space prevent immediate attention to them.

Miscellaneous.

A Vestry-hall for Bermondsey.—A movement has been set on foot with the view of inducing the Bermondsey Vestry to erect for itself a Vestry-hall worthy of that important parish.

Bradford Reservoirs.—The extensive works at Horton Bank, which are being executed by Messrs. N. B. Fogg & Co., for the Bradford Corporation, are progressing. These works are for supplying the high-level districts around the borough with water obtained from the Studden, or Thornton Moor, watershed. "No. 1" reservoir, 13 acres in extent, and which has a capacity equal to between 60,000,000 and 70,000,000 gallons, has been constructed on land at an altitude of 956 ft. above the sea-level, while the top of the bank rises to 975 ft. The reservoir is oblong square in shape, and is shallower than most works of this kind. It was intended to be completed early last spring, but a defect in the bottom was discovered, and extra expense had to be incurred in the construction of a deep puddle trench across the middle of the reservoir, to render it water-tight. The bottom has also been more deeply excavated, and an additional holding capacity, equal to 10,000,000 gallons, has thereby been added. The reservoir will be filled before winter sets in. The water is brought in iron pipes direct from the springs and streams on Thornton Moor, as far as the Studden Bank. The pipe-line attains an elevation of 1,157 ft., and the hills from which the water is taken range about 1,200 ft. in height. By filter-beds the water is caught at the various streams, passes into the pipes, runs from the moor-side, thence into the reservoir, and from this source the highest villages that take their water from the Bradford Corporation will get service. Works are in progress on Thornton Moor for increasing the supply to Studden, and when these are completed, and the immense reservoir "No. 2" at Horton Bank is finished, the water from Studden will flow into the latter, and will serve the people on the medium high-level. It will be from eighteen months to two years before Messrs. Fogg will complete "No. 2," the work being of a very heavy character. Between 500 and 600 men are at present engaged on the contract.

The Scott Monument Committee.—A meeting of this committee was held recently in the rooms of the Inventors' Institute, 21, Cookspur-street, Charing-cross; present, — Charles Mackay, LL.D. (in the chair), Thomas Faed, E.A., John Barr, F.S.A., George Cruikshank, E.M., Latham, Thomas Huxton, Andrew Halliday, C. Rae-Brown, honorary secretary. The hon. secretary reported that although a formal report had yet been received from the ball committee, the accounts being not quite closed, it was expected the proceeds of the Waverley ball would net 500l. or 600l. Mr. Faed read a communication which he had forwarded (lest he should be absent from the meeting), suggesting that the statues for the monument should be entrusted to more than two sculptors; as there were many "good Scotsmen and true, whose heads and hearts, and carving tools, are yearning to do work to be handed down in such niches as those of the Scott monument. Mr. Halliday moved, seconded by Mr. Burr, that copy of Mr. Faed's letter should be forwarded to the Edinburgh Committee. It was remitted to Mr. Halliday, to make arrangements, in conjunction with Mr. Rae-Brown, for a celebration of the Scott Centenary in the Crystal Palace, August 5th. The committee then adjourned.

The Newcastle College of Physiological Science.—It is stated that upwards of 23,600 has been already subscribed, out of the 35,000 required by the University of Durham to carry out its plan of establishing a college of physiological science at Newcastle-on-Tyne. Two of the professional chairs have been filled by men whose names are a sufficient guarantee that the scheme has been well received in the scientific world. Mr. A. S. Herschel, a son of the late Sir John Herschel, and for some time a professor in the Andersonian University, Glasgow, has been elected to the chair of experimental physiology, and that of geology has been given to Dr. Davy. The college is to be opened in October next.

Rome.—At the last meeting of the Archaeological Institute, Mr. J. H. Parker gave an account of recent archaeological discoveries in Rome. After touching upon the principal results of the excavations undertaken by the Archaeological Society of Rome, he criticised some of the proceedings of Signor Rosa, to whom the direction of the excavations was not committed, and who (in Mr. Parker's opinion) was too fond of restorations. Mr. Parker made an interesting exhibition of photographs, &c., which is still open at the rooms of the Societ 

Blowing out of the East Caisson of the East River Bridge.—The American Railway Times gives the report of the chief engineer, Mr. W. A. Roebling, on this subject. In the original design for the caisson, says the report, was the intention to make the air chamber a vast unbroken space, without dividing or supporting frames of any kind, reliance being placed upon the solid timber platform of 15 ft. thickness to transfer all strains equally from the caisson inward. To diminish the work above, the masonry was to be built inside of a wooden cofferdam placed on top of the caisson. This programme was quite feasible theoretically, provided the air pressure could be maintained at the proper standard without possibility of failure, and provided the caisson was sunk through a sufficiently yielding material. The shoe and sides of the caisson were made strong enough to resist the overweight occurring at low tides. . . . The south water shaft blew out, every particle of compressed air leaving the caisson in an instant. To say that this occurrence was an accident could certainly be wrong, because not an accident in a hundred deserves the name. In this case it was the legitimate result of carelessness, brought about by an over-confidence in supposing that matters would take care of themselves. The immediate cause of the blowing-out lay in the washing away of the dam around the pool under the shaft. Eyewitnesses outside state that a dense column of water, fog, mud, and stones was thrown up 500 ft. into the air, accompanied by a terrific roar and a shower of falling fragments, covering the houses for squares around. This column was seen a mile off. The noise was so frightful that the whole neighbourhood ramped and made a rush up Fulton-street. It was all over in a minute. As soon as possible a stream of water was passed into the shaft from above, the locks were closed, and in the course of an hour the pressure was restored to fifteen pounds, corresponding to a head of 31 ft. The total setting that took place amounted to 10 in. all. The marvel is that the air-tightness was not impaired in the least. The weight of the caisson at the time was 17,975 tons. The air blew out so suddenly that this weight must have acted with considerable impact in falling through a space of 10 in.

Restoration of St. Mary-le-Wigford Church, Lincoln.—The restoration of this edifice progresses under the supervision of the architects, Messrs. Clarke & Son, of Nottingham. The cleansing and reparation were much needed, the earth in the interior being full of human bones to within a few inches of the boarded floors. About 15 in. deep of this earth having been removed, some ancient sepulchral slabs were exposed to view, at the original floor level; one, of Purbeck marble, contained three interlaid brasses. A number of intricately-carved arch-stones, found in the walls, are being utilised in the arches over two of the windows on the north side. In the north wall a base of one of the window-shafts was found to be an abacus belonging to a cap, turned upside down and used as a base; it is now put to proper use in the restoration of the north doorway. Instructions were given to work a proper base, but before they could be carried out a missing base was found among the old masonry material, and was repaired and fixed under the window-shaft. The lower part of the channel aisle wall and the deep courses of facing on adjoining are built of old stone coffins. The nave and chancel walls present none of these features, and the materials used in their construction do not appear to have been disturbed. The roofs are to be new. The north wall of the aisle was very much out of upright. The extent the work is limited by want of means.

St. Thomas's Seminary.—The Roman Catholic Diocesan College for Westminster and Southwark, is about to be rebuilt in the grounds rear of Copula House, Hammersmith. The outline will be arranged in ornamental plantations and "academic groves," which will extend back to a great depth from the high-road. The ramshackle premises which have hitherto served for the mere housing of students for years were previously occupied by a community of nuns.—*West London Advertiser.*

The New Courts of Justice.—The other evening the Chancellor of the Exchequer informed Mr. G. Gregory that the plans and elevation of the new courts of justice had been prepared, and had been hung up in the Library of the House for the inspection of hon. members.

Messrs. Morant, Boyd, & Blanford's Games.—The employees of this firm had their annual feast and athletic sports on Saturday last, at the Cricketers' Inn, Fairfield, Kingston. They numbered about ninety. The prizes comprised eight silver cups: the first of which, being the most valuable, was presented by the firm, and bears the inscription to that effect. The first prize cup was contested in a handicap race of 100 yards, in five heats, and was won by Mr. Burton, cabinet-maker. The second prize cup was competed for by veterans over forty years, in four heats, and won by Mr. Barnard, designer to the firm. The third prize cup was for a hurdle-race of 200 yards, in two heats, level ground, and won by Mr. Isley, cabinet-maker. The fourth prize cup was for a long jump, won by Mr. Burton, who cleared 14 ft. 11 in. The fifth prize cup, was the high jump, won by Mr. Isley, who cleared 4 ft. 11 in. The 6th prize cup, a one-mile walking race, won by Mr. Spring, polisher. The subject for the 7th prize cup was a half-mile walking race, level ground, won by Mr. Wm. Carpenter, carver. The 8th prize cup was a consolation race, 300 yards, won by Mr. G. Hutchins, carpenter. The principle gentlemen engaged in conducting the sports were:—Starter, Mr. R. Morant; judges, Mr. T. Blanford and Mr. P. Boyd; handicapper, Mr. W. Carpenter. At the close of the sports the company retired to the inn, and there partook of dinner, and listened to various agreeable addresses.

The New Mint Building Site.—In committee on this Bill, Mr. Lowe said there was no reason to apprehend any nuisance from the erection of the Mint on the new site. The present machinery at the Mint was very old-fashioned, and it was necessary now that coining should be expeditiously performed. The building, too, was large and straggling, and thus the essential work of inspection could not be so well performed as it could if the building were smaller. There would be no expense whatever attached to the alteration, the money to be obtained for the old building and the old site being, it was believed, sufficient to pay for the new site and for all the new machinery which was required. The new site was not on the Thames Embankment, but in Water-lane, near the Temple, where the gas-works were situated. Mr. Munz said he had been to the Mint that very day, and found very excellent machinery there, although some of it required renewal. As a practical man, he should say that for 8,000l. or 10,000l. they could make the present establishment sufficiently complete to meet all necessary requirements. The majority in favour of the grant was 118 to 95.

The Patent Laws.—At a recent meeting of the London Patent Agents, held to consider the proposed changes in the patent laws—Mr. Geo. Haseltine, M.A., chairman—it was resolved:—1. That inventors have a right to the sole use of their inventions, which it is the duty of legislators to harmonise with the interests of the State. 2. That patents should no longer be granted to mere "first inventors," but should be confined to actual inventors. 3. That the term of a patent should be twenty years (now fourteen), without provision for extension. 4. That the official fees should be reduced from 175l. to 100l. for the entire term, which is sufficient to defray the expenses of an efficient patent system. 5. That the French mode of granting patents—without any official investigation of the merits of the application—should be adopted. 6. That in patent suits the rights of patentees should be determined by a competent court of equity, dispensing with jurors and "expert" witnesses.

A National Theatre.—With reference to this subject treated of in our last, a meeting is to be held on Monday next to consider what steps should be taken with a view to the realisation of the object. Amongst those who are expected to co-operate are Lord Houghton, Lord Dufferin, Sir H. D. Batho, Sir Countess Lindsey, Sir H. D. Hardy, Mr. Theodore Martin, Mr. Geo. Godwin, Mr. Planché, Dr. Doran, Mr. Tom Taylor, Dr. Westland Marston, Mr. P. Simpson, Mr. Bayle Bernard, Mr. Knight, Mr. T. Holmes, Mr. H. Neville, Mr. Baldwin, Mr. W. Laoy, Mr. H. Compton, Mr. F. O. Ward, Mr. A. Dubourg, Mr. A. Wigan, Mr. Frith, R.A., Mr. E. M. Ward, R.A., &c.

The Westminster Chapter-House.—A meeting of the Society of Antiquaries is to be held in the Chapter-House, on this Friday, the 21st inst., at four o'clock. The Dean and Mr. Scott will deliver addresses.

Metallic Tiles for Roofs.—An improvement, patented by Mr. Van Poppelendam, of Charlestown, Iowa, consists in forming a covered channel between two ridges and two tiles to exclude water. The tiles are made of galvanised iron, or other suitable metal, and may be struck up out of sheet metal, or cast, as may be desired. They are made square or diamond shape, and placed diagonally on the roof or wall. Upon each upper edge of the tiles are formed two upwardly projecting ridges, about $\frac{1}{2}$ in. in height, the ridges running along the two edges of the tiles, and the second ridge being parallel with, and at a little distance from, the outer ridge, so as to form a channel between them. Upon the under side of the two lower edges is formed a single downwardly projecting ridge. The side angles of the tiles are cut off, and then arranged upon the roof, so that the downwardly projecting ridges of each upper tile are placed below, and embrace the upwardly projecting ridges of the adjacent edges of two tiles. By this construction it is considered to be impossible for water or wind to beat in and pass above the three ridges. Upon the body of the tiles may be struck up or otherwise formed an ornament, in the shape of a tassel, flower, or other suitable device. This ornament strengthens the tiles, prevents them from being rolled up by the wind, and may add to the beauty of the roof or wall.

Civil and Mechanical Engineers' Society.—The annual meeting of the members of this society was held, on Friday, 14th inst., at their room, 4, Westminster Chambers, when the report of the council was considered. It congratulated the members on the satisfactory condition of the society and the merit of the papers read during the session. Votes of thanks were passed to the outgoing president, Mr. James B. Walton, A.L.C.E.; the treasurer, Mr. Arthur C. Pain; and the secretary, Mr. Charles H. Rew. The following were then elected office-bearers for the ensuing year:—President, Mr. Arthur C. Pain, A.L.C.E.; vice-presidents, Messrs. G. J. Crosbie Dawson, A.L.C.E.; and Charles W. Whitaker; members of council, Messrs. E. M. Banoroff, F. E. Cooper, Wm. Meakin, F. Lee, A. Tyrrell, A. Walmsley, and G. W. Wilcocks; hon. treasurer, Mr. Charles H. Rew; hon. secretary, Mr. H. E. Hunt. Mr. J. Wagsstaff Blandell was re-elected hon. accountant. The meeting was then adjourned until the opening of the next session, on the first Friday in December.

New Church in Kennington.—The foundation-stone of a church to accommodate the intended new district of St. John the Divine, Kennington, has been laid by the Bishop of Winchester, in the presence of a large number of spectators. The new edifice is to be erected on a site abutting on the Vassall-road, the ground having been presented partly by Earl Russell and partly by the Ecclesiastical Commissioners. The church is intended to afford sittings for a congregation of 1,000 persons, free. The architect is Mr. Street. The site is surrounded by a fine shrubbery, which affords a pleasant relief to the brick-and-mortar aspect of the neighbourhood. The estimated cost of building the chancel and temporary nave is 5,000l. of which 1,000l. are already promised. A permanent nave would save the loss otherwise to be incurred by the temporary building, and give the congregation a complete church. A parsonage-house has been purchased.

Flowers and Industry in the Borough.—The Earl of Shaftesbury distributed the prizes at the annual flower-show held in St. Stephen's National School-room, Kent-street, Borough. The exhibition consisted of upwards of 400 plants. Upwards of seventy prizes were given for plants, and prizes were also accorded for yard-gardens, paper flowers, and clean rooms. There was a very large gathering of well-behaved and decently-clad poor people. The vicar of the parish, the Rev. James Amos, has had good success in stimulating the people to improve the state of their homes by taking some fifteen of the houses there, and doing them up; and he is now raising funds towards building a workmen's hall.

Surveyor to the Whitechapel Board.—Mr. S. W. Irons has been elected to this office. The salary is 300l. per annum: no private practice allowed. Mr. A. Harston was second.

The Balfie Statue Fund.—The sum at present raised is 527l. The statue is to be placed in the vestibule of Drury-lane Theatre.

Worcester Model Dwellings Association.—The seventeenth annual general meeting of this association has been held at Worcester, Mr. J. Parker presiding. The report of the directors stated that during the year the changes in tenants and the number of void houses had been greater. This had reduced the amount received for rental, and had also increased the cost of repairs. No less than 2,000 houses for the artisan class had been erected during the past three years by the Freehold Building Society and by private individuals. The continued depression of trade had also caused many artisans to leave the city. The governors regretted that their financial position was unsatisfactory. Out of a population of 150 souls, who inhabited the block of dwellings only two infants had died during the year. The report was adopted. It was the general opinion that, unless the association were more successful financially, they had better dispose of the dwellings.

The Proposed Building Act and the Timber Trade.—On Tuesday last a meeting of timber merchants, owners of saw-mills, cabinet-makers, and others engaged in the wood-cutting trade, was held in the Music-hall Store-street, Russell-square, for the purpose of taking measures for opposing the Metropolitan Buildings and Management Act, now pending in Parliament, on the point to which we drew attention last week. Mr. Howard (of the firm of Howard & Sons, Barners-street) occupied the chair. The following resolution, amongst others, was passed:—"That, in the opinion of this meeting the Metropolitan Buildings and Management Act will most injuriously affect the owners of saw-mills, cabinet-makers, manufacturers, and others who are engaged in the timber and wood trades, and the owners and occupiers of large or spacious buildings." A petition to Parliament against the Bill was approved of.

The Rural Hospital, Tewkesbury.—At the seventh annual meeting of the governors, it was stated that it had become necessary to erect a building specially adapted for a rural hospital. A site had been purchased; a design of unpretending character had been supplied by Mr. Middleton, architect; a portion of the funds were already in hand; and the committee made further appeal. The building committee recommended that the building should be begun as soon as the applications were received from the architect. The estimated cost, including that of the land, was 1,100*l.*, and the committee had received promises to the amount of 572*l.*, in addition to the grant from the governors at their last annual meeting of 200*l.* The reports were adopted.

Tramways (Metropolis).—In the Commons, last week, Mr. Beresford Hope moved,

"That in the opinion of this House it is expedient that an inquiry be instituted early in the ensuing session of Parliament, either by a committee of this House or by a joint committee of both Houses, into the whole question of metropolitan tramways, including the following considerations:—1. Whether it is desirable or not that any fresh tramways should be laid within the metropolitan area. 2. What should be the limit of the metropolitan area in respect of such tramways. 3. Under what authority the construction and working of metropolitan tramways, if any, should be placed. 4. Along what lines of streets, if any, tramways should be allowed to be constructed, and under what restrictions."

The motion was agreed to.

Proposed Wesley Memorial Chapel.—A movement is on foot among the Wesleyan body with the object of erecting a chapel at Oxford, in memory of the two Wesleys, John and Charles. The estimated cost of the new structure is set down at 15,000*l.*, and a committee, consisting of the trustees of the present Oxford chapel, Dr. Jobson, late President of the Conference, and many other eminent Wesleyan ministers, has been appointed to carry on the movement.

Church Restoration with a Vengeance.—The following extract is from the *Man of Ross* newspaper, of June 29, 1871:—"Ross Church.—During the last fortnight this sacred edifice has been thoroughly cleansed. The interior of nave and chancel has been covered with two good coats of whitewash, and is now as neat and clean as the Wesleyan Chapel."

The British Association.—The first general meeting in Edinburgh will be held on Wednesday, August 2, at 8 p.m., when Professor Huxley will resign the chair, and Professor Sir William Thompson will assume the presidency, and deliver an address.

Statue of Sir Titus Salt, Bart.—The model of the Salt statue has been submitted for inspection to the committee in the Bradford Exchange by the sculptor, Mr. J. A. Acton, of London. The memorial represents Sir T. Salt in a sitting posture, and the figure will be surmounted with an elaborate Gothic canopy, designed by Messrs. Lookwood & Mawson, and in keeping with the architecture of the Town-hall, at one side of which it will be erected. The figure is to be carved out of Carrara marble, at a cost of 1,000 guineas.

Damage by Lightning.—During a heavy thunderstorm which visited King's Lynn last week, the lightning struck the south-west turret of the south-west tower of the fine old church of St. Margaret's, by which the turret was shattered from its base into fragments. Some of these were hurled in all directions, and were picked up at a distance of 100 yards, while a large mass of masonry fell to the ground beneath, breaking the tombstones and trees.

Monument to Washington Irving.—The ceremony of publicly unveiling a colossal bust of Washington Irving in Prospect Park, Brooklyn, U.S., took place on July 1st. It is supported on a pedestal of Aberdeen granite, and stands 15 ft. 6 in. high. The only inscription is the name of Irving on the pedestal. After various addresses had been given, a wreath of ivy from the walls of Westminster Abbey was placed on the brow of the statue.

Working Men's Club and Institute Union.—The annual meeting of this society will be held this Saturday, evening, July 22nd, at the lower room, Exeter Hall. Lord Stansbury takes the chair at eight p.m., and will be supported by the Dean of Westminster, Sir C. Trevelyan, the Hon. Abernethy Herbert, M.P., Lord Lyttelton, Mr. A. J. Mandells, M.P., Mr. W. H. Smith, M.P., and others.

A New Thoroughfare, East and West.—On the motion of Mr. Wickens, the Clerkenwell vestry, at their last meeting, appointed a deputation to wait upon the Metropolitan Board of Works, for the purpose of urging upon that body the desirability of opening a new thoroughfare between East and West London, by the construction of a new street from Old-street to Hart-street, Bloomsbury.

Coming Statues.—Permission has been asked of the Metropolitan Board of Works to erect a statue of the late Earl Derby on the Thames Embankment, opposite the House of Lords. The letter was referred to the Works Committee for report. The statue of Brunel, by Marochetti, for which also a site on the Embankment has been asked, is not well spoken of. It is ugly and unlike.

TENDERS

For alterations and repairs to No. 69, Wigmore-street, for Mr. C. Barker. Messrs. Tolley & Dainton, architects:—
Runcie £298 0 0
Conder 659 0 0
Macey 919 0 0
Tully 885 0 0
Nutt & Co. 850 0 0
Sabey 842 0 0
Smith 797 0 0

For building new sulphate house and stores for the Crystal Palace District Gas Company, Lower Sydenham. Mr. E. S. Cathels, engineer:—
Hayward £1,750 0 0
Aird & Sons 1,157 0 0
Wells 1,097 0 0
Ames 1,090 0 0
Bulter 944 5 0

For St. Matthew's new Schools, Redhill. Mr. R. Hesketh, architect:—
Bagaley £1,440 0 0
Nightingale Brothers 1,251 0 0
Cook 1,176 0 0
Carruthers (accepted) 1,100 0 0
Wright, Brothers & Goodchild 1,080 0 0

For construction of a sewer in King-street, Chelsea, for Chelsea Vestry. Mr. Joseph Pattison, surveyor:—
Brass & Son £230 0 0
Newe 439 0 0
Leay & Torkington 427 0 0
Whitlock (accepted) 414 0 0

For the erection of a new school and teacher's residence at West Holey, Berks. Mr. Edwin Dolby, architect:—
Bryan (accepted) £400 0 0

For the restoration and partial rebuilding of a 24-quarter malthouse at Abingdon, Berks, for Mr. W. Stacey. Mr. Edwin Dolby, architect. Quantities supplied:—
Drew £547 10 0
King (accepted) 650 0 0

For the erection of schools at Lough, Derbyshire. Mr. S. J. Barber, architect:—
Alcock £796 6 0
Dent 685 4 0
T. & S. Whitaker 693 13 0

For additions and alterations to National Schools, Heanor, Derbyshire. Mr. S. J. Barber, architect:—
Alcock £286 6 0
Dent 256 0 0
T. & S. Whitaker 250 0 0

For the erection of four dwellings, with shop, Tredegar-road, Bow, for Mr. T. Maddison. Mr. Chas. Chapman, architect. Quantities supplied by Mr. Bradley:—
Bregger (accepted) £1,525 0 0

For repairs and additions to the vicarage house, Dorking. Mr. F. J. Dibble, architect:—
Hamblyn £751 0 0
Putney 623 5 0
Lynn & Dudley (accepted with some modification) 613 6 3

For marine residence, West Cowes, Isle of Wight. Mr. F. J. Dibble, architect:—
Thomas (accepted) £2,132 0 0

For detached villa residence on the Drake Estate, New Cross, for Mr. W. Wundett. Mr. Theo. Rook Napier, architect and surveyor. Quantities supplied:—

	House.	Fence.	Boundary.
Smith	£1,131 6 9	.....	£14 13 3
Smith	1,030 0 0	.....	130 0 0
Allpress	1,017 0 0	.....	135 0 0
Stanes & Sons	1,019 0 0	.....	119 0 0
Heath	980 0 0	.....	140 0 0
Money, Brothers	920 0 0	.....	121 0 0
Stephenson	910 0 0	.....	121 0 0
Ball	899 0 0	.....	110 0 0
Pearce, Brothers	883 0 0	.....	107 0 0
Jaslynne	877 0 0	.....	110 0 0
Cooke	869 0 0	.....	110 0 0
Henshaw	835 0 0	.....	124 0 0
Hawks	850 0 0	.....	105 0 0
Atcheson and Walker	825 0 0	.....	120 0 0
Watson Brothers	821 0 0	.....	100 0 0
Peashitt & Taylor	810 10 0	.....	98 0 0
Riley	790 0 0	.....	105 0 0
Gooding	769 0 0	.....	121 0 0
Goodley & Dickes	783 0 0	.....	95 0 0
Wentill	762 0 0	.....	104 18 0
Bowyer	768 0 0	.....	.....

For the erection of two warehouses, Sheppey Yacht Minories, for Mr. W. Nokes. Mr. J. Bradbury, architect. Quantities supplied:—
Leggett £1,070 0 0
Harvey 1,019 0 0
Cox 1,028 0 0
Sawyer 991 0 0
Merritt & Ashby 974 0 0
Whitlock 951 0 0

For painting and decorating to house at Herne Hill, for Mr. J. D. Welch. Mr. W. H. Powell, architect:—
Smith £365 0 0
Sin, son & Sons 313 14 0
Covian & Mannoch 232 17 0

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1. The first part of the document is a title page. It contains the title of the report, the author's name, and the date of the report. The title is "The Effect of the New Tax Law on the Investment Decision." The author is "John Doe." The date is "January 1, 1980."

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VOL. XXIX.—No. 1486.

Public Monuments and Portrait Sculpture.

HE motives which occasion the now universal patronage of portrait may be classed as of two kinds; and, to a certain extent, each may exercise an influence in the treatment of portrait art. One is the interest that attaches to such records in their relation to the more intimate personal and family feelings: the other, less individual in its object, has reference to the acts or circumstances that have signified the career of the subject of the portrait,—be it as a statesman, a great commander, a judge, or the reputation he may have achieved as a scholar or a man of science,—rather than personally to himself. In the

minute particulars are of the greatest importance, and may, nay must, be made the most to give the portrait its true value. The advantage of painting will here be obvious in giving the complexion the life, as it were, and the colour of the eyes, and other familiar details, even to those of dress. In the other, where marble or bronze is to be the medium of representation, such *minutiae* are less essential, as, indeed, they are beyond the reach of sculpture. Here a larger and broader view of the subject may be taken; and as this increases the difficulty of the task of an artist, so does it call for ability of a high order and considerable practical experience to know how to meet it.

It is essential to the true and fair understanding of these papers* and the accompanying criticism on the modern schools of art that the unprejudiced reader should recognise the real bearing of their design in relation to the peculiar difficulties of portrait sculpture; not in disparagement of portrait, but to show that unless this class of art shall be practised on some higher principle than mere imitation, sculpture must and will suffer deterioration as a fine art. Some of the causes of this are stated in the former paper. It must also be understood that the remarks apply exclusively to sculpture as an art that has its own conditions of practice. It is because it cannot do what painting can, and that painting cannot attempt what sculpture performs, that the distinctive means and power of each should be clearly seen.

It has been said, and with much truth, that up to a certain point sculpture is of all the arts the most easily learnt. Technically, practice soon makes a tolerably fair modeller; and merely copying a model in marble or casting it in metal may be done mechanically and by ordinary workmen. It is here the real difficulty and trial of sculpture, as a fine art, begins. Where the great

variety of subjects gives large opportunities, even to mediocrity, in the sister art, the sculptor, from the limited range of fitting subjects and his restricted means (representation by form only) frequently finds himself unable to command attention or success. The higher class of art is, possibly, beyond his ambition or reach. Portrait is then the usual resource, and especially of those whose opportunities of studying the higher art principles or practice,—as invention, composition, anatomy, drawing, and refined form have been limited. Too often it is found that this practice degenerates into copying a face and dressing a sort of lay-figure in a modern costume; and it is to meet this commonplace view that these remarks are offered: to show, especially to the dispensers of patronage, first, that sculpture must be practised under conditions special to it; and, secondly, that portrait sculpture, if it is to rank as fine art, is far from being the easy exercise some suppose; but that it demands, even for comparative success, artistic talent of a high order.

And here occurs one of the great difficulties an able artist has to consider. Though sculpture is essentially an art of truth, in its mode of imitating form, there is a technical necessity for a certain amount of conventional treatment in its practice. Certain well-defined forms may be copied; but there are other particulars on which likeness may depend which are entirely beyond the reach of sculpture. Take hair, for instance. This, whether of the head, the beard, the eyelashes, cannot be reproduced. They are as impracticable as the colour of the complexion, the eyes, the lips, and, like the dress or drapery, can only be made effective by such conventional treatment as the skill and good taste of the artist may be able to bring to bear upon it. The mode of doing this is a test of the portrait-sculptor's knowledge of the requirements of his art. No genius or ability in the sculptor would suffice to bring satisfactorily before the public, with the same success as would be comparatively easy to the painter, certain characters, historical or contemporary, whose individuality is associated in men's minds with well-known peculiarities. Even if the closest resemblance should be achieved, it might easily be shown it would tend to the injury of sculpture as fine art. Take, for instance, the celebrated Charles XII. of Sweden, with his flashing eagle eye, his high black stock confining his throat as in a vice, his heavy, lumbering trooper's boots, and other details so well known in his pictures; or Frederick the Great of Prussia, with his mean, bent figure and high shoulders, his cocked-hat and long pigtail; or Louis XIV., with his full-curved, flowing peruke falling over his shoulders, his lace frill and ruffles, embroidered garments, and high red-heeled shoes, lifting him two or three inches from the ground; or another, whom many now living have seen,—the first Napoleon,—his short *embogpoint* figure, crowned with his favourite three-cornered cocked-hat, his open grey coat, with its short cape, and his high boots. Would it be possible for sculpture to reproduce these subjects as here fairly described, and not be taking a much lower position as a fine art than is fitting; while, at the same time, however accurately the forms might be rendered, the colour so essential to the resemblance would be wanting? It is to meet this that the question is now raised as to the possibility—of the desirableness there can be no doubt—of discovering some treatment of a portrait in sculpture that shall effect the object of perpetuating the memory and even personal traits of distinguished public characters in a manner consistent with good art. There is no desire here to ignore altogether contemporary costume, or sufficient indication of the character of dress to mark the date of a statue; but it is absolutely necessary, because an artist or an employer who has some pretensions to good taste shrinks from entirely covering

the figure of an eminent character with the most ugly of dresses, that the subject should have no dress at all? or, as an alternative equally objectionable, be represented, as is sometimes seen, half-naked with a cloak thrown over him,—or as a Greek demigod, or a Roman general or senator? Surely not; art has its rights and privileges, and it asserts itself in meeting and modifying difficulties opposed to its requirements. Sculpture, especially, finds this a condition of its existence as a fine art. It has its own special requirements, and may not even be put in the same category as painting, when considering the common conditions of imitative art. To save itself from easy degradation and vulgarity, it must insist on its right to beautify and to elevate; and it must spurn the notion that its sole and only function is to copy mechanically whatever is put before it. Mere craftsmen may do this; ill-educated in everything but the mechanical parts of art, they may not desire to have sculpture raised beyond the standard of their own practice, as they find their profit in producing works for an equally uneducated and incompetent public. But the true artist will, even in small and comparatively humble works, endeavour to stamp upon them the impress of a beauty, an excellence which, reflected from his own genius and refined taste, has nobler aspirations, and looks for higher objects than immediate gain or praise.

The first step towards improvement will be to endeavour to agree upon what is wrong in the present practice. First, then, whether the test be truth, as insisted on by the realistic school, or consistency, as mere common-sense would view the subject, it cannot be right to dress a statue of a person, familiarly known, in a costume to which he never had any claim, simply because it is picturesque, or suits the artist's notion of effect. This must be condemned in whatever light it is viewed. The question, then, is whether, admitting the modern costume to be the proper dress for a modern statue, such modifications can be made in the treatment of detail, as may, while insuring truth, preserve the work from meanness and vulgarity: that is how the sculptor can mark in his work the distinct nationality and the date of his portrait, and still keep the statue within the bounds of good taste; so that it may rank as a true work of art and not hereafter be cast aside as worthless for any qualities or interest it may have beyond the bare fact that it professes to be a portrait. There are instances, no doubt, where, even with accurate copying of modern dress, an artist of genius may make the spectator forget the meaner *minutiae* of costume in the treatment he is able to give to the nobler elements of his design. Roubilliac, who with all his sins of bad taste was one of the most able sculptors the world has seen, has left proofs of this power in two works which immediately occur to our recollection. One is the statue of Newton in Trinity College Chapel, Cambridge; the other that of Duncan Forbes in the Advocates' Library at Edinburgh. They belong to a bad school of sculpture; but, in spite of the faults of style, these works will always justly be referred to as examples of what portrait statues in modern dress may become in the hands of an artist of genius. No one probably will care to look in these productions for the exact likeness of either the great philosopher or of the astute and eloquent lawyer, though in this respect they are believed to be excellent; but every line of the composition in each tells the character of the distinguished man it represents; and so absorbing is this charm of expression that, though both figures wear the very objectionable (in a sculptural point of view) costume of their time, the offensive details are overlooked in the admirable treatment of the subjects. But these are remarkable and exceptional cases; and endless examples might be adduced of the art-degradation consequent upon

* See p. 537, ante.

a strict obedience to the rule of copying the details of dress, when wigs, knee-breeches, high-heeled shoes, frills, and embroidered coats were universal. It will be observed also that the success above referred to does not, after all, most or get rid of the real difficulty—the inappropriateness of the ordinary modern costume to the requirements of good taste in sculpture. How this may be effected is a question well deserving the consideration of the more intelligent artists and others whose interest in the success and honour of sculpture must make them alive to the importance of laying down some general rule to guide the profession. With the peculiar fancies of subscribers to statues or other works not erected under Government control, it would, of course, be idle to interfere. For public works, however, the Department entrusted with the administration of art may with propriety be invited to endeavour to introduce such general principles for the guidance of those whom it employs as may, at least, secure the works from deserved discredit; even if, from the necessity of the case, as in modern portrait sculpture, they may not aspire to take a foremost place in art,—a position which the very best performances of this class cannot, for the reasons adverted to, occupy. They must always rank subordinately to works of invention, presented under forms of beauty; but they may still have qualities which may make themselves felt, and vindicate the character of portrait sculpture, if they are not overpowered by the forced and injudicious presence of damaging accessories. It is with the view of impressing this both on artists and in the quarter where the recognition of this fact may serve the cause of art that the question is thus strongly urged on official attention.

Enough has now been said, in the way of preliminary remarks, on the treatment of statues of eminent public characters to show the importance of the subject in its art point of view, and at the same time to exhibit some of the more striking difficulties that beset even the most able and accomplished sculptor in practising a very interesting and indeed valuable branch of art.

The second part of the subject, to which reference was made in the preceding paper,—namely, the mode of procuring the best ability for carrying out the scheme proposed by Government,—offers some problems of considerable difficulty. Assuming that it has been shown in our previous remarks that, from certain special difficulties, portrait-sculpture demands ability of no ordinary kind in the artist, it would seem to follow that this should be sought amongst the best known and most experienced sculptors, and that they only should be entrusted with such works.

The usual course, when an employer desires to have a work of sculpture, is to consult some individual artist, in whose ability, either from his own knowledge of art or, it may be, the judgment of others, he has confidence; and he places the commission in his hands. This appears the most reasonable way of proceeding, and, for ordinary or private works, is not likely to be impugned or superseded. But where public works are required, many serious objections would naturally be urged on the part of the profession to a rule that would be so exclusive, and, at the same time, so open to abuse.

No doubt, as a general proposition, the employment of the most popular sculptor, as the artist most likely to fulfil the object desired, would seem to be a safe conclusion, and the selection be justified on the presumption of his greater experience. But it must also be borne in mind that this would not necessarily insure a good style of art, though it might, relatively, be a guarantee for a certain amount of executive proficiency. It might happen, as it has happened, that the most popular and fully employed sculptor of the day might be addicted to a very false style of art; and a succeeding generation, better educated, and more sensible of what constitutes fine art, might justly condemn what the previous age may have thought admirable. This, as might easily be shown, is no mere fancy. To avoid touching on more recent instances of such failure, a very striking illustration of the contingency referred to as possible, is afforded in the history and fate of two of the most deservedly distinguished artists of modern times (the seventeenth and eighteenth centuries). Probably no sculptor of any period has equalled in popularity and fame the celebrated Cavalier Bernini and Rubens. These were artists of indisputable genius; fertile in

invention, and thorough masters of practice. To the present day their works are looked at as marvels of daring design and consummate execution. Yet, although unrivalled in their special excellence, the productions of these masters, eminent as they were, hold no rank as examples of really good sculpture. They are not admitted into galleries or collections, as eminent specimens of art, nor would any competent judge or teacher allow a student, ambitious to become a great artist, to take them as his guides. The selection, therefore, of the favourite or fashionable sculptor of the day affords no absolute security, either for the success or the permanent fame of a work; and thus it is seen that the contemporary influence an artist may exercise must not, as a rule, be accepted as a true or safe criterion of excellence. But we have already reached our limits. This question of selection, and another of great importance, the constitution of committees to judge art, and the expediency of establishing some general rules for the guidance of sculptors engaged to execute public works, must be postponed to a future opportunity.

PORCELAIN AND POTTERY AT THE INTERNATIONAL EXHIBITION.

The Eastern Gallery of the International Exhibition, on the ground-floor, is filled, as before observed, with objects in earthenware and porcelain, which are included, together with the terra-cotta and fire-clay products in the adjoining cloister already described by us, under the head "Pottery" in the Official Catalogue. The number of "articles" specified in this manual is 604. This enumeration, however, gives no information as to the actual number of objects exhibited. In some cases a single article has a number all to itself. In other instances a group of objects, contributed from the same source, or by the same exhibitor, have a number between them, as in the case of No. 4,600, which index number applies to a collection of nineteen specimens of Japanese porcelain and pottery, exhibited by her Majesty's Commissioners for the Exhibition of 1851.

However, waiting objections, those who, with ample leisure and adequate knowledge of the subject, again and again visit the gallery, have the opportunity of comparing the outcome of our own ceramic manufactures with the works of Spain, Portugal, Belgium, Sweden, Italy, Denmark, and India. The comparison is in the highest degree instructive. Nor do we think it can be denied that, with the exception of certain individual excellences special to certain localities, the pottery and porcelain of England will bear comparison with those picked specimens of skill which have been sent to the Exhibition of 1871 by the potters of all nations.

The special physiognomy of every local ceramic manufacture is due, in the first instance, to the qualities of the clay. Not only do the colour, tenacity, smoothness, and other distinctive properties of each argillaceous deposit materially affect the surface finish of the articles formed from the material which it supplies, but the method of the workman is modified, and, in some cases may have been originally adopted, by and in consequence of such peculiarities.

For some purposes, indeed, it may be worth the while of the manufacturer to import his clay from some well-known mine. But these instances must be rare and exceptional. The cost of the carriage of the bulky material, so much more heavy than the fired product of manufacture, is prohibitory of any distant transport on a large scale. Neither would the proprietors of beds of pot earth actually worked be likely to supply rival manufacturers with a material of which the owners would gladly themselves retain the monopoly. Some exceptions may exist. The discovery, within the last few years, at Belleek, in Ireland, of a group of different colored clays of exquisite plastic beauty, some of which yield a "skin" or natural enamel, equal to that of the finest Chinese egg-shell porcelain, has led to the establishment, at that place, of a manufactory of articles of a character entirely original. A peculiarity attainable by the use of one of these beds of clay is the production of a nacreous or iridescent surface, hardly distinguishable from that of mother of pearl. Thus a nautilus-shell, modelled after nature, can be produced, which not only vies with the organic product in form and in translucent delicacy, but which is hardly to be distinguished from it in lustre. A set of tea cups and saucers, in which a delicate form of

schisms has been reproduced, exhibited by Mr. Mortlock, is a product of this clay, than which nothing more graceful has ever been produced by the art of the potter. The appearance in the market of this lustrous Irish porcelain has led to the production, by a Worcestershire manufactory, of articles coated with the same iridescent surface. Whether the clay has been obtained from Belleek is not stated; but the influence of the discovery of a particular material on the course of manufacture in a distant district is very distinctly illustrated by this case. The Belleek clay also produces a ware of the description known as Parian, which is, perhaps, the most beautiful of all the ceramic manufactures that attempt to vie with marble for statues and medallions. Mr. Mortlock exhibits a statuette of the famous Crouching Venus of the Capitoline Museum, the model of which is from the hands of Flaxman himself, which is one of the most charming ornaments for a room of a certain degree of elegance that money can procure.

Again, Messrs. Minton & Co., ceramic artists surpassed by none living, have given a series of reproductions of articles in the unique style of what is called *Henri Deux* ware deserving of high commendation. This *finesse*, as is well known to amateurs, commands prices that are absolutely fabulous. No raw material, not even the steel formed into a watchspring, is so enormously enhanced in value by the process of manufacture as is the *Oïron* clay. The fantastic articles, which are covered with a sort of inlaid ceramic veneer (in the same way that the inlaid woodwork of Tunbridge and of Sorrento is produced), sell for much more than their weight in gold. Messrs. Minton's reproductions are not, indeed, such as to deceive the eye of a person familiar with the ware (of which only about seventy specimens—all carefully noted and described, a sort of peerage among the pots—are known to exist) but they are so near the mark that if one of them were slightly maltreated, and then exhibited in some appropriate French locality, there is no doubt it would be eagerly snapped up at a fancy price. But though there is a recognizable difference between the touch of the artist who has modelled the masques and arabesques that adorn these meritorious English forgeries, and that of the authors of the French original, the crucial distinction is to be found in the slightly different appearance of the clay. The English ware is more like porcelain, and less like biscuit than the French. We do not speak of the merits of either product, in an abstract point of view. It is a question of accuracy of copy; and this can only be attained by making use of the identical clay employed by the potters who wrought under the Valois kings. Even the upper part of the costly candlestick of this ware in the ceramic gallery of the South Kensington Museum, which (it is not generally known) is a restoration, may be distinguished from the base, in spite of the admirable skill of the counterfeiter, by a slight difference in tint.

It is not necessary, nor would it be easy, to assign the palm of excellence to either of the four or five principal English firms that exhibit their *chefs d'œuvre* on the present occasion. With the well-known names of Copeland and Minton of Wedgwood and of the Royal Worcester Porcelain Works Company, of Mortlock as Pellatt, must be ranked those of W. J. Good of Adams & Co., of Kerr & Son, and of Thomas Goode & Co., as exhibitors of English manufactures. The Imperial (originally Royal) manufactory at Sévres seems to be represented by only a single vase. Egyptian pottery is contributed by his Highness the Khedive; Swedish porcelain is exhibited by K. A. Balag; Bavarian, porcelain, and painted and enamelled, by the Royal Berlin Porcelain Manufactory; Moorish pottery, by G. Maw; Italian Spanish, and Portuguese pottery, by the Science and Art Department; Danish statuettes, vases, and other objects, by Bing & Grøndahl and by the Royal Porcelain Manufactory, Copenhagen; miscellaneous china, from Hungary, by Moritz Fischer de Farkashaza; Indian pottery by the Punjab and Hyderabad Government; the Oude, Berar, Rangoon, Madras, and Bombay committees, and their Highnesses the Maharajahs of Bhartpore and of Duttah. It will be seen that there is a goodly display of the ceramic art of many if not of all nations.

In harmony and blending of colours to Oriental workmen, whether in plaster or textile material, are far in advance of those who work under the pale skies of Europe. In the

intermixture, as if by way of inlay, of gold and silver, the Indian artificers are unequalled, or rather, it may be said, are second only to the magic lacquer-workers of Japan. But in full, pure, powerful colour, we have English specimens in the gallery equal to anything hitherto produced by art. The turquoise blue of Mr. John Mortlock is as pure as that of the stone itself,—we speak of the Oriental turquoise, not of the magic gem to which organic origin is attributed, which was of old regarded as a test for the presence of poison, and which is the most delicate of all blues but that of the sky. Messrs. Minton have a turquoise blue which, though not identical with that of Mr. Mortlock, is hardly inferior to it. The glorious purple produced by Messrs. Copeland, their delicate rose tint, the celadon of Messrs. Goode and Messrs. Minton, the wonderful green of a pair of jardinières exhibited by Messrs. Goode, the royal blue of the Royal Worcester Porcelain Company, are all so admirable that it is impossible to attach to either exclusively the title of best, although that term may well describe them all. The most beautiful tints hitherto produced in ceramic work of any description may be considered those of the Munich enamel pictures. But even these colours do not excel those which we have named,—a few out of the many beauties of English origin. The superb black and white vases relieved with gold, shown by Messrs. Minton, should be compared with the entirely different application of the same coloured pigment in the well-known basalt ware of Messrs. Wedgwood.

For beauty of form great praise is attributable to the Danish potters, who supply most accurate reproductions of the exquisite shapes of Greek vases and tazzas. Many of our own ceramic artists produce very shapely articles. But there are some costly and elaborate vases which exhibit both waste of time and unacquaintance with the true principles of naturalistic ornamentation. An instance will be found in a pair of large and highly-wrought vases, in which the handles are formed of serpents, so accurately twisted into counterparts of one another as to give an exact bilateral symmetry. Nothing can be a greater mistake than this. Bilateral symmetry, in nature, is produced only for the purpose of motion, and that rapid or sustained. It is absent from the vegetable world, until we descend to minute details. No vegetable form, as a whole, approaches this structure; and it is equally absent from an immense range of the lower animal orders. When not required for flight or for locomotion, bi-lateral balance should either be avoided by the artist or displayed only in strictly mechanical or conventional forms. The handle of a ewer may be designed in the wildest and most fantastic curve. In one instance of recent Italian art, that of a magnificent inlaid steel ewer, produced by Signor Cortelazzo, of Vienna, we find such a handle formed of the figure of a nymph, who is seized by a monstrous python, from the fatal coils of which a nixy is struggling to rescue her. Nothing can be more graceful. But if such a handle had been fitted to an amphora, and balanced by an exact reflexion on the other side, few things would have been more odious. It is thus with the vases in question. A single serpent, though not the most agreeable of animal forms, or an inter-twined pair, may be thoroughly artistic and allowable; but when snake coils to balance snake,—only because handle should balance handle,—the sense of incongruity overpowers any satisfaction with the excellence of manipulation. We find, indeed, on some very perfect antique vases, masks bilaterally disposed. The mask itself, however, is a conventional ornament. It does not simulate a living head. But when we find animal exactly balancing animal, as in the case of two prancing horses, which jut forth to form the handles of an enormous vase, we know that we see the work of a period very far removed from the most excellent.

In the Wedgwood ware we have, to a great extent, a reproduction of Greek forms. But the true severity of the sculptor's taste is too often absent. The idea of adaptation too often peeps out. A grace curled here, and a beauty copied there, are united in a plaster wedlock which was not registered in heaven. For one very general illustration, the square tile on which the Wedgwood vases almost invariably stand may be cited. The slab is good in itself. Its ornament is good. Its utility, in preserving the delicately-balanced vessel from overthrow, is undeniable. But it is no part of the original design. It is an evident appendix; and, if a vase thus furnished

with a veritable antique, of the same form and size, the incongruity becomes at once manifest. This objection applies to the very best period of the Wedgwood manufacture, no less than to the present time. Great excellence has been attained in many of the exhibits now before us. The above is, in many cases, fully equal to that of the old ware. The actual moulds, some of which were prepared under the eye of Flaxman, have been used. But, as a rule, a commercial element is traceable in modern Wedgwood, the marks of which are happily absent from the old specimens. True, the main object of the potter may be said to be commercial; but there are different modes of attaining this object. One is, to make excellence the main thing, to spare no toil or trouble to attain it, and to fix the price in accordance with the work. Another is, to do pretty fairly, and to pour as much on the market as possible. The older manufacturer would break an imperfect specimen. The younger one would laugh at what he considered so much waste, and would sell it at a reduced price. In this mode of treatment may be seen at once a certain evidence, and an efficient cause, of the decline of art.

Were we less familiar with the Wedgwood ware of old times, we should speak in terms of more unmingled admiration of the fine collection of articles contributed on the present occasion by the firm of Josiah Wedgwood & Sons, the list of which occupies more space in the catalogue than the exhibits of any other manufacturer. The variety of ware included in this series is remarkable. Not only are there the beautiful black basalt, the pale blue and white jasper, the black and red Etruscan, the black and white, the green and white, but imitations of granite and of serpentine, gilded enamels, and charmingly-painted majolica. Messrs. Adams & Co. exhibit a ware which has the effect of Wedgwood at a distance, but which, on closer inspection, cannot be taken for it. The colour, especially in the blue and white, is very good, and there is so much boldness in the modelling as to compensate, except in the case of articles that can be viewed very closely, for the less careful and elaborate finish. As articles for table use, if the price be moderate, such objects as the cheese-stand and cover, and cold water jug, of these exhibitors, will form welcome adornments for daily use. As competing with the basalt ware for statuettes, small busts, and graceful plastic ornaments for the saloon or library, the British Porcelain ware has great attraction. The name of Kerr & Son, attached to some of the most beautiful specimens of this ware, does not appear in the index to exhibitors. The Irish Porcelain is not very distinguishable from the English, except in cases where the lustrous Belleek clay appears under the former name. The Royal Porcelain Works, Worcester, also exhibit some lovely Porcelain statuettes, as well as others covered with a glaze like that of Della Robbia ware. The Danish series of statuettes attracts much attention. With regard to most of them, the excellent plan of affixing the selling price is followed by Messrs. Bing & Gröndahl, the exhibitors. Of these the most costly is the "Cupid and Bow," after Thorwaldsen, which is priced at 18*l*. There are also specimens of a dinner service for twenty-four persons, copies of the original in the Chronological Museum of Danish kings, at Rosenberg, which is priced at 215 guineas. The copy of the Hebe of Thorwaldsen, for which 100*l*. is asked, may more properly be called a statue than a statuette. There is much admirable work in the Danish collection.

In the painted and enamelled earthenware, which occupies so much space in the galleries of the International Exhibition, we find the passage from industrial art, properly so called, in which design and colouring have a subordinate position (being strictly decorative) to fine art, making use of ceramic material for its display. It is not always easy to decide under which of these two main departments an object most properly ranks. The reproductions of paintings in enamel on earthenware plaques, such as those which are exhibited from Munich, although produced by what we are accustomed to regard as an industrial process, are works of the highest art. In the Italian majolica, art is, primarily, only decorative, and yet, in some of the Urbino and Castel Durante ware, the charm of the decoration is such as to overpower any idea of industrial use having been the original object of the designer. The very high, as well as peculiar, charm of majolica is due to the rapidity and

certitude of touch which its execution requires. The artist has to paint on wet enamel, in which the object to be decorated has been dipped after the first firing. No correction, no obliteration of a single stroke, is possible; nor can time for deliberation be allowed. Therefore it is necessary, in order to produce anything at all worthy of note as decoration, to ensure the service of a painter of firm and rapid touch. While every artist will be fettered by the requirements of the process, the artist who can work freely in such fetters is sure to produce something which is truly admirable.

After the finest specimens of the best era of the Italian majolica, it is probable that nothing has been produced in enamelled earthenware superior, if equal, to the Belgian work displayed in the present Exhibition. There is a case containing painted plaques, plateaux, and other ceramic objects, which ought, strictly speaking, to be placed in the fine-art gallery. There is an oval dish painted with a battle scene, that is full of life and power, the vigour of which is enhanced by the sharp character of the drawing. An Adam and Eve on a vase might rank with almost any old Italian *faienza*. Another charming scene represents the petition of Thetis to Jupiter, the attitude of the suppliant goddess being described by Homer. One or two of these objects are remarkable for deep, full colouring; but in these the actual drawing is not equal to that of the articles to which we have referred.

As if to give the fullest relief to the high artistic character of the Belgian majolica, it is placed side by side with a case of Portuguese pottery, which can only be spoken of as extremely debased *Pallissy* ware. While there is a certain amount of industrial adroitness manifested in the manufacture, nothing can be more striking than the utter absence which it displays of any approach to the sentiment of art. Fish and other animals are reproduced with a heavy, unpicturesque rendering, like that of a child's copy of a picture beyond his capacity. The clay at the command of the artisans appears to have been excellent; but it has been put to a very poor use. One vase, probably intended for a soup-tureen, is crowned with the head of a cat, with cropped ears, as it is the fashion to disfigure the poor animal in Portugal. Nothing can present a stronger and more striking contrast than does the outcome of modern Portuguese design to the richness and magnificence of the ecclesiastical monuments to be found in that kingdom.

Another novelty deserving of favourable mention is the smoke-painted porcelain from Berne, executed by Madame A. Leuzinger. It is highly desirable that a good account should be given of a process productive of such beautiful results. At first sight the articles thus decorated appear to be adorned by means of the Woodbury type. The soft clear shades, grading from white to deep black, are admirable. The manufacture appears to be a speciality, and it is one to which our own manufacturers will do well to direct some attention.

The reproductions of ancient and modern pictures in enamelled porcelain, exhibited by Carl Schmidt, of 61, New Bond-street, find room both in the Ceramic Gallery and in the towers on the other side of the garden, among the English fine-art objects. They are worthy of a distinguished place in the Exhibition. The rare peculiarity attends these enamels that the colour is altogether changed by firing; so that to produce the exquisite blue which tints the hood of the Madonna of Carlo Doldi, a green, or some other shade, has to be employed by the colourist. Several lovely pictures, best known in this country by the medium of the silver photographs of the Berlin Company in Rathbone-place, have an unfading brilliancy imparted to them by this process. Subjects of all kinds are represented,—the Sistine Madonna, and the "Dignity and Impudence" of Landseer, the bewitching features of the Countess Pototska, and the stern frown of Columbus in prison.

It would require more space than we can command to give a fuller description of the contents of this well-filled gallery. They are such as to repay careful and repeated attention. Especially in the article of table china immense advance has been made. As a rule, the mechanical and chemical portion of the manufacture is in advance of its artistic merit. The latter, however, is often great, and will, there can be no doubt, derive a fresh and important stimulus from the very fact of the exhibition. England does not intend to be distanced by the potters of any other nation.

THE TEMPLE OF DIANA AT EPHEBUS.

At the last meeting of the Society for the Encouragement of the Fine Arts, Mr. J. T. Wood gave an account of the discovery of the famous Ephesian fane, the Temple of Diana. Lord Stratford de Redcliffe presided. Mr. Newton, Professor Donaldson, Dr. Hyde Clarke, Mr. Penrose, and others who know the locality, and are interested in such investigations, were present, and some interesting statements were made. The first clue, it was stated, which led to the discovery of this great temple was an inscription unearthed by Mr. Wood at the remains of the great theatre, particularising the circuit of the city to be made by the priests of the temple in their sacred processions, and specifying the "Magneſian Gate," where the young men of Ephesus met the priests, and assisted in the ceremony. The previous labours, however, and hypotheses of Mr. Edward Falkener, Dr. Buhl, and others must have sided, and ought not to be overlooked. Mr. Wood was enabled, by tracing the route of the city wall, to find this gate, which, from its peculiar position, led him to the correct conclusion of there being two roads leading from it,—one in a southerly direction (towards Magnesia), the other in the opposite direction (towards Ayasolok). Choosing the most worn of the two (the north road), he opened it up, discovering thereby numerous tombs and sarcophagi, and afterwards found a road branching towards the open country, some distance along which excavations were made and a thick wall of large stones touched upon, two inscriptions being found proving it to be the "Peribolus Wall" built by Augustus, it being evident, therefore, that the precincts of the Temple were reached. By sinking trial holes a white marble pavement was found, of Greek workmanship, 9 in. thick, with its joints rubbed and carefully fitted and laid on a course of stonework, which he afterwards ascertained was the floor of a crypt some 8 ft. below the level of the temple pavement, which last had evidently been supported by dwarf columns, of which many remains were found. Remains of large columns with their capitals and bases were also discovered, upon which traces of colour were discernible. Mr. Wood is to start in September to resume his excavations, on which he has already been engaged many years. The discovery is one of much importance, and should be fully pursued. It is really a great event; but, as Mr. Hyde Clarke said at the meeting, there has been a system of "bottling up" pursued, which may prevent the discovery from being turned to proper account, and deprive the profession and the public of adequate knowledge, until many of the present day have passed away.

The public know nothing of the matter, and there is no public interest to stimulate adequate expenditure and exertion. Another consequence may be, that Mr. Wood will fail in getting adequate materials for illustration, and that will impede him in getting a publisher, so that we shall not have a proper record.

Now they are on the site of the Temple, the explorers require a very large grant, for the country has changed so much, that when the winter floods come they fill the excavations, and at most times there are 9 ft. of water on the pavement of the crypt, 1 ft. below the pavement of the Temple. It is requisite to go deep to find debris of the former temples, which were on the same spring and marshy spot. There is a further reason which we should urge, and that is, that Ephesus was one of the most ancient seats of civilisation, dating from at least 3,500 years, and there are very likely to be found pre-historic relics of value.

The excavation of the Temple of Diana ought to be a greater work than that of the Mausoleum, but unless public pressure be brought to bear, it will be cramped and limited.

TO, AT, AND FROM BERLIN.*

FRIDAY, June 16th, 1871, was a day of days! Phobus, like Berlin, was wide awake betimes, and never so much as winked his eyes till he went to bed at night. All prognostications and memories of rain were utterly forgotten in the brilliant sunshine that gleamed down from an unclouded sky, and speedily desiccated the lately drenched *Via Triumphalis*, the surface of which the myriad feet of trampling soldiers and horses were long to pound up into the well-known and much-dreaded "Berlin dust." Preparations

for the grand entry were progressing all night long. The noise of hammers and voices through windows that were obliged to be left open on account of the close heat, was continually intruding upon one's sense of hearing, and breaking up into fitful snatches the repose one was endeavouring to obtain. With the dawn, about three o'clock, a light breeze sprang up, which enabled me,—weary of ineffectual attempts to sleep,—to rise and close the windows, and so shut out the noise. Groups of sightseers were already going out, by way of the Brandenburg Gate, doubtless to secure good standing-places whence to view the sight. At five o'clock, in spite of the closed windows, the hubbub of voices and noise of feet and wheels was so great as utterly to banish all further notion of "making up for a bad night;" so the only thing to be done was to get up too. Looking out, I found the Linden filled from side to side with a moving crowd, all with their faces turned towards the Brandenburg Gate; and till the troops entered, some six hours afterwards, this living stream continued to flow, and ever in the same direction.

As the march is not to commence from the Halleschen-Thore until eleven o'clock, I will fill up the intervening time by giving a succinct description of the decorations of the city along this triumphal route of about five miles in length, which, commencing at the aforesaid Halle Gate, traverses the Potsdamer Platz, passes through the Brandenburg Gate, and along the Unter-den-Linden to the Schloss Platz. A colossal statue of Berolina, by Herr Encke, is the first to greet the victorious troops. On each side of her, gaily-adorned tribunes rise, the occupants of which, with their joyous cheers, will doubtless make amends for the silence of the plaster lady; while a row of tall masts (bound together by garlands of fir, and adorned with streamers of the Prussian "black-and-white" at the summit, and with two crossed flags above the arms of some federal city suspended half-way down) forms along the south side of the unfinished street, with its face towards the troops, what the Germans term *ein Spalier*; from which word, or a cognate one, must doubtless come our "espalier."

In the Aaskanischer Platz are more gay tribunes, with groups and trophies representing the victories of Weissenburg, Wöhr, and Spieker. Here, scholars from the various Berlin academies are to be seated; and it ought to be remarked that, with the troops and invited spectators, the same rule was observed,—only a deputation, and that always a small one, and frequently consisting of two or three individuals, was allowed to be present; thus space was found for every corps, brigade, regiment; every trade, profession, art; every school, college, university; every body, in fact, throughout the empire of men, youths, and even women employed in a public capacity,—the army nurses, to wit,—to be represented. One other point to be noted is the manner in which the chronology of the war was preserved in the decorations, commencing, at the beginning of the triumphal way, with the victories of August, and ending, at its close, with the taking of Paris and its forts. But, to continue our route.

The Potsdamer Platz presents a grand trophy, some 70 ft. in height. A large circular crimson platform in terraces,—on the centre one of which thirty French guns are placed, muzzles outward,—supports an elegant white pedestal, bearing on its front the word, "Sedan," in tall gilt letters,—Latin type, not German. From the pedestal rises a colossal Victory, the work of Herr Schulz. Below the platform Amazons are seated, modelled by Herr Begue,—Meitz to the right, with one arm akimbo, as if still unsubdued; and Strasburg on the left, extinguishing a downward-bent but still flaming torch. Masts stand around, bearing banners inscribed, "Gravelotte," "Mars-la-Tour," "Beaumont," and so on. And here, again, a handsome tribune for spectators is erected, while all the houses are covered with wreaths, carpets, and flags.

The Königgrätzerstrasse exhibits two rows of masts and flags similarly decorated to those described between the Halle Gate and the Potsdamer Platz, excepting that these are surmounted by the Prussian eagle; between every mast four cannons are placed on both sides of the road all the way up to the Brandenburg Gate; on the left side stands a large tribune shaded by the trees of the Thiergarten. The spacious platz outside the gate contains six huge masts raised upon very elaborate pedestals, on which figure four great Berlin bears, Prussian eagles, coats of arms, flags, and huge medallions bearing the names of victories. The two first

trophies are dedicated to Paris and her forts; the third to the campaign of Orleans and defeat of the Army of the Loire; the fourth to the victory of Le Mans and rout of the Western Army; the fifth to that of St. Quentin (Amiens), which was followed by the dissolution of the Northern Army; the sixth to Pontarlier, which drove the Eastern Army over the Swiss frontier.

The Brandenburg Gate, with its extensive centre arch and smaller side-colonnades, is entwined with garlands of fir, the symbolic tree of Germany. Just at this season the young shoots are all fresh, and in their bluey-greenness contrast pleasantly with the dark bottle-green of the old branches; and as the fir is the favoured tree so the blue cornflower, "*korn-blume*," is the favourite flower; branches of it are seen everywhere,—in bouquets, button-holes, hands, hats, bonnets, and everything.

The Pariser Platz, inside the Gate, contains the greatest mass of display. The handsome tribunes raised all round give it the appearance of a large amphitheatre; and their gracefully-arranged draperies of scarlet cloth, garlanded with festoons of fir and oak, have an admirable and quite Classic effect. The tribunes are backed by flags of all colours and designs, which flutter gaily in the wind; the French Embassy alone, with its unadorned façade, closely-shut faded green jalousies, and looking utterly lone and deserted, by its sad and silent exterior, seems to offer a reproachful protest against all this gaiety and rejoicing. But be it ever remembered, Germany was forced into the war. The cruel work was thrust upon her, and she would have been wanting in honour, as well as in common sense, if she had refused to do that work. She has done it, bravely and well. She has done it, too, with less ferocity, less suffering to the conquered than almost every other nation would have inflicted. How France would have conducted herself as victor, let her former dealings with these same Germans, let her tender mercies to her own sons and daughters during her late grievous civil war, show! Still, she is a great nation, and our sympathetic sorrow for her sufferings, her mistakes, and even her faults, needs must rise up, even while we accord to the noble people whose hard-earned triumph we have come to witness, the well-deserved meed of our admiration, may, our love and esteem. I have often thought the true secret of the Germans' success is well defined in one line of their patriotic war-song,—"The Watch on the Rhine":—

"The Germans honest, pious, and strong;"

these qualities they undoubtedly possess, and they form an excellent foundation for a national character.

To return to the Pariser Platz. In the tribune nearest to the Gate the sixty young ladies are to be accommodated who will crown the victorious heroes as they pass beneath it. They are to be robed in white habiliments fashioned like those of Marguerite in Göthe's "Faust," and will wear their own hair in plaits hanging down their backs, or bound round their heads. The speaker is Fräulein Blesser, daughter of the sculptor, Professor Blesser. Each warrior will receive on entering, in addition to the laurel wreath of victory, a small sum of money and a little book containing the official war-despatches. Opposite the Gate, and at the beginning of the Linden Avenue, is placed a crimson velvet baldachino, as it is called, supported by four gilded columns, 45 ft. high, and surmounted by large "Victories." Under this hangs a huge iron cross, beneath which the troops will march between two gaily-decorated and gaily-filled tribunes. On each side of the Linden, French cannon and mitrailleuses,—700 in all in the avenue alone,—are placed, and amongst them intervals are tall standards and low Roman altars, formed of plaster, over a core of wood coloured and gilt. The altars are to have inscribed upon them the 191 official war telegrams; the standards are surmounted by a vase or tazza intended to hold a flare of gas, representing antique pots of fire, and all are decorated with wreaths and garlands of fir, entwined with knots of ribbons, black, red, and white, the colours of United Germany. The Prussian "colours" are black and white, and where the alone are used,—and in the profession in which Berliner rejoices,—the effect is most lugubrious, suggesting much more the idea of sorrow than of rejoicing.

At the junction of each of the five side streets which cross the Linden, two tall fluted columns

* See pp. 540, 593, ante.

are erected, only temporary ones, but they have an excellent effect, being of admirable proportions, painted white, and their salient lines gilded. Each pair of columns supports a gigantic picture, illustrative of the civic and military patriotism which enabled Germany to carry on the war; the motif for each picture being drawn from one authentic utterance of the then king, and verses in illustration are placed on the back. The pictures are by well-known artists, such as Verner, Heyden, Schaller, Ewald, &c.; the verses are by Herr Eggers. I have omitted to say that every gun bears on it the name of the place where captured, roughly painted in white. The double row of guns extends through the Brandenburg Gate, down the Königgrätzerstrasse, a distance of at least one mile and a quarter: so there are here alone two miles and a half of guns; but it must be remembered these are only a portion of the small guns, the large ones are placed in the different arsenals, and are distributed among the various towns all over the empire; 5,988 guns, including mitrailleurs, were captured in all.

At the east end of the avenue, the space immediately around the statue of Frederick the Great is filled with flowering plants in pots; the whole of the Opera Platz is surrounded with beautifully draped and decorated tribunes; the palaces are perfectly veiled by flags, inscriptions, and trophies; on the left stands the Royal Academy of Arts, the front of which is hung with life-size portraits of the principal directors of the war, including princes and grand dukes, Bismarck and Holke. These portraits are painted on gold ground, and are by the first artists in Berlin, to wit—Menzel, Oscar Begas, Richter, Friedrich Paulbach, Becker, Steffisch, &c. Though necessarily somewhat sketchy, these works are very realistic, and extremely rich-looking and effective. I inquired what was to be done with these portraits when removed from their present temporary position, and was told, if I remember rightly, that they would be placed in the Historical Museum.

And now, worthily terminating this true *via triumphalis*, there remains alone to be mentioned the Colossal group of Germania, with "Elises and children" (Alsace and Lorraine). The whole is about 70 ft. from the pavement; the circular base is 30 ft. in circumference, and beneath it allegorised the principal German rivers. The adjoining group was entrusted to Professor Albert Wolff. This appeared to us too gigantic; female rivers, even when allegorical, always lose in size and beauty what they gain in size and power; but of Herr Simering's beautiful forcible (these running round the circular base, there are but one opinion, namely, that it is the most successful and admirable rendering of a grand and noble ideal. In the front, a herald in livery and plumed cap is seen, trumpet in hand, proclaiming the war and its cause, and summoning all Germania's sons to assemble beneath his banner and repel the invader. Right and left of him is depicted the ready obedience with which the summons is obeyed: the student seizes from his books; the smith turns from his anvil and buckles on his sword; the painter leaves his easel; the sculptor puts down his mallet and chisel; the tradesman turns from his merchandise; and the father lifts his babe from the mother's arms, and with a wistful glance into that mother's tearful but brave eyes, prints a kiss on its dimpled face; and then, with sword upraised, as if taking the solemn oath, *Mit Gott für König und Vaterland*,* they crowd around the herald, eager to be led forth to defend their much-loved country, ready either to conquer or to die!

And now the eventful hour of triumph has arrived; the Linden trees are already swarming with men and boys; balconies and tribunes are filled with eager gazers; roofs, where practicable, are crowded, and where not practicable from outside, heads and half bodies of men and women, rise up through them, out of large holes made for the occasion, by ripping off the tiles, and uncovering the rafters, thus leaving open spaces. Yesterday we saw at the royal stables a long row of these big, square holes; a portion of the roof, about 30 ft. long by 8 ft. or 9 ft. broad, having been stripped to the rafters. Deputations from all the various trades begin marching past, carrying banners bearing their arms, and the representations of their craft; and each is accompanied by its band, mostly very bad, and frequently clashing with the preceding or following one. A well-trained military

or civic band (I cannot see which for the trees) is seated at the foot of one of the tall columns close by, and every now and then treats us to something infinitely superior. And now tremendous hurrahs ring out, as several large vans, with covering at top, but open at the sides, drive slowly by. These vans contain many hundreds of the invalid soldiers, some with an arm bandaged, or a head tied up, and each van carrying in its midst a pile of crutches decorated with wreaths and garlands. The invalids were to have been seated along each side of the Linden, but another, and, I suppose, more appropriate, position has been found for them and their nurses. Many of the wounded soldiers are crowned with wreaths—doubtless presented to them on their route; there is one carriage full of wounded officers; and this whole cortege elicits the greatest enthusiasm. It is quite a mistake to suppose Germans do not shout: many of the volleys of "hoor-r-r-rahs" we heard would in nowise have disgraced a ship's crew of British tars when "manning the yards." During the war, too, I remember frequently reading that their wild "hurrah!" when charging, often demoralised the French raw levies before they even came within sight of their bayonets. The only difference between the German and English cheer is, the former sounds as if spelled with two o's, and half-a-dozen r's at the least.

More trades' processions pass; there is more music; and cheering goes on incessantly from one quarter or another, being redoubled as an occasional officer well known to the crowd rides by; and is quadrupled when the "Kronprinz," with a small but brilliant staff, gallops past towards the palace. In front of the cathedral the large platz is cleared of the populace, and kept by soldiers, some of whom stand about in glittering twos and threes, or sit on the lowest step of the still-veiled statue. At 10.30, vociferous shouts. The Emperor, followed by a gay-coloured, brilliant staff of some fifty or sixty officers, including the Prince, —*Unser Fritz*,—rides down the Linden towards the Brandenburg Gate. Ten minutes afterwards an open carriage, drawn by six dark horses and attended by mounted escort and servants, driven by it contains the Empress, all in white,—so far as I can see,—accompanied by three ladies. Prolonged cheering. But the heartiest of the acclamation was reserved for our English Princess Victoria, consort of the Imperial Crown Prince Frederick William. The Princess appeared to be as great a favourite in Prussia as she was in England; and her husband, who is spoken of in the most loving terms as the type of excellence and amiability, and as perfectly devoted to,—nay more (but let it only be most gently whispered), as being positively even ruled by,—his little wife, seems to be the very idol of his future people. How such a tender-hearted, kindly-natured man could ever have been transformed into the brilliant hero of the French campaign, must remain a mystery; surely nothing less than a most exalted sense of a supreme duty could have wrought this wondrous change.

Thirteen carriages in all, most of them with six, some with four, and two with only two horses, drive by in quick succession; their appointments unimpeachable and the horses magnificent.

The weather is very bright and hot, but now merciful little clouds are flecking the blue sky and giving rest to the sun-blinded eyes of the spectators facing south; fortunately for us, the Hotel St. Petersburg stands on the shady side of the Linden; but our *vis-à-vis* must be fearfully scorched. Still, sunshine is far preferable to the deluge of rain the Berliners anticipated, and were actually suffering from, three days ago.

The bands of music play alternately and continuously; the tune most frequently heard is, of course, the "Wacht am Rhein;" but this is now and again varied by our National Anthem, possibly out of compliment to the English Princess, and another melody very similar to it, and which from the frequency with which it is everywhere heard, is, I presume, a German national air. At 11.30 the carriages full of ladies return; the Crown Princess is looking bright and animated, and her green dress is particularly becoming. They have doubtless been out to the Tempelhofer Feld to witness the parade of the troops held there by the Emperor, and which commences the day's ceremonial. Now the excitement redoubles, and about twelve o'clock, Field-Marshal Count Wrangel rides by, heading the procession of victorious troops,—surely, a proud position, yet he looks as calm and placid as if taking an ordi-

nary *spazier-ritt*. Behind him come the late Staff-Commanders, Von Blumenthal, Von Podbielski, Von Stosch, and Von Stiehl; then more generals and officers; then Herwarth von Bittenfeld, Vogel von Falkenstein, Von Bonin, von Rosenberg-Gruszyński, and the Saxon War-Minister's Lieutenant-General, Von Fabrice, from St. Denis. Next pass three notable men, Prince Bismarck, Count von Moltke, and General von Roon.

I understand the Emperor waited a few seconds behind, in order to allow these three tried and trusted servants of himself and his people to receive from the lips and hands of that people the acclamations and applause they had so well and so hardly earned: if so, it was a graceful act, a kindly German thought, and, from all we hear, just the sort of thing William I. would do. But the welcome accorded to the chancellor, the chief of the staff, and the war-minister in no way detracted from that reserved for their master, and when His Majesty the Emperor and King rode slowly by, bowing and smiling to all, the wondrous "hoor-r-r-rahs!" that rolled along the line of route, the wravings of handkerchiefs and hats, and the showers of garlands and evergreens scattered before him, made a triumphal ovation that must, indeed, have deeply stirred the religious poetic soul of the noble, sturdy old man. A German in our room said, with such affectionate enthusiasm, as the Emperor passed by, "Nice old man!" as if he loved and revered him like a father. On his head he wore what I took to be a very much ornamented helmet; but I have no doubt the ornamentation consisted of the golden wreath of victorious bay with which, I hear, he was presented on entering the city. I was too much occupied in studying the venerable but vigorous face to note very clearly what was above it. He looked calm and contented.

Immediately behind the Emperor rode the three field-marshal princes, all abreast,—the Crown Prince Frederick William, Prince Frederick Charles, and the Crown Prince Albert of Saxony; then followed the regimental band; and then came, carried when possible by the men who captured them, the eighty-one war trophies taken from the French: the flags, eagles, and standards. As they came in sight, and it was the only one time throughout the whole of our three weeks' stay that such a feeling manifested itself, wild, maddening cheers burst forth from thousands of many throats, which sounded to me like a mixture of triumph and defiance. On such a day German nationality must be allowed a little self-glorification; but to the eyes of neutrals these flags were a touching, painful sight. Many of them were weather-stained and time-worn,—all the more sorrow to their owners to lose them; but some were quite new and fresh. Possibly the latter had belonged to Gambetta's hurried levies.

The troops who form the "entry" number 42,000, and are composed out of the corps of Guards, a combined battalion of King's Grenadier regiments, a combined battalion of the whole army, a combined squadron of the whole army, and a combined battery of the whole army.

The corps of Guards precedes, commanded by Prince Augustus of Württemberg, and Major-General v. Dannenberg. The 1st Infantry Division is under Lieutenant-General v. Pape. It contains: 1st Infantry brigade, under v. Kessel, composed of 1st and 3rd Foot regiments, Oberst v. Bohn and v. Linsingen; 1st combined battalion, Oberst v. L'Estocq; and a Jäger battalion, under Major v. Arnim. The 2nd Infantry brigade, under v. Medem, composed of 2nd and 4th Foot regiments, under Graf v. Kanitz and Oberst Neumann; Fusilier regiment, under v. Papstein; 1st and 3rd Pioneer companies; No. 1 Sanitary detachment; Hussar regiment, v. Hymmen; 1st combined squadron, v. Alvensleben; 1st Foot detachment of Artillery corps.

The 2nd Infantry Division, Lieutenant-General v. Badritzki, contains: 3rd Infantry Brigade, General Knappe v. Knappsdt, composed of Kaiser Alexander's Grenadier regiment No. 1, v. Ziemer; 3rd Grenadier regiment, Königin Elisabeth, under v. Sommerfeld; Schützen battalion, under v. Bölsiger; and the 4th Infantry brigade, under v. Berger, composed of Kaiser Franz Grenadier regiment No. 2, v. Wangenheim; 4th Grenadier regiment, Königin Augusta, v. Rosenberg-Lescinsky; 1st Battalion Königs Grenadiers (2nd Westphalians) No. 7, under v. Berken; 2nd Pioneer company; Sani-

* With God for King and Fatherland.

tary detachment No. 2; 2nd Uhlan regiment; 3rd Foot detachment of Artillery; and 1st combined battery, under Major Korber.

The Cavalry Division, under Lieut.-General Graf v. der Goltz, is composed of the 1st cavalry brigade, under the 1st Graf v. Brandenburg. It contains a regiment of Body Guards, under Oberst v. Kroesigk; and a Cuirassier regiment under O. Freiherr v. Brandenstein. Of the 2nd cavalry brigade, under the Prince of Hohenlohe-Ingelfingen, which contains the 1st regiment of Uhlans under O. v. Rochow, and the 3rd Uhlans. And of the 3rd cavalry brigade, under the 2nd Graf v. Brandenburg, which contains the 1st and 2nd dragoon regiments under v. Brozowski, and v. Zedlitz-Leipe.

The Artillery corps, Major-General the Prince of Hohenlohe-Ingelfingen, consists of the 2nd foot detachment of the artillery corps; the horse detachment of ditto; deputation of munitions and pontoon column; the train, and various deputations from different departments, such as the field-telegraph, the field-railway, the field-clergy, the field-post, and the marine: the latter sending one officer only of every rank and twenty sailors.

We particularly remark what fine sturdy fellows all the soldiers are; they may be "picked men," but 42,000 such are a good picking. They march firmly and regularly, with great rapidity and a springiness in the step. Frequently they rush past at an immense speed; and, when they suddenly stop, each man is in his place, and there is no huddling nor confusion. Many of them, possibly all, have a long leather strap under the rifle, fixed at each end, forming a loop which they pass beneath the arm, and thus sling the gun, as it were, at times; and this plan seems to afford much rest and ease. Whether cavalry or infantry, they pass along to-day six abreast; yet the marching by will occupy four hours.

Several of the German flags were shot almost clean away from the nail-studded staff, leaving only the cords and tassels remaining; others were much tattered, having large holes through them, and great pieces missing, while two of them were mere ribbons of bunting. The victorious troops were not only crowned with laurels, but some of them were half hidden by a mass of green, and each wore a small ring of laurel on his sword-hilt. One cavalry-soldier, failing to catch a wreath that was thrown to him from just before our windows, stooped a little from his horse, as he rode along, and with the point of the drawn sword he held in his hand lifted the circlet from the ground, and, raising his sword aloft, carried it triumphantly away with him, to the intense delight of the applauding crowd. It was a most graceful feat, reminding of ancient Greek sports.

Close to our hotel, one of the side streets above-described crosses the Linden, and, as will be remembered, a couple of lofty columns, supporting a large picture, stand beside each crossing. As the troops arrived in front of these pictures they suddenly stopped, whether infantry, cavalry, or artillery, raised a tremendous cheer, presented arms, saluted them with their swords, and the Uhlans with their pennon-adorned lances, waving them in the air, and then passed triumphantly beneath. Later in the day this act produced a singular representation of "a charge," when the myriad feet of men and horses had pounded up the friable surface of the Linden into a thick layer of white dust, which rose in clouds under the shock and sudden stoppage of the heavy artillery, following and partly obscuring the soldiers as they galloped away.

On the Opera Platz the troops have collected that are to "assist" at the unveiling of the statue. As others ride up they file off right, and left to their barracks, after being reviewed by the Emperor, who distributes medals and decorations among them. The "iron cross" is the special award for this war, and (unlike the tardy gratitude of our own country, which occasionally waits so long that many of the intended recipients die ere they can obtain the coveted reward of their labours) it is given as soon as possible after the performance of the noble deed it is destined to commemorate. As will be remembered, a distribution of the iron cross was held by the Crown Prince while at Versailles, standing at the foot of the statue of Louis XIV., on the 26th of last September. The cross is in the form of the Maltese cross; is of iron, with a narrow border of silver; bears on the obverse a crown, W., and 1870; and on the reverse a crown, with F. W. below it, three oak-leaves, and

1813. The ribbon is black, edged with white. This cross we have seen on the breasts of mere youths as well as of older men. But now the ceremony of unveiling the statue of William III. is proceeding. The French trophies are laid on the steps of the surrounding platform; military drums beat "to prayers"; the cathedral choir sing some hymns; the field priest of the army, Thülen, makes a short prayer; drums sound again; the Chancellor prays the Emperor to allow the statue to be uncovered; he assents, and down slides the obscuring veil; flags and standards wave; soldiers present arms, shouting "hurrah;" the bands play "Hail to thee in Victory's crown." Then the booming of 101 cannon is heard, and every church-bell in the town joins in the chorus; afterwards the grand choral "Now let all men praise the Lord," is sung, and all is over. And thus ended the grand triumphal entry of Germany's victorious troops into Berlin.

I must postpone, till another occasion, the account of our evening experiences, the illuminations and so forth, as this paper has already extended beyond its intended limit. The number of troops forming the *cinquus*, was 42,000; and on the last page of the Fest-programme, a modest-looking little publication filled with remarkable facts, is a closely-printed column, from which I deduce the following particulars:—

Engagements fought during the late campaign.....	81
Prisoners taken.....	445,799
Cannon captured.....	5,317
Mitrailleuses.....	171
Eagles.....	69
Flags.....	20

R. F. H.

HUGH MILLER, STONE MASON.

We cannot permit the opportunity with which Mr. Peter Bayne has just supplied us to pass by, without giving our readers some account, however brief, of the late Hugh Miller†. His name is very popularly known in his native county. Originally, and for long, a stonemason in Cromarty, he turned out in after years to be one of the most distinguished geologists which Scotland had yet produced; and in addition to this he also rose to almost equal eminence as a journalist. In this latter capacity he excelled as a political writer, a theologian, and even, we believe, as a poet, although these are certainly qualities of rare combination with those of the field geologist, or the scientific handworker of any kind. But Hugh Miller seems to have possessed that universal taste and aptitude for literary work which are calculated to make a man, and particularly a hard working and persevering north countryman, excel in almost any department of life.

It appears that he sprang from a family of mariners, but he had the misfortune to lose his own father by a storm at sea, when he was a little boy of five years of age. From this cause he had to be reared by two of his maternal uncles, one of whom gave him a taste for traditional lore, and the other for natural history. He seems on the whole to have acquired a fair English education at the Cromarty parish school, of which, by the way, he many years afterwards gave to the world a graphic account in a book entitled "My Schools and Schoolmasters." His chief course of reading, as we might be prepared to expect from his literary tastes, lay among the great English essayists and prose writers. In another book which he published nearly thirty years afterwards ("The First Impressions of England and its People"), he shows very strongly his loyal allegiance to his early masters by describing his pilgrimages to their tombs; together with the necessary and appropriate moralising thereby induced. This work, although a good deal mixed up with geological jottings, is probably one of the most interesting books he ever wrote; and if any one wishes to get an accurate glimpse of the author's mind in short compass, we commend it to his perusal.

He worked as a journeyman stonemason from his seventeenth to his thirty-fourth year,—a long apprenticeship, if we may call it so, to one of the most laborious of handicrafts; and it was during this period that he found time to carry out those famous researches into the palæontological character of the old red sandstone with

which his name is now inseparably identified. Nor did he fail to prosecute his literary studies. He found time to publish a volume of poems, in the year 1829; and a few years afterwards he produced his interesting "Scenes and Legends" of the North of Scotland.

After giving up the mallet and chisel, he seems to have settled at Linlithgow, as a clerk or assistant in the local branch of a Scotch bank. And it is a singular circumstance that in this situation it fell to his lot to perform his last piece of stone-cutting work. The occasion, although interesting, was melancholy; but we must leave his biographer and his widow to tell the story. It is one that comes home to the business and bosoms of us all; and, indeed, it seems to illustrate so well the deep emotional nature, and to foreshadow so truly the strange erratic idiosyncrasy which eventually led poor Hugh Miller, under a fit of intellectual aberration, to put an end to his own existence, that we venture to transcribe the passage:—

"The cup of Miller's happiness was full [says Mr. Bayne] when a little daughter began to smile upon him from the arms of her mother. All gentle helpless things he loved with a passion of tenderness, and his affection for his own little prattler was inexpressible. He observed her movements with ever fresh interest and charm. 'My little girl,' he wrote once, 'has already learned to make more noise than all the inmates of the house put together, and is a present deeply engaged in the study of light and colour. She is still in doubt, however, whether the flame of the candle may not taste as well as it looks!'

"One lovely evening in April" [writes Mr. Miller to the editor], 'I went out, for the first time that spring, to breathe the air of the hill. When returned I found the child in her nurse's arms, at the attic window, from which she used to greet her papa when he came up street. She had been planting a little garden in the window sill, of polyanthus, primroses, and other spring flowers. When she saw me she pushed them away, with the plaintive 'awa, awa,' she used to utter, and laid her head on my breast. An internal tremor came on. The next time she looked up it was to push my head backwards with her little hand; while a startled, inquiring, almost terrible look came into her lovely eyes. All the time she lay, which was three days and three nights, her father was prostrate in the dust before God in an agony of tears. Whether he performed his daily bank duties, or any part of them, I do not remember. But such a perspicuous David the King, at a like mournful time, is impossible to imagine. All the strong man was bowed down. He wept, he mourned, he fasted, he prayed. He entreated God for her life. Y when she was taken away, a calm and implicit submission to the Divine will succeeded, although still his eyes were fountains of tears. Never again in the course of his life was he so affected. He was an affectionate father, and some of his children were at times near death, but he never again lost thus the calmness and dignity, the natural equipoise, as it were, of manhood.'

This was the first and last poignant domestic sorrow [continues Mr. Bayne] Miller ever experienced. He cut the little headstone for his darling, and never again put chisel to stone. It is not necessary for us to enter at large on the subsequent well-known events of Mr. Miller's career. A few facts, however, we may condense. In the year 1840 he became editor (and subsequently part-proprietor) of the *Witness*, a quasi-theological newspaper published in Edinburgh, which has long ago been "swallowed up," as his friend Mr. Carlyle would say, "in the Hollow Eternities." It was during the year that he published his celebrated researches on the old red sandstone, for which exhausted monograph he was warmly praised and encouraged by Dr. Buckland, Sir Roderick M. Mieson, and other eminent geologists, at a meeting of the British Association. A period of severe and protracted illness followed; but long he was able to resume his pen in order to do those valuable services (ungratefully received, as it appears, by the leading clergymen as a journalist on behalf of the Free Church of Scotland, which that body, it may be hoped will for long remember. Gradually the philosophical schemes of his science and theology got combined; took also a wider scope; and accordingly, his latest work, "The Testimony of the Rocks," was an attempt to reconcile geology of the Pentateuch with the geology

* "Hell dir im Siegerkranz."

† "Nun danket alle Gott."

‡ "The Life and Letters of Hugh Miller." By Peter Bayne, M.A., 2 vols., Bro. London: Strahan & Co. 1871.

ture. It is needless to say that the attempt did not succeed; and the book, although magnificently conceived and eloquently written, failed to reconcile the wide differences at that period of the theological and physical schools of natural science. There can be no doubt that the severe toil of composing this book, added to the overwork of a long course of newspaper editing and partisanship, was the proximate cause of his unfortunate and untimely death. This occurred on the 24th of December, 1856, while still in his 54th year. His shattered body was buried in the Grange Cemetery, near Edinburgh, and his grave lies next to that of Dr. Chalmers, the founder of that celebrated theological sect in Scotland of which Hugh Miller was the most distinguished literary disciple.

THE CATHEDRAL AT ARUNDEL.

EXCLAMATIONS of surprise have been heard through the press touching the enormous building which is growing rapidly out of the ground, for the Roman Catholics, at Arundel, in Sussex; for are they to be wondered at. Arundel is but small place, best known by its Castle, yet there are hundreds of men at work, and thousands of pounds are being spent, in erecting a cathedral nearly 200 ft. long, and which is to have a tower and spire some 260 ft. high. The Duke of Norfolk, as we mentioned at the time the first stone was laid, is paymaster, and is doing what other proposed but did not perform. "Great monarchs have had great playthings. Some have played at hewing mountains into men," the Lord of Arundel seems determined not to be outdone, and Messrs. Myers & Sons, at any rate, must be very well contented with this determination.

RANSOME'S STONE FOR CAISSONS.

THE uses to which the siliceous concrete stone, invented by Mr. Frederick Ransome, is applied, are already numerous and varied, but the limits of its capabilities have not yet been reached, it could appear. The application of the concrete stone to the construction of caissons is the subject of an additional patent.

In some mining districts engine pits that are to be lined with ashlar are sunk by "travelling ribs." The crib consists of a strong cylinder of iron, chamfered on its under edge to the outside; the upper edge square, and broad enough, either in solid thickness or by a flange, to give a solid bed to the first course of ashlar, upon which there are superimposed, and the travelling crib sunk until the requisite depth is reached. The process by which the stone caissons will accomplish the same result is similar in some respects, but essentially different in others. The first section of the caisson, for instance, is shod with iron, and takes the duty of the travelling crib; for the rest there are no "courses" of ashlar, but a succession of cylinders, lowered one after another as the pioneer section descends, the joints tongued and easily made water-tight before the water-level is reached, in the case of all that follow those that have to be lowered, in the first instance, under the water-line.

It will be readily apparent that these caissons, provided that the material is of sufficient strength, are applicable to the construction of hydraulic works of various kinds. The cylinders having been lowered to the requisite depth, the process of filling with Portland cement concrete is sufficiently simple; and, inasmuch as the caissons may be lowered in any number, and according to any arrangement in relation to each other, piers, abutments, sea or embankment walls, of any required strength, may be constructed.

The application of Mr. Ransome's process to hydraulic construction has been suggested by Mr. J. W. Butler, of Willesdon, by whom, in conjunction with Mr. Ransome, the stone caissons have been patented. One principal object of the patent is to provide a cheap and efficient substitute for stone for hydraulic works, and another to obviate the necessity for false works, coffer dams and the like, and to secure a much less costly mode of construction than by iron cylinders and caissons.

The strength and quality of the material to be employed in the construction of these stone caissons is, of course, a consideration of essential importance. As regards its quality and power to resist certain influences, an important report has been made by Professor Frankland, who has tested its comparative porosity, the

action upon it by acid, and by boiling. The water absorbed by dry specimens he found as follows:—Bath stone, 11·57 per cent.; Caen, 9·86; Portland, 8·86; Ransome's Patent, 6·53. Alteration in weight by immersion in 1 per cent. of acid,—Bath, 1·28; Caen, 2·13; Portland, 1·60; Ransome's Patent, none. Loss by three applications of acid, and by boiling afterwards,—Bath, 5·91; Caen, 11·73; Portland, 3·94; Ransome's, 0·63. Ransome's stone has also been subjected to the crucial test of being boiled and immediately transferred upon ice, without the slightest effect being produced. But its power to resist crushing weight is of greater importance than these tests. From a series of comparative experiments, it has been ascertained that granite has a power of resistance to crushing of from 8,000 lb. to 12,000 lb. per square inch; Portland stone, 2,630 lb.; Bramley Fall, 5,120 lb.; and Ransome's, 8,960 lb.

THE VICTORIA EMBANKMENT.

THE piece of land which has been laid out, and is already opened to the public, extends from the Charing-cross Railway Station up to Waterloo Bridge, and forms a charming place of resort for the neighbouring residents and the public generally. There are entrances at each end from the embankment, and one from the Strand in the street next the railway-station. Inigo Jones's ruined water-gate, though in a hole and defaced, forms an interesting feature. Turfed slopes shut out the arches and low buildings under Adelphi-terrace, the houses of which, by the way, are rendered pleasant residences, overlooking as they now do the new gardens and the river. Other plots on the embankment are being laid out, and probably for the public. The statue of Outram, for which a site has been found here, appears to be finished, and stands in its shrouding-sheet ready for formal display. Lamp-standards are being set up on the embankment-wall after Mr. George Vulliamy's design (with dolphins at the base), and have a very good effect. The design has been considerably improved since the original model was set up.

COMPETITIONS.

Bromley (Kent).—The committee appointed for the erection of additional schools in this parish, a short time since invited designs from architects in limited competition. The invitation was accepted by Messrs. J. P. St. Aubyn, W. C. Banks, W. Barrett, A. C. Bean, Clarke, H. Lovegrove, and G. Truefitt. One of the designs marked "Utilitas" (Mr. H. Lovegrove) was preferred, we are informed, by some of the committee, but the estimate was rather in excess of the sum at disposal, and the design of Mr. Banks was selected for execution.

Ashton-under-Lyne.—The guardians of the poor determined to erect a new female hospital close to the workhouse, and invited five local architects to send in plans. The successful competitors were Messrs. Healey & Hall, architects, Ashton-under-Lyne. The estimated cost is 4,000*l.*

A NATIONAL THEATRE.

A PRELIMINARY meeting, or rather conference, was held on Monday last, and a considerable number of gentlemen interested in the drama were present. Opinions were exchanged, and some valuable information was elicited. A resolution was passed declaring the desirability of establishing a theatre for the production of pieces of the highest class, and a committee was appointed to consider what steps should be taken with the view of testing the practicability of the scheme.

"The play's the thing."

SIR,—I have read the letter in the last number of the *Builder* with much interest. It is practical and severe, but not too much so. Financially, I regard Mr. Godwin's suggestion as the best of those put forth; and if a properly-organised meeting on the subject were convened, and the right people got together, "The National Theatre" would soon become a thing of life.

A theatrical company, on the principle of a commonwealth, as suggested by Mr. Arthur Skemchley, I have no faith in. Mr. Reeve, too, distinctly urges a theatre company. Mr. Godwin aims at something far higher,—a society, whose

object would be the maintenance of the legitimate drama, and the establishment of the means of supplying the necessary talent for carrying out the object, in an educational point of view. These are sterling and substantial points, which would induce many guarantors to come forward with the means of supplying a fund in the way suggested. The guarantors might be remunerated for their capital at a fixed rate of interest out of profits (if any); or, in lieu thereof, they might possess the privilege of *entrées*, in sections, on certain evenings of the week; such privileges to be interchangeable amongst them, at will.

In such an undertaking it would be a great point gained if some portion of the receipts of the house could be guaranteed and paid up at the onset; and I think it would be quite possible to effect this by pre-letting a portion of the dress-circle and stalls, by the issue of annual tickets, transferable and available for certain nights only, in order that the holders might have an opportunity of witnessing each production of a play on several occasions. Such tickets might be issued at reduced prices, and the result, while being productive of a certain amount of paid-up money, would nightly insure an audience in the best parts of the house. At the same time, care would have to be taken in the issue of such tickets that the privilege of entry as regards number should be limited nightly.

P.

OPENING OF DORKING COTTAGE HOSPITAL BUILDING.

THE movement for the establishment of cottage hospitals throughout the country has extended to Dorking, and has been successfully carried out. Mrs. Hope, of Deepdene, gave a piece of land, near St. Paul's Church, as a site for the building, and augmented the gift, valued at 250*l.*, by the gift of 250*l.* in money; and this was supplemented by a gift of 1,000*l.* from Mr. Cubitt, M.P. Other subscriptions came in, and the proposal for a cottage hospital soon became a reality. Mr. Graham Jackson, architect, of London, supplied plans, from which the building has been erected by Mr. William Shearburn, of Dorking, contractor. The building contains accommodation for eight patients, three wards being set apart for that purpose, with nurses' wards intervening. There is also a dispensary for out-patients. The wards are lofty and well-ventilated. The basement contains a kitchen with scullery adjoining, larders and cellars for ale, beer, wine, &c. On the ground floor are several rooms used for the following purposes, viz., surgeons' room, to serve as an operating room and as a committee room; an out-patients' waiting-room, with enclosure forming a dispensary; the latter is fitted up with polished birchwood fittings with brass mountings; this room also contains water supply and waste sinks, &c. There is a ward for two men, and a nurse's room adjoining, with speaking-tubes to all parts of the building. A staircase of convenient steps leads to the first floor, which consists of a large convalescent-room, a ward for two women, and another nurse's room adjoining; above this floor are some useful rooms in the roof which could be used as wards if required. On each floor are bath-rooms, W.C., and patent ventilating sinks. The exterior is designed in an extremely simple style.

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-fourth annual meeting of the subscribers and friends to this charity was held on Thursday afternoon, at Willis's Rooms, Mr. Alfred J. Mansfield, the president of the Institution, being in the chair.

The report, read by Mr. A. G. Harris, the secretary, stated that the funds of the Institution remained in much the same state as heretofore. The first election of pensioners took place in November, when one man and one woman were elected to the benefits of the Institution; and the second in May, when a similar number were chosen. In addition to this, three of the widows of deceased members,—Mrs. Budd, Mrs. Hambrook, and Mrs. Lambert,—were, in accordance with the rules, receiving the widows' pension to which they had been respectively entitled by election from the time of their husbands' deaths. At the close of the last election, Mr. J. Waldram, of the firm of Hill, Keddell, & Waldram, presented a cheque for 12*l.* 12*s.*, to be divided between the unsuccessful candidates highest on the list of votes.

The names of the pensioners elected in November, 1870, were Mr. B. Johnson and Mrs. M. Morgan; in May, 1871, Mr. William Peters and Mrs. H. Proctor. The names of the pensioners who had died since the last report were Messrs. H. Budd and S. M. Hambrook, and Mrs. Garrod. The addition to the funded property of the Institution, in Three per Cent. Consols during the year, was £137. 8s. 8d.; 214l. 9s. 5d. stock for the relief fund; making a total of 15,389l. 3s. 7d.—12,137l. 15s. 1d. for the relief fund; and 3,251l. 8s. 6d. for the building fund. The report concluded with an earnest appeal to the committee and friends not to relax their endeavours in supporting an institution which had conferred on the helpless and necessitous members of the building trade such incalculable benefits.

The secretary next read the balance-sheet, which showed the receipts to have been 2,251l. 15s. 4d., and the expenditure to have left a balance at the bankers' of 425l. 13s. 3d. The report and statement of accounts having been adopted, votes of thanks were passed to the patrons of the Institution, the presidents, vice-presidents, the trustees, directors, the treasurer, to Mr. Joseph Bird for his services at the last ball, to the auditors, and the honorary solicitors.

Mr. Bird mentioned that the Tile and Brick-makers' Society were prepared to place some of the accommodation afforded in their almshouses at Ball's Pond at the disposal of the Builders' Institution for the use of some of their pensioners if the directors were prepared to accept the offer.

The matter was reserved for the consideration of the Board.

A vote of thanks to the chairman closed the meeting.

ST. BRIDGET'S, WAVERTREE, LIVERPOOL.

SIR,—I beg to draw your attention to a notice given in the *Builder* of July 15th, in relation to the twenty-one clerestory windows in stained glass for the above-named church. Mr. E. A. Heffer, the architect, is there credited as being the designer of the said windows, which I beg positively to assert was not the case. The idea of carrying out the twenty-one clerestory windows in the way in which they have been executed emanated from me; the designs and cartoons were made by me; and the entire work was executed under my personal supervision and control.

In justice to myself, I trust you will kindly insert this letter. I enclose proofs of the truth of my statement.

CHARLES A. GIBBS.

HEALTH AND ART IN LIVERPOOL.

At the closing meeting of the Liverpool Architectural Society, the president, Mr. H. H. Vale, read an address. He said,—That Liverpool is becoming daily a more stately and noble place none dare deny; that she is becoming a more healthy place statistics disprove,—the highest death-rate in England, alas! How this reflection seems to dash all one's exultation and town pride at once to the dust! No doubt, we have all thought seriously over the matter, and are anxious to aid the work of finding out a remedy for such a lamentable state of affairs. The early sanitary engineers seem to have considered, when they had once obtained their necessary gradients and outfalls, the whole matter of town sewerage was satisfactorily accomplished. Those volatile gases which lurk in the close sewer-chambers underground, ever ready to spread disease at the bidding of the winds, the tides, and the over-heated atmosphere, were not considered as calling for any precautionary measures at their hands; and so it comes that we now have the sewer gases and deleterious vapours roaming about with deadly stealth,—some too subtle indeed to be detected by the sense of smell; and others, though they be detected, not considered as more dangerous than ordinary farmyard exhalations; and so cholera, typhus, and small-pox go on reaping their great harvests among the people; bad air in the dwellings of the more indigent, depressing the nervous system, and driving them to vicious courses for excitement. It is a curious fact, that in Liverpool the recent ravages of small-pox should have been so virulent in the districts of Kirkdale and Everton, but any one going to the brow of Everton Hill, or sunbathing around the Audley-street Water-works, when the temperature happens to be a little higher than usual, will, if he have any sense of smell, experience most unmistakable traces of these sewer gases and exhalations in the air he breathes; and I do not hesitate to affirm that the deleterious vapours engendered in Yaxhall Ward and the lower regions of the town ascend,

according to the immutable law which they obey, through the sewers to the highest parts of Kirkdale and Everton, there exhalving by the grids, to be drawn into the system through the respiratory organs; and until sufficient attention be paid to the proper deodorising and trapping of sewers, such must continue to be the case. It is my opinion that the whole sewerage system of the town should be divided into sections or areas, and all communication between the various portions cut off. I would have a number of large charcoal filter-pits constructed to purify the sewage before fermentation sets in, one in each district, so that the purified water from the various centres only should be allowed to commingle; thus a valuable measure might be produced that would soon reconquer the authorities for the small expense of constructing and emptying such purifying-tanks or filter-beds. This measure could be removed, as proved by experience, without the slightest inconvenience, at any time. The charcoal-baskets, which are, we are told, placed in many of the sewer openings, merely to catch and neutralise the vapours as they arise, must necessarily be more expensive and less effective than such a method as I have suggested, which would prevent fermentation and the formation of those vapours that now do their deadly work in the hollow poison darts below our feet. I believe that the whole problem of sewer sanitation will be yet solved by the union of the wet and dry systems. The admirable paper delivered here by one of our vice-presidents, Mr. T. D. Barry, early in the session, has led me to touch primarily upon this subject. I notice that a committee has been appointed by the Liverpool Polytechnic Society to consider this great question in all its bearings, and I am sure our council would be most willing to co-operate with that society in this important work for the benefit of the community. Referring again to what I have said with regard to Everton, the ascending property of gaseous fluids may account for the statistics published a few years since tending to prove that low-lying situations were more salubrious for human habitation than the elevated sites. Be this as it may, the Everton fever and small-pox district smells most abominably of sewer exhalations, and calls for investigation by the sanitary authorities. The clay-pits being filled in, as they continue to be at Kensington by the corporation scavengers, to make building sites, will serve to augment the evil, while the notorious overcrowding of small houses in these districts, two or three families frequently occupying one four-roomed cottage, puts the *coupe-de-grace* on the mortality bills which make strangers avoid Liverpool as a plague-stricken spot; for assuredly neglect such as gives rise to these results will tell more and more against the reputation and the prestige of our town. It is quite certain that a great deal more will have to be done in the matters of sewage and scavenging before we take our proper place in the health returns. One of the leading errors of the present system seems to me to be the burying of our gas, water, and sewage pipes out of easy sight and reach, and requiring the thoroughfares to be taken up to get at them, and I much doubt if a perfect sanitary result will arise until we adopt some such system as that of Paris, and have our sewers and our gas and water pipes laid in subways, so that they may be examined and attended to without breaking into the crust of the thoroughfare at all; and when the tramway system becomes universal, as I doubt not it soon will, it is easy to foresee many difficult complications arising. The people must also become more alive to these matters, and feel the individual responsibility which should attach to every inhabitant. A growing hatred of dirt is one of the first essentials to an improved state of the public health. Each individual has much power of amelioration in his own hand. Let it be remembered that sewerage cannot be considered as self-acting in all its ramifications, but that it requires attention and watchfulness as much as the gas and water service, only the deadliness of its exhalations is more stealthy, and not attested by explosions or inundating torrents. The mischief, however, goes on apace and within the dwellings of the people, a mould of which mischief a little timely practical forethought might prevent even under the existing state of the public machinery, bad and inefficient as that machinery undoubtedly is. The sanitation of large populations, as I have asserted, will never become perfect till the people themselves, who have so much to do with its non-automatic details, are thoroughly aroused to the

importance of the subject; for it is only during the prevalence of a severe epidemic, and hundreds are carried off weekly, when even the homes of the influential are not exempt from invasion, that the first principles of sanitary science are discussed and commented upon by the public press. I say it is only under the pressure of some appalling visitation of fever, or cholera, or small-pox, the subject receives the slightest medium of serious thought. We ought, therefore, I think, to take advantage of such periods to impress upon all how much may be done by the aggregate by endeavouring to render each individual dwelling healthy by the free daily use of cheap disinfectants in each house, by which whole lines of drains might be purified. The timely removal of all sources of fermentation, by the admission of fresh air and the plentiful use of pure water,—by the practice, in fact, of such personal and household cleanliness the sanitation of the great aggregate population can alone be accomplished; and each one should recollect that no human system, however perfect, can be rendered entirely automatic, or independent of individual supervision.

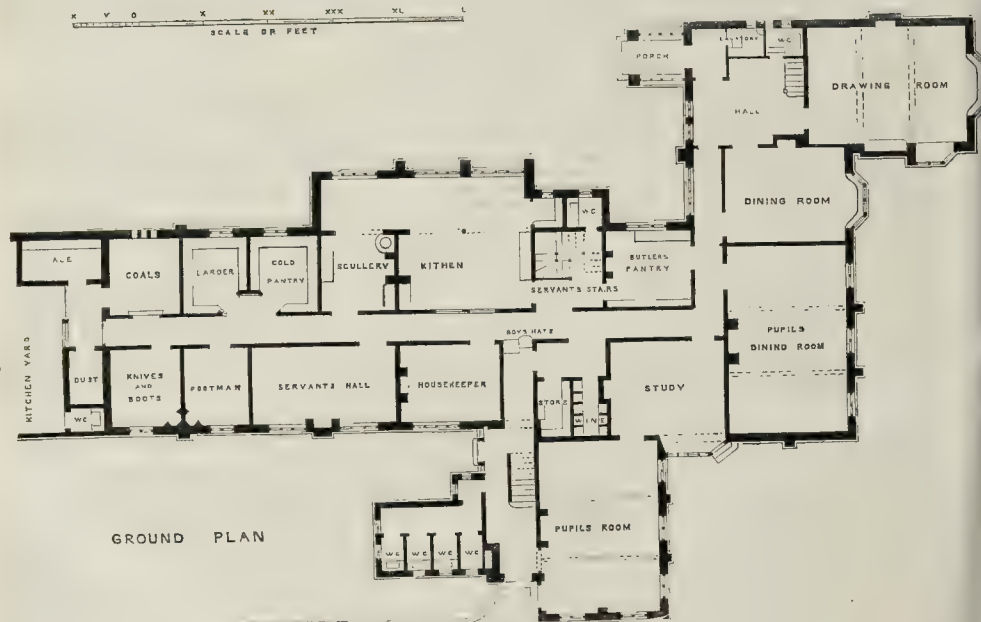
I will now, with your permission, touch upon one or two questions bearing upon art in Liverpool. Since the opening of this session, the statue of the Queen has been unveiled; and I wish I could speak in terms of unqualified praise of this work of an honoured sculptor, but I cannot. For my own part, I consider all exposed metal statues to be, in our northern climate altogether a mistake. If we wish to have public places adorned with such full-length statues, I would prefer to see them done in marble or polished bronze, enshrined beneath canopies, and protected by glass from the staining influences of the atmosphere, the sootiness of which soon fill up the lines, and makes the work of the best sculptor become nothing better than a hideous caricature. Poor Huskisson, at the Custom house, is, to my mind, a sad example of a costly and misplaced statue. But the question here arises, What do we want, in an age of intellect rather than of muscular prowess, with full-length undraped statues at all? They were, no doubt, in keeping with the spirit of other days when the fashion arose in Greece. Now, however, I would prefer to see nothing more than the face and bust of such as have served our loved people set up, on a colossal scale, in our public places, upon simple granite pedestals, so that the features we know and revere might still look down upon us, and become a continual presence to overawe, as with an almost godlike aspect, public life and manners out of all thing that are mean, or base, or selfish. Our present statues serve to excite public pity rather than regard or reverence. They are either placed altogether too high or made much too small to impress the mind with ideas of the heroic.

Looking around upon recent examples of church architecture, and comparing them with the old models, one is constrained to ask the question,—architecture be essentially a "joyous thing," recently defined, how are the church architects of the day fulfilling their mission? If it be a pleasant thing, how is the ascetic school furthering its hold upon the popular mind? Is our art no longer to speak in the national voice, and be the exponent of the heart impulses of English speaking men and women? Is it no longer to be English in its breadth and beauty, or is it to be dwarfed and narrowed to propagate sects and schisms? Is it to be written in cipher, or plain straightforward English, or made melodious by the swarming music of a nation's joy? Is it rhythm to be the cadence of exclusiveness, the glorious song of the liberated religious life of our land? Shall we continue to pander to the pet fancies of a self-laudatory Druidist striving to express by an effete symbolism meanings that require to be translated as diluted before the ordinary working intellect? Our day can compass them? Should we measure, by originality and vigour, give little to those who would endeavour to make us believe that architecture is altogether a thing of models, rubrics, and canons? We have little or nothing in the way of progress in church architecture to thank the clerical mind for. The man who will most closely conform to the particular development which is held to be representative in church arrangement, though all his designs be almost *à similes* one of another, finds much more favour with the clergy than the original designer who dares to consider the question of site and climate and materials, and other

The total cost, including conservatories and fittings, may be called 7,000%.



The Figures 1, 2, &c., mark the Pupils' Chambers.



HOUSE FOR MR. G. E. MARINDIN, M.A., ETON COLLEGE.



A MASTER'S HOUSE, ETON COLLEGE.—MR. W. WHITE, F.S.A., ARCHITECT.

J. W. B. & Co. del.

UTTING, ENGRAVING, AND BORING HARD STONES AND METALS BY JETS OF SAND.

A MORE detailed account than has heretofore been given of a process already noticed in the *Builder* has reached us.

Mr. C. Tilghman, of Philadelphia, engineer, as discovered that, with a jet of sand blown through a pipe by steam, at 300 lb. pressure to the square inch, he can make a hole in a solid block of corundum, an inch and a half deep and of the same diameter, in less than twenty-five minutes. Corundum is little, if at all, inferior in hardness to diamond. Mr. Tilghman turns upon corundum a pipe which discharges sifted sand, mixed with a furious squirting of steam; and he fine shower of particles thus flung, cuts a hole equal to the diameter of the jet, the same effect being produced in anything else submitted to the same process, thus effecting what is desired in a tenth of the previous time, and with exquisite precision. But the discoverer of the new engine has also found that so great a force as steam is not necessary for finer work, such as grinding or engraving glass, a blast of air being sufficient for this, by means of a rotary fan. The pipe is fitted with sifted sand, which the air takes up and whirled against the glass. It will thus completely depolish a surface moving past at the rate of 5 in. per minute, and the spent sand and glass-dust can be perpetually returned and re-employed.

By covering parts of the glass with any semitransparent material, such as paper, lace, caoutchouc, or oil paint, designs of any sort may be engraved. The articles which eat off the hard glass or stone are in vain upon the interposed medium; and so curious is this resistance, that even a green fern-leaf may be used, and the sand-shower will consume all but the parts thus covered, leaving the delicate pattern of the frond. Again, in that kind of glass-work where a sheet of one colour is superimposed upon another, the upper sheet may be partially protected by a paper stencil, while the parts left exposed are eaten or bitten away into the desired figures. The film of bichromatised gelatine used for photographic negatives may also be thus utilised for producing an engraving on glass or steel; and by a very simple arrangement the jet can be rendered movable and handled with an absolutely artistic freedom. So effective, indeed, is this principle of minute myriad tapping upon any exposed surface, that small leaden shot driven in the same manner bore a hole in the hardest quartz rock. The exhibitor of the new agent showed at Philadelphia a sheet of glass which had been perforated by the sand-jet, under a covering of wire-lace. The glass was turned, as it were, into a delicate square of blonde-lace, with meshes of $\frac{1}{16}$ in., and threads of $\frac{1}{32}$ in., a result unattainable by any other process.

When rougher work is called for the inventor employs the steam-pipe at high pressure, with forces of 125 pounds to the square inch. The sand, conveyed to the steam through a $\frac{1}{8}$ in. concentric tube, is sucked into the blast, and, being discharged upon a surface at 1 in. distant, will eat away per minute, with its tiny, but sharp teeth, $\frac{1}{16}$ cubic inch of granite, 3 cubic inches of marble, and 10 of soft brown sandstone. At a still higher velocity nothing can resist the sand-squirt. With only a limited pressure, in ten minutes, the inventor drilled a hole 1 in. long by $\frac{1}{4}$ in. wide, through a hard steel file, $\frac{1}{4}$ in. thick; and corundum is cut through almost like cheese.

Certain mechanical phenomena in connexion with this ingenious application of the commonest principles are especially curious. If, for instance, templates of brass or sheet steel be laid over the surface operated upon, they curl up, and, as it were, withdraw away under the impact of the sand-shower; hence, paper, gum, or even the delicate leaf of a plant, or the finest lace, is more durable or a shield. Fine lace will guard the glass from the sand, and leave its pattern accurately marked on polished lines and spaces, so that this new method promises in every respect to supersede the slow process of engraving by fluorid acid or by the emery-wheel.

Stone-carvers know that many hard materials, such as granite, are very much injured,—"stunned" is the technical phrase,—in the process of being hand-dressed. By the sand-squirt, however, everything is done neatly and perfectly, without any damage to the face of the material; and one would almost think that the Egyptians, who produced such admirable intaglios knew some process resembling it.

Where the sand and steam impinge upon stone under high pressure a red glow is visible, the result, it is supposed, of intense disintegrating action, like the flash of light which appears when heavy shots strike upon an iron target. An inquiry into the electric, calorific, and especially the diamagnetic stamp and relationships of the substance operated on might prove instructive as well as interesting.

It is needless to point out the many uses to which the new agent may be applied. Every practical engineer will at once see that, instead of a chisel, or stamper, or punch, or drill, perpetually to be renewed, he has here the idea of a cheap and exhaustless self-regulating and irresistible tool, which, with its infinitely industrial impact of atoms upon atoms, does a prodigious work, so to speak, microscopically.

THE EMPLOYMENT OF SURVEYORS.

SIR,—The committee appointed by the Council of the Royal Institute of British Architects to consider the question of "the employment of surveyors," in accordance with the resolution of the General Conference of Architects, 1871, having authorised us to collect from all available sources reliable information respecting the appointment and employment of surveyors in reference to building works, we desire to avail ourselves of the publicity of your columns to invite the attention of architects, builders, measuring surveyors, and all others interested in this important question, to the inquiry now being conducted, and to ask from them the immediate communication of detailed information as regards general principles or their own special practice.

We shall feel obliged by any communications on this subject being addressed to us at 7, Whitehall-yard, S.W.

ARTHUR CATES.
T. M. RICKMAN.

LONDON STREET TRAFFIC.

A FEW years since, Mr. William Haywood, engineer to the Honourable the Commissioners of Sewers for the City of London, presented an interesting report which contained, *inter alia*, details of the numbers of horses and vehicles that passed given points in the City in the course of a day, and at different hours of the day. We do not intend herein to recapitulate the statements in that report, but to supplement it by a few facts that have been collected in relation to the recent inquiries concerning the Tramway Bills that have been brought before Parliament in the current session. The supplementary facts relate to certain thoroughfares in the liberties of Westminster. In Oxford-street, west of Regent-circus, it was ascertained on the 10th of April of the current year, that from 8 o'clock in the morning until 8 o'clock in the evening, the following vehicles passed a given point:—Cabs, 3,265; spring carriages of other kinds, 2,218; omnibuses, 1,673; heavy vehicles, 639; total, 7,745. The cabs reached the maximum, 430, at between 3 and 4 o'clock, and other spring carriages, 333, in the same hour. Omnibuses touched their highest number, 182, for any single hour, between 10 and 11 in the forenoon. The largest number of heavy vehicles that passed a given point in an hour was 86, between 1 and 2 o'clock. In Oxford-street, to the east of Regent-circus, on the 22nd of April (Saturday),—the 10th fell on a Monday,—the cabs that passed a certain point in twelve hours were 3,936; carriages, 2,422; omnibuses, 1,511; heavy vehicles, 1,027; total, 8,896. The aggregate stream of vehicles were at their highest at the hour of noon, 12 to 1, when 931 passed the point of observation. The cabs reached to 415 from 1 to 2, carriages to 293 from 12 to 1, omnibuses to 153 in the same hour, and heavy vehicles to 112 between 3 and 4 o'clock. On the new thoroughfare, the North Thames Embankment, on the 3rd of April, 953 carriages and other light vehicles passed in the course of twelve hours, 452 vans, wagons, and other vehicles, and 392 cabs; total, 1,797. This is not, it will be borne in mind, an omnibus route as yet. On this road the largest number, 202, in any hour of the twelve, passed between 3 and 4 o'clock. The traffic over Westminster Bridge, taken at two periods, gives a result that could scarcely have been anticipated, showing, as it does, a very considerable decrease. In 1865, June 11th, an account of the traffic was taken by the police, from 6 a.m. of the 10th to

6 a.m. of the 11th: the total vehicles counted were 13,119. The Tramway Company's return is for the twenty-four hours from noon on the 1st of May, to noon on the 2nd, and gives a total of 12,223 vehicles, consisting of 4,221 light-spring carriages, 3,891 cabs, 3,418 slow and heavy vehicles, and 638 omnibuses. The greatest number of vehicles in both of the returns are represented to pass between eleven and twelve o'clock in the forenoon. It may be supposed that the opening of Blackfriars Bridge has had an effect upon the traffic over Westminster Bridge. In 1865 the omnibuses passing across Westminster Bridge were 553; in 1871 the number was 638; the cabs in the earlier year were 5,110, in the later 3,851; the miscellaneous light traffic was 4,990 in 1865, and 4,281 vehicles in 1871. In the former year the slow and heavy vehicles numbered 2,466, whereas in the present year they reached to 3,418 vehicles. It may reasonably be expected that a well-managed tramway system, upon any of the thoroughfares named, will considerably reduce the number of spring vehicles required for public accommodation, including especially cabs and omnibuses; this is apart altogether from questions of construction and ownership.

THE TIMBERING OF TRENCHES AND TUNNELS.

At a meeting of the Society of Engineers, on the 5th of June, Mr. Charles Turner read a paper "On the Timbering of Trenches and Tunnels applicable to Railway and Sewerage Works, and Grain." In the course of the paper the reader said,—Before entering particularly into a description of the timbering required for open cuttings for sewerage works, and for driftways, headings, &c., for railway tunnels, it will be well to set forth a few simple rules for carrying out such works of timbering generally:—

1st. All timber used should be of as hard and tough a nature as it is possible to procure for a reasonable cost.

2nd. All timber should be cut at the fall of the year, when the sap is down, and no timber ought to be used that has not had a certain amount of seasoning, having been kept either constantly wet or dry for not less than six months after it was felled.

3rd. All timber used should have been barked three months before using.

4th. The best description of timber for shores, sills, posts, &c., is larch or fir; oak may be used occasionally to resist a great traverse strain.

5th. The principal strain should in all cases be thrown as far as possible upon the end grain of the timber, or in the case of walling pieces, sills, or sleepers, which should always, if possible, be of half-round timber upon the rounded side of the timber.

6th. All side pillars or side posts should be slightly oblique, forming with the head and ground sills the section of a truncated pyramid. The tenons of the pillars, &c., should be cut square, and the mortises in the sills at an angle, to prevent lateral movement.

7th. The timbers should be framed, and fitted accurately; no spikes or bolts to be used to keep the timbers together; all wedging up to be avoided as far as possible, except in certain cases described hereafter.

8th. All poling boards in headings, and the linings at the back of the curbs, where square shafts are timber-lined, should be pointed and driven obliquely, each set to overlap the preceding one.

9th. All shores to be fitted to drive from above; and never in any case sideways or horizontally. When half-round timber is used for the walling, the ends of the shores to be slightly bird-mouthed, to fit to the shape of the timber.

10th. As large a bearing surface as possible to be allowed where the end of one timber takes a bearing upon the face of another timber.

11th. When planks, batons, or other square timbers are used for walling pieces, they should be bedded in the sides of the excavation at a slight angle, so that when the shore, out to the proper angle, is driven down from above, it will always take a fair bearing over the whole of its surface.

12th. Adjustable gauges to be provided for taking the exact length and exact angle of ends of the timber required.

13th. No timbers require to be fitted in their places more tightly than to take a fair bearing. If any strain is shown upon them, they will be

tightened far better and more in the direction required than by any artificial means that can possibly be used.

Timber in Open Cuttings, or for Sewerage Work.

Most of these works are executed either in large towns, or in the neighbourhood of them, and the timber used to support the sides of the excavations, is either such as can be found in the place or can be most easily conveyed to it, fir scaffold poles, cut up into lengths, being used for the shores, and the cheapest description of battens or planks that can be procured for the wallings. In many cases these are only used for form's sake, and might readily be dispensed with. The common practice is to introduce tiers of battens, about 4 ft. or 5 ft. apart in depth, with round poles of from 4 in. to 6 in. diameter for shores. These are almost always driven sideways into their places, and even if well out and fitted, have but a comparatively small bearing upon the batten which forms the walling piece. If the cutting is dry these shores frequently become loose and drop down, as there is seldom any upright or support under them. In many cases this arrangement proves sufficient, as no timbering is really wanted, but when there is really a pressure exerted against the timber the walling planks or battens are very apt to split, from the shores being driven in sideways, and therefore bearing on a very small surface of the timber. If battens are used in the above manner, it is much better to cut the excavation to a slight batter, and to let the battens or planks in parallel to the face, and to drive down the shores from above sufficiently tight to give the batten a firm bearing against the sides of the excavation. The lower tier of battens should be struttled up from the ground, and the tiers of battens, especially under the joints. When half-round timber can be procured it is generally preferable to the battens, as it has less tendency to split. In that case the flat side of the timber should be placed against the side of the cutting and slightly let into it, and the end of the shores should be slightly bird-mouthed out to fit the round side of the timber, and should be driven down from above. If the ground worked through is of very shifting nature, such as thin strata of sand or clay, with water, it is often necessary to close-timber the cutting. In this case planks should be placed upright at intervals of from 5 ft. to 6 ft., with horizontal planks behind them, one upon another; the usual round shores being introduced between the planks, which must always be laid at a slight angle, so that by driving down the shores from above the whole will be wedged firmly into its position. Where the ground is very insecure the upright planks can only be driven in short lengths, the one being made to overlap the other. Of course, a system of timbering comparatively so complicated should not be used unless absolutely necessary, and in many cases where there is sufficient depth of roof it is better to carry on the excavation in short lengths and tunnel in between. But there are cases where tunnelling cannot be adopted, and it is better to go to any reasonable expense in timbering rather than to risk life. Besides the above reasons, in many instances it is absolutely necessary to leave the timber in until the ground has become thoroughly consolidated. Unless such timbers are of the proper size, and have been well framed together, such a precaution is worse than useless, and it gives a fancied security which does not really exist.

There is another use of timber, which cannot be said to be confined strictly to cutting trenches for sewerage work, as it is applicable in all cases where masonry is carried on in deep excavations. It has been found more advantageous, instead of carrying down the mortar in hods to supply the bricklayers, to construct small trunks 5½ in. square internally and about ¾ in. thick; they are made out of stiff procured by putting two ones through a batten, and fitted with hopper heads. The lower ends are easily shifted, so as to deliver on to the mortar-boards, the trunk being slung by a rope attached to short shearlegs across the cutting. The mortar-heap is made close by the cutting as the work proceeds, and one man filling the mortar into the hopper-heads of two trunks can keep four bricklayers going instead of two, or even at times three, hodmen, who would otherwise be required, temporary shores and struts being used in some cases until the permanent shores can be driven. Where the ground is of the nature of running sand, and

can only be excavated in very shallow lifts or stages, the excavation may be carried on after the manner in which square shafts are sunk and timbered in some of the German Brown coal mines, upright pieces of half-round timber, pointed at the ends, being first driven into the ground, in advance of the excavation, and inclining slightly inwards. Walling planks are fixed between these timbers, and supported in a temporary manner by short piles until the shores are introduced and driven from above as before mentioned, care being taken always to have uprights under the walling planks. A space varying in width from 2 in. to 3 in. will be left behind the walling planks, into which should be driven planks, or battens, or half-round pieces of timber pointed at the ends, and which pieces must be gradually driven downwards as the work proceeds, as far as safety will allow, when another upright is driven down in front of the first, in the same manner as already described, and shown in sinking short lifts through shifting ground, requiring to be close-timbered. Great additional strength is given to this mode of timbering by introducing long binders of stronger timber from top to bottom of the excavation, taking a bearing against all the wallings, and having independent shores between them.

PROFESSIONAL PRACTICE AND CHARGES OF ARCHITECTS.

SIR,—In your issue of the 15th inst. were published the resolutions passed at the late General Conference of Architects, one of which was, that a committee should be appointed to consider and report upon the subject of professional practice and charges of architects. At a committee meeting since held, I have been requested to take steps to elicit from the whole of the provincial architects their views and suggestions on these subjects.

It is quite out of my power to communicate with each member of the profession individually, and as we in England have not the organisation by means of chapters of reaching them, as proposed by the American Institute of Architects, described in a recent number of the *Builder*, I shall feel obliged if you will enable me, through the medium of your journal, to invite suggestions as to professional practice and the Royal Institute scale of charges, in order that I may lay them before the committee at their next meeting, with a view to the preparation of a uniform scale of charges throughout the United Kingdom, to be discussed at the Conference in June next year.

I shall be happy to give all particulars in my power to any provincial architect so requiring.

J. DOUGLASS MATHEWS,
Acting Secretary to Committee.
10, Clock-lane, London.

NEW MOVEMENT IN WORKING MEN'S CLUBS AND INSITUATES.

An amalgamation has been effected between the Social Working Men's Club Association and the older society, which has had its headquarters at 150, Strand. Under the new arrangement the councils of both societies are united; Lord Lyttelton becomes the president of the Amalgamated Society; the vice-presidents of each society take office together in the new society; and Mr. Solly becomes its organising secretary; the honorary secretaries probably remaining as before.

A movement has been set on foot for increasing the working men's clubs in the metropolis. To this end it is promised to raise a capital of 5,000l. for the purpose of purchasing five clubs now in existence, viz., the "Cobden," Bermondsey-square; the "Alexandra," Lambeth-head, Peckham; the "Paradise," Lambeth-head; the "Unity," Deptford; and another at Camberwell. At each of these places the leases, fixtures, and stock in hand will be secured to the shareholders with the capital mentioned. The number of shares issued to each subscriber will be limited, and the undertaking is to be entered upon not for trading purposes so much as to provide for the respectable working-classes all the advantages of a good club. The shares will be paid for by small weekly payments. The promises of support which the movement has received indicate that it will be attended with success. There are a very large number of what are called "non-proprietary" clubs in existence, and in every instance where they have

been established they have received the most extensive support of tradesmen and the working classes. The police have, in many instances, threatened these clubs with prosecution; and they have secured a conviction in the case of the "Times" Club, Walworth-common; but Mr. Ellison has granted a case to be argued in the Court of Queen's Bench as to the legality of the sale of exposable liquors in that and similar institutions, and a subscription has been opened to carry that case on. If the new plan now proposed be adopted these prosecutions will cease, as the clubs will then be found similar to those at the West-end.

HOUSE-BUILDING IN LONDON.

It has often occurred to me that one of the problems of the day is, how to build a house in London, the rent of which may be within the compass of an ordinary income, and yet that the house should not be very distant from a neighbourhood inhabited by the upper crust of society, at the same time ensuring the ground landlord a good rent. Between Piccadilly and Oxford-street there is a large block of houses that must in a few years be rebuilt. I am anxious, therefore, to throw out a suggestion which I think would, in some measure, solve the enigma.

I observed a large pile of buildings in a fashionable locality, the Belgravian mansions, which afford some hints how houses of the future may be built. Take, for instance, Oxford-street, where new buildings will shortly be commenced. It is the custom, and an increasing habit, for shopkeepers to rent a shop, and to reduce the rent of their warerooms by letting the upper part of their houses, and availing themselves of the high price lodgings bring in, to place their families in a suburban villa, which can be easily reached by the metropolitan trains. I propose that the upper part of the houses should be built complete for a family, the ground floor being independent, and constructed for a shop. The height of the house must be limited by the width of the street. Oxford-street would, therefore, afford facilities for building houses of sufficient height to accommodate families able to pay an adequate rent, and requiring good-size rooms. It might be said, Oxford-street being a large thoroughfare, houses there would not be so popular. I readily admit that at first there might be a prejudice; but the traffic of Oxford-street is not greater than Grosvenor-place or Hamilton-place, and those streets cannot be said to be unpopular, nor are the rents deteriorated by constant streams of vehicles. Oxford-street is now paved with granite; but why should not some better material be used,—such as asphaltum,—avoiding thereby dust and noise? The same system might be applied to the smaller streets where shops are in request. I will not trouble you with the details in my mind, as all the minor points could be worked out when such building is contemplated to be erected; but I do not see any real difficulties in planning houses on this system.

MALT CISTERNS.

SIR,—I should feel obliged if any of your correspondents will give me any practical suggestions as to the best way of leading a 12½-quarter malt cistern, and how to fit the pipes over the drain at the bottom, without damaging and wearing away the lead?

MALTESER.

LIGHTNING CONDUCTORS.

SIR,—Will one of your correspondents give some information as to the average distance at which a "Lightning Conductor" of ordinary form, is calculated to afford protection to any building or buildings, being of course fixed on the highest point, i.e., how far its influence will extend? I make this inquiry from a boy being recently injured by lightning in my immediate vicinity.

ACCIDENTS.

Canon-street, City.—While a carpenter, assisting in some building operations in Canon-street, was endeavouring to remove a piece of timber from a stack, the pile fell down, and crushed him against a wall, injuring seriously both his chest and abdomen. He was removed to St. Bartholomew's Hospital in an insensate state.

Leeds.—A bricklayer, employed by Mess Longley, Brothers, was engaged at the n. offices in course of erection in Bond-street, the Imperial Insurance Company; he was on the third story, and got upon a window-sill,

er to reach a scaffolding, when somehow he lost his balance, and fell to the ground, a distance of 30 ft. He was taken to the Infirmary, where he died. The coroner's jury returned a verdict of accidental death.

THE CENTRAL SOCIETY OF ARCHITECTS, PARIS.

We are glad to learn from the *Bulletins* now issued by the "Société Centrale des Architectes" is again holding meetings and pursuing its usual course of usefulness. At a meeting on the 30th of June, the president, M. V. Lard, communicated a proposal that the acts of the incendiary fires in Paris from the 1st to the 27th of May last, and the resistance offered to the flames by various materials, should be inquired into. The proposal was referred to a committee already appointed with reference to the results of the siege important to architects. At the same meeting, M. Charles Lucas read a translation he had made of two papers from the *Builder*, referring to the recent Conference of Architects in London, namely, the account given of the visit of the members to the Tate Museum, and our review of the architectural designs exhibited during the Conference. These translations, lucidly annotated by M. Chas. Lucas, are printed in the *Bulletin* issued.

INAUGURATION OF THE NEW LONDON ORPHAN ASYLUM, WATFORD.

The new buildings for the London Orphan Asylum, erected near the London and North-Western Railway Station, at Watford, have been formally inaugurated by her Royal Highness the Princess Mary of Cambridge and Teck. The series of structures which form the present asylum are intended to accommodate 600 boys and 100 officers and servants, and the arrangements will admit of the reception of 100 more every year. The asylum is erected in an Early Gothic style, composed of red brick and stone, and built on the block, or detached plan. Light, space, and air are abundant; and from its elevated situation the asylum commands pleasant views. In a prominent position is the chapel, built at the sole expense of a lady (Mrs. Godding), who was once an orphan in the asylum, and who gave 5,000l. for the special purpose. Behind the chapel, and at a small distance, is the administrative portion of the building, 140 ft. long, 75 ft. deep, and 60 ft. high to the ridge. On the right of the administrative block is the girls' quadrangle. This building on one side is 220 ft. long by 37 ft. deep. The quadrangles for the boys, senior and junior, are on the left of the administrative block. There are seven houses, each containing complete domestic accommodation for fifty boys and their matron. There is a swimming-bath, 62 ft. by 37 ft. A tower of 125 ft. elevation, provided with bell and clock, rises from the administrative block of buildings. The central entrance and vestibule are under this tower, and in the same way the principal staircase is reached, behind which is the dining-hall, forming a separate building. This hall is 108 ft. long by 60 ft. wide, and 56 ft. high. It contains a visitors' gallery, divided from the body of the hall by a screen of columns and arches. Underneath are culinary arrangements on an extensive scale for cooking, baking, &c., and lifts for bringing food to the dining-room. There is, behind the girls' quadrangle, an extensive range of laundry buildings, and an abundant supply of water is obtained from a well specially sunk for the purpose.

There is ample provision, by means of covered playgrounds, for recreations in wet weather as well as in fine. Provision is made for the immediate reception of 450 children; but all the administrative buildings are on the scale of ultimate accommodation for 600. There is an apse at the east end of the chapel, in which three stained glass windows have been inserted. The centre window is the gift of ex-girls of the institution, and represents the "Crucifixion," the subject of the predella being "Christ Blessing Little Children." The window on the left, the subjects of which are the "Nativity," and "Christ in the Temple with the Doctors," is the gift of Mr. Bonner, and the window on the right, the "Resurrection," is the gift of the architect. A special feature of the buildings is that no plaster has been used in their construction, and no material is likely to require frequent repair, but they are all

finished in brickwork inside and out. The architect is Mr. Henry Dawson, of Finsbury; and the contractor, Mr. W. Hicks, of Lambeth. The original contract was for 63,000l., not including the cost of the infirmary, which was 7,000l., nor of the chapel.

GREAT YARMOUTH.

The Britannia Pier has, under the superintendence of the proprietor, Mr. Isaacs, undergone of late extensive improvements. The circular area has been supplied with iron standard seats, and a wooden partition has been erected for the purpose of shielding promenaders from draughts and cold winds. A wooden canopy has been erected on the north and south sides, and the centre is covered with canvas. The fishing platform has also been materially improved. The new Post-office, in Regent-street, will be completed, according to the *Norfolk Chronicle*, within a few weeks from the present time. The building is superior to the old establishment on the Hall Quay. The various postal and telegraphic offices attached to the building are commodious and suitable to the purposes for which they have been set apart. The new Corn Hall, in connexion with the Duke's Head Hotel, is rapidly approaching completion. It is 62 ft. in length and of proportionate width, and will accommodate from 800 to 1,000 people. It is a light structure, has a glass roof, and is supplied with every requisite convenience. The corn merchants have engaged stands therein. The architect is Mr. J. Pearce, of Norwich. A correspondent of the *Chronicle* calls attention to the fact that in Mautby Church (St. Peter and St. Paul) there is a very fine Parbeck marble sculptured tomb of one of the De Mautbys. It is a specimen of the ring-mail dress, and of the long shield; and even now is in a sufficiently perfect state to deserve some pains with regard to restoration. The whole tomb is cased with white-wash, and it has the reading-desk over it in part, while the seats and partitions also partially cover it. The Norfolk and Norwich Archaeological Society ought to have their attention directed to the matter.

CHURCH-BUILDING NEWS.

Lilley (Hertfordshire).—The new church of this village has been consecrated. It is dedicated like the original one, in honour of St. Peter. Mr. Thomas Jeekyll, of London, architect, who was consulted, advised the parish not to restore, but to rebuild; and for this purpose he prepared plans and estimates, and eventually the contract was let to Mr. John Snel, of Tring, builder. The new building consists of nave and chancel. The former is 53 ft. long, by 25 ft. wide, and is fitted with open deal seats. The entrances to the nave are in the north and south walls, near the west end, that on the south being approached through the tower, which forms a porch. The chancel is 32 ft. long and 16 ft. wide, fitted with English oak choir seats. The red sandstone chancel arch out of the old church is refixed on the north side of the chancel, opening into a recess for an organ, and on the south side an arch opens into the upper part of a mausoleum built by the Lord of the Manor. The vestry is built north-east of the chancel. The church is in the Early Decorated style, the lancet windows to the nave are earlier than the Geometrical. The walls are built of flint, with bath stone quoins, windows, doors, &c., the flint work not being executed in the usual way, with all faced or black flints and close joints afterwards pointed; but more in the ancient way, with a proportionate number of whole or white flints and a thick joint, the mortar squeezed out in laying the flints being left untouched. The tower is very plain, and Early in character. There is to be accommodation for five bells in the belfry, which is to have on each face a large two-light tracery window with oak louvres.

Cotham (Redcar).—The new chapel at the Convalescent Home has been opened for divine service. It is a brick structure, and has been erected by Mr. William Langdale, of Whitby, from plans by Mr. G. E. Street. It consists of nave and apsidal chancel, and is capable of holding 200. The length of the nave is 61 ft. 3 in., and of chancel, 18 ft. 9 in. Width of nave, 21 ft.; height, 17 ft. to top of wall-plate; and 36 ft. 9 in. to apex of roof. There is a bell-turret at the west end, with bell by Messrs. Mears. The chapel is lighted by lofty windows, of which seven are already filled with stained glass, viz., two west windows, with Christian emblems;

three apsidal, with scenes in the Passion of our Lord; and other two in the chancel, with subjects from the parable of the good Samaritan and the corporal acts of mercy,—all by Mr. Waller, of Newcastle. The reredos is of alabaster, inlaid with marble, by Mr. Earp. The centre compartment contains a Maltese cross, with monograms on each side. The tessellated pavement is from the manufactory of Godwin, of Hereford. The chapel is at present connected by a covered way with the men patients' side of the Home, and ere long another covered way will be put up to the women's side.

Cotham (Bristol).—The designs of Mr. John Bevan, architect, Bristol, for the new church which is to be erected at Cotham in connexion with the district of St. Matthew's, have been conditionally accepted, and referred to him for revision. The edifice is to accommodate about 700 persons. It is to be built in the Early Gothic style, of Pennant stone, with freestone dressings, and will consist of a nave, north and south aisles, apse chancel, organ-chamber, and vestries for the clergy and choir; and there is also to be a south porch, and a tower and spire 140 ft. in height at the eastern corner of the south aisle, adjoining the chancel, the tower and chancel forming one end of the building, as seen immediately upon approaching the church from the Redland-road. The roof is to be open timbered, stained and varnished, and the seats are to be of the same material. The covering of the roof is to be of slate. The lighting will be by numerous windows in the clearstory, as well as the outer walls. The cost of the church will be about 5,000l.

Saffron Walden.—An influential meeting was lately held in reference to the repair of the fabric of the church of St. Mary. Mr. Wade said the committee had formerly obtained a report from an architect, Mr. Smith, of the Adelphi. That report showed that, to carry out the suggestions it contained as to the needful restorations, would require a sum of 2,093l. Lord Braybrooke offered to assist. This meeting was now held for the purpose of ascertaining what could be done by the parishioners. A new committee was formed, authorised to attempt to raise at least 2,000l. at once.

Kearsley Moor.—St. Stephen's Church, Kearsley Moor, which is generally known as the Blair Memorial Church, has been consecrated, by the Bishop of Manchester. Several years since this church was first projected, and four or five years since the designs were made; but difficulties, mainly connected with the site, have until recently prevented the building from going forward. The work which her late husband began has been taken up by Mrs. Blair. The accommodation is for 500 persons, all free. The site lies rather more than half-way from Manchester to Bolton. The ground slopes steeply towards the south, so that the church stands on a terrace. The plan consists of a nave 67 ft. long and 24 ft. wide, and a north aisle the same length, and 20 ft. wide. The design comprises also a south aisle, not yet built. The tower, which is built as a memorial of the late Mr. Stephen Blair, by his four nieces, is upwards of 60 ft. high. The parapet on its eastern side is gabled, and surmounted by a cross. It stands at the western end of the nave, into which it opens by a lofty arch. At the other end is of course the chancel and north chancel aisle, divided into organ-chamber and vestries for the clergy and choristers. The style is Decorated. The cost of the church has been 3,000l., and the tower 600l. The carving is by Messrs. Earps & Hobbs; the gasfittings, by Messrs. Thomason & Co.; and the heating by Messrs. Haden & Son. The contract was taken by Messrs. Ellis & Hinchliffe, and the work has been carried out by them, under the superintendence of the architects, Messrs. Medland & Henry Taylor, of Manchester.

Barnston.—Christ Church, Barnston, has been consecrated. The church is from the design of Mr. Street. Its style is Early English, and it is built of white sandstone from the Storeton quarries. The church consists of a nave and chancel, the organ-chamber and vestry being on one side. The roof is covered with red tiles; it is open-timbered within, and the seating consists of open benches, all pitch pine stained. The cost of the edifice is about 2,000l.

Bicester.—The foundation-stone of a new church has been laid at Fawcett. The edifice is to be called "The Church of All Saints at Fawcett." It will be erected to the memory of Miss Anne Hind, of Ardley. The new building will form a chapel of ease to Stoke-Lyne. The cost will be 800l. The architect is Mr. H.

Woodyer, and the builder Mr. Claridge, of Banbury. It will consist of a nave and apse, and will seat 130 persons.

Hindon.—The new church of St. John the Baptist, which has recently been erected here at the sole cost of the late Marquis of Westminster, has been consecrated by the Bishop of Salisbury. The edifice is in the French First Pointed style, or rather in that mode of architecture which prevailed in France during the Early English period. The nave is separated from the north aisle by five bays, the arches resting on short circular columns, and there are clearstory windows above the arcade. The south aisle is separated from the nave by three bays. The chancel is fitted with stained pine seats. The east window consists of three lights, with a circular window above, the shaftings of Devonshire marble, and the capitals Romanesque in character. This window contains stained glass, placed there by the Dowager Marchioness of Westminster as a memorial of her late husband. In the rose-window above the triplet is depicted the Ascension of our Lord, angels being placed in the circles which surround the central subject. Below, in the north lancet, are represented the Nativity of our Saviour, and Christ bearing the cross, together with figures of Isaiah and Jeremiah. The centre light contains the subjects of the Crucifixion, the Lord's Supper, and the Baptism of Christ in the Jordan; while the south light has the Burial of Jesus, and the Angels announcing the Resurrection to the Holy Women, together with the figures of Ezekiel and Daniel. The roofs of the nave, aisles, and chancel are open, and of stained pine, the sittings of the same wood. The pavement of the nave is of stone, and the church is warmed with Hadyn's heating apparatus. The designs for the church were furnished by Mr. T. H. Wyatt, the diocesan architect; Mr. J. B. Miles, of Shaftesbury, being the contractor, and Mr. A. Harrison the inspector of works. The church is between 80 ft. and 90 ft. long, is over 40 ft. wide, and will accommodate over 300 persons. The building, we understand, will cost more than 3,500*l.*, the whole of which will be defrayed by Lady Westminster.

Kingston.—The foundation-stone of a new church,—to be known as St. John's,—at Spring Grove, Kingston, has been laid. The building will be erected on the piece of ground which the late Mr. W. Mercer, of Surbiton, made over to trustees for that purpose, and which is situated at the corner of Springdale-road. The cost of the church, according to the plans, which were approved by Mr. Mercer, and adopted by the building committee (exclusive of the tower and spire), is 6,750*l.*, towards which the trustees have in hand about 2,000*l.*, vested in them by Mr. Mercer, on condition that the church should be built within five years, from July, 1869. The church, which is intended to accommodate about 830 persons, will be built of Kentish ragstone, and will consist of nave, aisles, transepts, and chancel, with seven-sided apse, and tower and spire on the south side of the chancel. The architect is Mr. Arthur J. Phelps, of Surbiton, and the builders are Messrs. Jackson & Shaw, Westminster.

Luddenden Foot.—The foundation-stone of the new church about to be erected on the hill-side at Blackwood Hall has been laid. A large school building has been erected here, and now the church has been commenced, to be followed, when finished, by the parsonage, so that the group of ecclesiastical buildings will be then fully completed. The site of these buildings is on the steep slope of the hill, just above the railway station, and opposite to Blackwood Hall itself. The total area of the site is 1*1/2* ac. 1*1/2* sp. The school, which is in the Gothic style, presents a facade of two gables, and three smaller gables to the east. There is accommodation for 300 children. The large school-room is 60 ft. by 20 ft., having a class-room, 18 ft. by 15 ft., opening into it. The infants' school-room is 35 ft. by 18 ft., and it has also a large class-room attached. The whole cost of the church will be borne by the sons and daughters of the late Mr. W. H. Rawson and Mary his wife, of Haugh-end. The design is by Messrs. Parr & Strong, of London, and the church will be in the Early Decorated style of architecture, and provide accommodation for 530 persons. The ground floor gives a nave of four bays, with side aisles, north and south transepts, chancel, and tower at the north-east side. The total length will be 106 ft., of which the chancel will be 30 ft. deep and 18 ft. wide. The nave will be 76 ft. by 24 ft., and the aisles will be each 12 ft. wide. The arcading

between the nave and aisles will be 15 ft. high, while the nave will be 22 ft. to the plate and 41 ft. to the ridge of the roof, which is to be an open-timbered one. The tower and spire will reach an altitude of 117 ft. The spire is a broach, and the square of the tower changes into octagon at a height of 60 ft. In the tower will be the organ-chamber, having openings into the chancel (where will be seats for the choir) and into the nave. The east window (which, we hear, is to be filled in with stained glass) will be of five lights, with geometrical head tracery. The west window is of four lights, similarly treated; and the transept windows are of three lights each. In the clearstory each light is surmounted by a separate gable, with the foiling of each opening alternated. The windows in the four bays on each side of the nave are triplet lancets. There are entrance-porches on the north-west and the south-east. The ringing-loft is over the organ-chamber, and a vestry is placed near to the entrance at the south-east. The church will be built of Nain-end stone, with Fore-lane stone dressings. All the seats are to be free, and of stained deal. The contractors are Messrs. Siddall, Brothers, masons; Mr. Haigh, joiner; Mr. Hoyle, alater; and Mr. Dyson, plumber.

Easton-in-Gordano (near Bristol).—The whole of St. George's Church, Easton-in-Gordano, with the exception of the tower, has been taken down, and is now being rebuilt, in memory of the late vicar of the parish, the Rev. J. H. Mirehouse. The church just pulled down was built in 1825, and although scarcely half a century old, the roof was found to be quite unsafe, and the floor timbers were rotten; the pews were high, narrow, and uncomfortable; the fittings of the most meagre description; and the style of architecture was the worst of the period. The new building will be in the Gothic style. It will be built of local stone, with Bath stone facings, and will consist of nave, side aisles, chancel, vestry, organ-chamber, and south porch. It will be fitted throughout with open seats. There will be three arches on each side of the nave, the pillars of which will be of Hambrook stone, and the bases and caps of Bath stone. The chancel is to be paved with Minton's encaustic tiles, but the aisle will probably be covered with the old grave stones. The old organ gallery will be dispensed with, and the organ and choir will occupy the organ-chamber at the upper end of the south aisle. The new building will be rather shorter, but wider than the old one, and the tower, which was formerly enclosed, will now be thrown open to the entrance-door. The entire cost of the work is estimated at about 2,000*l.*, of which about 430*l.* remain to be obtained. The whole of the work, including the rebuilding of the church, the fitting, and furnishing, has been undertaken by Messrs. J. A. Hayes & Son, of Bedminster. They have already made considerable progress in rebuilding. Within the last few years a new vicarage and schools have been built in the parish.

DISSENTING CHURCH BUILDING NEWS.

Gloucester.—The chief stone of the Whitefield Memorial Church of the English Presbyterians, to cost 4,000*l.*, has been laid at the Park. The church which is now in course of erection is designed in the Gothic style, and a photographic representation of it is deposited under the stone. The building is intended to accommodate 600. The dimensions are 80 ft. by 40 ft., and the height 34 ft. The roof-timbers will be exposed and wrought. A platform will be provided for the minister. The walls, externally and internally, are to be faced with white Shropshire bricks, with bands and devices in red bricks, the dressings to be of Bath stone. The tower, with spire, will be 140 ft. high. Over the principal entrance will be a *bas-relief* carved in stone, representing Whitefield preaching in the open air to the multitudes. In the principal gable will be placed the Presbyterian emblem, the burning bush, with the motto, "*Non tamen consumebatur*." Underneath the church will be a school and classrooms, vestries, and a residence for the curator. The floor of the church will be elevated 6 ft. above the ground-level. The amount of contract for the building is 3,000*l.*, exclusive of spire, heating, lighting, and architect's fees. The building is designed by Messrs. Medland & Son, architects, and the works will be executed under their superintendence by Mr. Joseph Meredith, all of Gloucester. With a written record and the photograph of the design were deposited portraits of Whitefield and of various other persons, local newspapers, and coins.

Harborough.—The memorial stone of a new Wesleyan Chapel at Market Harborough has been laid by Sir Francis Lycett, of London, who has contributed liberally to the erection of chapels in connexion with Wesleyan Methodism. To the rear of the chapel are two large vestries communicating, and behind them a school-room 33 ft. by 26 ft., &c., adjoining. The contract sum for the whole, including boundary-walls, &c., is 1,569*l.* The architect is Mr. Charles Bell, London, and the builders are Messrs. Stanon & Son, of Market Harborough.

Walthamstow.—The new Congregational Chapel lately erected in Marsh-street has been opened for divine service. This new building stands on the spot where was erected in 1895 the old "meeting-house," as it was termed, and in which Dr. Watts, who was one of the trustees often preached. It is built of Kentish rag, with Bath stone dressings, in the Gothic style of architecture, decorated, with tower and spire 150 ft. high. The length of the edifice is 120 ft., width, 55 ft.; and height, from floor to top of gable, 50 ft. The arches supporting the roof, which is partly open, rest upon ten iron pillars. The seats, which are open benches, made of plain deal stained and varnished, are calculated to accommodate 800 persons. Messrs. J. Tarring & Sons, of London, furnished the designs, and the builder was Mr. P. Henshaw, of London.

Rook Ferry, Liverpool.—The memorial stone of the Congregational Church now in course of construction at Rook Ferry, has been laid in the presence of a large number of ladies and gentlemen. In March last the lecture-hall, which adjoins the church, was completed, and since then the congregation have worshipped therein. The estimated cost of the church is 6,000*l.* Towards that amount, 3,200*l.* have been subscribed, including 1,000*l.* from the Lancashire and Cheshire Church-building Association, leaving 2,800*l.* to be raised. The edifice, which occupies a commanding site at the junction of Highfield and Rook-lane, is being rapidly proceeded with, and the plan is now ready for slating. The plan is cruciform, and consists of a nave, 76 ft. 9 in. long by 48 ft. in width, with transepts 25 ft. 6 in. by 10 ft. The material employed in the construction is white Stourton stone, with brick for the internal linings; the external face of the walls being of coursed face-work and tooled stone dressings. The nave is divided into four bays by cast-iron columns supporting the roof. The church as at present designed will provide accommodation for over 800. The several works are being executed by Messrs. Booth & Richards, builders, Rook Ferry, from the designs and under the superintendence of Mr. David Walker, of Liverpool.

Reading.—Caray Baptist Chapel has been opened for divine worship. The building is situated in Tappenden-street, hereafter to be named Caray-street. The plan of the structure is rectangular, the interior dimensions being 44 ft. 8 in. by 56 ft. The roof is of single span divided longitudinally into five bays by wood trusses, semi-circular in outline, springing from the level of the gallery-floor. Messrs. C. G. Sears & Son, of London, were the architects, and the contractor was Mr. Kendall, of Reading. The total outlay, including the site, which is freehold, is about 3,100*l.*, and the contract for the work was 2,423*l.*

Bristol.—The chief stone of a new Baptist chapel has been laid in Cotham-grove. The architect of the chapel is Mr. Hans Price, of Weston-super-Mare; and Mr. Gorvett, of Bristol, is the builder. The estimated outlay, not including the cost of the site, is 3,400*l.* The style of the building is Geometric, and the material to be used is Pennant with freestone dressing, and the roof will be of slate. The Elm-rose front of the chapel will be surmounted by a small turret and spire. On the ground-floor the building open seats of pitch-pine, varnished, will supply accommodation for 500 persons, while sixty others will find room in a small gallery, which is also to receive the organ.

Ashbourne.—The free church on the Buxton road, which for nearly two years has been in course of erection, has now been opened for divine worship. Although denominated a "free church," we believe it is the wish of the trustees that the doctrines taught in it should be in common with those held by the Evangelical section of the English Church. Episcopal consecration of the building was sought, but difficulties intervened, and so it is, we suppose, that the "Ashbourne Free Church," as a body, in registering the building, "object to be designated by a distinctive religious appellation." The church

ered at the west end through a central doorway the lower part of a tower, which rises to a height of 34 ft., and is 22 ft. in the square. At the south-east angle is a circular staircase, leading to a belfry, at the west end of the church, for organ and an organ. In the belfry story, which contains a bell, are three semicircular-arched lights, recessed on each of the four sides. The seats are open, of red deal, stained and varnished. The interior of the church is plastered throughout. It is lighted by six south, six north, and two west windows, with iron frames, supplied by Handyside, of Derby. The windows are glazed with fluted plate glass, of a light tint. The exterior of the building is of stone entirely, courses of roof face, with posted dressings to windows, moulded and recessed, with semicircular arches. The height of the aisle walls is 23 ft. The roof is of one span externally, but divided internally into three semicircular vaultings over nave and aisles. At the east end, intersecting nave and chancel, and at the west end, intersecting the nave and tower, are bold semicircular arches concentric with the line of ceiling. The walls are plastered, finished rough stucco, formed into panels by flush mouldings. The floor, which is 30 ft. wide, and lighted by five doors of similar design to those in the aisles, is a semicircular apsidal termination. Adjoining is a minister's vestry, with heating-vault beneath. The church stands upon an elevated site, and is approached by a broad flight of steps. The style of architecture adopted is a manseque. The plan is a parallelogram, of 42 ft. by 42 ft. The church stands back from the road 54 ft. The stone of which the church is built has been selected and supplied from the Ashfield Quarry, by Mr. Benjamin Buxton. The work was manufactured by Mr. Elches (late of Ashbourn). The architects were Messrs. Stevens & Robinson, of Derby; and the surveyors, Messrs. Critchlow & Ward, of Uttoxeter. Henry Goode, surveyor to Mr. F. Wright, and throughout as clerk of the works. The organ was Mr. Charles Garlick. The site and the gift together are the gift of Mr. Francis Wright, of Osmaston manor, at a total cost of £7,000.

SCHOOL-BUILDING NEWS.

Burslem.—The premises hitherto used by the Wesleyan body at Milton as day and Sunday schools having been found too small and inconvenient, friends in that locality, which is in the same circuit, have decided to erect a new building upon the old site. The plans have been prepared by Mr. Padgham, the master of the school. The building will be a plain structure of brick. The large room for the mixed school will be 40 ft. by 30 ft., and at one end there will be two class-rooms, and over these an infant school-room. The contractors for the work are Messrs. Moss, of Ford-green; and the work will be £250l., exclusive of the fittings. The memorial-stone has been laid.

Barking.—The memorial-stone has been laid for new Wesleyan schools to be built in connection with the new Elementary Education Act, and to obviate the necessity for a school at Barking. The proposed building, the location of which is far advanced, will be 60 ft. length, 30 ft. in width, and 27 ft. high. When completed it is calculated to accommodate about 500 Sunday scholars, and from 200 to 300 day scholars. Towards the entire cost of building, which will not be 500l., about £40,000 have already been subscribed.

Chesham.—Within the last four months a building has been in course of erection, in Milton-place, intended to accommodate the day scholars connected with the congregation of St. Peter's, and to afford provision for a night school. It is now completed. The building has cost some 700l. Messrs. Kelly & Edwards designed the work. The school consists of a large room with two entrances from vestibules appropriated one for boys and the other for girls. The dimensions of the main room being 50 ft. by 30 ft. There is a high-pitched roof, timbered with Baltic pine, and covered on the exterior with tiles; the height from the apex to the floor is 30 ft. The accommodation provided is for 150 children. The respective yards for girls' and boys' are separate. The builders are Messrs. Reynolds.

Rochester.—The tender of Mr. Solihit for the erection of the new school for St. Mary's, Strood, has been accepted, and tenders have also been invited for the erection of a vicarage-house.

Pentonville (London).—The foundation-stone

of a new school for girls and infants, in connexion with St. James's, Pentonville, has been laid by Lady Bodkin. The schools, which are to be erected immediately in the rear of the church, with a frontage in Collier-street, will be built of red brick, with bands and patterns of bricks in different colours. The style will be Gothic. On the ground floor there will be a playground, divided from Collier-street by open Gothic arches. On the first floor there will be a school for about 150 infants, and on the second floor a school for about 100 girls. The architects are Messrs. Habershon & Brook, of London, and the builder is Mr. C. Wood, of Highgate, who has taken a contract to erect the building for a little over 1,000l.

Gateshead.—The foundation-stone of a new school in connexion with the Gateshead Wesleyan Schools, High-street, has been laid. The new school-room is considerably larger than either of the existing ones, and, with the two class-rooms, will accommodate nearly 300 scholars. It will be used as the boys' school, and the second room thus set at liberty will, after undergoing the necessary alterations, be opened early next year as an infant school. Mr. F. R. N. Haaswell, of North Shields, is the architect; and Messrs. Greason & Stockdale, of Gateshead, are the contractors.

Wantage.—New schools have just been completed at Chilton, Berks, and would have been opened last Sunday but for the sudden death of the rector's daughter. The buildings are of the local red Berkshire brick, with dressings of Douling stone, and are covered with plain flat tiles, having an ornamental ridge crest of red terracotta. The main timbers are exposed to view, and the roofs are celled below the rafters. The windows are fitted with iron lights; the doors are of wrought deal, hung with hinges of hammered iron. All the works have been carried out by Mr. R. F. Bryan, of Abingdon, builder, from the designs and under the direction of Mr. E. Dolby, of the same place, architect.

Bradford.—New memorial schools are being erected, the foundation-stone of which has been laid. The cost of the erection of that part of the schools which is now in course of construction is about 1,450l., but the whole scheme is estimated to cost between 3,500l. and 4,000l. Towards the former about 1,000l. have been raised.

PROVINCIAL NEWS.

Chelmsford.—The alterations and improvements at the Essex County Gaol, begun in July last, have just been completed. The work has consisted chiefly in the enlargement of 72 male cells so as to make them fulfil the requirements of the most recent Government regulations in regard to separate confinement. The sanitary arrangements of the cells have also been altered. Men's earth-closets having been substituted for those previously in use. The contractors were Messrs. Saunders & Son, of Dedham, and the works have been executed under the superintendence of Mr. Charles Weavings, clerk of the works, and Mr. J. Moore, foreman. In addition to these alterations, a new workshop has been provided for the matmakers and cordwainers by covering the lower debtors' yard, the space on which the old workshop stood having been incorporated with the enlarged cells. The new building has been put up entirely by prisoners' labour, under the superintendence of Captain McGorrey, governor of the gaol, and a good deal of the material from the old cells has been utilised. A new room for interviews between prisoners and the friends and relations who visit them has also been built.

FROM IRELAND.

Portlennas.—The new Presbyterian Church at Portlennas has been formally opened for public worship, by Professor Porter, D.D., of Belfast. The edifice stands on an elevated site, about 50 ft. from the south side of the principal street of the town. The porch, which large access to the body of the church, has two, and arch-entrance doors, with moulded jambs, and arches with label mouldings, stopping on curved bases. It is 23 ft. by 12 ft. inside, and abuts against a tower, 17 ft. by 21 ft., which rises at the north-west angle, and contains, on the ground floor, an entrance-door, with arched head, and staircase to galleries. It rises from a battered base to a height of 56 ft. to the eaves-course, from which a steeply-pitched

slated spire springs to a height of 92 ft. to the ridge, which is finished with wrought-iron cresting and finial. The upper stage of the tower is intended for a belfry, having on each of its four faces lofty lancet and louvred openings in couples, with gablets rising over them, and their roofs mitering into that of the spire, and finished at each apex with a small finial. The church itself is 79 ft. by 46 ft. inside of walls, and 26 ft. high to the wall-plate, and 34 ft. to the flat portion of the ceiling. Galleries are constructed at the north end, and for half the distance along the east and west sides of the church, against which they are returned in a curved form. They are supported by twisted metal columns. Sittings are provided on the ground floor for 644, and in the galleries for 264. The external walling is of the local whin-stone, with tooled dressings of Dunganon sandstone. The contractor was Mr. George Tipping, of Castledawson. The plans were furnished by Messrs. Young & Mackenzie, architects, Belfast, who have also superintended their execution. The cost has been about 2,000l. The style adopted is a free adaptation of thirteenth-century Gothic.

Books Received.

Scientific and Educational.

"TEXT BOOKS OF SCIENCE: The Elements of Plane and Solid Geometry. By H. W. WATSON, M.A., late of Harrow School. Longmans & Co." This work agrees with Euclid in retaining the syllogistic form throughout, but objections are met, and innovations introduced, in some important respects. The treatise, however, lays claim to very little originality. It is intended to meet educational requirements as a Text-book of Science for beginners, and especially for the instruction of artisans.—"Explanatory Mensuration for the Use of Schools. By the Rev. Alfred Hiley, M.A., Mathematical Teacher. Longmans & Co." Recent works on this subject having been considered too long to be used as ordinary school books, brevity has been a leading idea in the production of this treatise. The questions, however, are about 700 in number, and for the most part original, but they include nearly all those in the Oxford examination papers.

THE *Mechanics' Magazine* of July 22nd contains a good article on "Theatre Planning." The writer comments at the close of it on an inconvenience which is making itself very strongly felt at the Royal Albert Hall.—

"There is no building of the theatre or music-hall class, unless Drury Lane Theatre, which can be at all compared with the Royal Albert Hall. Isolated as the theatre is, there has been such an opportunity for providing external doors to the building of the Royal Albert Hall, as no architect had previously had. Of staircases there are an ample number. Unfortunately the advantages of the provision are much reduced by the absence of sufficiently distinctive decoration in the staircases, and by the structural and decorative treatment of the numerous openings between corridors and staircases. A curved plan of corridor is always a cause of confusion, needing correction in every available manner; and mere notices on walls are not sufficient. Each staircase and the way to it should be at once distinguishable, whereas in the Royal Albert Hall people are constantly pushing at what appear to be glazed doors, but are mere glazed partitions, similar to the doors. This would have been avoided by bringing decorative effect into play in the direction of one of its uses, the giving distinctive physiognomy to each portion of a building, or where the distinction may help to perfect the result aimed at in the plan. With all the attention given to the design of the Royal Albert Hall, there is much wanting of what a qualified architect could have supplied, and the results are loss of time and temper to many of the visitors. Coloured decoration will not supply this want."

Miscellaneous.

Trevelyan Goodall Memorial.—We are asked to mention that a committee has been formed to found an annual prize at University College School, as a memorial of the late Mr. F. T. Goodall, who, while pursuing his studies in the Island of Capri, met with an accident which unhappily proved fatal. We willingly do so: the committee is a very strong one, and will doubtless effect what they desire; but any warm advocacy of the movement we do not find it in us to offer. The memorial-raising movement is surely being carried a little too far. If the promising student is to have a medal struck in his honour when early cut off, what is to be done in the case of the great artist who, dying, leaves the country his debtor for delightful and ennobling works?

Utilisation of the Tides.—The flux-motor, of which we have before spoken, is essentially composed of—1st. A reservoir, by which the power is produced, which is to the flux-motors what the boiler and its accessories are to steam-engines. 2nd. A motive apparatus, constructed, with some slight modifications, on the principle of a stationary steam-engine. The motive force of the flux-motor may, it is said, be applied to all kinds of industry, even to those where, on account of the inflammable nature of the substance to be worked, it is impossible to use steam. It is not affected by atmospheric variations, such as arise from decrease of water in rivers and waterfalls; and, moreover, it can never fail in its effects. The inventor was about to apply his principle at Granville, where the tide rises 45 ft., under the auspices of the French Government, when the war broke out. He is now going to try the experiment practically at Bristol. It seems that, given a tide whose average rise and fall is 36 ft., the pressure to be produced in the reservoir would be 0.6 atm. With this pressure, it is necessary that the reservoir should be of the dimensions of 420 cubic yards for every horse power, working twelve hours a day. In constructing a reservoir whose diameter is 15 yards, whose horizontal section is 176 square yards, and whose height (equal to that of the rise and fall of the tide) is 12 yards, it would have a dimension of 2,119 cubic yards; that is to say, a little more than the equivalent of 5-horse power. The total cost of a reservoir with a diameter of 15 yards and a height of 12 yards would be 800*l*, which makes for every horse power 160*l*.

Village Homes for Little Girls.—Some of the ladies connected with the Discharged Female Prisoners' Aid Society, who carry on their charitable work at Nine Elms House, Wandsworth-road, have supplemented their reformatory operations by founding a country home for juvenile daughters of criminal parents. The liberality of one of them, the Hon. Miss Cavendish, provided a temporary refuge of the kind at Chertsey, which, up to the present, has well served its limited purpose; but the first public step has been taken towards placing the design upon a more permanent footing, and to the same lady belongs the credit and pleasure of having rendered the step possible. By the gift of a three-acre meadow, surrounded by rich foliage, with ample frontage to a sylvan Surrey lane, scarcely five minutes' walk from the Addlestone Station of the London and South-Western Railway, she has supplied the institution with a site. Upon this land it is hoped, at no distant date, a series of cottages will be erected suited to the abode of the little girls for whose welfare they are intended. Messrs. Habershon, Pite, & Fawcner, the architects, of Bloomsbury-square, have prepared the drawings for thirty-one, or for two of them; but as yet the funds will not allow of more than two being built, and the ceremony of raising the first sod of these two has been performed by the Princess Mary of Teck. Her royal highness descended from the dais, shovelled the sod into a mahogany wheelbarrow, and wheeled it to the front of the stage. The undertaking will henceforth be known as "The Princess Mary's Village Homes for Little Girls." Each home is to be provided with a matron, or mother. The girls will enter by selection, not election, and be brought up in habits of industry. Nearly 500*l*. were contributed to the charity on the spot, of which 300*l*. were given by one lady, viz., Mrs. Finlay.

Burlington Fine Arts Club.—The Exhibition of Water-colour Drawings here closed last week, without our giving that further notice of them which we promised. The claims upon our space are such that it is sometimes difficult to keep up with events. The collection was one of great interest. The catalogue, a valuable document, includes brief biographical notes of artists whose works were exhibited. The date of birth placed on each frame with the artist's name served somewhat to mislead. For example, No. 12, which bore the inscription, "David Cox, 1783," was painted in 1850.

The Scott Centenary at Edinburgh.—The arrangements for the national festival are progressing in a way which exceeds the expectations of the promoters. Sir J. Noel Paton has executed and presented to the committee an elaborate design for a memorial card for the celebration. The card is to be presented to each member of the company on retiring, in exchange for the ticket of admission, with the view of being framed and kept as a memento of their presence at the festival.

Westminster Chapter-house.—The meeting held in the Chapter-house on Friday, 21st, to celebrate the completion of the restoration, so far as the structure is concerned, was numerously attended, and included a number of eminent persons. The Dean of Westminster, who presided, made an address, as did Mr. G. G. Scott, and a resolution was passed congratulating the Government, and particularly the Right Hon. W. E. Gladstone and the Right Hon. W. Cowper-Temple, on the progress which had been made in the work of restoration, and expressing the anxious desire of the meeting to impress upon the Government, and upon both Houses of Parliament, the necessity for completing the task which they had taken in hand by filling up the windows with stained glass. On the motion of Mr. Cowper-Temple it was resolved: "That this meeting, anxious to secure for future generations of illustrious Englishmen the honour of interment in the Abbey or its precincts, suggests to her Majesty's Government that steps should be taken for the erection of a new cloister, in accordance with the plan proposed by Mr. G. Scott, fulfilling the purpose of a *Campo Santo*. We shall take an opportunity to speak fully of the restoration."

St. Stephen's Crypt.—The following return to an order of the House of Commons, dated June 1st, 1869, shows in detail the sums expended every year on the restoration of the crypt of St. Stephen's, from the commencement of such restoration and repairs; also the cost of the cloth which has been placed upon the communion-table:—

	General Construction.	Gas Mains and Burners, Iron Shutters, &c.	Fittings.	Decorations.
1861-64	£2,540	—	—	£630
1865	—	£800	—	—
1867	—	310	—	—
1868	653	—	10	207
	£3,499	£1,110	£1,110	£837

The first item of general construction represents the estimated expenditure between 1861 and 1864, on the restoration of the crypt, exclusive of decoration and fittings, being part of a lump sum contracted for the completion of the structural works of the new palace generally. The restoration of the walls and groining was carried out before the appointment of the present architect in 1860, and the expenditure on the same was included in the general cost of the building. The cost of the cloth which has been placed upon the communion-table was included in a contract of 363*l*. in 1866 for fittings, and it is not possible to state the separate cost of each item. The estimated cost of the cloth is 60*l*. The return is signed by Mr. A. H. Layard.

New Market-hall at Howden.—The foundation-stone of the new market-hall at Howden has been laid. The site is centrally situated, on the east side of the Market-place. The Market-place was decorated with flags, the old church bells rang out merry peals at intervals, and there was a large attendance of spectators. The new building is to be constructed of brick, with stone facings, in the Tudor style of architecture. The front to the Market-place will present a lofty embattled gable, with two-light windows, which will light the large public room erected over the market. Between the windows, in a cramped niche, is to be a figure of Roger de Howden, the early English historian, who was a native of Howden. Below, two arches open into the Market-hall, and at the side are a turret and two ale shops. The Market-hall is to be spacious, and the public room will be approached by a wide staircase. It will be well lighted, with an open-timbered roof, and will have a stage or platform at one end, with retiring and committee rooms. The architects who have furnished the plans are Messrs. M. E. Hadfield & Sons, of Sheffield, and the works are being carried out by Messrs. Sinclair & Sons, builders, Howden.

Laying of the Foundation-stone of St. Barnabas Schools, Holloway.—On Tuesday last the Lord Mayor laid the foundation-stone of new National Schools, in the parish of St. Barnabas. The estimated cost is 5,100*l*. Towards this outlay the Council on Education has promised a grant of 800*l*., on condition that the remainder of the money be raised before the end of 1872; the Bishop of London's Fund has voted 945*l*., and the National Society for Promoting the Education of the Poor, 210*l*. In addition to the above grants, the sum of 2,225*l*. remains to be raised from voluntary contributions, over and above the amount raised from such source already.

The East London Railway.—The Bill for facilitating the construction of the East London Railway, by which the cost of the line will be materially reduced, having passed through both Houses of Parliament, the directors are now about to issue 200,000*l*. six per cent. debenture stock which will complete the 466,600*l*. the company authorised to borrow under its Act of 1865, at the interest on which will be the first charge on the income of the railway. This sum 200,000*l*. will enable the directors to construct the line from Wapping through the London Docks to Shadwell, and open that important section of the line on the north of the Thames. A sufficient sum will be invested in Consols, the names of trustees, to provide for the interest to July, 1874, by which time the earnings of the Railway are expected to be sufficient to meet the charges upon its revenue; and, considering that debenture-holders will have for security upwards of 1,500,000*l*. of capital already expended on the railway, and which will be further increased as the works proceed, this would seem to be a promising investment. Mr. William Hawes is the chairman of the company.

The Post-Office Telegraphs.—A return has been presented to the House of Commons respecting the financial results of the transfer of the telegraphs to the Government. The return is in the form of a letter from Mr. Frank Eyre Scudamore to the Chancellor of the Exchequer, and shows that the transfer of the telegraphs to the Government has been productive of most satisfactory results. Mr. Scudamore says:—

"Assuming the capital expenditure up to the present time to be 7,600,000*l*., we are certainly earning a gross annual revenue upon it of 10 per cent., i.e., 760,000*l*. It is equally certain that our working expenses are more than 58 per cent. of our revenue. This result has been arrived at after an enormous increase in the facilities afforded to the public, and after a reduction of tax which on the present number of messages is equivalent to a reduction in the total sum paid by the senders of telegrams of 30*l*. 0*s*. 6*d*. per annum."

The statement of telegraph revenue collected from the commencement up to March 31, 1871, shows the amount received to have been 1,068,585*l*. This leaves a revenue of 798,585*l*. The sums already paid to companies and improvements, &c., amount to 6,719,025*l*. 0*s*. 11*d*. the sums which have yet to be paid amount to 234,832*l*. 17*s*. 8*d*.

Order in Art.—Mr. Cave Thomas, writing in opposition to those who assert that order is the weakest part in creative design, and content in poetry, painting, and sculpture, says: "It is possible that philosophy has all these things been wrong in supposing that progress is to be made by the hazy and nebulous towards system, order, and the well-defined, rather than from symmetry and order to confusion and the nebulous? If, later were the true sequence, then, when there is least of squareness and method in our intellectual madness, or when science and art are as tales told by idiots, 'full of sound and fire signifying nothing,' they would be at their best. Do not these thinkers recollect that wonderful prophecy in Isaiah,—that forecast of 'teaching of modern science,'—'Judgment will I lay to the line, and righteousness to plummet?' It will be backwards, ever backwards, till the spirit of that prophecy is generally understood, and men strive after spontaneity, order, and proportion in all things, not excepted."

Opening of a New Bridge.—On the 2nd at Nottingham, was opened a new bridge over the Trent, superseding the old one, a structure of ancient date. The design for the present bridge, the estimated cost of which is 31,000*l*., was the work of Mr. M. O. Tarbotton, C.E., borough surveyor. The total length of the bridge is about 700 ft., the clear width below the parapets 40 ft. Messrs. Benton & Woodhouse, of Derby, were contractors for the general building and masonry work; Messrs. Ant Handyside & Co., of London, for the ironwork; Messrs. Mawer & Ingle, of Leeds, for the general carving; and Messrs. Marshall, of Nottingham, for the painting and decoration. We shall give a view of the bridge and particulars before long.

London International Exhibition of 1881. At a recent meeting of the General Purposes Committee appointed by her Majesty's Commissioners for the Exhibition of 1881 to carry out the current series of Annual International Exhibitions, it was stated that the Exhibition proved a brilliant financial success. The expenditure has been already covered, and a large balance in favour of the commissioners assured.

Sanitary Work in the Crimea.—An uncorrespondent complains that we did not in the late Mr. James Newlands sufficient credit in our recent notice of his lamented death his work in the sanitary department of the Crimea during the Crimean war. The fact is, however, that we gave him more than he would have deserved for himself. The part he played there has been greatly overrated in some quarters. The credit of the sanitary engineering work in Crimea belongs to Mr. Robert Rawlinson. Newlands volunteered to go to the Crimea with the Sanitary Commission, of which Mr. Rawlinson was the engineer member, as superintendent of inspectors of scavenging. His services were accepted for this purpose, and he did not act in any other capacity. There were several inspectors borrowed from Liverpool, Messrs. Wilson, Ainsley, and Freney. The Sanitary Commission arrived at Constantinople in March, 1855. Mr. Newlands returned to Liverpool early in May.

Parliamentary.—Mr. C. Bentinck asked that it was intended that the elevation of new Courts of Justice should be erected in conformity with the designs exhibited in the gallery. The Chancellor of the Exchequer, in reply, said the matter was in the hands of the Treasury, under the Act of Parliament, and it was not yet approved of the elevation in question. Mr. C. Bentinck's inquiry whether the House would have an opportunity of expressing an opinion upon the subject, the Chancellor of the Exchequer replied that he was sure the hon. gentleman would find one.—Mr. W. Gregory of the First Commissioner of Works when East London Museum was likely to be completed and thrown open to the public. Mr. Gregory said the exterior parts of the building would be finished by the 1st of October, and it was treated with the president of the Privy Council to decide what purposes the building should be applied to.

The Archaeological Institute at Cardiff.—The opening meeting held on the 25th inst., the Marquis of Bute as president, delivered the opening address, a somewhat recondite discourse. Among speeches of congratulation and welcome were made by the Mayor of Cardiff, Mr. David, Bishop of Llandaff, Lord Tredegar, Sir T. A. Clifton, Archdeacon Blosse, Sir Stephen, by the High Sheriff, and other gentlemen representing the local interests or the Institute. At these proceedings the members and visitors were entertained at a *déjeuner*, in the Drill Hall, the Mayor, and in the evening the Marquis, president, held a reception. On Wednesday proceedings commenced with a meeting of the Historical Section. Mr. G. A. Freeman, the president of the Section, read an inaugural address; and papers were also read by Mr. J. J. and by the Rev. J. Goldie. An excursion was made to Llandaff, where Mr. Freeman delivered an address on the newly-restored cathedral.

The Trade of Nantwich.—During the past month an extensive establishment belonging to Messrs. Harding, Doody, & Sons, of Manchester, has been opened at Nantwich, for the manufacture of men's and boys' clothing. The new factory is situated on the Barony. It is an oblong, two-storied building, having a plate-glass roof, covering an area of nearly 6,000 superficial feet. The building has been erected by Mr. Henry Ray, of Nantwich, Messrs. Whymatt & Mellor, of Manchester, being the architects. It is intended to have at least 150 sewing-machines at work on the premises, and employment will be given to between 400 and 500 people. Since the erection of the shoe-manufacturing establishment in Nantwich by Mr. Leonard Gilbert, seven similar ones of business have been built by other manufacturers, and another is now in course of erection for Messrs. Hobson.

Hand Turning.—The Company of Turners propose to establish an annual prize for technical skill. The prize will be in the form of the company's silver medal and the freedom of the company and of the City of London, and will be given for the best specimen of hand-turning in any year. This year the competition will be in turning in wood. It is provided that the specimens shall be delivered at the Mansion House in the first week of October, and that they shall not exceed 18 in. in height and 1 ft. in diameter. The Company deserve praise.

Covent Garden Market.—Endeavours are being made to remove the business of Covent Garden Market.

State of the Dust-bins.—In reference to the recent remarks on this subject in the *Builder*, a correspondent suggests that "the dust-bin should be in the form of a barrel, open at the top, with a cover, and should be taken away frequently by the dustman, and a clean one left in its place." His instances the case of Paris; but there the motive impelling the use of closed barrels for the retention and removal of excreta from dwellings is a much stronger one than any that would practically operate in the case of dust-bins; and we have to consider not only what ought to be, but what is practicable; and we suspect it is much more practicable to compel the dust contractor and his dustmen to clean out the dustbins oftener than to carry out our correspondent's suggestion. However, we observe that the City authorities have given permission for public moveable receptacles to be placed in the streets before 8 a.m., into which dust may be put from private houses for the dustmen to take away.

The Lancashire Memorial to Lord Derby.—Two movements, originated for the purpose of doing honour to the memory of the late Earl of Derby, have been amalgamated, and the funds procured through the medium of both will now be applied to the successful attainment of one common object. The executive committee of the Penny Memorial have offered the whole of the funds at their disposal to the North Lancashire Statue Committee, conditionally that a statue should be erected in Miller Park, Preston. This offer has been accepted. Miller Park is situated on the north bank of the river Ribble, and is a place of extensive resort, not merely by the people of Preston and the neighbourhood, but also by persons from every division of Lancashire.

The Eastbourne and Hastings New Loop Line.—The ceremony of laying the last stone, to complete these works, took place at one of the bidders about midway on the line, the stone being laid by the general manager, in the presence of Mr. F. D. Banister, the engineer, Mr. F. G. Banister, the resident engineer, and other officers of the company. Mr. Fredk. Furniss was the contractor. A minute inspection of the works throughout was made previously to the Government inspection by Col. Yolland on the following day. At the conclusion of the ceremony, the men employed on the work were supplied with refreshments in honour of the event. These works have been carried out in a little more than ten weeks.

Bursting of a Reservoir near Bolton.—One of the lodges at Hill Fold Mill, Notting Bridge, near Bolton, belonging to Messrs. Hollins & Co., has suddenly burst. The lodge, which had only been constructed some two months, was 140 ft. in length, 40 ft. in width, and 7 ft. in depth. Upon one side there was a natural embankment, on the other an artificial one. The latter, it is said, had an exterior face of a perpendicularly built stone wall, without buttresses or support of any kind (?), and to this circumstance may be attributed the rupture. At the time it burst the lodge was full of water.

The Drainage of Oxford.—Mr. Robert Rawlinson, C.B., C.E., has attended at the Townhall, Oxford, by direction of the Secretary of State, to hold a local inquiry with reference to the main drainage works, the improvements in New Inn Hall-street and St. Ebbs-street, and the loans required for those purposes. Various evidence was led and objections were heard; and Mr. Rawlinson, at the close, congratulated the citizens on having, after numbers of years of strife, succeeded in obtaining a proper and feasible system of drainage.

Meeting of the Institution of Mechanical Engineers at Middlesbrough.—The meeting of the Institution of Mechanical Engineers has commenced at Middlesbrough; Mr. John Ramsbottom, the president, presiding. There was a good attendance at the first meeting, not only from the North of England, but from the Midland, Scotch, Manchester, and other districts of gentlemen connected with the iron and engineering trades.

New Orphan Homes, Leominster.—The chief stone of a permanent building for the Leominster Orphan Homes has been laid "by a little boy." The site is at the Sandpits. The two houses are being built by Messrs. Page & Son, of Leominster, who have undertaken the contract for 1,250l. The architect is Mr. C. Beale, of Belper, who has given his services free of charge.

St. Alban's Abbey.—During last week discoveries were made establishing that the ancient level of the floor was 2 ft. below that of the present time, the upper stratum being now composed of debris taken from various parts of the abbey and deposited there. The discoveries in the north transept consist of some tiles of a raised geometrical pattern, supposed to have been placed there during the abbacy of John de Cella (twenty-first Abbot of St. Alban's), from the year 1195 to 1214.

The Opening of the Mont Cenis Tunnel.—It is stated in the *Riforma* that there is every probability the great tunnel under Mont Cenis will be opened on the 5th of next September, if the arrangements at present made be not changed. The ceremony is to be accompanied with some little display.

Subsidence of a Canal in Pennsylvania.—About 50 ft. of the Wyoming Canal, in Pennsylvania, near Wilkesbarre, have suddenly sunk, completely draining the whole level. The canal had been built over the deserted chamber of a coal-mine, the roof of which fell in, causing the disaster. The miners were fortunately off work, holiday making.

The New Infirmary Plans, Halifax.—We understand that several sets of plans for the proposed new infirmary at Halifax have been received, and are placed for the inspection of the quarterly board in one of the rooms at the New Assembly Rooms. As yet, however, the public have not been admitted to view them.

The Printers' Pension, Almshouse, and Orphan Asylum Corporation.—The new wings to the almshouses at Wood-green are now completed, and will be opened on Saturday, the 5th of August, when the occasion will be celebrated by a public breakfast under a marquee on the grounds attached to the almshouses.

Columbia Market.—The Baroness Burdett Court is about to expend 60,000l. in improving the approaches to the Columbia Market, and to lay down a tramway a mile in length, extending from the Great Eastern Railway to the market.

Monumental.—According to the *Market Standard*, Capeaux, the sculptor, is engaged on a colossal piece of statuary, destined for Anber's tomb. The composer will be represented, surrounded by groups emblematic of his various operative *chefs-d'œuvre*.

The Epping Forest Bill has passed through a Committee of the House of Commons. It is evident the Government do not wish to entrust the control of the forest to the City Corporation.

Proposed Schools.—The sum of 100,000l. is about to be raised by the School Board on account of the twenty schools which they have already resolved to establish.

Scandinavian Seamen's Church.—The foundation-stone was laid by Prince Oscar on the 26th of July. The site is near the Surrey Commercial Docks.

Portsmouth Dockyard.—The president council, and students of the Institution of Civil Engineers will pay a visit to the Portsmouth Dockyard extension works on Monday, 31st inst.

TENDERS

For a pair of villa residences, to be erected on Crystal Palace Park Estate. Mr. J. Norton, architect. Quantities by Mr. Tucker:—

Pearce, Brothers	23,938	0	0
Shapley & Webster	3,900	0	0
Wright, Brothers, & Goodchild	3,796	0	0
Thompson	3,644	0	0
Nightingale	3,673	0	0
Moore & Grainger	3,549	0	0
Peskett & Taylor	3,435	0	0
Waterson & Co.	3,369	0	0
Plummer	3,277	7	0
Stephenson	3,233	0	0
Walson, Brothers	3,219	0	0
Crosley	3,098	0	0
Roberts	3,038	19	0
Ball	3,010	0	0
Gooding	2,969	0	0
Byah	2,890	0	0

For a warehouse, Watling-street, including part of fittings. Mr. H. Ford, architect:—

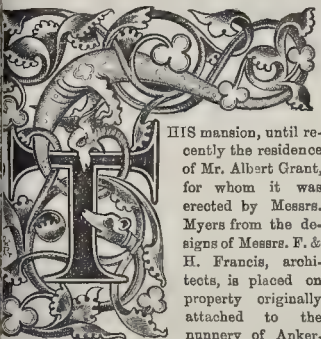
Downs	23,829	0	0
Gammon & Son	8,897	0	0
Colls	8,298	0	0
Stimpson	8,163	0	0
Dove, Brothers	8,155	0	0
Hill, Keddell, & Waldrum	7,998	0	0
Brass	7,610	0	0
Perry, Brothers	7,554	0	0
Fritchard	7,480	0	0
Moreland	7,470	0	0
Brown & Robinson	7,279	0	0
Corder	7,263	0	0
Hendshaw & Co. (accepted)	7,080	0	0

N.B. When more than four copies required, a considerable reduction allowed if lithographed.

The Builder.

VOL. XXIX.—No. 1487.

Royal Indian Civil Engineering College,
Cooper's Hill, near Staines.



THIS mansion, until recently the residence of Mr. Albert Grant, for whom it was erected by Messrs. Myers from the designs of Messrs. F. & H. Francis, architects, is placed on property originally attached to the nunnery of Ankerwyke, in Bucking-

hamshire, on the opposite side of the Thames, in the reign of King Stephen. It was, some six months ago, purchased by the Indian Government, and placed in the hands of their architect, Sir Digby Wyatt, for adaptation, by certain alterations and additions to the existing building, and the erection of an entirely new block, to its new purpose, that of a Civil Engineering college for India.

The object held in view in making the alterations to the mansion was to utilise, as far as possible, existing arrangements, and to avoid any serious, and therefore expensive, interference with the main structural features. A glance at the ground plan* will show that this has been successfully accomplished, and most of the rooms have been adapted to their new purpose without undergoing any vital changes.

The principal staircase, with which the architect was loath to interfere, but which of course could not be common to the professorial, domestic, and students' departments, has been left intact, and the difficulty of providing separate access to those departments has been surmounted by the addition of the two new staircase turrets shown on the plan. These lead to the president's and professors' apartments, for whom fitting accommodation has been provided on the first and second floors. The offices for the resident officers are in the basement. In addition to the president's and married professors' quarters, accommodation is provided for three unmarried professors in the mansion.

The four class-rooms are 30 ft. by 30 ft. 6 in., 28 ft. by 25 ft., 25 ft. by 30 ft., and 22 ft. by 27 ft. respectively; the library, 20 ft. by 50 ft.; reading-room, 20 ft. by 16 ft. 6 in.; model-room, 20 ft. by 23 ft.; lecture theatre, 29 ft. 6 in. by 47 ft.; dining-hall, 22 ft. by 60 ft. 9 in.; billiard and recreation room, 22 ft. by 34 ft.; kitchen, 24 ft. by 30 ft. 6 in.; servants' hall, 18 ft. by 24 ft.

The professors' rooms are on the first and second floors, and do not appear, therefore, on the plan we give. The portion of office building from "still-room" to "coals" inclusive (shown by the shading on the plan), has been raised by two stories, and the remainder shown as shaded is entirely new. Accommodation is thus provided

for the president and his family, one married professor and his family, three unmarried professors, the steward, 100 students, each of whom has a separate room, and the college servants.

In addition to the alterations to the mansion and the erection of the new block we have already described, five residences for professors have been erected on the estate, within a short distance of the college, comprising one single and four semi-detached houses.

Considerable alterations have been made in the stable block to adapt it as residences for married servants.

The contractors are Messrs. Ashby & Horner, whose resident foreman on the works is Mr. Winney. Of various sub-contractors, we may mention Messrs. Easton & Amos as having executed the water supply; Messrs. Baily & Sons, the cooking apparatus; Messrs. Thwaites & Reed, the clock; Mr. Samuel Gale, the hot-water apparatus and electric bells; Messrs. Lawrence the lifts; Messrs. Forrest & Sons, the gasfitting; and Messrs. Macfarlane, the iron gutters and finials.

Mr. John M. Gritten is the clerk of the works; and his father, Mr. H. F. Gritten, is the surveyor employed by Government to take out the quantities and adjust the accounts. The whole has been carried out from the designs and under the superintendence of Sir M. Digby Wyatt.

The works were commenced on the 1st of February of this year, and have been pushed on by the contractors with the greatest vigour; the president has been some time in residence, and the remainder of the building is formally opened this day, August 5th, with the following staff:—The President is Lieut.-Col. Chesney, of the Royal (Bengal) Engineers, well known for his distinguished career in India, and for his valuable contributions to current literature. Col. Chesney was severely wounded at the siege of Delhi, and held the appointments of Principal and Professor of Engineering at the Civil Engineering College, Calcutta (1859 to 1860), and Accountant-General to the Indian Government from 1861 to 1870. His chief literary work is "Indian Polity," and amongst his various contributions on military and other subjects he is the author of the article which recently attracted so much notice, under the title of the "Battle of Durking."

The Professor of Construction, Mr. Calcott Reilly, M.I.C.E., is well known as an eager inquirer into the principles of iron-girder bridge construction, and for the published results of his investigations.

The Professor of Mathematics, the Rev. J. Wolstenholme, late Fellow of St. John's College, Cambridge, graduated as Third Wrangler in 1850. With Mr. Frost, he is a joint author of a treatise on Analytical Geometry of three dimensions. On several occasions he has acted as an Examiner at Cambridge for the Mathematical tripos.

Major W. H. Edgecombe, Royal (Madras) Engineers, the Professor of Surveying, was formerly Superintendent of the Topographical Survey of Pegu, and for some years of the Civil Engineering College at Madras.

The Professor of Experimental Science is Mr. Herbert M'Leod, for many years assistant to Professor Frankland.

Lieutenant G. S. Clarke, Royal Engineers, the Instructor in Mechanical Drawing, passed out first with great distinction from the Royal Military Academy, Woolwich, in 1868.

The Instructor in Landscape Drawing, Mr. Samuel Evans, is an Associate of the Society of Painters in Water Colours, and Drawing Master at Eton College.

We shall look anxiously for the proceedings of this organisation, and shall hope to have to report continuously the most successful results.

THE DRAUGHTSMANSHIP OF THE SUN.

EVERY architect and every engineer is aware of his obligations to the drawing-board. The use of square and compass in the art of design is the very alphabet of their professions; and those of our readers who are best aware of the hoary antiquity of this method of delineation, and of the royal and patriarchal names which are inscribed in the unwritten record of masonry, do not need to be reminded that what is now a simple matter of education was once a sacred mystery of a high order. Without, however, going back so far as the ark or the pyramids, we may speak of all structural work as being in the first instance put into form by the draughtsman. With the increase of skill and of artistic taste in the production of original drawings, the claim of the architect to take a high rank in his profession becomes more successful. With the elaboration of detail on paper, not only does the certitude of aesthetic effect in the finished work become more attainable, but the probable cost is more readily ascertained. The only drawback is the large expense of making a sufficient number of copies of detailed and elaborate working drawings.

It is in this particular that the photographic process to which we shall presently refer becomes so highly interesting to the architect. Three complete sets of drawings are desirable in almost any instance, and more numerous copies of all or of some of those originals are often desirable. The expense of making these copies is exactly proportioned to their number. By the use of tracing paper and cloth, errors of transcription may be avoided, at the expense of delicacy and durability, and also with a saving of time. Still the cost of tracings, when their use is admissible, is not to be despised, and careful collation with the original is necessary in every instance.

In drawings requiring multiplied copies, as in the case of Parliamentary plans, Ordnance surveys, county maps, and the like, the aid of the printing-press has been found indispensable. But the great expense of engraving is such as to limit the employment of the copper plate to comparatively few cases of draughtsmanship. And, both in engraving and lithography, re-drawing in some mode, whether by tracing or by transfer, is requisite. Thus an element of uncertainty is introduced, which prevents the copy from being, *ipso facto*, a *fac-simile*; nor is either of these methods of reproduction admissible, as matter of cost, unless in cases where a considerable number of copies are known to be required.

If, on the other hand, the architect were put in possession of a simple, accurate, and cheap method of producing *fac-simile* copies of his drawings, or copies on reduced or enlarged scale which should be accurately true to that scale, he would soon learn to avail himself of such an aid. It is precisely this which the process called heliotype does for the draughtsman. The cost of producing, from the original drawing, a matrix from which to print any number of copies, is so small that, for any design involving detail, it would be easier to make a single copy by the heliotype process than by hand in the ordinary way. And the production of half a dozen more copies would only cost the paper, ink, and a minute portion of workman's time in addition to the expense of the first. The scale should, of course, be not merely referred to or written, but drawn on the original; and thus, in the case of reduced or enlarged copies, the scale would be enlarged or reduced by the same process that reproduced the drawing itself.

The drawing produced by the heliotype differs from any other copies that can be made at the present time, in possessing the combined characteristics of being incapable of error, and printed in ordinary ink. It is not necessary to discuss the absolute durability of other photographic processes. With regard to the prints with which we have long been familiar, which are produced by the chemical agency of the salts of silver and other metals, it is admitted by their warmest admirers that their absolute permanency is more than dubious. By the use of a large proportion of gold, and by the application of long and costly manipulation to each individual print, a considerable degree of permanence can be obtained. Still, this is far from absolute; and there is not only the question of cost, but that of the inability of the ordinary purchaser to decide whether what he buys is one of those elaborated works, or a more fading product of ordinary manufacture. Touching the processes, other than the

* See p. 618.

heliotype, which are called permanent, and with specimens of which our readers are, no doubt, more or less familiar—namely, the autotype and the Woodbury type, they can hardly be regarded as competitors for the employment which we now suggest. That they are unfauling, in the strict sense of the word, we do not question. Exposure to light has no influence in obliterating them, as they contain, or may contain, non-metallic pigments, such as carbon. The effect of damp is more doubtful. But it is unnecessary to discuss a subject on which there are conflicting opinions, as it is immaterial from our present point of view. The Woodbury-type is not suited for lineal reproduction. Every part of the paper submitted to the press in this process must be tinted, however slightly, with the ink. So absolutely is this the case, that no margin can be left, and, to ensure one, every Woodbury-type has to be mounted. Again, in the carbon process, as much labour and art is requisite to produce every individual print (with a large percentage to be added for accidents) as is needed to produce the matrix of the heliotype. As matter of art, therefore, to say nothing of absolute reliability, which can hardly be ascribed where a gelatine vehicle is made use of, there is really no competition between these two methods. Neither will any mode of transfer by means of stone, insure the sharp fine lines producible by the heliotype.

Another advantage, of unusual weight, which the heliotype process possesses over every other form of printing is the small cost and small storage that are required for securing all the facilities of stereotyping. When the gelatine film used as a matrix is once dried, an operation that takes from twenty-four to thirty hours, at a temperature of 90°, it is as durable and convenient to handle or to stow away as a piece of leather or of horn. One, six, a hundred, or any other number of prints can be pulled from the gelatine plate; and the tablet can then be laid aside, serving at once as a permanent record and as a matrix from which, at any future time, a fresh set of impressions can be taken. This property is unique, and its great commercial importance will be readily recognised by all those who are familiar with printing.

As briefly as possible we will now attempt to give an idea of the nature of the heliotype process. The prints ordinarily known as photographs owe their existence to the chemical action of light in dissolving certain salts of metals, notably the nitrate of silver, and in precipitating the metal on the paper. The three processes of the autotype, the Woodbury-type, and the heliotype depend on the effect of light, in rendering certain compound substances, chiefly of organic origin, insoluble in water. Striking as the paradox may seem, that photography is not the action of light, it is nevertheless true that it is not the luminous rays of the spectrum, but the invisible chemical rays that accompany and overlap the blue rays, that alone appear to have any influence in these subtle changes. In the autotype and the Woodbury-type, light, transmitted through an ordinary glass negative, on to a film of gelatine, renders the exposed portions insoluble. The unchanged parts of the film are then washed away, and the result is a sort of model, or picture in low relief. In the autotype, a coloured pigment is combined with the gelatine, and the actual relief above described is transferred to paper, and forms the print. In the Woodbury type, the gelatine mould is made use of for the formation, by hydraulic pressure, of a metal counterpart (as in the case of nature printing), from which impressions are subsequently taken in gelatinous ink. In the heliotype the gelatine is exposed to the action, both of bichromate of potash and of chrome alum. A leathery texture is thus produced, together with a degree of sensitiveness to light, which renders the film, when exposed to its action under a negative, insoluble in, but not entirely insensible to, water. The parts most freely acted on by the actinic rays become thoroughly water-proofed. The half tones and shadows are rendered partially impermeable, but retain the power of absorbing amounts of water proportionate to their degree of exposure. Hence results a picture, invisible by itself, but which becomes immediately conspicuous on the application of a greasy ink, which adheres to the dry gelatine, but is rejected by the damp portions, as in the case of a lithographic stone. From this inked surface the pigment is removed on to paper, by the use of an ordinary Albion press, and this impression is the heliotype plate.

An obstacle to the practical use of this elegant process was found to occur from the unequal inkability—to coin a word—of the gelatine matrix. A thick ink would adhere to the darker portions of the film, leaving the lighter parts uncoloured. The reverse took place with a lighter or more fluid ink. This very peculiarity was grasped by the fertile genius of Mr. Edwards, and converted into one of the distinctive beauties of his process. He uses two inks, applied by successive rollers. These inks may, if required, be of different colours; so that it is not necessary that a heliotype should be a monochrome.

TO, AT, AND FROM BERLIN.*

In my last week's account of the triumphal entry of the troops, I omitted to mention the singular "standards" carried in the procession. These are in form like a Latin cross. From the extremity of each arm hangs a "horsetail," or large tassel of horsehair, in colour varying with the nationality, or regiment, to which the standard belongs, being one white and one red, or white and black, or red and black. Tolerably large bells are suspended beneath the transverse beam, and an eagle surmounts the whole. To assist the bearer in supporting this edifice, a broad white belt passes round his waist having a loop or pocket in front in which the pole-end of the standard rests. Numerous military bands headed their regiments, the bandmaster marching in front, bearing his very handsome staff, of large size, and covered with crimson and gold. The music of these bands, it is needless to say, is most excellent: it is, like the marching, somewhat rapidly executed, bold and invigorating. As the regiments advanced, and the music grew louder from diminution of distance, then died away as it neared the Schloss Platz, and was drowned by that of the next approaching band, the effect was admirable and very exciting.

The march past terminated a little after four o'clock; and then began the return of the stream of people that had been flowing out through the Brandenburg Gate for so many hours in the early morning. Now the faces were all directed the other way, which gave one an odd sensation, just as if the Linden and its houses had been turned round during the day. Since our early breakfast there had been too much occupation for eyes and thoughts to allow us to think of eating; therefore when, after nine hours' hiatus, the dinner-bell sounded, a little before five o'clock, food was extremely acceptable. The *table-d'hôte* was crowded with officers in their gay uniforms, and ladies in pretty toilettes, and a very Babel of voices rose up on all sides. Some few brassards were visible. For the information of those persons who have never seen a brassard, I may as well say that the one I examined was made of a strip of coarse white linen, about 5 in. wide, machine-stitched at both edges, and a cross of red cloth all in one piece, and about 3 in. in diameter, machine-stitched on to the white.

The extreme ceremony used between the aforesaid officers, and the respectful, almost servile, deference shown to superior military, even when the two colloquists are evidently of equal civil,—rank, is a peculiar feature: part of the marvellous subordination and organisation, I presume, which so materially contributed towards the attainment of the recent successes. Like almost all other nations, excepting the English, Germans are not great at "shaking hands;" so they clasp their own two instead, and, allowing them to hang down before them, they fling for a few moments from side to side, bowing all the time, smiling graciously, and uttering polite nothings. At table, champagne in ice was in immense request, and the friendly *klingsklang* of glasses was very pleasant to witness, and quite inspiring to hear. Opposite to us sat a lady-nurse, with her little bit of "decoration" ribbon pinned on the bosom of her brown silk dress. I longed to have a talk with her, and had just made a commencement when she unfortunately spilled some *potage* on the aforesaid brown dress, and became absorbed in the removal of the stain. Ere the little trouble was rectified, a fellow-countryman sat down beside her, and, pointing to the "decoration," began an eager conversation; so my chance was gone. She was by no means young, but suggestive, having a gentle, subdued, care-worn expression of countenance.

To our right, a touching little episode occurred,

later on. A youngish officer, with a charming wife, sat amongst a circle of brother-officers and relations, grouped on both sides of the table. When the dinner was half over, many of the military men throughout the *spesssaal* had to leave, possibly to return with their regiments to St. Denis, or some other distant "quarters." Our officer rose to depart, which was too much trial for his dear wife, and a flood of tears was the consequence. A nice old grey-haired man beside her essayed to comfort her, but in vain. Presently some few of the absentees returned, when she wistfully gazed round a projecting angle of the room, in hopes her One might come back also; but he came not, and the rebellious tears again began to flow.

In the late afternoon, or early evening, carriages were in great request for driving about to see the decorations; but when the illuminations were being lighted up, and afterwards, no vehicles were allowed to circulate,—which was a wise precaution, for it spared all crushing and inconvenience to the orderly, good-tempered, and well-behaved crowd. There must have been many, many miles of green garland hung up in Berlin, and where the fingers came from to make them is a marvel; as likewise the materials of which the long green ropes were composed, although Belgium and Italy were laid under requisition as well as Germany. Everything capable of being twisted into a wreath fetched enormous prices, I hear: the garlands and wreaths, already made, were brought in from country districts by the wagon-load.

The illuminations were not very remarkable: not nearly so attractive as those put up in London on much more ordinary occasions; and when one remembers the superb demonstrations both in the way of fireworks and illuminations which England produced at the time of the Peace rejoicings after the Crimean war, one cannot but feel that in this line, as in a few others I could mention, there are some things we English can do as well as, if not better than, most nations, notwithstanding all the self-inflicted fault-finding we so delight to heap upon our own devoted heads. The electric light on the Brandenburg Gate was a very mild affair; and of the four pots of fire, only three generally—and occasionally two—condescended to burn at the same time. Red, blue, and green fire was lighted on the adjoining house, and was a more successful display, richly illuminating the large statues by which it is surmounted. Gas was mostly used for the houses, in stars—some of them very novel in design,—letters, and so forth. But the most effective arrangement with gas is, I think, to trace out all the architectural features of a facade with a line of gas jets. The beautiful screens of cut-glass pendants, with gas behind, so richly used in England, obtain but little at Berlin, but where they did appear they were very effective; and the old-fashioned coloured oil-lamps were charming and tender, as they are always, though so subdued in brilliancy. Of all abominations, the huge flares of gas surrounding the tall standards on each side of the Linden-avenue were the worst, for they utterly eclipsed the more elegant and refined private illuminations. The *Programm der Feierlichkeiten*, under the head "*Die Illumination*," says that the Schloss would have its 500 windows lighted up by eight wax candles in each window, and its chandeliers similarly filled, together with the burning of Bengal lights on the cupola; the row of candles in windows sounds very simple, but the effect is excellent, therefore its simplicity is an additional recommendation.

The noble memorial to Frederick the Great, in addition to the flowering plants already mentioned, is surrounded by beautiful arrangements of crown-and-iron-cross shapes, of coloured lamps, which, when lighted up, had a charming appearance; but the palaces and most of the houses are overdone with decoration, the palace of the Crown Prince in particular. The whole facade is a mass of flags, chalky-coloured shields, each bearing the name and date of a victory gained in the late war with frequent mention of the troops engaged, coloured lamps, gas-fires, Chinese lamps, flags, and cannon; and all dedicated to the *dritte armee corps*. The amount of bunting displayed is almost as astounding as the miles of garlands; the flags are of enormous size: one, suspended from an upper window, three measured with our eye being at least 12 ft. long. The German colours are, as I have said, black, white, and scarlet; they are not placed parallel with the flag-staff, but are "horizontal colours," as the term is. Profiting by the suggestion of a courteous officer, that if we wished

* See pp. 540, 567, 580, ante.

form a correct idea of the captured cannon *Roberten* is the word, which looks and sounds commonly like "robbed"), we should go to arsenal, we accordingly paid it a visit. Thisilding, the Zeughaus, is generally spoken of as very perfect specimen of architecture, but to eyes the huge size of the sculptured ornamentation utterly disfigures it; gigantic gaping helmets, with other armour, form the keystones the window arches on the exterior of the office; while on those surrounding the inner court large heads, carved by Schlüter, represent a human face in every imaginable contortion agony and death. The Zeughaus contains many interesting relics, such as seven bunches keys taken from captured fortresses, examples arms and accoutrements of all European nations, every description of fire-arm from the invention of gunpowder until the present time, a key of Adrianople and a Turkish standard, and several hundred stands of colours dating from the French Revolution, and captured in 1815. But the greatest interest naturally centres in the guns taken during the late war; these there is, indeed, a large number, and they are of great size. A peculiar one, short and thick, came from Fort Issy; some were cast in 176, and are inscribed "1^{re} République," some of Louis XVI.'s time, and are engraved with the two L's crossed; one gun, with very ornamental handles, has the royal monogram imperfectly obliterated; a fellow to it still bears a monogram; eighteen of these long guns are all taken at Metz, according to a young officer who was present. Of three short guns, similar, one is dated 1851, and has beneath, P. (République Française). The iron gun from Fort Valerien is here with some ammunition belonging to it. This was the only trophy brought away from the terrible fort: "and enough, too," said a gentleman present; "those who brought it could not have desired anything else to carry for a long time." It is a huge monster, and its rusty exterior is by no means attractive. Some much-ornamented long guns, brought from Fort Vanves, are dated 1748. Amongst the mitrailleuses are several of the old pattern: eight barrels only, and those separate, without an outside casing. Some of the guns taken at Neu Breisach are dated 1733; and two on embrasure-guns are marked "Sir F. G. Armstrong." The fearful manner in which many of the cannon are knocked about by the German shot and shell is perfectly marvellous. Sometimes a ball has carried away a thick lump from the rimmed mouth of the gun, and then striking along the barrel has dug a deep groove as it went; sometimes a large hollow is ploughed into the immensely thick metal, the force of the blow appearing to have produced heat by which the metal has been partially fused; and then again, the handles of the gun, nearly as thick as a man's wrist, are bent and twisted out of all shape, or are occasionally shot clean away. After seeing these, we drove down the Wilhelm-strasse have a look at Prince Bismarck's house; and then, General von Moos's and von Moltke's; the latter in a barren, recently laid out, part of the biergarten.

An interesting collection of objects in the Monbijou Palace has recently been opened to the public, forming a small historical museum. The following items seem especially deserving of notice:—A picture painted by Charles Vernet in 1822, "The Consecration of the Flags of the Allies on the Champs de Mars, at Paris, in 1814." Frederick William III. was king. Blücher was not there; he was ill with his eyes," said our guide. A picture of the Linden at the end of the eighteenth century shows Berlin an unpretending country seat of place. A Parade unter den Linden, 1819, by Schröder, is also interesting from the same cause. A portrait of the first General von Zieten (*querre* was it he who organised the Zieten Hussars, of whose brave deeds we read during the late war, and who wear that wondrous scarlet uniform?) and three other portraits, that of Fürst Bülow, General Bülow v. Dennewitz, and General v. Scharnhorst, interested us likewise.

A wine-glass of Frederick I., father of Frederick the Great, is carefully preserved here. It is of Venetian glass, with his crown and monogram in gold and red, and has a straw stem, with white twisted threads inside. A saddle, said to be 800 years old, covered all over with carved figures in ivory, nailed on, is very curious. A schwert-brecher, a singular-shaped shield, with narrow bars, in rings, fastened on so as to catch the point of the sword, when the wearer, by turning the shield sideways, can snap the sword

in half. There are two of these shields. Iron masks, for condemned criminals to wear on their way to execution, hideous caricatures of the faces of animals, demons, &c., suggest the reflection, "See how these Christians loved one another." There are eight drawings of soldiers, by Professor Carl Schultz, with very thick soles to their boots, corrected by the hand of Frederick William III.; a suit of clothes worn by him as a small child; a glove and riding-hat worn by Queen Louise; dress and insignia of a Doctor of Oxford, conferred on Frederick William III., in 1814-15; the crimson velvet-covered chair, sitting in which Frederick William II. died, and a garden-carriage of his period; roughly-executed portraits of Frederick William I.'s tall grenadiers, of whom James Kirkland, an Irishman, was the tallest, best-looking, and most expensive. He was 6 ft. 8 in. high, and he cost 7,000 thalers. Many of the garden-carriages preserved here are curious concerns. Several of them are in the form of animals, the back left open for the riders to sit inside,—one of a dragon, for instance, and the servant has a seat behind on the tail. These reminded me of the hideous water-jugs I saw in Mortlock's window a few months since, (and was much surprised to see such a specimen of bad taste there), which were in the form of feather-covered ducks and swans. What can be more disgusting than the notion of taking a liquid that should be so pure and stainless, out of the hollowed-out body of a bird? A war-sleigh, of the time of the great Kurfürst, used in 1678 and 1779, during the expulsion of the Swedes from Prussia, is a curious and interesting memorial. The handsome robes worn at the coronation in Königsberg, 1861, of crimson velvet, and wondrously fine ermine, are preserved here with the two thrones, footstools, &c., used on the occasion. In the large room are to be seen the chair in which King Frederick William I. died; the stone sink in which he washed his hands at Schloss Wusterhausen; the leather purse used by Frederick II., during the seven years' war; a book, half burnt, which Frederick the Great was reading in bed when he fell asleep, and set himself on fire; some music composed and written down by himself; the cradle he slept in as a baby, and a very large cradle too; a wax cast of his face taken after death, with large, wide-open blue eyes, and nose all snuffy, as it was in life; also casts of his well-formed hands, but which painfully resemble those of a corpse, looking rigid and colorless; and his last favourite horse (stuffed), which lived more than twenty years after his master, though no one was allowed to ride it evermore; it was upwards of forty years old when it died, and looks such a poor, pitiful, worn-out old misery.

There is a wax model of Frederick as a child of about two years old, a pretty little creature, with large blue eyes; also the head in wax of the beautiful Queen Louise, as she died. It has on a lace cap, and lies sideways on the pillow, looking very sweet, and so natural. She was only thirty-two. Her little son is here beside her. In another division of the apartment is a painting on panel, by Von Criegewick, dated 1648, of the great Kurfürst, with his first wife, Louise von Oranien, and his mother: very careful in detail and minute in execution.

The historical "Cobelins" displayed on the walls have a special interest of their own, apart from the events they commemorate, for they were made in Berlin. The subjects of them are,—"The Landing on Rugen, 1678;" "The Siege of Stralsund, 1678;" "Passage of the Army over the frozen Curische Hafl, 1679;" "Siege of Stettin, 1677;" "Surrender of Wolgast, 1675;" and "The Battle of Fehrbellin, June 18, 1675." The history of the Berlin tapestry manufactory was as follows:—

In 1686, the Brandenburg resident at Rome, Winkel, recommended a refugee, named Pierre Mercier, to the Kurfürst, who accordingly sent over for him from Amsterdam, to come and give a specimen of his art. Mercier executed a portrait of his new master on horseback, and also his coat of arms, with which the Kurfürst was so well pleased that he desired his historical painter henceforth to occupy himself with this interesting art. Other artists were also summoned to give their assistance, namely, Rütger v. Langerfeld, born in Nimwegen, 1635, who was instructor in mathematics to the young prince, and was also known as an architect; he died 1693; the brothers Casteel, from Brabant, who came 1688, and one of whom died 1694; and Cornelius Baga, born in Holland, 1660, who was called from the Hague to Berlin, 1688: he died June 11, 1693. The manufacture was carried

on with great secrecy behind walled-up windows, and thence changed its locality, until it came, in 1720, into the hands of Carl Vignes, of whose work the tapestries in Monbijou Palace are examples. Very fine specimens in silk, wool, gold, and silver were produced during his superintendence.

The green and pleasant, though small, grounds of Monbijou, filed with large trees, are always open to the public. This wise provision of breathing-places for the people in all the German towns, the ground being frequently laid out as charming gardens, is a peculiar feature, and an admirable one. The national love of greenery is very remarkable; the *cafés* in Berlin have a large slip of the wide pathway before them, partitioned off by a wire or wooden trellis breast high, over which is trained some climbing plant, usually ivy; and behind this slight but leafy screen the frequenters sit sipping coffee or discussing ices, near enough to be enlivened by the bustle and movement of the thoroughfare, but sufficiently removed to feel privacy and ease. The English mode of living in detached houses is beginning to obtain greatly in and around Berlin, and some other large towns. Several delightful residences, each standing in a well-laid-out garden-plot, are seen on all sides. Stucco is being gradually discarded for the more honest brick. We saw much most excellent brickwork; and ornamentation in baked clay, or terra-cotta, is largely used. This is called "the modern style."

The Jews' Synagogue is worth a visit, being richly adorned with marbles, painting, and gilding. The interior of the Opera House we were unable to see. A special performance had been commanded in commemoration of, and suitable to, the occasion, about which we could only learn that all the seats were retained by the Emperor, for his guests, his generals, and so forth. In default of the Opera, we went to the Concert-house, and heard some good singing by the royal cathedral choir. The same evening the troops were entertained at grand dinners given by the city or by private persons; and on Sunday morning a solemn thanksgiving service was held in the Cathedral, at which the Emperor and his Court, his visitors, the military heroes, and as many ordinary individuals as could possibly squeeze within the doors, were present. We essayed to enter, but though we arrived half an hour before the appointed time, we were assured that the building was so *finischlich* voll that no one more could get in; so we desisted, and went instead to the English service held in a room of the Monbijou Palace. During the Litany, we were startled by the report of several large cannon close at hand. We subsequently learned that these cannon, 101 in number, were fired off at the conclusion of the "Te Deum;" immediately afterwards the Emperor quitted Berlin, and the grand Triumphal Festival was at an end,—henceforth a thing of the past,—a memory! * R. F. H.

ON THE USE OF PORTLAND CEMENT CONCRETE AS A BUILDING MATERIAL.†

This subject has for several years awakened a considerable amount of interest, and provoked much inquiry and discussion. This is owing partly to the novelty of the material and partly to the statements made in its favour by some of its advocates. These statements are some of them just, and capable of clearest proof; others are not borne out by experience; and fairness and candour demand that they should be disproved, and the public and the profession put in possession of the truth concerning them.

I propose to examine some of the chief of these in the order of their importance hereafter. Before doing so, I may be permitted, by way of preface, to say that all my remarks have reference to Portland cement concrete, built in continuous layers in what has been called the monolithic system, with such machines or frames as those patented by Tall, Drake, and others. Roman cement for concrete walls is out of the field, and concrete blocks are neither better nor cheaper than ordinary brickwork.

The use of lime concrete dates from very early times, and its value has never been questioned. The introduction of cement concrete as a substitute for stone and brick, with far greater pre-

* To be continued.

† By Mr. Thomas H. Wonnacott. We noticed this paper at the time it was read at the Institute of Architects, and printed some correspondence on the subject afterwards.

tensions to usefulness, is of very recent date, and in a diminutive way may be said to mark an era in the history of construction. Though quite of modern origin, it has already won for itself almost universal acknowledgment as a valuable building material. This, I think, is a point that needs no discussion. The points in connexion with it which do call for examination are—whether it should supersede brick and stone, and whether it is universally applicable with safety, profit, and economy. As it has been my duty to employ it frequently in works varying in cost from 100*l.* to 4,000*l.* or 5,000*l.*, I have had opportunities of testing its qualities, and my convictions having assumed a somewhat definite shape, I venture to express them with an approach to confidence. I have no hesitation in saying that the general impression of its value is in the main correct. By severe tests, its claim to adoption has been fully established.

But approval must not be unqualified. It has its drawbacks and defects, as well as merits, and these should in fairness be shown. Influenced by a knowledge of these, I would not advocate its universal or even large adoption, and would deprecate its use for many purposes suggested by pamphlets I have read on this subject. It is also to a great extent incapable of artistic treatment, except at great cost for moulds, patterns, &c.; and for these reasons, and others hereafter mentioned, I am persuaded neither brick nor stone has anything to fear from competition with it. Its claims to superiority, as stated by its advocates, are chiefly the following:—First, much greater strength than brick or stonework in mortar; second, less cost; third, superior weather-proof and water-proof qualities; fourth, that it is a non-conductor of heat and sound; fifth, that it can be constructed with safety more rapidly than work in mortar; sixth, that it requires no external facing, and only one coat of plaster internally; that chimneys require no pargeing; that bond timbers, lintels, and brassmums may be dispensed with; and that roofs, gutters, and stack-pipes may be constructed wholly of this material.

These are the demands made on our credulity by those who advocate its general introduction. If proved to be just and true, they would lead to a revolution in our art, but they are not yet all established beyond controversy, and I venture to believe they never will be. Before examining these claims in detail, I may be permitted to offer some suggestions on the preparation of the concrete. The proportions that have been found to make the strongest work are six of clean gravel or ballast, broken bricks and flints; one of sand, and one of Portland cement. The sand, I think, adds to the ultimate though not immediate strength, by multiplying points of contact and giving a better bed for each stone of the aggregate, and is especially necessary if the gravel is large. When thus composed, it is not unlike a stone wall, built with one of sand to one of cement, in random courses. The gravel or bricks forming the aggregate should pass through a $\frac{1}{2}$ -in. mesh. Smooth, non-absorbent stones, as chalk flints, are not so good as those that are somewhat porous and rough on the surface. This is accounted for by the fact that the process of "setting" in the cement is partly mechanical and partly chemical; the mechanical part of the process demanding some pores into which to penetrate, or some roughness to grasp. Large stones and brick-bats may be advantageously used as "packing"—that is, they may be "packed" or pressed into the mass while in a semi-fluid state, and if thoroughly surrounded by the concrete, will lessen the cost without diminishing the strength.

It may appear strange, but I have not found a larger proportion of cement than one in eight increase the strength of the concrete. On the contrary, it appears to diminish it. I was accustomed to specify for piers, arches, lintels, &c., one of cement to five of gravel or bricks, but I have abandoned the custom, finding it useless. Why the larger proportion of cement should make weaker work, I am unable to explain. For ordinary walling I have found one in ten sufficiently strong. Mr. Reed, in his work on concrete, says that twenty to one has been used for engineering works at Copenhagen, and I was once informed by an experimenter that he had gradually lessened the proportion of cement to one in twenty-four, and found it then make fairly strong work. But in such a case the conditions must have been exceptionally favourable, and the dispersion of the cement among the mass perfect. As a rule, I should fear to recommend a less proportion than one in ten.

Before using the cement, it is desirable to ascertain its age. It should never be used less than a month old, and if so new as this, should be exposed to the air on a dry floor for four or more days, and occasionally turned over. If this is not done, it sets too rapidly, much to the delight of the inexperienced; a delight I need hardly say considerably modified on the appearance of fire-cracks and fissures a few days after.

It is absolutely essential that every cargo or load of cement should be properly tested. Work built with bad cement is no better than a mud wall. The tests usually applied are threefold. Weight, size, and tensile strength. The weight should be not less than 110 lb. per bushel. In size it should pass through a No. 50 gauge sieve, leaving not more than 10 per cent. residue. Its tensile strength, after seven days' setting under water, should be not less than 200 lb. per square inch. Some cements will bear twice that amount of strain. A much more simple method of ascertaining its quality is given by Mr. Reid, and one that has the advantage of giving its results in twenty-four hours. He says:—"Make up two circular cakes of neat cement 6 in. in diameter and $\frac{1}{2}$ in. thick, with the smallest quantity of water. When they are sufficiently set to permit removal from the board on which they are mixed, put one of them into water and the other in the open air. After twenty-four hours' immersion examine the water-cake, and if there are no indications on its surface of cracks or fissures, it may be considered free from excess of lime and thoroughly hydraulic. The cake in the open air should be light grey in colour. If it looks yellow and cobbly, the cement contains too much clay, and is deficient in tensile strength. If the water-cake cracks, and the air-cake is of a whitish grey, the cement is worthless, and should at once be removed from the premises.

I have never known of but one case of failure in works under my supervision. This was owing to the inferior quality of the cement, and was discovered and corrected before the walls were above the ground-floor line. The merchant had guaranteed the quality, but I learned that nothing should be taken on trust. Equally with bad cement, loam or clay in the gravel or sand is fatal to stability. In mixing the cement and gravel, the mass should be turned over twice dry and twice with water, which should be poured on through a perforated hose like a water-pot.

I will now speak briefly of the claims of cement concrete to superiority, of which mention has been made before.

First,—That it is stronger than brick or stonework in mortar. This is probably true of the first hundred years of the existence of each material. It is undeniably true of the first twenty years. I need scarcely say anything, I think, to prove this. I venture, however, to cite a few illustrations in support of it. We are all probably familiar with an engraving, in which a gentleman is represented as standing on a beam, a considerable height from the ground, inserted into a small pier, said in the description annexed to the engraving to be a cement concrete wall eleven days old. This picture is a sort of hieroglyphic; interpreted into English, it reads thus:—"This cement concrete wall is immensely stronger than a new brick or stone wall, and I am risking my neck to prove it."

This was no doubt considered proof positive by the gentleman who ventured, and by those who saw him. Strong arms and sledge-hammers have also been employed to drive conviction home to sceptical minds. I was once present when a quick wall was being operated on by a pickaxe, and my astonishment was great to see how little impression was made by each blow. It appeared as firm and strong as a solid block of stone. On another occasion a concrete wall 47 ft. long, 12 in. thick, 10 ft. high, was exposed to the fury of a great storm for some time in a very open position. It was without support, except a cross wall at one end, and a small return at the other. I visited the building after the storm, and met my client and the builder there. We had all come prepared to find the wall demolished, but it was perfectly uninjured.

At another time a wall, 16 ft. high, 18 ft. long, 9 in. thick, withstood on a hill the fury of a storm that blew down a 9-in. brick wall in a less exposed position. At Fernlands, near Chertsey, in a house wholly constructed of concrete, it was thought desirable to cut a doorway through one of the walls shortly after it was built. The opening was dug out with a pickaxe, leaving a straight beam across the centre, 3 ft. 3 in. long, 9 in. deep, and 9 in. thick. There was no hoop

iron bond in this beam, but along the centre ran one of the joints between the layers, well known to be the weakest part of these walls. This beam was loaded in the centre with more than a ton; the foreman then leaped on the weight, but the jar produced no effect, and it had ultimately to be dug down with a pick-axe like the rest. The cement in the centre of this beam had but very imperfectly set at the time of its demolition. Illustrations of this nature might be multiplied, but are unnecessary.

The much greater initial energy in setting, which cement has, as compared with lime, gives it this advantage, that a cement wall may be built with great rapidity, and loaded at once without danger, such a wall being as firm in seven days as a mortar one in as many months or even years.

But there are three characteristics, or qualities of cement work, which are sometimes found to diminish this strength, especially when the layers are continuous for 20 ft., 30 ft., or 40 ft. They are expansion, contraction, and contraction in setting. That cement contracts slightly in setting is of course well known. This contraction is greatest in those cements that are over-limed or used too fresh. But before contraction it sometimes expands.

In examining a wall 40 ft. long, one day, which had no hoop-iron bond, and was unfettered by abutments, I observed a hair-like fissure running almost from top to bottom. I called the attention of the foreman to it, and made a mental note of it. Some days after I was again on the spot, and on looking for this vent or fissure, was astonished to find scarcely a trace of it visible. My client, who was with me, thought I must have been mistaken, but it opened again afterwards. There had been a change of weather in the interval of my visits. The barometer had I think, fallen. Possibly this might have had some influence on it.

The contraction of the cement in setting, when it is used too fresh, or when it sets too rapidly, sometimes opens most unsightly fissures, and these appear generally over doors and windows where cohesion is weakest, by reason of the small section of the wall at those parts. The same thing occurs in cement facings on brick walls. At first sight they appear to be "settlements," but they are not caused by subsidences. Close examination of any concrete wall reveals small fissures; but these are not seriously damaging if the mass holds together. Knowing this tendency to fracture, which is sometimes not fully developed till the facing is on the walls, I never build without the usual lintels, and would recommend a prodigious expenditure of hoop-iron bond.

In using blocks of concrete these defects are not so manifest, the process of setting being completed before they are built into the walls. Stress is often laid on the fact that cement concrete walls may be built much thinner than brick or stone. They may be, doubtless; yet, would not advise extreme thinness; for should the cohesion of the cement fail there would be less width of base, and therefore less stability. Where 18 in., 14 in., and 9 in. brickwork would ordinarily be used, 15 in., 12 in., and 8 in. cement concrete may be safely trusted. Contortion is mostly found in composite walls,—that is, wall partly of brick in mortar, and partly of cement, or in brick walls coated with cement. I have it on the most reliable authority that such a wall has been twisted by a cement coating, like a elm board in seasoning.

The next point for consideration is that of cost. This is an important one. In speaking of it I shall take no notice of published estimates. Conclusions drawn from them are most unreliable, few things being more deceptive than figures framed to prove a desirable point. I have found the cost vary very considerably in different localities. In some cases it has been done for 12s. per cubic yard, including the cost of apparatus; but this, I feel constrained to say, was when the builder was the apparatus maker. In other cases it has cost as much as 18s. per yard without builder's profit or cost of apparatus. I should be remembered that the concrete and apparatus are not the whole of the cost of these walls. There are many other items which help to swell the final amount, which do not appear in the published estimates. These estimates are most of them misleading,—true, as far as they go, doubtless, but stopping short of what they ought to say. Added to the first cost of concrete, which is usually all that is taken into account in these estimates, I have found in nearly every case 10 per cent. of the whole cost of the building in the form of cost of apparatus. I

some cases this tax has risen to 20 per cent. for hire, unless the builder has been the apparatus-maker, the charge has never been less than about 31 per cent. the whole cost of the building, and very rapid work is necessary to reduce it to low.

Other items appear in the form of linings, boxings, screeds, close-boarded centres, chimney and flue cores, and outside cement rendering. In one house the 4-in. and 1-in. rough boarding or screeds, &c., amounted to between 3,000 ft. and 4,000 ft. superficial. Every deviation from a flat surface, whether aperture or projection, demands a core, a box, or lining. All these items combine to raise the average cost of concrete to about 80 per cent. of the cost of plain brickwork; and, taking the whole cost of an ordinary house, the saving is only from 5 to 10 per cent. It may be urged that this estimate is unfair, because it takes no notice of the fact that the same apparatus may be used for 100 or 200 houses; but as it rarely, if ever, happens that the same employer or builder erects so large a number of houses of precisely the same size and shape, it ought not to be taken into account in a general estimate. But if it ought, I should be slow to believe that 100, or even 50 houses, could be constructed with one machine. I have known an apparatus returned to the maker for considerable repairs after only once using, and another very much damaged after twice using; and the fact that one apparatus-maker offers to take back his machines, allowing only 50 per cent. of the original cost, would seem to indicate a fear in his mind that they would not last 100 times. If men would handle them more carefully, the case might be different; but we are bound to take things as they are, and not as they ought to be.

Next in importance, we have to consider its damp-proof qualities. These have been much overestimated also. Concrete walls are not found, in practice, to be weather-proof, unless rendered externally in cement; and they are not water-proof unless trowelled to a smooth surface, and kept from extremes of temperatures. By water-proofing, I mean suitable for tanks, cisterns, and reservoirs. I should certainly not advise any one to make roof-gutters or rain-water pipes of this material. In these walls it is impossible to be sure that there are no cavities or interstices, especially along the bed of the layers. No amount of ramming will ensure it, or, if it would, the apparatus would not admit of it. An outside coating is also as necessary for basement-walls in contact with the earth as for those above ground.

In passing, I may remark that I have heard complaints of the frittering away of the concrete in chimney flues, showing it does not withstand the effects of fire. Frost has no influence on it after it has set; but during the process of setting it is affected by it as much as brickwork in mortar, the surface blistering out and scaling off. Walls should therefore be covered up, and work suspended, during severe frost. It gives off its moisture very rapidly, and is generally fit for papering as soon as finished.

As a non-conductor of heat, it may take precedence of brick, but I am not sure of this. As a non-conductor of sound, I cannot speak in its favour, the slightest sounds being distinctly heard through its walls. I can readily believe that it is warmer in winter than brick, because of the less moisture it retains. That it can be rapidly and safely constructed is true. Leaving out of consideration the time necessary to remove and readjust the apparatus, 2 ft. in height per diem may be safely carried up. That it takes less cement externally, and less plastering internally, is altogether contradicted by my experience. Certainly not less in any case is required, and in many cases dubbing out is found necessary before commencing the ordinary rendering; but the interstices and cavities in the concrete give a far better key to the plaster than ordinary brickwork does. Concrete offers great facilities for warming and ventilation. Heated air is readily conveyed through flues formed in the body of the walls, and admitted into the several rooms through the skirting. The vitiated air is as readily allowed to escape through apertures in or near the ceilings.

Of the machines in use for concrete building I may not now speak particularly. They are fully described in the pamphlets, issued by the several makers. They have, however, one defect which is common to them all, and which, I think, much limits their usefulness. Every apparatus yet constructed is so rigid in its dimensions that it cannot be adapted to any

increase or diminution of size; consequently walls are carried up the same thickness from basement to roof, causing a waste of materials and overloading the lower walls. By the introduction of extending plates, which permitted the lengthening of each plate 50 per cent. on the principle of Clark's shutters, I sought some time ago to remedy this defect, and so to adapt the machine as to be able to build a room of any size: for instance, between 12 ft. by 12 ft., and 18 ft. by 18 ft., or between 10 ft. by 10 ft. and 15 ft. by 15 ft., and so on. As it is, every deviation of only an inch or two necessitates clumsy contrivances or new plates. For floors concrete may be used with advantage and economy. It also makes an admirable hearth, scarcely to be distinguished from rubbed York stone.

Pavings should not be less than 4 in. thick. On a well-rammed foundation, and trowelled smooth, it makes a neat and durable floor, easily washed, and vermin proof. For terraces, landings, and stairs, that are not exposed to sun, rain, and frost, it also answers well. But when exposed it cracks, becomes unsightly, and is not durable—at least, I have not found it so. In arches built of cement there is no thrust so long as the material remains entire and unbroken. Seeing this, it has been recommended to discard the form of the arch, and treat it as a lintel, breast-work, or landing; but knowing its liability to fracture, I fear to do this, and prefer excess of caution to possible failure.

After what has been said it may be asked, is cement concrete to be recommended at all; and if so, in what cases?

I will conclude by replying to the question, and adding to my reply a few suggestions dictated by experience, to those who desire to use it. For first, second, or even third class houses I would not recommend it, but for houses having no intricacies of plan, and no pretension to ornament, especially if bricks are dear, and still more so if the gravel can be dug on the spot, or from the basement of the house, as is sometimes the case, it may be used with advantage. In thick walls this advantage is still more evident. For retaining walls, backing or filling in to ashlar stonework, for cottages, farm-buildings, fence-walls, warehouses, sea-walls, and other buildings that may be made enduring to the eye by cement rendering, I should certainly permit, if I did not recommend its use. On the whole, I look on this as a material to be employed as an exception, and not as a rule. But when it is employed, it is of the utmost importance that the cement be of good quality; that the gravel and sand be perfectly clean; that the cement be thoroughly distributed through the mass; that constant, careful, and trustworthy supervision be exercised to secure correctness of proportions of the ingredients; that hoop-iron band be used with no sparing hand; that wooden bricks be superseded by slips not more than 1½ in. thick, and in section like a dovetail. Wooden bricks swell with the moisture of the cement, and in shrinking again become loose. Besides this, every wall should be rendered in cement externally, the usual damp course should not be dispensed with, and chimney-flues should be lined with brick, and parge-lined in the usual manner. Given these conditions, and a wall in cement concrete may be built, in some respects as good, in others better, and in some others not far inferior to a brick or stone wall in mortar.

I offer these remarks as the results of my own experience, to be confirmed by the experience of others, if they are correct, to be corrected if they err.

PEABODY-SQUARE, BLACKFRIARS-ROAD.

The aspect of the Peabody Buildings in the Blackfriars-road, to which tenants were admitted on the last inst., is decidedly superior to that of other establishments erected for the trustees. The buildings are not so lofty, are more spread about, have turrets in front of them, the high-road and within the quadrangles, and are altogether more home-like and less barrack-like. Moreover, and this is of very great consequence, the blocks are not connected, so that the inner areas have more chance of complete ventilation than is the case when they are surrounded on all sides with continuous buildings. Mr. Henry A. Darbishire was the architect, as heretofore; and the work has been executed by Messrs. Wm. Cubitt & Co., which is pretty nearly tantamount to saying that it is very well done. There are sixteen blocks,

providing 320 dwellings, some of three rooms each, some of two, and a few one room only, the rent being respectively 5s., 4s., and 2s. 6d. a week. That the new homes meet the views and wants of the surrounding population is shown by the fact that the whole are let, and the applicants still numerous. A lavatory and W.C. are provided for each two or three tenants, as the case may be; and there are laundries where all may take their turn. These and the drying-ground seem scarcely sufficient at present, but wants will doubtless be met as they make themselves felt. The range in living-rooms looks like a useful one. There are a few feet of rail in each room, to which pictures may be hung; and an arrangement for the admittance of air to the bedrooms which have no fireplaces. In fact, it is everywhere evident that pains have been taken to make the place useful and comfortable. An objection has been taken, and not without some reason, to the position of the coal-bunker. It stands under the window in the sitting-room, and was doubtless prompted by the desire to enable the tenants to lay in a tolerable quantity at a time, which means buying at a cheap rate. If the trustees thought fit to provide a stock, and allow the tenants to have it at wholesale price, a small closet for each on the landings would then suffice.

We will merely add that there are shafts for each block of dwellings, and shafts for the dust and refuse, and that the impression that inhabitants cannot go in and out after a certain hour without permission is altogether erroneous. The outer gate is very properly looked at eleven o'clock, when the gas is turned off; but each tenant has a key, and can go in and out when he pleases. According to the very courteous superintendent, Mr. Heath, the freedom of the subject will be in no way interfered with in Peabody-square, Blackfriars-road.

THE WOODEN ARCHITECTURE OF NOVA SCOTIA.

In a country where wood is plentiful, sandstone scarce, and bricks dear, it is not to be wondered at if a people who have not much collective wealth to spend on luxuries, no fine buildings erected in their midst, no ancient ruins planted in their landscapes, and no fine pictures hung on their drawing-room walls, to educate and refine their taste, should build their houses of the cheapest material, and according to designs generally drawn and superintended by themselves.

When wooden architecture is mentioned, Europeans immediately conjure up visions of those quaint old buildings they have often seen in many of their older towns, and picture to themselves the beauty of a modern city composed entirely of such dwellings. But a sail up the magnificent harbour of Halifax, and a look at the wooden wharfs, the unsubstantial wooden warehouses, and the wooden spires of distant churches, is enough to dispel any lingering sentiment that may have been had regarding them. For the wooden houses of Halifax, with few exceptions, are so devoid of architectural taste that, if all the brick and stone ones were taken away, the city would not present such a good appearance as the wooden stables and barns attached to the houses in a large British city, if they were all collected together, and arranged in the form of streets and squares. Notwithstanding this, we have no doubt of being able to make the subject interesting, by exhibiting it in the three phases of construction, style, and the shams connected therewith, showing to the inhabitants of the British isles a style of art that must be entirely new to them.

To a foreigner, a wooden building in course of erection is rather an interesting operation. For, in the first place, although the wooden walls are only 9 in. thick when finished, yet the foundations are built of stone, 2 ft. thick, and sunk 4 ft. below the surface of the ground, in order to be beyond the reach of frost in winter. When the frame arrives from the country (which has been erected according to an extra plan which the architect has to furnish), the different parts are all fitted together and put up in a few days, the whole thing looking like a vast cage. It does not take long to finish the exterior then, for the frame is all boarded over with inch boards, except the openings for doors and windows; and when the frames for the latter are inserted, the architraves and other finish are nailed round them, the cornices and pasteboards are put on, and then the whole of the walls and roofs are

elated with wooden slates called shingles. Yet although the exterior is thus soon completed, the interior requires as much time as a brick-and-stone building, for it is finished exactly similar, so much so, that a stranger taken into one in the evening would never imagine he was in a wooden house.

Although dwellings are thus easily framed and built, yet there is considerable constructive skill sometimes shown in building a wooden church, for an open roof is thrown over a space of 40 ft. or 50 ft., and yet these 9 in. walls, without any buttress, maintain the whole without spreading an inch. A wooden tower and spire, 160 ft. high, also awakens astonishment in a stranger; and well it might, as it is one of the most difficult problems in wooden architecture.

We now come to consider the style of the structures. Until lately they were of the most nondescript kind. Our oldest church in the city was meant to be Classic, but the spire is somewhat Chinese in appearance, and the louvers of the windows are all painted green. Another was after some Grecian model, and has a lofty portico, with massive columns, constructed of dozens of inch-boards. Another was designed by a German after a church in his own country. The form is peculiar, and the original would, no doubt, be beautiful, but the copy is spoilt through ignorance of design and detail. The style was meant to be Romanesque. Some of the churches also are designed in what is meant to be Gothic, the tracery in the windows of which is usually Perpendicular. Classic cornices and details are put on the whole of these buildings alike; while the crockets on the pinnacles of one church have a strong resemblance to rams' horns.

Several churches put up lately evince great improvement in design and detail, and are generally fair specimens of Gothic, considering the material they are built in. The great fault of the old structures was a slowness and want of relief about them that made them look as if the least wind would blow them over. By making the walls thicker, greater depth is now obtained for the windows, the mouldings and details are made bolder, showing more relief, and, generally speaking, the different features are detailed more massively and decidedly, thus giving a more solid look to the whole. While we think the interior of a wooden church will always look better than the exterior, and that there is great room for improvement everywhere, yet in the course of a few years some of our smaller edifices may be not undeserving of a place in some itinerant European's sketch-book.

Our older houses, worse than the churches, were built of no design whatever, and seemed to be put up by the yard. The absurd practice generally prevailed of building them as plain as possible outside, while all the wealth was lavished in furnishing the inside. Still a portico was considered a necessary appendage, supported by a couple of fluted columns, which were generally painted like marble. When the exterior began to show some design, they were still wrong, for they hankered after a stone construction and solidity, instead of the picturesque bracketing, overlapping, and broken skyline of our Medieval wooden buildings. In the wealthy little town of Yarmouth, we have a number of the most elaborate wooden houses in the country, built in the solid style, with full suites of rooms, offices, ice-houses, barns and stables, that cost 7,000l. and 8,000l. sterling, a sum that would have erected the same complete in stone, in Britain. Lately there has been more attempts at wooden construction and appearance, a greater use of brackets and barge-boards, while the roofs are as much broken up as is consistent with the climate, which is famous for causing leaks. There is no doubt that we may in time be able to rival our Medieval architects in wood, as we have already done in Gothic architecture in stone, but we hope that it will be accomplished with less slavish copyism and imitation than have accompanied it.

We now come to the shams in wooden architecture; and, as might be expected in this country, they are innumerable. Even some of the very latest churches abound with them; for shell buttresses are thrown against the sides and up the corners of towers and spires, while the walls of the interior are lined and coarsed in imitation of stone, showing the horrible construction of a stone interior to a wooden exterior! Sometimes whole fronts are built in pieces to look like stone, and then the whole is painted, and carefully sanded, defying detection in the

mere glance of the uninitiated. Wooden cornices and balusters to brick and stone buildings, painted and sanded, are very common. Some of the shams are too absurd. A doorway on a recently-erected house, otherwise finished like an ordinary wooden building, was painted a green and black marble. The effect is outrageous. None of our own painters would ever have thought of doing it. But it shows the taste of our moneyed men when a temptation is thrown in their way, and an opportunity for display is offered them, although it is rather glaring. This was an importation, and the artist was said to be a Scotchman. If so, he was a very degenerate one, and must have been drawn through the United States. The most amusing sham we have seen for a long time, however, is on a house in one of our principal streets in Halifax. An entrance was wanted to the platform of the roof, and instead of a mere hatch, the idea occurred to the proprietor of building a sham chimney of wood with a door in it, especially as there was a chimney on the other side of the roof it would correspond with. But the absurdity does not end here, for the other chimney being brick, this one was not made to resemble that material, but was painted, lined, and coarsed in imitation of stone. The whole idea is as absurd as if the occupant of the house, who is a doctor, had, in putting a wooden arm on a negro, made it hollow with a lid in it, so that it would serve as a snuff-box, while he painted and coloured it in imitation of that of a white man.

We have now given a general idea of the state of wooden architecture in the country, and while there does not seem much for congratulation, yet there is appearance of considerable improvement being exhibited, which may produce good fruit in a few years' time.

AND DEWAR.

Halifax, Nova Scotia.

POPLAR AND STEPNEY SICK ASYLUM.

ON Thursday, the 3rd, this asylum, which has been erected under the provisions of the Metropolitan Poor Act (1867) for the accommodation of the sick, bedridden, and infirm of the Poplar and Stepney Poor Law Districts was opened. The land upon which the building stands is a strip of about $\frac{1}{4}$ acre, opposite the workhouse of the Stepney Union at Bromley-by-Bow, the two buildings being divided by the Tilbury and Southend Railway. The building has been erected upon the pavilion system, and consists of eight separate blocks. In the centre of the front and facing the railway is the administrative block, consisting of the board-room, offices, chapel, officers' quarters, kitchen, stores, &c. Upon each side of this block is a double pavilion and single pavilion, each separated from the block and from each other by a clear space of 70 ft.; completing this range of buildings is a porter's lodge at one end, with receiving wards and separation wards. The whole of these buildings are connected along the front on the ground-floor by a corridor, 10 ft. wide and upwards of 600 ft. long; above this, on the first floor, is a covered way, and upon the second floor an open terrace, both of which afford a communication between the pavilions or separate blocks upon each floor, and so reduce to a minimum the great defect of the pavilion system, viz. the labour of administration. In the rear of the administrative block is the laundry, and in the most retired corner of the ground the stable and dead-house.

The building is entered from Devons-road, Bromley. The materials are brick and Portland stone. The central block includes a tower, containing a large tank for the hot-water warming circulation and supply. This building is faced with malm bricks, and has strings and dressings of Portland stone to the doors, windows, quoins, gables, &c.

The building is certified by the Poor Law Board to contain 572 patients' beds: the bedridden and infirm will be placed in the double pavilions, whilst the acutely sick will occupy the single pavilions. We are glad to hear that the erection of double pavilions did not form part of the architects' original design, but was an alteration suggested by the authorities. They are not advisable. The cubic space allotted to each patient varies from 1,000 ft. to 1,500 ft.

The administrative block contains nearly the whole of the accommodation necessary for the management of the asylum, and surrounds an open court, which affords facilities for lighting and ventilation. On the ground floor is a board-room, 30 ft. by 20 ft., decorated in carton pierre

by Bockbinder, and furnished from designs by the architects. The building has been fitted with electric bells by Messrs. Moseley & Co. In the waiting-room has been fixed a bell indicator, and every ward and each principal room or office rings into this room.

In the rear of the administrative block are the various stores. The kitchen, measuring 40 ft. by 25 ft., and the scullery, are also in this part of the building. The cooking appliances include two large roasting and baking ranges, with open fires, and a capacious iron panolled steam cooking apparatus, fixed on the floor in the centre of the kitchen, under the louvre ventilation in the open timbered roof. It has an underground flue to the chimney, and consists of six 50 to 80 gallons steam jacketed boilers and a series of potato-steaming trays. This apparatus was erected by Messrs. Fraser, Brothers, of Bromley-by-Bow.

The first and second floors of this central building contain the resident officers' quarters and nurses' dormitories.

The chapel contains sittings for 110 persons. It has an open-timbered roof of pine, with moulded tie-beams and curved ribs under the principal rafters meeting in a pointed apex, and the spandrels filled in with perforated panels.

The single pavilion has three wards, lighted on each side by eight ash windows. The beds are disposed on either side of each window making 32 ft. to each ward. The brickwork of the walls is "dressed" in lieu of being plastered and is coloured with a mauve-grey tint above and the lower portion painted buff, with chocolate line and skirting. The windows are all fitted with green Venetian blinds. The dimensions of these wards are 117 ft. long, 21 ft. wide 14 ft. high. The warming is effected by two large ventilating grates to each ward, with air chambers at back, and terra-cotta blocks and radiators, by means of which, in addition to the direct heat by radiation from the fire, fresh cold air is mildly warmed in the air-chamber, and is diffused in gentle streams into the ward. Fresh air can also be admitted from the window at the sides, from the bay-windows at the end from the swing entrance-doors to the staircases from the large frame of regulating-louvres over these doors, and from Sherringham's ventilators one of which is placed between each side-window near the ceiling. The foul air is withdrawn by means of a number of separate upcast shafts built in the chimney-stacks, but separate from the smoke-flues, fitted with iron gratings in the wards, and terminating above the roofs with iron louvres, to prevent down-draught. Each shaft is separate from the other, so that the foul air of one ward may not penetrate into the other wards. There are also a number of similar ventilating shafts built in the end walls. Great care has been taken to provide means to give an upward direction to all fresh-air inlets, so as to prevent draughts, which are the frequent unpleasant consequences of badly-arranged ventilation apparatus. As the questions of warming and ventilation cannot be considered apart, it may be here mentioned that warming by open fire grates has been considered to be the most healthy, and, with the addition of the air warming chambers, will no doubt be sufficient to maintain a temperature of 60°. The ceilings and floors are supported by girders, each formed of two rolled-iron I joists, each 9 in. deep riveted one over the other, the top half of the girder concealed in the thickness of the flooring.

At the free end of each ward is built a bath room on one side, and water-closets and slop-shoots on the other; these are cut off from the wards by means of intervening lobbies fitted with ventilators and having windows on both sides. The bath-rooms have each a bath of wheels. The water-closets are fitted with Lambert's or Underhay's self-flushing seat and apparatus, and there are provided ranges of white marble slabs with earthenware wash basins fitted with Finch's anti-vibration self-closing hot and cold water push-valves. Attached to each ward is a room for the nurse, having a window by means of which she can overlook the patients under her charge.

In the laundry building are a receiving-room, three wash-houses, ironing-room, boiler and engine houses, and mess and sleeping rooms for the laundry women and her assistants. The wash-houses are fitted with McAlpine's dolly washers and Bradford's rotary washing-machines, patent hydro-extractors in lieu of wringers, steam boiling-tubs, mangles and other necessary appliances, driven by 10-horse power (nominal).

steam engine in basement. In the ironing-room a large chamber of drying-houses, heated by iron coke-stove which heats the laundresses' pans. The basement of this building contains a number of four large Cornish boilers, two of which are for steam, whilst the other two are for the hot-water warming and the hot-water supply respectively throughout the whole building; the whole is thus placed conveniently under the charge of the engineer and his stoker. A furnace is also provided in the laundry building, to cut off from the wash-houses and with a separate external entrance. In this chamber is a large out-door clothing of the patients for it is stored.

The drainage is of glazed stoneware pipes, from 15 in. to 4 in. in diameter, connected with a new northern low-level sewer.

The building was erected by Mr. Robert Mann, Kentish-town, whose contract was 30,000*l.* The total cost, with the other contracts for drainage, laying out ground, entrance-gates, boundary-walls and fences, stores, mantelpieces, bath-houses and stable fittings, stained chapel windows, gas and water supply, fire-mains, tanks, Venetian blinds, cooking apparatus, laundry machinery, steam-engine and boilers, hot-water apparatus and boilers, lifts, electric bells, speaking-tubes, dispensary fittings, asphalt-paving, &c., was 43,000*l.* The cooking apparatus and laundry machinery were supplied by Messrs. Fraser Brothers, Bromley-by-Bow; hot-water supply and warming apparatus, cold-water supply, and tanks and fire-mains, by Messrs. Jeaks & Co., Great Russell-street; the entrance-gates were cast by McFarlane & Co., Glasgow and London; the chapel windows executed by Mr. Gibbs, Bedford-square; the gas-fitting was by Mr. Falton, Tottenham; the blinds were by Mr. Riddell, Tottenham; painting and colouring of wards, &c., by Mr. A. Derby, Limehouse; asphalt-paving, Mr. Wilkinson, Fish-street-hill; and joinery fittings, by Mr. Sheffield, Poplar. Mr. V. Hibbens was clerk of the works, and Messrs. Arthur & Harston, East India-road, London, were the architects.

ALEXANDRA PARK.

A PARTY of some 120 gentlemen, many of them members of the fourth estate, met on the 29th ult. in the Alexandra Palace. An intended walk round the park was prevented by the stormy weather, but few present regretted that they are thus detained to hear the magic music of Mr. Sullivan on the organ. With all that we have heard of music during the past few months, the effect of the *vox angelica*, coming down from the solid roof of the noble building, was a surprise as well as a delight. A very elegant *dinner* was arranged in one of the saloons of the building, Sir William Wiseman, bart., one of the executive committee, being in the chair. We should have said no more on a matter chiefly interesting to those who were present, were it not for the remarkable speech of Mr. Lloyd. The Mr. Lloyd, as some people call him. The learned gentleman said that having been professionally consulted as to the formation of the new company, he had become so profoundly impressed with the importance and solidity of the scheme as not only to give his name as a trustee, but to take a most lively interest in the success of the undertaking. To secure the most perfect success, all that was required, in his opinion, was publicity, and that the public should understand the plan.

The long and conscientious detail of the prospectus is too difficult for many people to master in a hurry. The ordinary reader requires to know, in half a dozen lines, what is proposed: let us endeavour to supply this want. Without the four-mile radius from Charing-cross lies an estate of nearly 600 acres of hill-side land, covered with turf, and studded with fine timber. On this land is built a large exhibition-hall or palace, which is ready for immediate use. The annual growth of London is so rapid that, unless some check is interposed, in fifteen or twenty years' time the whole of this park will be turned into building land, and London will push on, in direct lines of brick and mortar, to Finchley and to Edgware. To preserve this land for public use, a company is now being formed, under the name of the Alexandra Palace Company. Every one who takes a guinea share in this company will become a proprietor of the park, and, as such, will have the right to free entrance on Sunday, when none but proprietors will be admitted. On other days, music, sports,

exhibitions of fine and industrial art, hawking, and other attractions, will be accessible for a moderate payment. No liability is incurred by the guinea shareholder. No dividend will be paid; but in 1886 the value of the property will be divided among the surviving guinea ticket-holders.

The estate is now purchasable at the price of 675,000 guineas. The land alone is thought worth upwards of 450,000*l.* at the rate of recent sales in the neighbourhood. The Palace and other buildings have, it is stated by the vendors, cost upwards of 400,000*l.* The value of ornamental property in the neighbourhood of London increases with great rapidity. At Sydenham, the Crystal Palace was opened in 1852; the Museum at South Kensington was opened more recently. In each of these cases the value of the ornamental land has multiplied from six to seven fold in fifteen years. The value of the Alexandra Park, in 1886, at this same rate of improvement, will scarcely be less than 5,000*l.* per acre.

The income from admissions will be devoted in the first instance to the maintenance and embellishment of the property, and to providing attractions for the public. The net profit will belong to the certificate-holders. It is proposed to distribute the amount among them every three years by means of Fine-Art Unions.

Thus the holder of a guinea-ticket will have 780 free admissions, five chances of an Art-Union prize (higher or lower), and a distribution share in 1886, which is estimated at not less than 10*l.* If the nominee on the certificate die before 1886, 1*l.* for each share will be returned by the London and Lancashire Insurance Company to the representative of the nominee. Thus the utmost loss, in any case, to an insured guinea certificate-holder will be one shilling, paid for insurance, and the interest on the guinea. The possible and the probable benefits we have mentioned. Of course, if the Tontine, as the scheme is called, is not filled up, the money will be returned intact.

A NATIONAL THEATRE.

THE committee appointed to consider the practicability of founding a theatre for the production of dramatic works of a high class met on Monday last, discussed at some length the best mode of raising money for the purpose, and adjourned to allow time for the preparation of a programme which might be set forth to test public feeling. The general opinion seemed to be that, whatever shape such an organisation might take (such as a limited company, for the sake of preventing personal responsibility), the expectation of pecuniary profit should not be offered as an inducement to subscribe. The return of money subscribed, if desired, in the event of success, would be but reasonable, but profits, it was thought, should go towards the erection of a complete building hereafter, or for the establishment of retiring pensions for actors. The time of year would probably prevent vigorous proceedings just now, but public opinion might be tested, and if the response proved satisfactory, the scheme could be launched in earnest when people return to town.

As full discussion is desirable, we print the following from one who has a right to be heard on the subject. We do not ourselves find anything in it to discourage those who are interesting themselves in the present movement:—

Sir,—I have read the communication on this subject in the *Builder* of July 15th with much interest. "That there ought to be a National Theatre where dramatic works of the highest class could be constantly produced," I quite agree with Mr. Godwin.

To the mode of effecting this most desirable result I do not, at present, see my way. From any Government that is or is to be no aid can be expected. Even if we had an enlightened Chancellor of the Exchequer,—enlightened, I mean, on the subject of a National Theatre,—can you conceive, I cannot,—the row there would be from all economists in and out of the House; the still greater row that would proceed from *chaplains*, if not from *churches*?

The Prince of Wales's Theatre is cited often as an example that when a manager leads well audiences will follow willingly. No one admires more than I do the excellent performances and plays at that house. But it must not be forgotten that the experiment of good leading and following is there made on a very small basis. The comedies, so deservedly successful, being devoted to

English life and manners, may be justly termed *national*, but *quantula pars*!—a nook and corner of English life.

I am in possession of J. Philip Kemble's account-books of his management at Covent Garden, at the end of the last and the beginning—*i.e.*, the first eight or nine years—of the present century. The general rule was at that time to give thrice a week, *i.e.*, on the on nights, either a play of Shakespeare's, Massinger's, Southern's, or some other classical drama; on the off-nights, *i.e.*, Tuesday, Thursday, and Saturday, new or not very old plays,—certainly few of them national or classical. The *Othello*-caste then comprised J. Kemble, C. Kemble, Mrs. Siddons, Miss Branton or Mrs. Powell, G. F. Cooke, Holman, Barrymore, &c., all more or less famous in their day,—a day when barristers, literary men, and M.P.s occupied the first five rows of the pit, and who constituted a very formidable jury both as regarded authors and actors. With what success? C. Kemble told me, many years after his brother and sister had retired from the world as well as from the stage, that "*Othello*," for example, was played to houses containing 30*l.* worth of tickets, while "*Pizarro*" and "*Bluebeard*" filled the treasury. The *elephants*, in 1807 or thereabout, were an immense success! You know, I have no doubt, George Colman the Younger's tale of Master Daw, the call-boy. I cannot recollect the exact title of the poem (it is in Colman's "*Broad Grins*"), but Master Daw is the hero of it, and Colman throws some light on the tastes of the British public, and on the catering of managers for their amusement, &c. &c.:

"During his time from the prosecution to 'em,
Thalia and Melpomene both vaunt'd:
Seeming to hint to a capricious age,
Sulter the quadrupeds to keep the stage,
The Muses to be banish'd."

As I have not seen the poem for at least thirty years, I may not quote *verbatim*, but this is the gist of his satire.

Again, if you consult that most useful book, Geneste's "*History of the Stage*," you will see very few traces of a National Theatre even at a time when, to listen to some people, there really was something like one.

Well, it is true that Shakespeare and other sterling dramatic poets were endured in these halcyon days. But how? Doctored by Cibber, by Nahum Tate, John Dryden, &c. Shakespeare, since the Restoration, has rarely been performed *pur et simple*. Edmund Kean, much to his credit, tried to give the real "*Lear*," but was compelled to fall back on Tate's, in which the old king winds up with a tag from Pope's "*Essay on Man*," and survives his afflictions, joins *Edgar* and *Cordelia* in holy matrimony, and lives happily ever after, with his pals, *Kent* and *Gloucester*!

Macready played the real "*Lear*," but failed in his attempt to restore the real "*Richard III.*" J. Kemble retained Dryden's abominable "*Jangle*" of "*The Tempest*," and inserted into "*Coriolanus*" some corroborating scenes from Thomson's ("*The Seasons*") tragedy of the same name. I do not know whether he, in "*Macbeth*," made a dying speech taken out of the second part of "*Henry IV.*," transplanted by Colley Cibber into "*Richard III.*," and then put into the mouth of "*Great Glamis worthy Cawdor*," but E. Kean certainly wound up the part with "*Now shall the world no longer be a stage*," &c. These are a very few of the many instances I could bring of the appreciation of the "*divine Williams*" by his countrymen and admirers. We have much hypocrisy in Britain,—none deeper than our profession of love for Shakespeare.

So, I can discern, neither in the present nor the past age, any reasonable grounds for expecting the public,—"*pensive*" or not,—to rise to the level of a *National Theatre*. I differ from some of my friends in thinking the fault lies with the actors and actresses in any great degree. Rather do I impute the failure of the stage to the want of organisation in the pieces enacted and the performers in them. I can recollect John Fawcett's,—stage-manager at Covent Garden,—training of his forces. Mr. Macready drilled even the wounded captain in "*Macbeth*" into good and forcible acting. Very little chance had a performer in his day of going home to his early dinner until he or she had done his bidding. E. Kean, so far as I knew, never interfered. C. Kean was most laborious in his rehearsals: so in Miss Wilton now. But where else is there a rehearsal de-

serving the name, except of tremendous effects,—jumping off a tower, or into a “cheerful blaze?”

For the decline of the stage we have much to thank our aristocracy for. They, with few exceptions, pooh-poohed E. Kean, cold-shouldered Macready, and lately, &c., within three or four years, gave Mdlle. Schneider a reception that could not have been exceeded in warmth or duration had Her Majesty, after her long retirement, suddenly appeared at the St. James's Theatre.

To have a National Theatre, there must be a national craving for one. Of that I see no symptoms. Mr. Planché does. He has better and wider opportunities of observing than I have, and I heartily hope that I am wrong and that he is right.

VETUS.

HALIFAX INFIRMARY COMPETITION.

The quarterly board of the Infirmary have selected the plans from those competing for the three premiums offered for designs for the new infirmary. Seventeen sets of plans were sent in from London, Newcastle, Stockton, Bradford, Leeds, Halifax, &c. We understand that the Board intend exhibiting the selected plans and those of the other architects who assent to their exhibition, in one of the public rooms in the town. The Board have awarded the first premium, of 150*l.*, to the plans marked “Æsculapius” (Mr. Bakewell, of Leeds and Halifax). The design is Gothic, and there are six pavilions, each in two stories, and two smaller wards for convalescents. There are to be 217 beds, when the infirmary is fully completed; and at present the portion accommodating eighty-four beds can be built. The total cost per bed is estimated at 150*l.*

The second premium (75*l.*), “Red Cross,” is given to Messrs. R. Ives & Son, of this town. This design is also Gothic, on the pavilion principle, having 200 beds, and 20 in the fever wards. At first eighty-six beds could be built. Cost 190*l.* per bed.

Premium three (25*l.*), motto, “Nightingale,” goes to Messrs. A. Smith & Co., of London. This design is also Gothic, and can either be built for 210 beds (98 at first) or for 172 beds (80 at first).

THE MOVEMENT IN COVENT GARDEN MARKET.

The daily press has been engaged in discussing the subject of Covent Garden Market, and the serious differences that have arisen between the Duke of Bedford and his tenants, the salesmen. One recommends the construction of a new market in Leicester-square; another the extension of Farringdon Market, and its adaptation to the business of Covent Garden, at an expense of 150,000*l.*; while a third recommends a compromise to both parties. Strange to say, none of the journals have anything to say about the anomaly of the Duke of Bedford having the only great wholesale vegetable market in the metropolis entirely under his own control. Of what practical value is local self-government when one of its chief duties is left in the hands of a landed monopolist like the noble Duke? Nearly all the large towns of the United Kingdom, and also of the colonies, are well supplied with markets established by the municipal authorities; and these being under the control of an annual election, no difficulty is found in checking any abuses in their management. The answer to all this, as well as to many other short-comings in London, is, that we must wait for that long-promised reform in our local government which seems to recede as we advance, its opponents skillfully buttressing themselves behind many other more powerful social and political monopolies and vested interests.

Every interest except the public interest seems to be over-represented. Well-managed and rich companies who supply gas and water are supported by others who cannot give so good a reason for their existence; livery companies, endowed schools, and close corporations, with all the following of officials, annuitants, contractors, &c., who “live, move, and have their being” under the patronage of these antiquated, effete, and often corrupt institutions, fight with a spirit and determination that often prevail over the common weal, for which they are supposed to exist. To do the City corporation justice, it must be admitted that during the last few years it has shown wonderful activity, and it does not seem at all indisposed to enter into the

views of the Covent-garden salesmen. It was not before time that it awoke from the dream of security in which it had so long indulged; and, immediately on the Thames Embankment being placed in the hands of the Metropolitan Board of Works for construction, set about the important and costly works of the Holborn Viaduct, the Smithfield Market, and Blackfriars Bridge. Its hands are, without counting this new project, already pretty full: a new Foreign Cattle-market at Deptford, an extension of Billingsgate and Leadenhall markets, all of which involve the expenditure of much money and skill. So far the public has benefited by the rivalry that exists between the two bodies, and will so long as it does not run to extremes. The City corporation has survived the other close boroughs nearly forty years, although it cannot be said that quiet and peaceable possession has been had; indeed, not a session of Parliament has passed without some open or covert attack upon its privileges. Municipal reformers at one time, the executive at another, have tried to exercise their skill upon it. The City, however, remains entrenched within its ancient fortress of royal charters and franchises, and some recent events show that there is “life in the old dog yet.” There is one peculiarity about the City mode of defence: it keeps on good terms with both the ruling parties, and while fending off every blow aimed at itself, is zealous in assisting to reform anything out of its own sphere. With all its faults we should have little to complain of were its boundaries identical with the bills of mortality, or even the four-mile circle; but I fear this or any reform of our vestry-ridden town is a good way off, and must wait the advent of a stronger man than the present Home Minister.

From this digression I now return to Covent Garden. I do not hold with any of the plans proposed to settle it. With the Duke, who has only a life interest, a satisfactory settlement is hardly possible, and everything duly considered, is not desirable. The fact is the country has outgrown its old suit, and the time has come when changes to be useful should be thorough. The market ought to be public property, the Duke being with all due speed disestablished and disendowed. Every one knows by experience the difficulty of diverting the current of business out of its accustomed channels, and in markets particularly the experience has been nearly uniform. The latest and most conspicuous failure is the Baroness Burdett Coutts's magnificent Columbia Market. The cause is not far to seek,—the custom of localities devoted to this purpose in streets and narrow lanes without much through traffic, such as Clare Market, Leather-lane, Newport, and many other places where people can supply their wants without the sacrifice of much time. The great extent of the metropolis would render it difficult to provide markets within an easy distance of its widespread and populous suburbs, while the central parts are sufficiently accommodated in a way they have gradually become accustomed to. If, therefore, experience is to guide us, it would seem to lead to the conclusion that wholesale markets only can be established with a fair prospect of success, and further to remove these, or to establish new ones, is evidently hazardous. The removal of Newgate to Smithfield was so long foreseen, and the two sites are so near together, as not to form a fair exception. The Metropolitan Cattle Market removed from Smithfield has caused a considerable pecuniary sacrifice to the corporation, and the same may be said of Farringdon.

I come, then, to the conclusion that the great wholesale fruit and vegetable market should remain in its present central site, but not with its present noble proprietor. The Metropolitan Board of Works should seek power from Parliament to buy him out, and to extend the site, and to open some new streets of access to it. The site should be carried eastwardly its full width to Wellington-street and Bow-street, which ought to have in front of the east end of the market a width of 80 ft. or 100 ft. Westwardly, it should extend not beyond Southampton-street, and the whole of this space would, with a central covered street, give ample space for vegetables. The fruit and flower market would form a separate affair, divided opposite the end of Southampton-street by a wide street, and extending west along King-street and Henrietta-street to Church-passage, being in two houses, having St. Paul's Church and fore-court lying between. The above would far more than double the existing accommodation; and considering the

vast trade present and prospective, ought not to entail any pecuniary sacrifice upon the ratepayers. I suppose an entirely new construction would be necessary; and, if so, provision ought to be made in a lofty basement for future subterranean railway connexion with the great line north and south of the river. The basement could also be utilised as a freight station, having a tunnelled entrance to the Strand for ordinary van and wagon traffic. This would be a similar arrangement to the Great Western at Smithfield, but with the advantage of a level carriage-way to the Strand in place of the circular incline leading to that station.

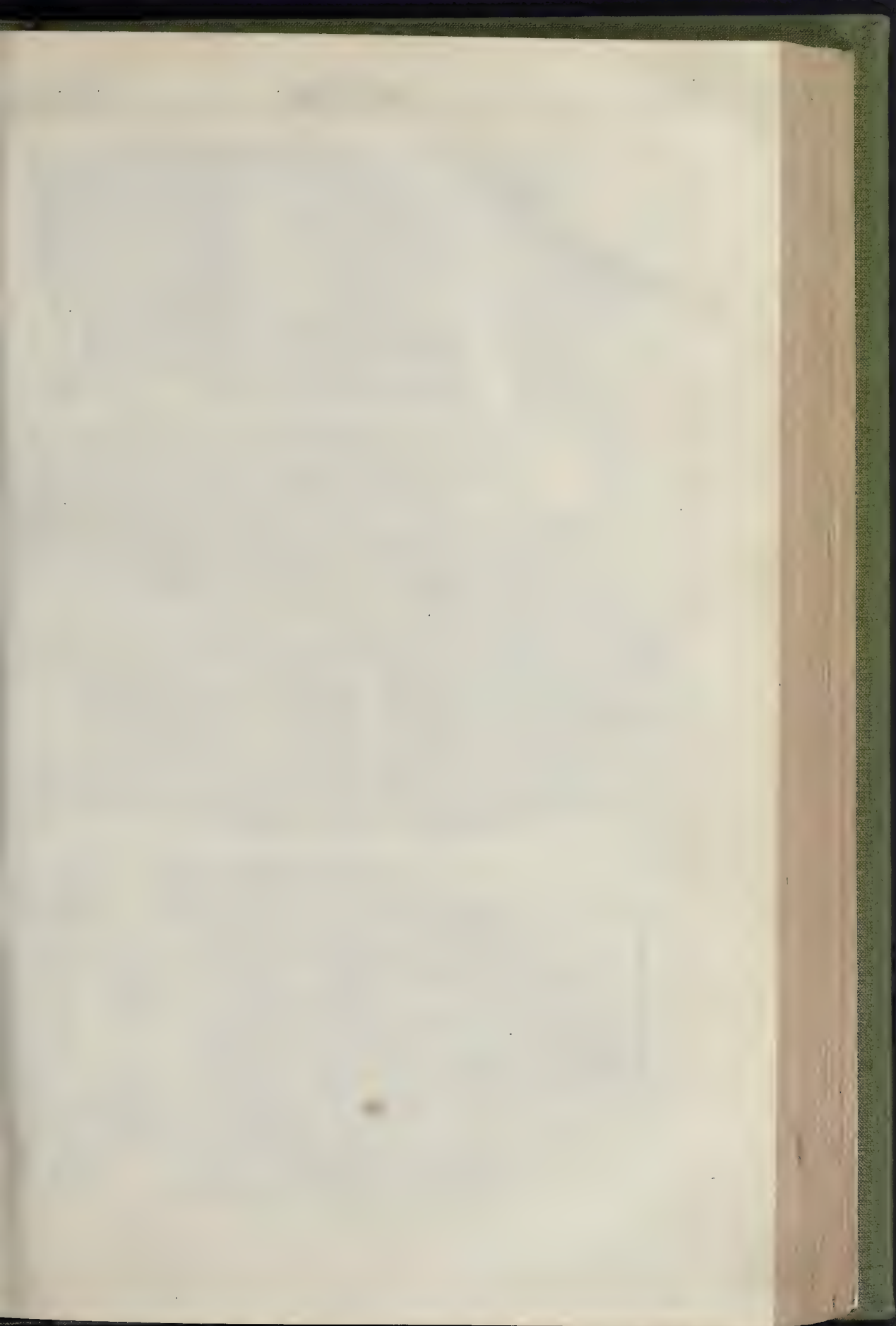
In conclusion, I would respectfully urge upon all classes to join in an active agitation to get rid of the miserable muddle we submit to in the matter of local government. The vestries should be replaced by regular municipalities of from 150,000 to 250,000. This would reduce the number from forty to fifteen, or not exceeding twenty. The City limit should be extended, so as to double its present population, and the present Board of Works, which is only a vestry, should be replaced by a body formed by direct election like the School Board. If we start on a basis of one member to 50,000, this would give sixty-five to which might be added one delegate, appointed by each local body,—say, fifteen,—in all, say, eighty. If men were really in earnest, such a reform is quite within their power, in spite of vested interests; and nothing satisfactory can be done without some such change. J. W.

THE NEW COUNTY COURT, GAINSBOROUGH.

The old mansion, at the corner of Beaufort market, erected in 1759, from designs by Hawksmore, having been purchased by the Government, it has been extended and altered to meet the requirements of the court and offices. The alterations and additions are now nearly completed, and it is proposed to hold the first Court in the new building on the 14th inst., when it will be opened to the public. The newly projecting steps have been removed from the front door in Market-street, and a new Ancaster stone doorway of Grecian architecture inserted, with small shafts above the transom and having two circular panels, with a carved monogram, the date 1870 at the sides of the door, and the words “County Courts” incised in the transom. Access is gained by this door to the public offices, and to the bailiff's and bankruptcy rooms. This door will form the public entrance for all office business. The judge's entrance is situated in Beaumont-street. The old dining-room, having at various times fulfilled the uses of a kitchen, larder, and scullery, is now restored nearly to its original form. There is a new strong room attached to this office. The public entrance to the Court is at the south-east corner of the new buildings in Beaumont-street. The front is executed in red brick, obtained at Warkington, and is relieved by a cornice and dressings of Ancaster stone, the mouldings being of Grecian, freely treated. The Courthouse is a handsome, lofty room, lighted by fifteen windows, semicircular heads, glazed with ground glass. The walls of the Court are panelled as wainscot, 6 ft. high in clear yellow deal, varnished; the fittings also are clear yellow deal, except the doors, seats, table tops, and mouldings, and these are oak French polished. The Court is lighted by brass gas standards, and is heated by a Peirce's pyro-pneumatic stove. The chimney-pieces and lavatories are of fossil marble. Mr. George Johnson of Nottingham, is the general contractor. The foreman of the works is Mr. J. Johnson. The gas-fittings have all been supplied and executed by Mr. Freeman, of Vine-street, Piccadilly, London. Messrs. Whetstone, of Coalville, Leicester, have supplied the encaustic tile floors. Mr. Mason, of Gainsborough, the plumbing and glazing; Mr. Calvert, of Gainsborough, the painting and decorating; Mr. Tomlinson, of Gainsborough, the plasterer's work; and Mr. Robert Phillips has been the clerk of the works; and Mr. Thomas Charles Sorby, late surveyor to the Crown for County Courts, is the architect.

Heath - Common Stone Quarries.

These extensive stone quarries, situated near Wakefield, in Yorkshire, with a face of rock nearly a quarter of a mile in length, have now passed into the hands of Mr. Stephen Seale, of the Darfield Stone Quarries, Barnsley.





ANCIENT TIMBER HOUSES: BOPFARD AND HILDESHEIM, GERMANY.—Sixteenth and Seventeenth Centuries.

ANCIENT TIMBER HOUSES, GERMANY.

SOME of our readers may be led to wonder why we have again returned to the subject of timber buildings, when so few works of this description are now carried out in this country. We feel sure, however, that a careful study of the examples of this kind of construction which we have lately given, would be most valuable and useful to those architects who have to make designs for the colonies. The timber buildings recently erected in New Zealand, for instance, show such a misapplication of material, and the magnificent timber so easily obtained, both in that colony and parts of Australia, offers such wonderful opportunities for the formation of a really artistic and scientific style of architecture, that we think we need fear no apology for returning to this interesting study.

We give in our present number three examples of timber houses of the most elaborate description; in fact, it would, perhaps, be difficult to find three more interesting specimens of this class of buildings.

The example on the left is at Boppard, and dates from the end of the fifteenth, or the commencement of the sixteenth century. This is called a "timber-framed" house; that is to say, the timber is used only for constructional purposes, all the other portions being of brick and rubble, covered with plaster. It will be seen by referring to our illustration, that the masonry work commences at once from the foundation, or at least from a basement of masonry, not more than 2 ft. or 3 ft. high. The timbers are not moulded or carved, except those forming the corbels supporting the upper story, and the "bressummer;" the effect of richness is gained by the struts and braces all being exposed to view. Four little pierced panels introduced into the flat surfaces, near the angles of the upper story of this house, are singular and pretty, and would offer a good suggestion for ventilation, though we were unable to find whether they were intended for this purpose, or were simply meant for ornament. All the timber work in this house has been painted a dull red color, which has a good effect, and is probably genuine. The gable is covered with small scale-plated slate.

We give a second example from Boppard. This is of a later date than the former, more elaborate in design, and more complicated in construction. It dates from the commencement of the seventeenth century, and is what is called a "half-timber house;" in other words, the upper portions of the building are of timber, the basement story being entirely constructed of solid masonry. Here it will be observed that the constructive portions of the timber work are richly carved, and ornamental details of wood are introduced, though sparingly, into the flat portions of the walls between the constructive timbers. These panels for the most part consist of a kind of rude parquetry-work, and occasionally a lozenge or circle sunk in the centre. The gables do not follow the outline of the roof, but take an ogive form. They are clad in wood, covered with slate. This form of gable for timber work is not commendable, as it is unsuited to the material, and excessively ugly, nor is the effect at all satisfactory.

Our third example is from Hildesheim, and is most sumptuous and superb specimen of late masonry construction. This house is entirely of wood. All the constructive portions are richly carved, and the wall spaces are formed by a series of very rich panels filled with human figures, grotesques, animals, and elaborate arabesques. It will also be noticed that there is not a single window space in this example than that of the former ones. The gable here is peculiarly striking, and the great bay-window which is also gabled, forms a wonderfully picturesque feature. This splendid building is a work of the domestic architecture of Hildesheim, which place, did our space permit, we might give a hundred illustrations, so rich is that interesting town in examples of ancient timber construction. We will, however, only mention one other building, and that is a large oblong house which must, from its appearance, have originally been a church. It stands east and west, and consists of one single nave of moderate size. The constructive parts alone are timber, the walling being composed of lath and plaster. It is probably a work of the sixteenth century, and rather plain. There is a tall square bell-cot on the western gable.

This building is now used as a store, and the interior has been so mutilated and destroyed, that it throws little light upon its original arrangement. This is one of the very few timber churches we remember to have seen, and reminded us of the singular church of Warburton, in Cheshire, which is one of the best-known timber churches in this country. The similarity between the two buildings must have been still greater before the late chancel and tower were added to Warburton Church. Before leaving this subject, we may say that, if we mistake not, there are other timber and half-timber churches existing in Cheshire, and we should be glad to know something more about them.

CONFERENCE OF GERMAN ARCHITECTS.

SIR.—At one of the last meetings of the Institute, I mentioned, for the information of members intending to travel in the south of Germany this autumn, that the Sixteenth Biennial Conference of German Architects would be held in September next in Carlsruhe. Permit me to inform them that it has now been postponed until the autumn of next year, partly because many architects are still doing duty with the armies of occupation in France, and their practice is being attended to by professional brethren at home, thus imposing upon the latter much extra work; partly because the gradual return to the peaceful arts by those who took an active part in the war has not given them sufficient time for the preparation of papers, questions, &c.

Berlin.

ALFRED STRONG.

THE CENTRAL HALL OF THE PROPOSED LAW COURTS.

I WAS much interested in reading, in your issue of July 1st, James Fergusson's remarks upon the "Central Vaulted Hall" in the New Law Courts.

I most sincerely hope you will not add to the many magnificent blunders that have been made in this country (America)—and, perhaps, some with you—of building great interior halls out off from direct communication with the external air, and, perhaps, worse—from the purifying rays of the sun.

We are fairly groaning, or had I better say perfectly paralysed, with all the vitality, —yes, and the very humanity,—bleached out of thousands of our citizens, by this fatal error of building interior rooms for offices and board-rooms, and for large assembly-chambers. Not in this city alone, where there was some excuse for such neglect of these great sanitary principles, but the *fashionable* plague has spread throughout the whole country.

The main halls of our national capital being thus located, call out annually the indignant protests of so many of our air-loving and sunshine-loving legislators—so, too, our colleges, our schools, our hotels, and many of our public buildings throughout the whole land; and worst of all is our horrible tenant-house system of this city. Many of these are grand new structures, six or eight stories high, with elegant fronts of brown stone, but in which three-fourths of the inmates sleep in interior rooms or closets into which the direct rays of the sun never enter. It has been very astonishing to me to see how very rapidly this fatal mistake spreads into the country after the building of an elegant hotel in the upper part of our city, in which the front room was used as a parlour, and the back one divided into two apartments for bed-rooms.

This made such a convenient arrangement for families, that it spread like a devouring pestilence.

But fortunately such buildings are being abandoned, or altered almost as rapidly as they were constructed.

I was requested lately to visit a new building occupied by the students of one of our most flourishing young colleges, and found it beautifully perched upon the hills overlooking a most charming country. But can you imagine my surprise at finding the horrors of a New York tenant-house multiplied fourfold? They had built a solid block, about 100 ft. by 175 ft., with a complete set of interior rooms, only lighted by an interior well, closed tight at the top by a skylight.

Their central space was used below for a kitchen, lighted mostly by gas, and the story above for a grand dining-hall.

The students using these central rooms sickened

so rapidly that they wondered what could be the matter.

My indignation at the stupidity of professors occupying such prominent public positions, and disregarding in so glaring a manner the great sanitary requirements of sunlight and pure air was (must I say, unfortunately) so illy concealed as to almost give offence to those who were so proud of their newly-completed monument to the good cause of public education in its higher branches! No—let me beg of you, on behalf of the cause of true sanitary science, not to express in so costly, elegant, and enduring a manner—and that, too, at the great centre of civilisation,—such disregard of the Creator's greatest temporal blessings to man—sunshine and pure air. I can reiterate most feelingly Jas. Fergusson's plea for the lawyers,—“They do not want to be stifled in dark, close consultation-rooms, nor to breathe the pestilential air of a deep, dark well-hole when taking a slight refreshment.”

L. V. LEEDS, Engineer of Ventilation.

New York.

MALTING CISTERNS.

YOUR correspondent, "Maltster," inquires the best manner of lining the bottom of a cistern, so as to prevent the cast-iron plates cutting, or wearing the lead. This can be done by lining the bottom of the cistern and gutter in the usual way, and afterwards closely soldering stout zinc or copper angle-pieces, so as to form a lining to the inside of the rebate carrying the cistern plates. I have always found lead a costly and unsatisfactory material for this purpose, and I should hesitate in using it for so large a cistern as that named by your correspondent. I believe brick and cement to be the best; and where this cannot be used, in consequence of the cistern being above the ground-floor, then a cast-iron cistern, properly made, answers very well. I have lately constructed one capable of steeping seventy-five quarters in cast iron, and it works in a very satisfactory manner.

B. A.

THE ROMAN PAVEMENT AT BIGNOR.

PERHAPS a notice in the *Builder* of the present state of the fine Roman tessellated pavement at Bignor, Sussex, may cause some steps to be taken for its better preservation.

On the occasion of a recent visit to the spot, I found the remaining portions of the pavement of the magnificent villa which, together with the inner court, once covered 6 acres of ground, were well protected from the weather by substantial sheds raised over them; and it is due to the owner of the property to say that he appeared anxious for the preservation of these antiquities, and conscious of the importance of his possession; but I observed that the mice were making grievous havoc of the beautiful pavement in several places, by burrowing holes and otherwise disturbing it. I was informed that it was difficult to stop their depredations, and I fear that little or nothing is done to prevent the work of destruction. Surely such treasures need not be given up to the mice.

L. H. B.

ROYAL ARCHEOLOGICAL INSTITUTE.

THE members of this institute now in congress at Cardiff, are making many pleasant and instructive excursions, but the papers read have been few in number. A *soirée* given at the museum was not very well attended. On this occasion a drawing of a handsome roof-screen in Llangwm Church, was exhibited. About the history of this screen Mr. Seddon gave some curious information. After the discovery of this work, which he described as being very artistic, he said an attempt had been made by the Duke of Beaufort to purchase it of the churchwardens of the parish, who, however, refused to sell it. Orders were then given by some one to a builder to steal it, and part of it was actually stolen; and he (Mr. Seddon) had heard that at Tortworth (Gloucestershire) the stolen parts had been used to make a screen. At Patricio, a remote church among the mountains near Llanllyf, there are some specimens of carving even more perfect than that in the Llangwm screen.

The visit to Caerleon was found very interesting by many. Caerleon is a small town on the Uke, and was once the metropolis of Wales. Mr. J. E. Lea conducted them to as many of the show-places as there was time to inspect. A museum

has been built in the village, where the relics of the past which have been exhumed from time to time in the locality are stored and taken care of. It includes two tessellated pavements. One of these, which is complete, was from a villa at Caerwent (examined last week), and is perfect. The mound in the outskirts of the village was visited. It is about 800 yards round at the base and 90 yards at the summit, and is ascended by a winding path. Mr. Lea said there could be no doubt that it was artificial. It had been said to be Roman by some and British by others. Probably both were right. The field below was the site of a Roman villa, a part of the walls of which ran into the mound. The visitors afterwards inspected a ridge of amphitheatral form, called Prince Arthur's Round Table, in proceeding to which the party walked alongside a considerable remnant of the old Roman wall. The facing of the wall has been removed, no doubt for modern building purposes. The "Round Table" is of oval form, 222 ft. by 192 ft., covered with turf. Nothing is known of it, nor why it is so called.

CURIOSITIES OF CONSTRUCTION.

SIR.—We have our "curiosities of literature," why not those of "building construction?" As a contribution towards such a collection I send the following. A gentleman's mansion is now approaching completion in the North of England, and under the personal superintendence of a clerk of works appointed by them. This man was formerly a bricklayer. In the roof of the mansion is placed a cistern of a capacity of some 200 to 300 gallons, with the provision of a standing waste-pipe, nine inches in diameter, made by the direction of the aforesaid clerk of works out of stout sheet lead, and carried down through the mansion to the ground, and there connected and connected with a 6-in. and placed drain-pipe. I think, sir, it is very probable this is the largest standing waste in any dwelling-house in this country, and the dwellers therein will not be carried, as the pipe is not trapped, and therefore a ready means of conveying sewer gases into the house.

We have heard something recently of the inability of joiner clerks of works. This is an instance of inability of a clerk drawn from another class in the business. E. G.

THE TEMPLE OF DIANA.

SIR.—The Temple of Diana is right, but there is something doubtful about the mode of discovery. The site as mysteriously discovered is that pointed out by the eminent writer on art, Dr. Guhl, and drawn on the plan by the traveller and geographer, Henry Kiepert. The site of the portico of Damianus was founded by another eminent archaeologist, Baron Probesch Otten, the well-known Austrian ambassador at Constantinople. The tomb of Androclus, the Magnesias Gate, the bifurcation of the Magnesias road and the way to the temple are laid down all right on Guhl's map, so that it was not necessary to discover them afterwards.

I consider it of great importance that our explorations of the temple should not be dimmed by claims which may bring down on us the remonstrances of the learned world of Germany, and that the expedition should be on an adequate scale, and have attached to it a competent archaeologist. There will be glory enough for us if the exploration be but properly carried out; otherwise we shall be landed in a muddle, and indeed the affair has been but little better than that for ten years. EPHESSUS.

SHAKESPEARE'S MONUMENT.

SIR.—There has been much said and written of late with reference to the immortal bard, Shakespeare; but is it not strange to say and strange to think that, in this country, wherein we have so much reason to boast and to feel grateful for the happiness, pleasure, instruction, and thought that we are beholden to him for, we have neither street, square, nor even an appropriate theatre to display the talent of his mind in, and not even a public monument erected in any of our squares, parks, &c.,—a disgrace to the country, when one sees how our countrymen's marvellous talent and mind are appreciated in foreign lands, who would ages since have executed such a monument as would have been the wonder of the age and world?

But here, when you propose any grand thing, the Government cry out that they have no funds for such an undertaking; whereas, if such a proposition were made in the right spirit, not only this country, but every foreign State would be ready and willing to send forth its aid, to our shame. How much longer is this parsimonious feeling to exist? Why not some influential parties stand forth, either in the form of our nobility, or men of talent, of every description, either literary, scientific, and so on? A sum of money would soon be raised to fulfil such a pact, and then to call forth the talent of artists, either as painters, sculptors, or architects. There is talent sufficient in the country to accomplish all this; and less encouragement be afforded at length to the arts, and prove what can or could be accomplished in the same form as was done in the case of the Houses of Parliament, or even such a work as the Albert Memorial in Hyde Park. It is not yet too late to accomplish this; and let our Sovereign and the whole of the Royal family of England affix their names to so noble a deed, to hand down their names to posterity. Awake, thou that sleepest, and be doing!

AN OLD SUBSCRIBER.

STRANGER AND STRANGER STILL.

The following tenders have been delivered for alterations and new seats in the parish church of Gravesend. Messrs. Wadmore & Baker are the architects:—

Lacelles.....	£495 0 0
Marsland.....	377 0 0
Hutchins.....	318 0 0
Brakley.....	436 0 0
Blake.....	339 0 0
Gough & Lawford.....	390 0 0
Saunders.....	355 10 0
Bragger.....	373 0 0
Capps & Rice.....	245 0 0
Gould.....	237 0 0
Rooney.....	189 0 0

Mr. Gould's tender was accepted.

THE INTERNATIONAL EXHIBITION AND THE WORKING CLASSES.

SIR.—At a recent lecture in St. Pancras, "On the Advantages of Annual International Exhibitions," several suggestions were made, for the purpose of getting the workmen to attend. Some proposed that it should be opened free on Saturdays, which would be a cheap way of seeing the valuable things, foreign and English, there displayed. I made some inquiries of my mates, and out of twenty only one had been to Kensington. They thought, if it was opened on Saturday at a reduced price, many would go; and that an appeal should be made to the Commissioners. I agreed to try to get a public mention of it; and as everybody who takes an interest in art and science reads the *Builder*, and as it is a great national disgrace that so few of our artisans have visited the international collection of arts and manufactures, I hope, sir, you will find a place for this in your columns.

JACK PLANE.

SIR.—Will you allow me to expostulate with the authorities of the Exhibition? It seems to me they are simply ignoring the working classes altogether. Except as a holiday, how can they go with any comfort with the six o'clock closing arrangement? Nine-tenths of the workmen of London live a considerable distance from the Exhibition, and if they try to take half a day to see it, by the time they have gone home, cleaned, and reached there, they will have very little time left to inspect it. Had the closing hour been eight, many more thousands would have found their way there. Half days and even quarters would have been taken for the purpose. Is it too late to have the early closing modified,—say seven o'clock? And then in the matter of refreshments, working people want something cheaper than the second-class bar. Let the directors take pattern by the Crystal Palace.

ONLY A TAILOR.

CASES UNDER BUILDING ACT.

RUINOUS BUILDINGS.

At Greenwich Police-court, the Blakely Ordnance Company, having manufacturing premises on the banks of the river in Greenwich-marches, appeared to a summons, at the instance of the Metropolitan Board of Works, to show cause why an order should not be made, under the Metropolitan Buildings Act, to put such premises in a safe state, the same being considered dangerous.

Mr. Taber, the district surveyor, gave evidence to the effect that the walls and arches of the factory were in a dangerous state, and a gentleman who represented the company contended that the provisions of the Act relating to dangerous structures could not apply, inasmuch as the

factory was not situated near a public thoroughfare, along which the general public had a right of passing, and that at the present time the only person on the premises was a man employed as a watchman.

Mr. Napier, who represented the Metropolitan Board of Works, said that it was not the intention of the Act only to protect the general public, but, by the 80th section, power was given for the district surveyor to interfere where structures were dangerous to human life.

After some considerable argument, Mr. Maude said that hitherto he had been under the impression that complaints under the Act as to dangerous buildings applied only to cases where there was danger to the general public, but the words pointed out in the section of the Act cited by Mr. Napier were very cogent. It had been argued that the watchman employed could not be considered an inmate, and that if any other person were found on the premises he would be considered a trespasser, and if injured by the falling of the building he would not be able to recover compensation. He believed it to be the intention of the Legislature that no such dangerous structures should be allowed to remain, as there was a hazard of their falling, and even the watchman or a postman having to deliver a letter on the premises might be injured. His order would therefore be that the defects complained of in the building be remedied within twenty-eight days.

POSITION OF ARCHITECTS.

SIR.—Is there any way of ascertaining what state the architectural profession is in at present? I am acquainted with many who (like myself) are literally doing nothing, and have not been for a year or two, and clever men too.

I hardly ever go into a town, large or small, without inquiring whether there are any architects located there, and the reply is, "Lots of them, sir," and, "And perhaps some val-to-do builder will tell you that they are half starved," "poor devils;" and in many cases I firmly believe it. As for going into a competition, why it is the next thing to absurdity unless you have "interest."

Even supposing you have worked up a design in a very attractive style, and you get the job, you feel quite certain you cannot carry it out for the money named, and we know what follows.

Can anything I do to prevent the swarm of "quacks" from doing plans, and doing architects and surveyors out of their mode of existence? I reside near several large manufacturing towns, and one or two of us could do very well, but for the frequent importation of local upward surveyors, who are badly paid, and frequently start in the quality on their own account, and generally disgraced by the board. These, and the quacks who do plans, make using very precarious. Now, in my opinion, the people in office in connexion with the schools, for which grants of money are made, almost ignore the name of an architect (it is occasionally mentioned as "builder"), for their Form No. 7, "Expenditure," you have,—

Paid for Site, &c.....	£
Buildings, &c.....	
Local Expenses.....	
Sundries.....	

But no Architect's Charges. And yet he is to prepare these plans, specifications, quantities, &c. Probably about the "Sundries."

I feel sorry when I see advertisements for "article pupils" in architects' offices, and often wonder what the all merge into. I know three that are making their per annum in a quiet "pub" or two, and they were good architects. M. M.

LEAD PAVEMENT AT SOMERSET HOUSE.

In the *Builder's Magazine* for 1793, vol. xlviii., part 1, p. 9, is given a plate, exhibiting on one side a view of the back façade of the new part, next the Strand, as built by Sir Wm Chambers, and on the other side a view of what remained of the old building. The description says that "at the time the drawing was made (probably about 1780) it showed all that remained of that once magnificent palace. The sheetings of lead on which the present pavement is laid, the watch-box, the wooden way to be remains of the old building, with part of the front, arched entrance, scaffolding, and progress of the new, are here exactly delineated, and for a view not less curious than interesting."

This "present pavement" appears to be a roadway between the balustrading of the squares, and that of the area to the vaults under the quadrangle, not at that time formed. I having before heard of this method of forming foundation for paving, I submit the extracts to your readers for a solution for the employment of the lead, with the queries,—Was it general practice at that time, or done in consequence to render the vaults dry? Is it known to exist, or has it decayed? W. F.

HEALTH OF SOMERSETSHIRE.

When recently in the *Builder* we gave so faithful pictures of the sanitary condition Somerset towns, two or three of the local priors not only flatly contradicted the statements, supplemented their denials with gratuitous rancour. The sanitary condition of every one of the towns we reported upon was bad, and the priors of the local authorities concerned was or nearly so. Since, however, in almost every one of these towns action has either been taken by central authority, or has been taken in anticipation of that certain pressure, the result that improvements are begun, and a mitigation of the evils complained of has already occurred.

our strictures on Taunton some rather testy response rushed in hot haste into print to prove that we were entirely wrong. But even up to the present time the Taunton Local Board of Health are beset with complaints, and more than a threatening letter from proprietors, complaining of nuisances, and calling upon them for remedy. We are glad to see that the Board are giving their attention to the complaints, and are showing a desire at last to aid in removing the nuisances.

The *Somerset County Gazette* makes some sensible remarks in its last issue on the question of the public health, and pendant to it puts the following pertinent question to the good people of Taunton:—

What is the sanitary condition of our own town? Is it perfectly satisfactory that we could meet a visitation of cholera with a full assurance that we have done all in our power for the security of life? This is a question which the local authorities of every town should ask themselves. It matters not how small the town may be, even if it is little more than a mere village. It is well known that preventable epidemics are more encouraged in small towns than in large cities. The drainage, the water supply, and the various sanitary precautions in London are undoubtedly superior to what we find in a Somersetshire town. Important revelations have recently been made in regard to two or three very small towns in Devonshire where disease was propagated by want of domestic accommodation and want of drainage. Where there is drainage there must be bad water; and medical men continually informing the public that nothing is more conducive to disease than an impure water supply. Water is now acknowledged to be the principal medium through which diseases, such as cholera and typhus fever are conveyed from house to house, and from place to place. The sanitary organisation of a small town is, of course, not so elaborate as that of a large city. The system of drainage is imperfect, and the water supply is very different. In one of our most picturesque towns we see the greatest neglect of sanitary laws. So long as they enjoy pure air, people absurdly suppose they can do without pure water. A cesspool or a dung-heap may be often found in close proximity to a pump; a privy which is ill-constructed is, perhaps, only a few yards from the well. When disease is favoured with all these advantages, no wonder that it ravages so terrible and fatal when it once takes out. It is full time in these matters to have reform all our towns. We are not living in a barbarous age, in a barbarous country. We make a great display of civilisation; yet we tolerate many of that barbarous neglect of sanitary laws which is more appropriate to the ages of North American Indians than to the towns of England.

We have said the same thing a thousand times over, and fear that we shall have still to repeat it in many quarters, in the teeth of possible ill and case-hardened ignorance.

BATH ABBEY CHURCH NAVE.

The nave of the Abbey Church, Bath, has been restored, and reopened for divine service. The first appeal made to the public was for funds to enable the committee to execute that which was essential to the stability and security of the building. The tender of Mr. Bidwell, amounting to £5,389l., was accepted. The work was divided into three portions.—1. The roof of the clearstory, with the east, west, and large aisle windows; 2. The groining of the ceiling of the nave and aisles; 3. The lower part of the building, including the cleansing of the walls, relaying of the floor, the removal of the prelate galleries and fittings, and the re-arrangement of the whole area for the use of the congregation, with the warming, ventilation, and lighting. During the first year the perilous roof of the nave was strengthened in its timbers, reroofed, and ventilated; the decayed lead on the tower roof was replaced by new; new battlements were erected of the design which is considered to have been originally intended; the newwork of the clearstory, west and transept windows was renewed, and the windows injured in appearance by the new form in which they were glazed. In the middle of 1865 the committee turned their attention to the stone masonry of the nave and aisles, as recommended by the architect, Mr. Scott, and determined to undertake the work. In the second year (1866) the committee were unable to make that progress they could have desired; nevertheless the gables of the groining were finished, and through the liberality of the rector similar work on the transepts was placed in hand. The following year was a period of steady and satisfactory progress.

During 1867, the stone groining in both transepts was completed, the ceiling in the nave and aisles was advanced another fifth, making three-fifths, and within 100l. required for this work had been contributed. A portion of the first transept was also proceeded with during this year, the roof of the north aisle of the choir being being thoroughly repaired, and that of the south aisle being in progress. The next year the groining of the nave nearly completed,

but 1,100l. were still required to make up the cost. Other parts were taken up and finished, the ceilings in the transepts were perfected, a new organ was built by the rector in the place originally proposed by Mr. Scott, and a faculty was obtained for necessary alterations in the internal arrangements. The next year a great change was wrought in the interior of the edifice, the groining of the ceilings of the nave and aisles was completed and opened to view. The floor of the nave was levelled and concreted, the monumental slabs being carefully relaid; the stone screen erected between the nave and choir at the previous restoration was removed to the west end of the nave, where it forms an inner porch; the mural tablets were removed with the view of re-arranging them below the string-course and providing space for those which were formerly affixed to the screen; and the pillars and walls were cleaned and repaired, the former being found in a very bad condition, chiefly in consequence of damage inflicted in former years when they were covered with tablets. Contracts were taken for lighting from Messrs. Skidmore, of Coventry, and for heating from Messrs. Haden, of Trowbridge, and the preparatory work necessary for carrying out these contracts was commenced. Last year the committee adopted the designs for seating the nave, and the completion of this contract with Mr. Brook, of Bristol, and other works, brings this review of the progress of the restoration, for which we are indebted to the local *Chronicle*, down to the re-opening.

ST. JAMES'S TOWER, TAUNTON.

AFTER much controversy, amounting at times to strong disputation, as to whether this structure should be repaired or rebuilt, the matter is at length in a fair way of settlement, inasmuch as the old tower has been demolished, and the memorial stone of a new tower has been laid by Lady Anna Gore-Langton, wife of Mr. W. Gore-Langton, M.P. for West Somerset.

The new structure has to be an exact copy of the old, which was a Tudor tower, dating from the latter part of the fifteenth century, in the reign of Henry VII., and probably erected before its sister tower of St. Mary's.

The height from the ground to the top of the battlements will be 105 ft., and 116 ft. to the top of the pinnacles. The size at base within the walls will be 14 ft. square, the walls themselves being 4½ ft. thick. The lowest tender for the erection, that of Mr. R. Spiller, was 3,072l., which was accepted; and, with architect's commission and payment to clerk of works, &c., the total cost will amount to 3,500l., towards which 1,000l. have been promised. The architect is Mr. Spencer, of Taunton. The ceremonial of laying the memorial stone was attended with much *clat*, the town being made gay with flags and streamers, and an arch of evergreens. In a cavity in the stone, in a glass bottle hermetically sealed, was placed an inscription, illuminated on parchment by the Rev. W. Kinglake. A luncheon was given immediately after the service, when about fifty sat down, including the Bishop of Bath and Wells, and Mr. and Mrs. Gore-Langton.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—A conference of employers and workmen was held with a view to settling the engineers' strike for the nine-hours movement. Mr. Charles Mark Palmer, of Jarrow, convened the conference, and urged both sides to consider the importance of coming to a satisfactory settlement. The trade of the district, he said, was prosperous, and he thought the masters were in a position to grant a concession to their workmen. A long discussion ensued as to the resolutions which were to form the basis of the conference. The delegates could not pledge themselves that the whole body of the men would decide by vote by ballot whether they would accept the result of the conference or continue out on strike; and as the masters insisted that the final decision should be by vote by ballot, no satisfactory conclusion was come to at the conference. A mass meeting of the men was afterwards held on the Moor, at which it was almost unanimously agreed to accept no compromise, and not to accede to the ballot. At another mass meeting the following resolution was agreed to:—

"After a most careful consideration of the sixth resolution of our employers in reference to our votes being taken by ballot, the Executive Committee recommends that the employers be requested to withdraw that resolu-

tion, and that the mode of taking the votes be decided by the Mayor of Newcastle, after the masters have made their offer."

At a meeting of the master engineers this resolution was submitted, and the masters, in reply, passed a resolution to the effect that, after considering the course adopted, and the statements made by the representatives of the workmen on strike, they, with regret, deem it useless at the present time to attempt further negotiations, and therefore it was out of their power to accede to the request of the League. The employers state that they had no alternative after the positive assurance of the men that they would accept nothing short of the nine-hours demand. About 4,000 of the men on strike have left the town to seek work elsewhere.

Cockermouth.—The joiners' strike is at an end. The whole of the masters in the town acceded to the request for a half holiday on Saturday, and the workmen returned to their employment.

Paris.—Numbers of the Communist prisoners are, by order of M. Thiers, to be released from custody. This step has been taken because the orders received in Paris cannot be executed for want of workmen. Hundreds of skilled workmen are said to have been killed in the massacre of May.

Berlin.—The masons in this city have resolved to stop work at every builder's without exception. They have appointed delegates to carry on all negotiations on their behalf with the masters with a view to a settlement of the pending difficulties. At the same time a resolution has been passed declaring it to be the duty of every unmarried mason to leave Berlin as soon as circumstances may permit. In consequence of the continuance of the strike, the Government is employing soldiers, and has issued orders to the regiments in Berlin to call off all men in their ranks trained to masons' work for the duty of building the new House of Parliament, which is in danger of not being completed in time. Disturbances have occurred among the masons, the strikers assaulting those who continued work, and the police have arrested forty of the rioters. The masters have held a meeting and passed a resolution to yield nothing, in order not to encourage more strikes. The masons are receiving pecuniary assistance from the journeyman carpenters. Fifteen fresh arrests have been made. The strikers had announced a magnificent *fitte* in the *Social Democrat*, but this has been prohibited by the authorities. The masters are resolved not to yield, and only four have been found to submit to the journeyman's terms. The blacksmiths have also struck for higher wages, and the carpenters are preparing to strike.

MISSION HALL, KENTISH TOWN.

In Kentish-town, a newly-erected hall for the district missionary of the London City Mission was last week opened by a public meeting, presided over by Mr. J. D. Allcroft, who has generously borne the entire cost.

The building consists of a hall, entered from a porch in Dickenson-street, with a class-room and convenient offices in the rear. It being desired to avoid a strictly ecclesiastical character in the design, and yet to express religious purpose, a somewhat free treatment of Early Gothic, with domestic outline, was adopted by the architects, Messrs. Spalding & Knight. The gable and porch towards the street are of malm brick, with red moulded cornices and strings, a rose window in the gable, with other stone dressings, being of Douling stone. The roofs are covered with plain brown-red Staffordshire tiles. Messrs. Scriven & White were the contractors; the iron gates and railings and the gas-fittings were supplied by Messrs. Hart, Son, & Peard.

CHURCH-BUILDING NEWS.

Bristol.—The foundation-stone of the new church of St. Matthew, Moorfields, St. George's, has been laid. The site is between the school premises and the residence of the Rev. D. Cooper. The church will consist of nave, side aisles, north and south chapels, chancel, and sacristy, with tower and spire, 120 ft. high; the south chapel forming the minister's vestry, and the north chapel the organ-chamber. The style of architecture is early thirteenth-century work, the tracery of the windows, wherever introduced, being plate, and all the detail generally being of a simple character. The walling will be of Pennant work, polled, with freestone

dressings; the inner walls being plastered to the face of the stone jambs and quoins. The timber work of the roof will be exposed; in the nave and aisles plastering will be used between the rafters; but in the chancel and sacristy the rafters will be boarded. The seats are to be open, stained and varnished. The estimated cost of the building, when completed, is 2,300*l.*, and a contract has been entered into for the erection of the nave, south aisle, chancel, sacristy, south chapel, and tower, up to the level of the clerestory windows, at a cost of 1,600*l.*, leaving the north aisle, north chancel, and completion of the tower and spire to some future day. The church, when completed, will seat 600, and the portion about to be built 450 persons. The contractors are Messrs. Wm. Banner & Co., of Bristol; and the masons' work will be executed by the Messrs. Beaven, of Westminster. The architect is Mr. J. Neale, of Bristol.

Benge worth.—The sum of 3,300*l.* has been subscribed towards the rebuilding of Bengeworth parish church.

Clerkenwell, London.—The memorial-stone of a new chancel has been laid at St. Philip's, Granville-square, Clerkenwell, in memory of the late incumbent, the Rev. Warwick Reed Wroth. The committee who have undertaken the task of raising the necessary funds for completing the work, state in their appeal that it is intended to rebuild the east wall of the church, to refit the interior of the thus improved chancel, and in other ways to complete the memorial nave. The nave proper of the church was re-seated by the exertions of Mr. Wroth, in 1850, at an outlay of several hundred pounds, and the work proposed formed part of the scheme he was unable to complete. The east wall was in a ruinous condition; there was no proper chancel, no vestry, and no place for holding classes, &c. St. Philip's, the committee further state, is the only church for the parish, which has a population numbering now probably nearly 12,000 people. The church seats only 400 persons. The alterations will provide extra accommodation for 183 adults. The total cost of the work will be about 1,000*l.* The architect is Mr. Withers, and the builders are Messrs. Dove, Brothers, of Islington.

Gainsboro.—Trinity Church, after being closed for alterations, has been re-opened. The chief alterations are a new oak screen and pulpit, and the lengthening of the chancel 4 ft. or 5 ft. into the nave, to give more room for the choir. The screen stands on the chancel-steps, and is about 12 ft. high. The upper part of the front consists of seven arches; the six side ones are of equal width, with trefoil heads and pierced spandrels, the centre one being considerably wider than the others, and open to the floor, with low gates. The work of screen and pulpit is of the character of that of the thirteenth century. The designs were prepared by Mr. J. L. Pearson, London. The pulpit was executed by Mr. Robinson, of London, and the screen by Mr. Cant, of Gainsboro. The church has been cleaned and renovated, the roof of the chancel being ornamented. A medallion of the Crucifixion has been promised for the east window.

Books Received.

THE August number of *Hardwicke's Science Gossip* contains a particularly interesting and instructive article by Major Holland, headed "The Trawl." The trawl being let down, the writer describes what is brought up from the sea. A number of illustrations increase the value of the article.—In the current number of *London Society*, Mr. Planché carries on his very interesting "Recollections," which treat of Stephen Price's career at Drury-lane, the foundation of the Garrick Club; Hook, Malibran, the author's first Extravaganza; Luttrell, and Rogers. A pair of prints in this same number, headed, "Paint and Powder," are powerfully suggestive.—"Atchley's Builders' Price Book for 1871" (Kent & Co.) includes a useful paper on "Iron applied to Building Purposes," by Mr. Eras. Campin, C.E.—"Practical Tables and Essays for Steam-engines. By H. Haedike, under-engineer in the German navy. Kiel: Schwere, London: Natt." These are no doubt useful tables and rules by a competent author, but the publication much requires revision by a mathematician acquainted with the English language.

Miscellaneous.

The Health of Marylebone.—The annual report of the medical officer of health, Dr. Whitmore, has been issued in a printed form. It shows that, notwithstanding fever and small-pox, the sanitary state of Marylebone has been favourable during the past year. As remarked by Dr. Whitmore, in reference to diseases of the miasmatic order, "an increased zymotic activity in any one of them is productive, in some way or other, of diminished activity in all the rest." He is of opinion that although some few diseases of the zymotic class are propagated only through infection or contagion, typhoid fever, while also highly contagious, will have its origin traceable to bad drainage, cesspools, impure water, accumulation of animal and vegetable refuse, and other such nuisances. And as to typhus, overcrowding, impure atmosphere, and insufficient food, are its more commonly exciting causes. The water supply in Marylebone is said to be good. The reporter prefers hard to soft water for health, and maintains that the death-rates of cities and towns justify the preference. He insists upon intermittent water supply in preference to constant, on like grounds. The measures of the water companies for the prevention of waste in constant supply, he foresees, will militate against the cleansing of closets and drains, which are now cleansed where there are no cisterns, by waste that is wasted by the companies under the intermittent supply. And as for the stagnation of water in cisterns, they are seldom or never large enough for that among the crowded poorer classes.

The Ventilation of the Queen's Asylum for Children, Hobart Town, Tasmania.—The cubic space afforded in this asylum has given rise to a correspondence, in course of which we are referred to as an authority on the subject. Dr. Coverdale urges that "in all cases efficient ventilation will compensate for want of cubic space," and against this doctrine Mr. E. Swarbrick Hall protests as too sweeping in assertion. That efficient ventilation will compensate for want of cubic space, in many cases, cannot be doubted, but not in all. And, moreover, even where the ventilation is efficient, as such, in decidedly small spaces it must be made so "efficient," that the apartments are necessarily converted into perilous draught-boxes, which may be still more injurious to life than defective ventilation. And then, too, it is very doubtful whether any system of ventilation yet known can be safely trusted to, or depended on, for efficiency, either in small spaces or in large. In short, much discretion is called for in the adjustment of space to numbers, and of ventilation to space.

The Thames Embankment.—The Select Committee of the House of Commons on the Thames Embankment have met to consider their report. The conclusion arrived at by a considerable majority, in spite of the opposition of the Chancellor of the Exchequer and the Attorney-General, supported by Mr. Laird and Mr. Anderson, is favourable to the claims of the public. On the motion of Mr. W. H. Smith, a resolution was passed, recommending that the greater part of the land in dispute, about 2 acres in amount, should be set apart as a public garden, to be held from the Office of Woods, under a lease of thirty-one years by the Metropolitan Board of Works, at a rental on the same scale as that paid by the Duke of Buccleuch and other lessees of crown property. To the crown itself is reserved for building purposes the line of land continuous with the houses in Whitehall Gardens. The committee asks the Government to take the necessary steps to give effect to this resolution.

Art Union of London.—In the ensuing distribution, the chief prize will be the fine group in marble of the Wood Nymph, now in the International Exhibition (No. 2,505), for which the premium of 600*l.* was awarded to Mr. Birch, as the result of a competition, when fifteen life-size works of various degrees of merit were submitted. For the current year, each subscriber will receive a set of eight plates, representing Sea-coast Scenes under various conditions of weather, the works of some of our best artists, engraved in the first style in the line manner by Messrs. Brandard, Cousen, Prior, and Willmore. The exhibition of works selected by the prize-holders of the past year will be held at the Gallery of the Institute of Painters in Water Colours, 53, Pall-mall, from the 9th to the 29th of August.

The Memorial of the Rev. W. B. Mackenzie.—The designs of Mr. S. Dutton Walker, F.S.A., have been selected by the committee for erecting the monuments proposed to be placed in St. James's Church and Schools, Holloway, London, to the memory of the Rev. W. B. Mackenzie, the late pastor. The design for the memorial proposed to be erected in the chancel of the church is Greek in style, the church itself being in that character. The monument will be constructed principally of French stone. The inscription tablet will be Sicilian white marble, and a white marble cross, wreathed with a crown of thorns, occupies a panel in the upper part of the monument. The whole is carved with Greek ornaments. The other memorial, to be erected in the school-room, in which Mr. Mackenzie took a peculiar interest, will be of the Decorated Gothic style, with trefoil-headed tablet and spandrels and carved hoodmoulds. The execution of the work has been entrusted by Mr. Walker to Mr. J. Birnie Philip.

Opening of New Home for Penitents at Manchester.—The New Home for Penitents, situated in Victoria Park, near to Dicken's-on-road, Manchester, has been opened by the mayor. The institution has been established in connexion with the Roman Catholic body, and will be under the management of "The Sisters of the Good Shepherd." They had previously occupied a building in Levenshulme, where from sixteen to twenty female penitents were received. The building is of brick, and is in the Domestic Gothic style. It is designed to afford accommodation for 260; but the central part only, with chapel, dormitories, and offices, had yet been erected, wherein accommodation is provided for about 100. The cost up to the present time has amounted to 6,000*l.* Mr. W. Nicholson, of Manchester, is the architect; and Mr. Healey, of Salford, the builder.

Prison Discipline and Reformatory Treatment.—An International Congress on this subject is to be held next year in London. The idea originated in the United States, and the task of arranging the preliminaries was imposed on Dr. Wines, secretary of the National American Prison Association of New York. He has entered into communication with persons of all nations, and with the accredited representatives of their Governments resident in Washington. He now comes to England accredited by the Government of the United States to take steps, with the several Governments of Europe, and with those interested in the subject, for the organisation of the proposed congress. The council of the Social Science Association at their last meeting, resolved unanimously to co-operate with Dr. Wines in every practicable way in prosecuting the objects of his mission. They have issued a circular explaining the purposes of the congress.

London Suburban Water Supply.—The West Surrey Water Company has been incorporated by Act of Parliament, with a capital of 25,000*l.*, in shares of 10*l.* each, and borrowing powers, 6,000*l.* The company's Act secures to it the exclusive right of supplying the districts of Chertsey, Walton-on-Thames, Hersham, Oxted, Weybridge, Cobham, Byfleet, and Shepperton, with water. These places, at present, are almost entirely dependent upon water for their supply. In consequence of defective sewerage and other causes, this well-water is admittedly bad. The new water is to be supplied from the Thames, near Walton Bridge, pumped into the mains, and conveyed into covered reservoir to be constructed on George's-hill, near Oxted Park. A provisional agreement has been entered into for the construction of the works for 23,500*l.*

The New Act on Hampstead Heath. The local Act has just been issued to transfer the Metropolitan Board of Works the open space known as Hampstead Heath, and to preserve, improve, and regulate the same. The Board is to pay 45,000*l.*, the purchase-money, on which Sir John Mayson Wilson and Spencer Mary Wilson are to execute a conveyance of the property. The money is to be paid on the expiration of three months from the passing of the Act on the 29th ult. The Heath is to be kept open, and the Board is not to sell or in any manner dispose of any part of the Heath, nor cut the turf nor sell the gravel, &c. The heath may be drained, with power to make roads or otherwise to effect improvements for the public benefit.

The Amalgamated Society of Carpenters.—The question whether the Amalgamated Society of Carpenters and Joiners is a trade union or a friendly society has been under consideration of the Marlborough-street magistrates. The executive council had ordered one branch to pay over to another the sum of 5*l.*, and on the trustees of the former refusing to do so, a summons was issued against them. On their part it was pleaded that as the organisation was a trade-union, the magistrates had no jurisdiction. Mr. Mansfield adopted this view, and dismissed the summons, with an intimation that the complainants' remedy lay in another direction.

The Birkbeck Permanent Building Society.—The annual report and balance-sheet of this society, just now presented to the shareholders, serves to show the remarkable extent of its operations. The gross receipts since the formation of the society have nearly reached millions, while those of the past year have reached 1½ million, which shows an increase over the years previous of nearly 200,000*l.* The recent available profits for the distribution of dividends in the year 1870 amount to 52,857*l.* 18*s.* 8*d.*, and the number of members and depositors at the present time exceeds 22,500.

China Clay.—A representation has been sent to the Medical Department of the Privy Council by weavers in the Todmorden district, complaining of the serious effects resulting from air being obliged to work in weaving-sheds wherein Chinaclay is used, and praying their lordships to send a medical inspector to inquire into the sizing system generally, and especially into the use and effects of Chinaclay, and such other ingredients as may be necessary to make China clay adhere to the warps, so that the petitioners may be delivered from the evils they now labour under.

London Statue to Lord Derby.—At a recent meeting of the Metropolitan Board of Works a plan of the Victoria Embankment in the vicinity of Westminster Bridge, containing four statues marked by the engineer upon which the proposed statue to Lord Derby might be advantageously placed, was submitted to the members of the board. Permission was given for the erection of the statue in the Board's ornamental garden, at a point marked in the plan; and the engineer of the Board was directed to confer with the sculptor, Mr. Noble, relative to the proposed site, and to report to the Board the results of the conference at the meeting of the board this Friday.

Cottage Hospital for Southend.—A proposal has been made for the establishment of a cottage hospital at Southend. The suggestion comes from Mr. Hayward, the architect of the Public Hall, who offers to give up any commission he might be entitled to receive in fitting one bed in the building, presumed to cost 400*l.* 50*s.* The cost of the building is taken at 800*l.*, to accommodate patients, with nurses' rooms and other conveniences. It is intended to be quite simple and cottage-like, but to possess all the usual necessary appliances for treating sick folk.

A Thibetan and Yarkand Court in the Crystal Palace.—The directors of the Crystal Palace have availed themselves of the results of a mission of Mr. T. D. Forsyth, C.B., into Yarkand in 1870, to add a Thibetan and Yarkand court to their collection. The new court is in the Tropical Department, on the gardens side. A first thing that will arrest the eye is a painting of the Buddhist monastery of Chimray, Ladak, Thibet, painted by Mr. Panton, from drawings taken on the spot by Dr. Cayley.

Silvering Glass.—Last week a piece of glass, measuring 100 superficial feet, underwent the process of silvering at the works of Messrs. Smith & Co., Peaseley Cross, St. Helen's. This said to be the largest mirror ever turned out by any establishment in Lancashire, and, with or two exceptions, the largest ever done in England. The silvering was accomplished by a new process, by which the mirror is completed in forty hours, instead of occupying ten days.

Sewage Irrigation at Swindon.—The Board of Health of Swindon, Wilts, having determined to carry out a complete system of drainage, have purchased a farm on which to utilise the sewage in irrigation, and are about to have it laid out. The works are entrusted to Messrs. Russ, Kinn, civil engineers, Westminster.

A Fatal Railway Station.—At an inquest, held by Dr. Hardwicke, on the bodies of two men who were killed at the goods station of the Midland Railway in St. Pancras, he called the attention of the jury to the great number of accidents which happen at this station, nearly all of which terminate fatally. He found that it was absolutely necessary (according to railway theory) for the different officials to cross the lines hundreds of times during the day, hazarding their lives every time they did so. Such a system of management, or mismanagement, ought, if possible, to be stopped. It is stated that during the past twelve months no less than thirty-six accidents have happened at this station, most of which have terminated fatally, and other sufferers who are still alive are helpless cripples. Verdicts of accidental death were returned.

St. Alban's Abbey.—The statement we printed as to the consideration shown for this building by English sovereigns at different times may not have been without its effect. The restoration committee have received an intimation that "her Majesty is pleased to consent to patronise the undertaking for the restoration of St. Alban's Abbey, in consideration of the great historical and religious interest which is attached to it."

Another New Playhouse.—We are informed that Mr. J. A. Cave is about to sell the Victoria Theatre, of which he is the present lessee, to a limited company, the object of which is to make "a palace of amusement" of the old house; and that Mr. Cave intends erecting a new theatre in the Edgware-road, which will be constructed to hold about 1,000 people. Mr. Walter Emden is mentioned as the architect of the new building.

Dwelling-house Improvement Company. It is proposed to form a new undertaking under the title of the Metropolitan Dwelling-house Improvement Company (Limited), with a capital of 25,000*l.*, in 2,500 fully paid-up shares of 10*l.* each, to improve the houses of the poorer classes in the metropolis. Mr. Thomas Brassey, M.P., and Mr. W. H. Smith, M.P., are directors of the company.

Scientific Congress at Antwerp.—Here a congress of geographical, cosmographical, and commercial science is to be held. Preparations have been made, and numbers of scientific men have responded to the invitation to attend the meetings, which will last for a week, terminating on the 22nd inst.

British Artizans in Paris.—Lord Lyons wishes it expressly stated that British artisans will not find work plentiful in Paris, and that there are no funds available to assist them back, should they find it desirable to return.

St. Luke's Workhouse, City-road.—The Poor-law Board have consented to the erection of a laundry and washing-house in connexion with St. Luke's Workhouse, City-road, at a cost of 2,000*l.* The proposed building is intended to meet the requirements of 1,500 inmates.

School, Islington.—A chapel and school in connexion with the Harecourt Home Mission are about to be erected in Britannia-row, Essex-road, Islington. On Monday evening the foundation-stone of the proposed buildings was laid by Mrs. Sinclair.

The Temple Gardens.—These fine gardens are now being carefully laid out, and the authorities have amalgamated the Inner Temple Gardens with the Middle Temple, so that the length is doubled, and presents a capital promenade.

Eastern Counties Industrial Exhibition, Norwich.—On Wednesday last, the second Industrial and Fine Arts Exhibition was opened in St. Andrew's Hall, Norwich, by the Mayor. There are about 400 oil and water-colour paintings, and a large assemblage of works of industry.

Opera Concert, Albert Hall.—The concert and promenade in the Albert Hall and Horticultural Gardens, on this, Saturday, the 5th, promise to be a remarkable entertainment.

Builders' Benevolent Institution.—Mr. Joseph Taylor, of the firm of Messrs. George Smith & Co., has accepted the office of President of this Institution for the ensuing year.

Opening of Saltair Park.—Last week the new park at Saltair, 14 acres in extent, formed at the cost of Sir Titus Salt, bart., was opened in a quiet and unostentatious manner.

TENDERS

For hospital, Kent County Lunatic Asylum, near Maidstone. Mr. Martin Bulmer, architect. Quantities by Mr. Geo. Ruck:—

Dover & Co.	23,300	0	0
Bridge	2,900	0	0
Assomb.	2,767	0	0
Cox, Brothers	2,750	0	0
Davis	2,438	0	0
Avard	2,600	0	0
Abnet	2,568	0	0
Shiff	2,580	0	0
Wallis & Clements	2,475	0	0
Lacy & Torkington (accepted)	2,371	0	0

For warehouse, 69, City-road, for Mr. J. W. Gabriel. Mr. Gordon Stanham, architect. Quantities supplied:—

Turner	23,338	0	0
Bryant	2,960	0	0
Heushaw	2,893	0	0
James	2,855	0	0
Allen & Sons	2,835	0	0
Adamson & Sons	2,796	0	0
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Scrivenner & White	2,594	0	0

For additions and repairs to Bleak House, Caterham. Mr. Richard Martin, architect. Quantities supplied by Mr. Frederick Sparrow:—

Smethurst	2370	0	0
Bray	350	0	0
Ward	350	0	0
Jarrett	340	0	0

For making new roads and drains on the Eversfield Estate, St. Leonard's-on-Sea. Messrs. F. H. Fowler & Hill, surveyors. Quantities supplied:—

Sadler	2,455	0	0
Bridgeland	376	0	0
Hughes	327	14	0
King (accepted)	300	0	0

For East Barnet parochial schools. Mr. A. R. Barker, architect:—

Wood	1,750	0	0
Pocock	1,195	0	0
Walton	1,100	0	0

For the erection of four cottages in Harewood-street, Stoke-on-Trent, for Mr. C. R. Clark. Mr. E. Penn, architect:—

Bennett	21,150	0	0
Jones	820	0	0
Hunt	795	0	0
Barlow (accepted)	738	0	0

For the erection of Temperance Hall, Newcastle-under-Lyme, for Mr. Wm. Warham. Mr. Edwin Penn, architect. Quantities supplied by Mr. H. Blackwell:—

Hall	2,348	10	6
Gallimore	1,050	0	0
Harvey & Davis	988	0	0
Sulton & Meadon	988	0	0

For cleansing, painting, &c., to St. James's Church, Clapham. Mr. F. T. Dolman, architect:—

Dove, Brothers	2,435	0	0
King & Son	412	0	0
Barber & Son	374	0	0
High	287	0	0

For building stables, &c., Elder-walk, Islington. Mr. J. Harrison, architect:—

Emor	2,475	0	0
King & Son	458	0	0
Browne & Robinson	439	0	0
Williams & Sons	423	0	0
Little	398	0	0
Carter & Sons	395	0	0
Falmer & Son	395	0	0

For erecting a small warehouse, Milton-street, for Mr. W. Jackson. Mr. J. C. Clarke, architect:—

King & Son (accepted)	2,489	0	0
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For alterations and additions to premises, Goswell-road, for Messrs. Copelake, Moore, & Crampton. Messrs. Treas & Innes, architects:—

Lucas, Brothers	21,924	0	0
Shaw	1,813	0	0
Browne & Robinson	1,765	0	0
Ramsay	1,763	0	0
Conder	1,747	0	0
King & Son	1,690	0	0

For making certain additions to the School of Art, Miller's-lane, Kennington:—

Heath	21,010	0	0
Gregory	997	0	0
Lamb & Son	967	0	0
Higgs	930	0	0
Cullum	898	0	0
Clarke	879	0	0
Rightgale	869	0	0
Thomson	868	0	0
Bowyer	812	0	0
Sharppington & Cole	818	0	0
Taylor	787	0	0
Batham, Brothers	735	0	0
Pitcher	693	0	0
Stephenson	897	0	0
Rooney, Brothers	685	0	0
Wagner (accepted)	639	0	0

For house, at Beckenham, for Mr. R. White. Mr. W. Seckham Witherington, architect:—

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VOL. XXIX.—No. 1488.



Public Monuments: the
Choice of Sculptors.

HE concluding remarks in the former paper on this subject (p. 577, ante) pointed to the difficulty of insuring the services of competent sculptors for public works. The selection of the most popular or the most generally-employed artist of the day, though offering, theoretically, the best chance for the adequate performance of the work required, was shown to be not always the surest mode, practically, of effecting the

sired object; and this difficulty would be rather increased by the want of such a tribunal to judge of the fitness of the artist as could have the confidence of the profession of the country. The alternative which it suggests itself either of open competition or the selection of any artist the head of a department might prefer, would neither of them satisfy the requirements of the case. At the very outset, then, two questions of the highest importance offer themselves for consideration; namely, the choice of artists and the procuring competent persons to make this choice; and, therefore, who should also act as judges on the merits of the performances. The second part of this inquiry is probably the most important; for without full trust in the competency and fair-dealing of the judges, no decision could be accepted as satisfactory. It is to this matter, then, that our first consideration will be given.

There is an impression which has, unfortunately, been strengthened by some late circumstances, that a real knowledge of art and of the principles which should guide its practice are not considered an essential qualification in those who are called upon to adjudicate in questions of the kind. A few individuals, perhaps dilettanti, but usually but little acquainted with the principles and practice of art, undertake either as committees of taste, or under other denominations, to decide on the most difficult questions, whether in painting, sculpture, architecture, or even the acquisition of objects of antiquity; accepting or rejecting, as it may happen, on grounds that are never subjected to any critical test, or examined by competent opinions. The consequence has been seen in the very unsatisfactory results,—as regards completion of work, style of execution, and artistic taste,—in so many of the public art undertakings of late years; involving, beyond the discredit incurred by such failures, a very heavy charge on the public purse. It was not always so; and it may be interesting, as it certainly will be new to many of the present generation, to point out how much more carefully the opinions of competent persons were collected in former years, when any great questions of judging art were mooted, than they are at present. It will be to the purpose to illustrate this statement

by referring to one very remarkable instance. In the year 1816, a proposal was made to Parliament to purchase for the nation the large collection of sculpture (known as the Elgin Marbles) which had formed the decoration of the far-famed Parthenon at Athens. They, with other interesting objects of art, had been brought to this country, from Greece, by the Earl of Elgin, whence their title of the "Elgin" collection. Before entertaining the question of purchase,—the sum required for them being of large amount,—the Government, distrusting, unfortified, dilettanti judgment, or mere official, or it might be partial representations of their worth, determined to procure the opinion of competent practical judges of sculpture as to the artistic merits of these works, and the desirableness of securing them for our national collection of monuments of art.

In the first place, the House of Commons appointed a select committee, composed of members who were well known for the interest they felt in art, and their attainments in art literature, "to inquire whether it be expedient that the collection should be purchased on behalf of the public." The subject was divided into four heads. The preliminary inquiries, relating chiefly to official questions, as to the authority by which the collection was acquired and to its money value, need not be now referred to. The point of interest to which attention is invited, is the conscientious care that was taken to procure competent opinions on the great questions of "the merit of the marbles as works of sculpture, and the importance of making them public property, for the purpose of promoting the study of the fine arts in Great Britain." In order to insure the best judgment attainable on these two difficult questions, besides the opinions of distinguished laymen, some of them honourable members of the Committee, certain of the more eminent artists of the day were invited to give their evidence on such matters, critical and artistic, as would not generally be considered within the cognizance of even the most cultivated unprofessional witnesses. Foremost amongst these appear the names of the celebrated sculptor, Canova, and the venerable President of the Royal Academy, Benjamin West, from whom letters were read. By *viâ-voce* examination, the opinions were obtained of the eminent sculptors, John Flaxman, R.A., Nollekens, R.A., and Rossi, R.A., concluding with Lawrence (afterwards P.R.A.), Westmacott, and Chantrey. The evidence generally of these artists is most edifying; and, as exhibitions of critical knowledge and true art feeling, would well repay the careful perusal of the present generation of sculptors. The names of such witnesses show sufficiently that the acquisition of objects of art for the nation was not then intrusted to chance, or to the antested, however well-intentioned, representations of amateurs and travellers, who, whatever their attainments may be as educated gentlemen and even scholars, cannot be accepted as competent judges on questions of fine art. The best means possible were here resorted to for arriving at a just estimation of the intrinsic merits of the monuments; first, as works of sculpture, and next, with reference to their importance as objects of study, and examples calculated to improve the public taste. The evidence was printed by order of the House of Commons, and the opinions given by the several witnesses were thus open to challenge if any chose to dispute their soundness. The character of the judges for competency admitted of no question as to the conclusion they advocated, and it was felt that, large as was the sum to be paid for them, the acquisition of these works, which combine the very highest artistic and æsthetic excellence with historical interest of the most indisputable kind, should be secured for the country.

How great the contrast here exhibited to the way in which decisions are now usually come to, must strike every one who takes the slightest interest in such subjects. The directly injurious effect on art has already been pointed out. The consequence of the absence of practical knowledge is equally apparent in the next matter adverted to, in the large amount of worthless objects—worthless in their relation to art—which encumber our great national Museum of antiquities. If it were the practice to engage, as above, the services of special advisers in examining the claims to notice of all objects of art offered for purchase to the Government, greater security would be given to the public both as to the artistic and pecuniary value of any such acquisitions. While scholars and antiquaries would be properly charged with the responsibility of subjects coming under their cognizance, questions of a purely artistic nature would be referred to those who, from their education and practical knowledge, would be competent to adjudicate on such matters. Our national Museum would not then be crowded, as it is at present, with endless duplicates and repetitions, when a limited number of specimens would sufficiently answer every purpose of illustration; to say nothing of the embarrassing accumulation of a vast amount of mere fragments and rubbish, for which accommodation, never sufficient, has to be provided, and whose only claim to admission is being "ancient." Nor is this the only evil. A very large expenditure of the public money has been, and is, incurred for little other purpose than to gratify mere archæological tastes or fancies, utterly apart from art; and over which, for want of some competent supervision there is really no efficient control.

It will at once be understood that the object of this reference to the judicious steps taken in the matter of the sculpture of the Parthenon is to suggest to those whose official position may enable them to effect changes so much required in this direction, the propriety of attempting to organise, on some well-considered principles, a competent tribunal for the conduct or practical working of matters connected with (fine) art. It should be a sort of council of reference in the Department of Public Works, and its functions should extend to advising on designs, ascertaining the competency of artists to execute the commissions entrusted to them, and to supervise the progress of the work, so as to ensure engagements being efficiently carried out.

We would not willingly expose some recent examples of follies, or worse, in illustration of these reflections; but it would be easy to show from costly experience the desirableness of some such supervision, if it were not sufficiently recommended from the common-sense point of view. Such a measure would speedily effect a most valuable reform in all that relates to the production of works of art under the present uncertain system of committees of taste, so called; and its influence would extend far beyond the original field of its operation. The thinking part of the public would soon come to recognise the value of competent artistic judgment, in guiding and correcting the public taste, and would learn how to discriminate between the productions of properly educated and accomplished artists, and the weak or vulgar performances of unqualified pretenders. It would not be difficult to sketch out a plan,—not of details, but of general rules, for a committee of consultation, of the kind hinted at. But it is very far from the intention of the writer of these papers to assume the right to propose any scheme,—however clearly to himself may appear its feasibility,—which might lead to discussion, in particulars, to the prejudice, possibly, of the general proposition.

There can be no doubt, that the solution of the other great difficulty connected with our

subject would be advanced if this question of the appointment of competent and trustworthy judges, to decide upon the merits of artists and their designs, could be satisfactorily settled.

The mode of selecting artists to execute public works has always been a subject of discussion and, it may be said, of complaint in the profession; not so much because of any general intentional unfairness in those who have had the power to nominate the artists to be employed, as of the uncertainty felt, from the want of knowledge in the dispensers of patronage, as to the decisions being founded on any principle.

It has already been shown that pre-erring an artist because he is the most extensively employed, or, in other words, the fashionable sculptor of the day, does not necessarily insure a good work of art; inasmuch as, in the instances quoted, the style or character of the prevailing taste may be extremely vicious. Nor is it a safe mode to intrust the head of a department, who, possibly, may have no just notions of art, its principles or requirements, with so important a function as deciding, *ipso facto*, on the fitness of a candidate to undertake a work of national interest. If he should distrust his own judgment in making his choice, he might, nay would, find himself beset by endless applications from the friends of artists desirous to put forward their own favourites, but for whose superior fitness to judge he would have no security. The chances of the artists would seem, at best, to depend upon fortune or the greater interest each could bring to bear on his claims; and merit would not be, as it ought to be, the qualification to secure success. Besides, either of these modes of appointment would inflict injustice on many artists who could not command the opportunities that others included in the above categories would possess. They might not be extensively employed, or be favourites of fashion; or they might not have any sufficient private interest to procure a recommendation to the dispensers of patronage. And yet there might easily be amongst them artists of great ability, only wanting a fair opening to assert their right to participate in public employment. The only obvious way to meet this extremely difficult question would be by the principle of competition; and here, at the very outset, we are confronted by objections of a very formidable kind.

It is found, as a general rule, that sculptors who have attained a high standing object to enter into competition to execute any public work. They expect to have it placed, unreservedly in their hands; otherwise, they leave the field open to another class of artists, either really, or assumed to be, of inferior ability. Occasionally, if the stake is a large one, either for honour or emolument, they will not refuse to compete with a very small and select company; but the rule is distinctly the exclusive one. Now, it would be unjust to assume that this feeling is always prompted by unworthy motives, either of overweening conceit in their assumed or real superiority over others, or jealousy of rival competitors. There are artists who decline to appear in these trials, who cannot be accused of acting under such influences. There may be, therefore, in such cases, some strong reasons for their so systematically standing aloof; and, in the interests of art, it is of real importance to inquire into the grounds of these, and to endeavour to see in what manner they may be met.

As, however, it will require more space to deal adequately with this question than can now be given to it, the subject will be continued, and completed, in a future number.

DOORS AND DOORWAYS.

THE door, or at least the doorway or portal, is the most venerable of architectural features. It is the only feature, when we once get beyond the mere shell of the building, without which no architecture, in a practical sense, is possible. The earliest hovel requires a hole to crawl in by; and if in primitive times or among "unsophisticated" races this passage of access is not found to have assumed any ornamental character, it enjoyed on the contrary the dignity, under such circumstances, of uniting in itself the functions of door, window, and ventilator supplied in these more degenerate days by three distinct kinds of apparatus. The mere hole in the wall, however, must after some centuries have been found by the pre-Adamites a defective arrangement, unworthy of and inconsistent with advanced science; and the problem of effecting

some temporary closing or blocking of the aperture when not wanted presented itself for solution, the desired end being attained by little and little, with every possible degree from rudeness to elaboration, from the earth piled at the entrance, or the stone block set up on end, to the paradisaical portals of Lorenzo Ghiberti; thence again tending downward to the modern street-door hung with (as Dr. Johnson is made to say, in "Rejected Addresses") "frappant and tintinabulant appendages," and having no story to tell the visitor beyond the dry and persistent direction, "Knock and ring." Nevertheless, the invention of a movable flap or cover to the entrance of our abodes is, if we think rightly of it, a notable one; and, in spite of the naturalists' story of a trap-door spider, one of the most marked distinctions between man and the lower creatures. "A door-making animal," we might call our own species in any *catalogue raisonné*. Indeed, as the making of a closed or closable door necessitates the invention and use of windows and ventilators; and as without it, too, privacy is all but impossible; may we not say that the door is in some sort the origin and first occasion of both architectural and domestic civilisation, or at least the condition under which these become possible?

Architecture has, at any rate, recognised, in all styles and in all periods since it became an art, the value and importance of the principal entrance as a feature in the design. The Egyptian led us up to it through so many corridors of sphinxes; the Greek spread his columns before it, and surmounted them with pediments and sculpture; the Hindoo gave a mystery to the portal, by the groves of pillars through which it was approached; the Gothic architect at Beauvais, at Troyes, at Peterborough, and in fifty other places, gave it dignity by the deeply-recessed and lofty arches whereby the comparative insignificance (in point of size) of the portal itself was disguised, and its dimensions enlarged to majestic proportions. More recently we have preferred the system of distinguishing and dignifying the principal portal by placing a tower over it, and in competition designs, the simple plea that it is "to mark the entrance," furnishes an excuse for the most elaborate and, perhaps, otherwise useless erection. A glance at these various methods, and others we need not enumerate, of giving architectural dignity to the entrance of a building, suggests that there are two different principles which have been, and may be, followed with this end. We may either seek dignity by the use of a large doorway of colossal proportions, with its own appropriate decoration; or we may leave the doorway itself of little more than the ordinary height which is considered necessary, and emphasize and call attention to it by the architectural treatment of the parts around and adjacent to it, by a tower over it, a colonnade or groups of sculpture in front—or on either hand,—by connecting the portal opening, in short, with larger portions of the building, and making it appear, though comparatively small in itself, an integral and central portion of the main architectural design. Broadly speaking, the entrance door must be treated on one or other of these principles; and the latter appears the most effective, and the most truly architectural. A doorway of colossal height does, it is true, present a very pompous and palatial expression, when seen with people passing to and fro under it; the superabundance of extra height, beyond what is practically necessary, immediately suggesting ideas of magnificence and lavish indifference as to space and expenditure. But the experiment is hazardous, since everything which, like a door, is habitually referred to the height of the human figure as a standard, operates in giving a scale to the building; and a very large door may materially reduce the apparent scale. That wealthy and not very wise humorist, Beckford of Fonthill, is said to have been in the habit, when he took visitors to see his ephemeral abbey, of sending a dwarf round to open the large doors from inside as the visitors approached, to cheat them in their first estimate of the scale of the structure. But we cannot always employ dwarfs, nor even men of ordinary stature, to stand by a door as "scales;" and the better judgment is shown, architecturally, in making the doorway itself of smaller proportions, and carrying its decorative design into, and as part of, the main design of the façade in which it occurs. This, as we need not remark, was the method pursued by the Mediaeval architects, who however in not a few cases went into the other extreme, and, making

their actual door only just high enough for convenient passage, reduced it to insignificant and paltry proportions,"—a mistake which should be guarded against. Let a door be of ample proportion, but only not so abnormally high as to confuse the judgment of the eye, and elude recognition of its actual scale and size.

In buildings of magnitude and importance the position, too, of the main entry is a matter of no little effect in the general impression on the spectator. This will vary with circumstances. Where the longest façade of a building is treated as a street front, the main entrance can generally be nowhere so well placed for effect as in the centre of that front, unless one of the angles command two or more principal streets, and occupy a prominent position in regard to the site and its adjuncts. In a building standing by itself, however, and to be viewed equally all round, the principal entrance will in a great number of cases find its natural and effective situation at one of the ends. If the building be one consisting mainly of a single large apartment, such as a church, a concert-hall, or public room, this position for the entrance will be a *sine qua non*, for it may be laid down as a universal rule, that no large apartment should be entered at right angles to its longer axis, such an arrangement being most injurious to the first impression of such an apartment, architecturally, upon the spectator entering it. There are few points in which the influence of a truly architectural mind is more evident in a design than in the right and effective disposing and designing of the main entrances without and within; a point often totally disregarded, if we may judge from the odd haphazard way in which entrances are so often disposed in competition drawings for large and important buildings. Indeed, there are some large and very costly structures to be found in certain parts of this country, places built for state and festive occasions, in which there is not a single good or effective entrance, solely for want either of a little consideration, or of an eye for effect on the part of the architect.

When we come to a smaller and more domestic class of buildings, especially such as are much subdivided on the internal plan, we, of course, become less trammelled as to central position, &c., for the entrance. Our external door is here only the access to a hall or vestibule, with which the principal rooms may be connected quite irregularly and without any special regard for symmetry. Here, an entrance near the angle of the building is rather in character than otherwise, if the plan lead naturally to such an arrangement; and as a general rule it may be said that a central entrance symmetrically disposed has a tendency to give dignity and stateliness of expression to building, while an entrance near one end, and placed with no special regard to symmetry, leads so far to what is called a picturesque expression. Going further than this, experiments have been made in placing entrances on the angle of a building, or with a porch projecting at an angle of 45°, and one or two clever though more or less whimsical architects have appeared to find special pleasure in producing triangular porches, flung out on a single column or pier standing opposite the centre of a doorway. Such fancies as these consort well enough with buildings where all is picturesque irregularity, and where this kind of character is specially sought, and they have a variety and interest of their own; but in all graver and more uniform designs such tricks in the mode of obtaining access to a building would seem impertinences, and at variance with architectural conformity. The mention of this kind of feature leads us to the subject of porches generally. We use the word "porch" as distinct from "portal," and as signifying the screen to the external door which is so valuable an adjunct, in this climate, to dwelling-houses and all buildings for purposes of a more or less domestic nature, as distinguished from the "portal" which forms (as much for architectural effect as use) the great feature of a larger and more monumental type of building. Viewed in this light, the "porch" at the entrance of the club, dwelling-house, or hotel affords a most legitimate

* Certain church poets (George Herbert), if we remember rightly, amongst the number have found in the low doors of some of our old churches, which cannot be entered with head erect, a pleasing emblem of the humility of man, with which the sacred precinct should be approached. There may possibly have been such an emblematical idea in the mind of the early builders, but it may be questioned whether the architect intentionally intended to be conveyed would through the holy convenience.

means of gaining architectural interest based on strictly practical requirement. The practical utility of the porch is very simple: merely that it should really afford us what it pretends to give, i.e., shelter from inclement weather or heat when alighting or waiting the opening of the door, and protect the house itself, when the door is opened for ingress or egress, from too violent an incursion of *Jupiter Pluvius* or *Ventossus*. Therefore, high shallow porches with a single column on each side, like those which pretend to screen the doors of many thousands of "respectable" street-houses, are simply delusions and absurdities. A good roof and closed sides are indispensable for a porch which is to be of any use in this country. The architectural treatment is a more complex matter, and may, of course, be influenced by a score of considerations having reference to the general style and material of the building and other points. But in all cases the object should be to make the porch a portion of the general design, and not a mere excrescence, unless in a case where different materials are employed from what are used for the main building, and it is made palpably a lighter kind of structure. A timber porch so applied often has a perfectly satisfactory and very picturesque effect, when in connexion with a house of somewhat modest pretensions and picturesque character; but it is out of place in buildings of a more solid and stately expression. We have still in our memory the unsatisfactory impression produced by the sight of a light porch of ornamental ironwork and glass projected from the massive stone front of one of the largest hotels recently built in this country, and which looked merely flimsy, suggesting the idea of a spider's web to catch customers. On the other hand, in designing a stone porch for a house of the same material, it is imperative that it should be connected with the main design, not suffered to appear a mere excrescence, so much as a necessary part of the design; an end to be attained partly by the continuation of horizontal members of the architecture through and around the porch, partly by the very simple expedient of recessing the porch into the building, by setting back the door from the main line of wall, which at once connects it with the building as an integral part of its construction, besides obtaining depth of shelter and shade without undue projection, and making new space which often may be of less use inside the entrance-door than outside.* This seems a very obvious idea, perhaps, yet we very seldom see it adopted; and, indeed, nine-tenths of the stone porches we see attached to clubs and dwelling-houses look as if they might be sliced off and carted away without the least injury to the general architectural design.

When we come from the porches to the doors themselves, especially in those less ambitious developments of house-building in which not even the porch finds place, the scrutiny is not a satisfactory one. We will say nothing of the sham pilasters and archivolts or pediments with which it is the fashion to adorn our street-doors; but the doors themselves—why must we have only one eternal type of joinery, and that, too, of a very flimsy and weak-looking description? Is there no other possible article to be had than the "12 in. double-moulded four-pannelled door," with which we are so sadly familiar? The panel system is certainly a legitimate piece of joinery, having regard to the material used; only we almost always get it as poorly and weakly carried out as may be, with thin panels, and meagre mouldings; and even at the best it is a very weak sort of construction, for an outer door especially, and the case with which a panel may be cut out or kicked through on an emergency is proverbial. An outer door being the principal exposed piece of woodwork on the outside of most structures, might be supposed to be an opportunity for the display of a little bit of characteristic (not necessarily elaborate or expensive) woodwork, of a more solid and durable nature than the thin stile-and-panel affair; and a little variation in the treatment of this feature in a row of street-houses, would give a slight variety of interest to each, and give the respective tenants something else to know their own threshold by than merely the number on a metal badge. Then the

wood must needs be painted and grained, the time and cost of which would in itself have paid for the better and more substantial joinery, the want of which it assists to conceal. Were the wood left plain, or with merely a transparent varnish for preservation, there would not only be an incitement to making a better job of the woodwork and selecting better and sounder stuff, but even the "four-pannelled" door could be treated with the simple and natural variety that would be produced by using two different woods for the panels and the stiles, an expedient which common sense almost would point out as likely to make the best work and to look the best. We want, however, to see something stronger and more substantial than the pannelled door for outside entrances. Where a porch cannot be afforded, a hanging penthouse over will answer some of its purposes, and afford opportunity for picturesque treatment, as the sketch-books of many artists can testify; and, with or without this, a porch can be obtained practically even in our most ordinary brick street-houses by simply placing the front door a couple of feet or so back from the wall line, a method which answers the additional purpose of giving an increased appearance of solidity to the structure, and providing a little bit of shadow to relieve the bareness of the front. In general, we would see as deep jambs to an external door as may be, the full thickness of the wall if possible; and where such jambs are stone, they present a very fitting position for a little ornament of a simple character, either by inlaying with tiles or by a lightly-carved ornament sunk on the surface of the stone. For internal doors of the better description, the panel-door is perhaps the best that can be had, owing to its lightness; but there is surely no need to have all the panels cut square in the same stereotyped manner; it might, one would think, be possible to frame the stiles on some other pattern just as strong and nearly as simple, and which would give variety at least, if not in every way superior to the regulation make. A plain unpainted door, of good constructive design, and stiles and panels of different tinted woods, might thus become a satisfactory and pleasant-looking bit of work, without the necessity of repainting at intervals. Where more expense in the article of doors is warranted, unpainted oak doors with a single line of gilding along the principal line of moulding will be found to have an admirable effect, bright and yet quiet, and far superior to the gilding on white ground, or the "woodwork painted two coats, and mouldings relieved in a third," which are the *non plus ultra* of "house decorators," as they term themselves, or "descenders," as we should sometimes prefer to read it. Nor is there any reason why ornamental hinges, which have added so much to the appearance of our outside doors in many cases, should not be used in internal doors also, provided they be so designed as not to present points for catching dresses, &c., which some of the modern Medieval "firework" patterns would be rather apt to do.

We do not go here into the vexed questions of locks, latches, and "furnishing ironmongery" generally. Our object in the present remarks has been to suggest a more varied and less common-place treatment of a feature which is the most prominent one in architectural design, whether in the cottage or the palace.

A HOLIDAY FOR STUDENTS: ELY, LYNN, BOSTON.

WHEN Mr. Edmund Sharpe had brought the Lincoln Excursion of the Architectural Association to a successful close at the end of last August, it was a moral certainty that he would be called up to arrange such another thorough students' holiday. We gave in vol. xviii., pp. 678, 699, 718, a detailed account of the churches visited in that excursion, comprising Lincoln Cathedral, the village churches on the South Cliff, the churches near Sleaford, and those near Spalding, finishing with an inspection of Peterborough Cathedral.

This year the excursion commenced on the 31st ult. at Ely, afterwards swept over the district between the (King's Lynn) Great Ouse and the Nen,—Freebridge Marshland, with a diversion to Sandringham and Castle Rising; then, running past the churches of last year's journey, visited in two days the interesting buildings that strew the space between the junction of the Welland and the Witham, within a radius of a dozen miles from the junction of their waters,

terminating thus at Boston on Saturday, the 5th of August.

Thus in two outings three cathedrals and between fifty and sixty churches have been reached, their main features of interest pointed out, and a heap of sketches and memoranda accumulated. The first excursion has been the occasion of the publication of the results garnered in continued studies, in journeys now and again repeated, in sketches, in full-size cymagrams of mouldings, and other details,—for no one should forget that Mr. Sharpe has been for years the most active user of the cymagraph. The royal octavo volume of 150 pages, with sixty-five lithographic plates and woodcuts, a "thorough" book, wrought out with long labour, deserves to be noticed among the few successful and complete treatments of local church architecture,* and will serve as a guide for future workers in similar fields.

Not that there are many such fields to be had for the asking; for, whether you imagine Euclidian lines on the face of the country, or draw non-Euclidian lines on a map that shall mark out the main limits of these excursions, you will not fail to wonder that so extraordinary a luxuriance should be found within them. Join Lincoln and Lynn, and your line will be about fifty miles long, and will pass through Boston. A parallel belt, twelve miles in width, of which this line is the upper edge, may be terminated by the line of the great Ouse on the east, and on the west by a line a mile or two west of the South Cliff. Within that magic belt are included:—Lincoln, with its splendid dignity, due jointly to its site and vigour of treatment; the grandest of purely parochial churches of England at Boston; the two great churches at Lynn; the spired fanes (amongst others) of Donington, Swineshead, Moulton, Holbeach, Helpringham, Threckingham, Heckington; the almost unique grace and beauty of West Walton; such splendid parish churches as four-aisled Wisbeach, as Walpole St. Peter, the most magnificent of the Marshland, and the great bulk of Sleaford. These, at the same time, bring only a few of the names on every lip, that might be followed up by gazetteer-like lists in alphabetical disorder or otherwise of buildings of rare beauty and interest: in every variety of situation, from the green-turfed "aeres" dappled with sunshine, broken by the foliage of ancient trees, as at Fulbeck, Algarth, or Gosberton,—to the bare flat stretches from which rises the grey spire of Quadring, or the town enclosures that are filled with long shadows, as at Sleaford or Wisbeach. At about four miles' distance, wickedly placed so, as to mar the pretty inclusiveness of this belt, or, let us say, as a rare jewel fast bound to it by the natural link of the (not silver) Welland, is the four-aisled spacious church and powerful tower and spire of Spalding.

As no one yet bears down with a theory carrying direct conviction as to the causes of the concentration, in so comparatively small a space, of so much and so varied excellence, may we accept provisionally the suggestion of one of this year's party, evidently the result of careful consideration, that the buildings were thus prepared by the good kindly people who built them mainly for the architects of to-day, and that these good intentions of the ancestors are imitated by their descendants? We are thus provided, without recourse to conjecture or to the painful process of direct investigation and research, with a theory adequate for all ordinary needs, and requiring only to be stated to imply all possible acknowledgments of obligations for opened churches, attentive vergers, for the presence of well-informed, pleasant-minded clergy, and in cases, not a few, of groups of ladies, in instances that will be remembered by every one, admirable specimens of art-knowledge combined with *faisness*.

Before stating in any detail the course and subjects of the excursion, we may say a word or two as to the objects of Mr. Sharpe in this labour of love. A pleasant bit of gossip, that leaked out through Mr. Mathews, the vice-president of the Architectural Association, let us into the secret that Mr. Sharpe had long delighted himself, during set tasks, at home and abroad, with the prospect of devoting some portion of his unlimited energy in future leisure to helping the students of English architecture. Without wishing to draw too exclusive a line, to separate the true future member of the profession from

* "An Account of the Churches visited during the Lincoln Excursion of the Architectural Association, August, 1870." By Edmund Sharpe, M.A. London: E. & F. N. Spon, 1871.

* One of the best porches we remember to have seen is one designed by Elmes, attached to, or rather forming part of, the lodge of a gentleman's house. The porch is circular on plan, half the circle standing out as a small semicircular expanse, the other half formed within the line of the building by a sweep inward of the main wall. The style (of course) is Greek; the same idea might be carried out, however, with different treatment.

the amateur, or the general enthusiast, he had determined that by spending a short time in each year in active fellowship, the younger students of architecture might find special guidance in the appreciation of the essential qualities of good architecture by seeing specimens of undoubted excellence with their own and with each other's eyes, thus broadening and quickening their perceptions. With what success?

A compact body of men have each time enrolled themselves; old faces seen again the second year, and a few new ones: but all within modest limits. For some reason the imposing army, that might well have struck terror (to be remembered with pleasure in retrospect) into the hosts at Inns, did not muster its complement. When the number of students in and about architecture in England (and elsewhere) is considered, this is a little remarkable, and may deserve some effort on the part of architects and architectural societies to enable a larger number of the young men of the profession to participate on another occasion.

As giving interesting evidence of the kind of careful forethought and general consideration which arranged everything and evaded throughout any hitch in the arrangements, we may mention that the not over-gorged purse, proper, or at least pertinent to, student life, proper, was not overlooked. The total cost, from London and back again, was summed up by a minutely careful member deputed to the task at 4*l.* 3*s.* 5*d.* Considering that journeying began in the grey of the Monday morning and ceased as the warmth was fading out of the yellow horizon on Saturday; that in the interval about 300 miles had been travelled in pieces and bits by rail, and nearly 100 behind horses on roads,—not to speak of the miles that were traversed by the active pedestrians, or the boat journey on the great Ouse,—one doubts whether the most severe advocate of Spartan regimen, the most devoted admirer of emaciation in money-bags, would accuse the young students of luxury or consequent want of energy. A still more curious piece of calculation was made, of the true Pickwickian kind, based by an ingenious inquirer on the idea that, taking the area of an ordinary parish church at 5,000 superficial feet, Ely, with over 60,000, might fairly be reckoned for a dozen; and so that the average sum of 1*s.* 11*s.* 3*d.* provided every member with an impression of a church burnt in on the memory in its real size, surroundings, and approaches, and from several points of view, both external and internal;—a species of photography, for a bright sunshine held its course fairly all the time,—of the most uncostly and permanent kind, and the best of preparation for a careful retreading of the ground, with, say, a single companion, to gather up more thoroughly and examine in full the sources of the impressions made by sudden flashes on untired eyes; such impressions being among the best tests of the qualities of any work of architecture or any other art. We shall have something to say of the places visited.

THE ALBERT MEMORIAL IN HYDE PARK.

THE monument erected by the nation to the memory of the Prince Consort is now approaching completion, and has been the centre, this season, as may be supposed, of much sight-seeing and admiration, as well as of some more learned criticism. The dazzling sparkle of the gilding, the gorgeousness of the bright colours and brilliant contrasts of the precious stones, the sheen of the mosaic work, and the lustre of the masses of granite and marble, are quite new effects to the untravelling Englishman, accustomed to nothing more striking, out of doors, than the gilded ball on the top of St. Paul's, and the granite ornamentation of Trafalgar-square. Now and then, therefore, there may be an adverse opinion expressed by the gazers, or a condemning shake of the head, or questioning shrug of the shoulders; but the general feeling is one of surprised satisfaction. Among those most qualified to judge, there is, over and above this, a fair contentment that the art of the nineteenth century will be so well represented to posterity.

There is still hoarding encompassing the site, for some of the sculpture is not yet in its place; but the monument is raised so high above the ground by the broad flights of steps upon which it stands, that most of it is visible, over this enclosure, from the approaches. The position of the statue of the great subject of the memorial is indicated by a packing-case only as

yet. Few of our readers need be informed that when viewed from the north, the monument has the Albert Hall for a background. Almost any point of sight is better than this; for the vast, many-storied, dawn-coloured building dwarfs it to some extent. But the best position for a spectator is south of the monument,—between it and the hall, indeed,—when its glittering spirelets rises against the sky delicately, and its broad base steps up from the sward and wide converging paths of the park boldly.

The masses of marble, as luminously white as snow, and the areas of gilding, as iridescent as flames, thrown out as they are by the deep-green setting of the foliage around, at a first glance, suggest the extremes of frost and fire; but the eye is quickly drawn to the varied details, and this impression leaves it. As sumptuously brilliant, we reflect, must have been the loggias of the Vatican, when the artists who perfected them were still giving them their marvellous finishing touches. We have but to wait, and those who think the rich colouring too showy, or too gay, will find this gorgeousness toned down, even as the cinque-cento magnificence of the throne of the arts has been toned down. Whilst the gloss lasts, then, we need not condemn as a blemish that glowing freshness whose loss archaeologists deplore in older structures.

The advocates of Gothic architecture are unable to point to the memorial as an instance of the successful application of the principle of the ornamentation of construction only; for it was feared the mass of sculpture enriching the angles of the canopy would be too heavy to be carried in the ordinary manner. Within the spirelet is hidden a framework of iron. This piece of concealed construction might, doubtless, have been dispensed with; but it was desirable to make the durability of the structure a certainty; and the theory of the perfection of ornamented construction was sacrificed to this great end, or left to be worked out in more ordinary structures.

The sculptors only have their share of the work to finish. The monument, if the architectural portion of it may be taken separately, for the sake of explaining the amount of progress made since our last account, is now completed. But the sculpture on the podium is not finished. Although six years have elapsed since the work was apportioned, nearly six months more will be required by Mr. Philip before his share of this work is ready. It will be remembered that poets, painters, musicians, and architects are the subjects of the relief. Three architects of our own day, but no longer living, have been deemed worthy of association with the picked celebrities of all times. They are Barry, Cookerell, and Pugin. It is whispered that it was contemplated to introduce the portrait of the architect, Mr. Scott, among them; but the modesty of that gentleman resolutely refused the honour. Mr. Armstead's portion is more advanced than that of Mr. Philip.

The hardness of the material has baffled their calculation. The four groups, representing Commerce, Agriculture, Engineering, and Manufactures, are finished, and fixed in their places. The four large groups, to represent the four quarters of the world, on the wide base from which the monument rises, are more or less advanced. Mr. MacDowell's Europe is perfected, and *in situ*. Mr. Foley's Asia is as farward. Mr. Theed's Africa and Mr. Bell's America are in progress.

The group representing Europe consists of five female figures arranged pyramidally; four surrounding the fifth, which is on an elevated centre. This central figure is Europa, youthful and graceful, as when she wandered in the meads of Phœnicia. Her elevation is gained by means of her seat, which is on the back of a bull. This animal, according to the old Greek story, is none other than the enamoured Jupiter, so metamorphosed that he might carry her away across the seas. She is crowned, as befits a king's daughter, and in one hand holds a sceptre, and in the other an orb. Her robe is short-sleeved, to display her braceleted arms, but it descends to her sandalled feet. Her features are lovely, and the expression upon them mild, bland, and composed. The bull is small and docile; its attitude that of patient waiting. The other figures are seated at the angles of the quadrangular platform on which the animal stands. They are emblematical of the most important countries in Europe, England, France, Germany, and Italy. Like Europa, they are youthful, comely, and crowned. England and France are on opposite sides of the head of

the bull, just as they are on opposite sides of the Channel. Italy and Germany are seated at the haunches. It would be difficult to think of anything more tenderly devotional than the expression upon the face of Italy. It is as though the soul of all the Madonnas and all the Magdalenes of all the Italian masters was in it. Her head is slightly thrown back. Her plaintive eyes may be raised heavenwards. She is listening, for one hand is uplifted, as though beseeching silence for the scarping strains she hears. Her other hand rests upon a lyre, which, like the palette by the side of it, reminds us of the national perfection in the arts. France, bright and almost Amazonian in her aspect, is altogether different from this. She is smilingly content and bewitchingly defiant. When we look at Europe, though the cold pale marble is before us, we feel that her long loose hair is as a sheaf of corn, gold-coloured; and when we turn to scrutinize France, we are sure she is a brunette. The dauntless beauty holds a sword in one hand and a wreath in the other, as though she cried to the world, with mistaken dash, *Vive la guerre!* Britannia, with a stately calm, rules the seas, which are represented by tiny wavelets dawning beneath her feet, up to the hoofs of the bull. The beautiful female representing Germany is associated with emblems of philosophy and science.

Asia is also composed of five figures arranged in a similar manner, with the difference that they are not all females. The majestic sultan representing Asia is seated on a kneeling elephant, and around her are stationed a Persian poet, a Chinese ceramic manufacturer, a merchant of Turkey in Asia, and a native of India. Like Sohebernazade, she is of surprising beauty. She is in the act of raising the veil which has enshrouded her from head to foot, and still covers her lower limbs. Her head, neck, arms, and wrists are encircled by jewels. Her Asiatic lineage is shown in her full lips, her large deep-set eyes, with wide softly-curved eyebrows and her low forehead, which is partially hidden by a jewel depending upon it from the circlet over it. The fringed and embroidered gear of the elephant and its capped tusks give scope for the introduction of more Oriental ornamentation. The Persian poet rests his right hand upon the shoulder of the animal; at his feet is a pile of books. On the other side, seated, cross-legged, is the Chinese manufacturer. He holds a vase in his lap, and at his knee stands a small Chinese chest, or box. The turbaned and bearded merchant stands behind this shaven and bare-headed Celestial. He is resting against the elephant in an attitude of thought, thinking, we may suppose, of the ill-fortune that happened to his fellow-merchant when he carelessly threw away the shells of the dates he had eaten, and in so doing put out the eye of the genii passing invisibly, at the time. And at the opposite side of the elephant, behind the representative of Mohammed Schems-Eddin Hafiz, and those upon whom his long tunic and fringed girdle, if not his mantle, have descended, is seated India. In this way two of the supporters are seated, and two are standing. As we turn away, though there are no curious silks, gold brocades, China satins, fans, ivory carvings, or Persian carpets, we feel we have looked upon sultry Asia and Oriental luxury.

Mr. Theed's group of Africa has been completed and on the ground for some time, and the process of putting it together is now, as nearly as may be, accomplished. For the centre of his piece he has placed a scant-faced Egyptian female on a dromedary; and a half-buried statue of a sphinx close by also recalls the ancient predominance and magnificence of Egypt. The figures around the almond-eyed daughter of the Pharaohs represent an inhabitant of the desert; a merchant trading in elephants' teeth, drugs, and other African commodities; and a South African chief, who is listening to the instructions of European civilisation.

The sculpture at the higher elevation is also worthy of minute scrutiny. Here there are fewer figures in each group. Engineering is a robed female figure of majestic stature and pleasing mien, at whose feet an engineer is kneeling to unroll a scroll. On one side of her kneels a brawny-armed working engineer holding a cog-wheel; on the other sits a navy, far-capped but bare-necked, with his shirt-sleeves rolled up that his mighty muscles may still further proclaim his calling. Commerce, too, is a graceful conception with, properly, less intensity of intellectual powers expressed, than lights up the face of the spirit of engineering. A

outh, who might be Sir Thomas Gresham, Sir William Walworth, or even Dick Whittington, with his account-book, purse, and scales in his hand, stands at the foot of the low pedestal on which she is elevated. An Eastern merchant, a banded knee, offers him a casket for sale; and a fourth figure exhibits a sample of cereal produce in a sack.

In a word, the subscribers to this memorial people seem to forget that there were subscribers) have many reasons to be satisfied with the manner in which their money is being expended. The half-dozen gentlemen who, in connexion with the late Lord Mayor Cabell, originated and raised the original subscription for this memorial, have had as yet but small recognition.

TO, AT, AND FROM BERLIN.

DRESDEN.

The wonderful manner in which Phœbus favoured the Berliners throughout the three days of their Triumphant Festival was really very regular.* There had been almost incessant rain up to within a few hours of the event; then, for the aforesaid three days, there came uninterrupted blazing, blinding sunshine; but no sooner were those notable three days over than Jupiter Pluvius resumed his sway, and on the evening of Monday, the 19th, we left Berlin in a pitiless and drenching rain as any one need wish to see. We were bound for Dresden; the journey occupied six hours and a half. The outer part of the route is dreadfully uninteresting: flat and featureless, like the plain traversed when entering Berlin; indeed, for some miles the railway to Dresden runs at a great distance from that to Hanover and Potsdam. It bends eastward at Jüterbog. A fort while before arriving at this station is, in a wood on the left, the scene of the "Black Knight," Hans v. Haeke's exploit: he who had bought a pardon of the monk Tetzel for all his sins he might commit, then laydied and buried him of the box of money he had obtained by selling this and similar indulgences. An indulgence-box belonging to the said Tetzel, the author's antagonist,—is preserved in the Nicolai Church at Jüterbog. Further on Donnitzsch is Prussia, under Bülow v. Dennewitz (see 560, ante) defeated the French under Ney and united, September 6, 1813.

The first view of Dresden, from the centre of the old bridge over the Elbe, is extremely picturesque. The more ancient portion of the town lies behind, its quaint buildings rising up in rich masses, piled story above story; in front stands the dark-coloured, statue-crowded Franzenstrasse, to the right of which stretches away the Brühl'sche Terrasse, with its green avenues of tall trees, its wide promenades, and handsome, incessant flight of steps. The bridge itself is very pleasing to the eye, with its fifteen arches, a massive rounded pier, jutting out, breakwater-fashion, into the surging, unruly flood; its road roadway, low parapet, and rows of gas-pipes.

Opposite to our comfortable hotel,—the Bellevue, whose side windows and garden pleasantly overlook the river,—is the site of the Opera-house, burned down in 1869. Semper was the architect, and from his designs the building is now being reconstructed; he, however, does not superintend the works, they are under the direction of his son. Herr Semper was obliged one time to leave Saxony for political reasons, and is recalled by the King about three years ago; he lives now mostly at Munich, I believe. The rebuilding of the Opera-house was commenced soon after the fire, but was discontinued on account of the war. Since peace was restored he has been recommended, but has not, as yet, progressed farther than the foundations.

In any account of Dresden, however hurried may be, the first place must be given to the glorious collection of pictures, the inspection of which is a real delight. So much has already been said and written on this theme, that it may, I fear, seem impertinent to utter any additional remark; yet I cannot refrain from particularizing some few of the pictures which have as the most pleasure. First and foremost must, of course, stand Raffaele's beautiful "Madonna di San Sisto," so named because it was painted for Pope Sixtus, for the high-altar of the Benedictine Convent of Piacenza. It was bought by Augustus III., in

1753, for the sum of 20,000 ducats, or 40,000 Roman scudi,—equal to 60,000 thalers. In the Dresden Gallery it has a room to itself,—a large angle-cabin, with a few chairs, for gazers being all that is admitted therein besides. The beauty of the work seems utterly to overawe spectators, who only venture, when in the presence, to speak under their breath; and one man, in particular, was observed to move past the picture on tip-toe. The Virgin is represented rising majestically upward, the divine infant in her arms; saints attend her, while the two well-known semi-figures of angel-children rest beneath, gazing upward to the central figure. The pale bluish-white background is composed of cloud-like heads of cherubim, of great delicacy and beauty.

Holbein's Madonna claims to be the next *chef-d'œuvre* of the gallery, and a grand work it is. The story it illustrates is doubtless familiar to many, possibly not to all: so here it is. A burgomaster of Basle, named Jacob Meyer, attended by his family, kneels before the Virgin, and prays her to restore his sick child to health. The child is represented in the arms of the Virgin, who has put down the infant Christ. The face of the child is very sweet, and all the details are treated with wonderful care and delicate manipulation.

Among many other charming works, the following stand out from memory's page:—Lorenzo di Credi: Mary with the child, who kisses such a pretty little John Baptist; Carlo Dolci: St. Cecilia playing the organ; also Christ blessing the bread and wine (the German catalogue says "The copy of this picture by Agnes Dolci, daughter of Carlo, is in the Louvre at Paris"); Carlo Maratti: Mary with the Christ-child, who sleeps on straw in the manger; Correggio: the Reading Magdalen (the well-known Magdalen reclining in a cave, and reading. We were surprised at the small size of this picture, only about 18 in. long by 12 in. high; we had imagined it much larger); also the Adoration of the Shepherds ("World-renowned," says the catalogue, "under the title of 'The Night of Correggio.'"). The light emanating from mother and child illumines the other faces. The early dawn in the East is suggestive of the New Light arising. Also by Correggio: The Doctor; Giovanni Bellini: half-length of the Doge Leonardo Loredano; Cima da Conegliano: Christ, holding a book in the left hand, and the right raised in the act of blessing; Giorgione: the portrait, called Pietro Aretino; Titian: the tribute-money, called "Il Cristo della Moneta;" Palma Vecchio: the Virgin and Child, with John Baptist and St. Catherine; Paul Veronese: Bearing the Cross; and the Centurion of Capernaum praying Christ to heal his servant; Alessandro Turchi: Christ with the reed and wearing the crown of thorns; also the Stoning of Stephen, painted on a large oval piece of Amethyst; Alessandro Varotari, known as Padovanino (this artist sprang from a family of Ansbürg, called Weibrotter; but when his father settled in Padua he changed his name): study of a head; Giuseppe Nogari: an old man in black cap, holding an eyeglass; Francesco Raibolini, known as Francia: Adoration of Kings and Shepherds, a small picture containing a multitude of small delicately-painted figures, with faces like fine miniatures; also a Baptism, in which Christ seems to stand on the water, not in it; Annibale Caracci: a large-sized head of Christ; Guido Reni: sleeping infant-Christ adored by the Virgin (in which the mother is charming); Murillo: St. Rodrigue mortally wounded, receives from an angel the crown of martyrdom: he is represented as standing upright, though his neck is cut through; but the imitation of needlework on his robe is marvellous; Claude Lorraine: Flight of the Holy Family. A curious picture to see here now is Napoleon I. as Emperor, in his coronation robes, by Gérard; Teniers: soldiers playing at cards in a guard-room; Franz Hals: portrait of a man in black dress, with a wonderful lace collar; a questioned Daniel Sieghers (called "the Jesuit of Antwerp"); a Holy Family in the centre of a garland of flowers; Van Dyck: likeness of a man in armour; Ludwig Neefs (son of Peter): interior of the High-Church at Antwerp; Mirevelt: a young man in black dress, leaning with his right hand on a table; also a woman in black dress; Steenwyck: a very clever interior of a church; Gerard Dow: his own portrait; an old schoolmaster mending a pen; and a praying hermit with an open Bible before him; Jan Davidz de Heem: a fruit piece, with birds and insects; also Jan, son of the above Davidee; a rummer of wine in

a stone niche, surrounded by a garland of fruits and flowers; Bartholomew van der Helst: likeness of a man with long hair; Cornelius Janson van Ceulon (who it seems is our Janssens, and who was born in London): likeness of man in black dress; a ditto, by Rembrandt; also the artist's wife; a young man in cap, with cuirass and cloak; an old bearded man; a likeness of himself, with his first wife on his knees; a grey-bearded man holding a stick in his hand; and himself in a red cloak and velvet cap; Ferdinand Bol: his own portrait; Gabriel Melzu: a young woman in grey dress, reading a letter; two charming Raisaels, a curious picture, by an unknown artist, called "Van den Pökelharigh,"—praise of pickle-herring, dated 1656; on a white-decked table lies a poem with the above title; before it a plate, with a cut-up herring on it, a jug of beer, glasses, and so forth; Mignon: a garland of flowers and fruit, bound with blue ribbon (but by the side of Da Hoem's pictures, those of Mignon look cold and hard); Caspar Netscher: a young man writing a letter; a gentleman accompanying with guitar; a lady who is singing; likeness of Madame de Montespan, with much clever painting, especially the beads and worked pattern on her dress; also, the same playing the harp; Adrian van der Werff: likeness of the artist with his family, a delightful picture; also a seated Magdalen reading; and Abraham sending away Hagar; Miria: Cephalus and Procris (she dying of the wound, he striving to staunch the blood, and his bloody javelin lying on the ground); also, Preciosa recognised by her mother and nurse; Leermans: an old hermit kneeling in front of his cell; Christoph Paudiss (a pupil of Rembrandt): a man seated before a red-covered table in the act of writing, to whom a most charming lady is speaking; J. Tilius: a young woman sits at a table and sews (very careful painting); Jan van Haysum: a large bunch of flowers, near which lies a branch of pomegranate; J. van Eyck: the Virgin and Child seated in a rich Gothic chapel beneath a tapestry baldachino; on the right wing Saint Catherine, on the left St. Michael with the donor; the outer portions portray the Annunciation, by standing figures, painted in greys to look like sculpture. A Latin hymn to the Virgin, Archangel Michael and St. Catherine, in Gothic letters, by the master's own hand, runs round the enclosure of the picture. (Says the catalogue: "An uncontroverted tradition tells that this fine work belonged to the travelling-altar of Charles V. The centre portion bears an unmistakable likeness to the famous picture by van Eyck in the Academy at Bruges. By some writers our picture is still called an Albert Dürer.") Roger van der Weyden: Christ on the cross with Mary, St. John, and Mary Magdalen; A. Dürer: Christ on the Cross; signed with Dürer's monogram—a very careful work: as is also, "Christ shown to the People," by Lucas Cranach, the elder; and a small "Christ on the Cross," by Christoph Schwarz. Jan Gossaert—called Mabuse, from Maubeuge, his birthplace—a large picture, the adoration of the kings; also, the same subject, wherein the faces are not captivating, but the details are wonderfully executed.

The Virgin and Child, by Hans Holbein the younger, mentioned above, is placed on a very handsome screen of carved and parcel-gilt wood. Beside it hangs a likeness of Mr. Morett, goldsmith to Henry VIII. of England, which picture was formerly designated a Leonardo da Vinci, together with the original sketch of the same in pale colours; Wallerant Vaillant, a panel covered with letters and notes affixed to it; Denner: an old woman; also, an old man; Christian Siebold, court painter to the Empress Maria Theresa: a half-length of an old man; Anton Graff: a life-size portrait of Frederick Augustus the Just, King of Sweden; Angelica Kauffmann: a young lady as a sibyl; Bernardo Belotto, known as Canaletto: View of Verona and the Castle of San Pietro; also the Ponte Della Nave at Verona, with a tower in the centre of the bridge; View of Dresden, with the Elbe bridge, evidently before the Hôtel Bellevue was built; also the Bridge, Catholic Church and Brühl'sche Terrasse, with a tall grenadier; Dietrich: "Rest during the Flight into Egypt," also a grey-bearded man; Schurr v. Carolsfeld: Visit of Zacharias, Elizabeth, and a sweet little John the Baptist to the Holy Family; Alessandro Buonvicino, known as "il Moretto da Brescia," a statuesque figure in white, "Apparition of the Holy Virgin to the Peasantry of Monte Catone, in Brescia, on the Cessation of the Plague in

* See p. 598, ante.

1523;" and "Disputation of Luther with Dr. Eck in Leipzig," a very large picture filled with life-size figures. Luther is in a pulpit on one side, and Eck facing him from another pulpit on the opposite side. This work cost 9,000 thalers. One much talked-of crayon drawing, by Lotard, I have not mentioned, because I did not care for it, namely, "The Chocolate Girl." To my mind, however, it shows the source whence many of our contemporary artists have drawn their inspiration for such pictures as "Sherry, sir!"

The number of works on the catalogue of the Dresden Royal Gallery of Pictures is 2,383. To give even the most condensed list of notable ones out of so fine and comprehensive a collection is necessarily a lengthy and fatiguing undertaking; so, to refresh brain and eyes, we will make a little excursion among the very charming outskirts of the town. Here we find park-like public gardens in all directions, apparently fully appreciated by the townfolk. Extending our drive, we come to the entrance of the Pläuschene Grund, a lovely valley, or glen, about two miles from Dresden. It is hemmed in by precipitous rocky sides, the red stone cliffs sometimes rising bare and sharp from the green foliage that screens their feet, sometimes being clothed with lovely fresh verdure to their summits. There are iron mines and various factories in this busy valley, and as we drove through, the road was swarming with workmen and women returning home: the men, looking very jaded and somewhat dirty and neglected, mostly plodding silently along; the women, chatting and laughing with one another, many carefully dressed, and some even gaily and ornamentally attired. As we neared Dresden, we overtook a long procession of school-children with their teachers, band of music, flags, and so forth, returning from a day's outing in the country.

At Dresden we had for guide a most gentlemanly, well-read, and intelligent *valet-de-place* named Katscher, whom we should like to recommend to every person about to visit that town. By laying out our time judiciously for us, he showed us an immense number of interesting things during the four days and a half we had at our disposal. From him we learnt that the building called the *Zwinger*, which we next visited, took its name from the word *zwingen*, to oppress, because it was built out of a tax imposed upon the people, and which was felt by them to be very oppressive. In the *Zwinger* is arranged the historical museum called the Armoury, or Rüstammer. This is a marvellous collection, finer even, we think, than the Ambras at Vienna. The most noteworthy objects are the following:—A parade suit, "rüstung des Churfürsten Christian II.," who lived from 1583 to 1611. It was made by Desiderius Kollman, in 1599, and is of bronze, with gold ornaments. A Spanish shield and helmet, sixteenth century, covered with exquisite minute work. A suit of the Herzog Heinrich des Frommen, from the Friesland chain,—a large iron one, with flat square links,—round the shoulders. He was born 1473, and died 1541. The pistol-ball that killed Churfürst Moritz, at the battle of Sieverhausen, July 9th, 1553, and his blood-stained scarf; also a suit worn by him, at the siege of Magdeburg, 1550, of steel damascened with gold in bands and rosettes. An Italian dagger, which, after entering the flesh, opened by a spring in the handle into three pieces, thereby causing a fearful wound, out of which it was impossible to withdraw it. Two effigies of tournament-knights on horseback, sixteenth century, engaged in the "gottesgerichts-kämpfen" ("unto-death-fight"). The weight of armour of each is 200 lb. An "umfang-eisen," a long spear, with a ring and springs each side, to catch people by the neck. A field-serpent—schlange,—early cannon, 1476,—merely a long barrel, on swivel, mounted on wooden tripod. A "rüstung" of Churfürsten Christian I., born 1560, died 1591, curiously fluted and notched, of large size, and with open-barred visor. A chased "sattel-kopf" of copper-gilt, used by Christian II. A half-suit of the Churfürst August I., with chasing of Crucifixion on the breast, worn at the battle of Muhlberg, 1547; also a ditto, more elaborate, likewise ornamented with Crucifixion, worn at siege of Gotha, 1567. A suit of Edward VI. of England, having on it St. George and dragon, surrounded by the motto, "*Honi soit qui mal y pense*." A suit of iron, ornamented with iron studs, bought of a Viennese armourer, 1604. A fine bright copper-gilt saddle-front. A sort of half-coat, covered with scales, each bearing a raised Maltese cross: and a handsome mace, with round ball-head of repoussé work, studded with turquoises. A suit

that belonged to Gustavus Adolphus, of Sweden; he was born 1594, and died 1632. A Feld Kürass of Churfürsten Johann Georg IV., worn in engagement with the French, 1692; it has three large round dents from bullets, and a great gasb, all on the back, but none went through the thick material of which it is made. Some Turkish flags taken at the siege of Vienna 1683. A horse-shoe broken with his hand, by Augustus the Strong, Feb. 15, 1711. A suit of armour, worn by Augustus III. of Poland at his coronation in Cracow, 1734; he was born 1702, and died 1763. The pistols of Charles XII. of Sweden, worn by him on the day of his death at Frederickschal: he was born 1682, and died 1718. A pair of large-sized pistols, ornamented with a delicate inlay of steel, made by Lorazino Comazzo in Brescia. Bridal dress of Churfürst Aug. I., 1548. A helmet, bearing as crest an eagle with expanded wings, all of gold, covered with precious stones, and all real but the blue. A gala horse-apparel of Christian II., 1602, encrusted with garnets, diamonds, and enamel; the saddle-cloth covered with needlework of gold and silver thread and precious stones. Another horse-apparel, studded with hosts of enormous turquoises and garnets, a present to the Emperor Rudolph II., 1610. Another, presented by Kaiser Ferdinand to John George I., 1620, studded with turquoises and rubies, and having a fan of blue and red feathers to match, as crest to the horse's head; also a gold mace, set with turquoises and rubies. Another, encrusted with diamond-like crystals, and having a large glittering star of the same for the horse's head.

Other historical relics are the shoes of Maria Theresa; Murat's boots; Kant's shoes; rich mitres, of the fifteenth century, one covered with pearls, and another with groundwork of pearls, on which are medallions of precious stones, figures of the Virgin, &c.; a suit of silver armour, covered with chasing, made for Prinz Christian v. Anhalt; another silver suit, chased all over, made for the Churfürst Christian I., 1590; a state suit of Christian II., for man and horse, of steel repoussé and chased, most admirably worked and gilded; several Nuremberg sword-hilts, exquisitely cut in iron, most delicate work, of sixteenth century; marvellously rich sabres and scabbards, of Polish nobelgarde, silver-gilt and studded with precious stones: one with a beautiful ornamentation of flowers in coloured enamel and jewels. In a glass case are preserved the small ivory bâton of Weber; a wooden implement used by Thorwaldsen; some of Koscinak's hair, &c. In another case are the boots worn by Napoleon I. at the battle of Dresden, 1813; and his coronation shoes of white satin and gold-thread embroidery; and lastly, there are some curious sword-supports, called *Degengehänge*; and numerous Turkish and Eastern weapons, and a Turkish tent, taken at the siege of Vienna, 1683.

In the Japanese palace there is a museum of ancient china, filling twenty apartments, and containing upwards of 60,000 pieces. A large portion consists of specimens of early Meissen porcelain (called "Dresden"), of large size, and bearing underneath the crossed swords mark; there is likewise much Japanese and Chinese porcelain of old dates; some Sèvres, some Italian, and a very little English,—principally Wedgwood,—which last looks so dirty and mean that it quite pained me to see it. Surely if this humiliating fact were better known, some patriotic English porcelain manufacturer would step forward to remove so disgraceful a reproach by presenting to this museum some more worthy specimens of our ceramic art. In a pecuniary point of view too, it is most unwise, and so unjust to English manufacturers to have these paltry little articles pointed out as the produce of their works; for what foreigner is likely to be induced by seeing them, to send an order for English goods?

The celebrated collection of state jewels, known as the *Grüne Gewölbe* or Green Vault, is kept in some badly-lighted apartments on the ground-floor of the Palace. Here are seen, in glass cases, marvellous treasures, such as whole suits of diamonds, of emeralds, of rubies, of sapphires, and so on: these suits consist of coat buttons, of large single stones, collars, rings, pines, necklaces, brooches, &c.; there are caskets studded with gems, costly toys, such as obelisks, columns, fountains of gold, enamel, jewels, and all the most costly products; one large piece, about 4 ft. long by 2 ft. high and 3 ft. broad, is "the court of the green Mogul," filled with numerous little figures, sitting, standing, salaam-

ing, and so forth, the whole composed of gold, silver, enamel, precious stones, lapis lazuli, malachite, rock crystal, &c. Then there are myriads of cups out of agate, rock crystal, studded with gems, gold, and enamel; trinkets, such as an egg, the shell of gold, which, when removed, discloses a yolk of yellow enamel; inside this is a little cock; inside him a royal crown; and inside that a handsome diamond ring. There are rich caskets, fine enamels, and delicate cameos and mosaics. The walls of the principal apartment are covered with looking-glass, the joints and edges hidden by gilt scroll-work; from this numerous brackets stretch out, artfully arranged so as to look as if they came through the sheets of glass, and on these brackets the rich vases and cups stand.

There is in Dresden a manufactory of curious self-playing, musical instruments, that every one goes to hear, paying a small sum for admission. These instruments are in elegant carved cases; the tone and power of them are remarkable, the larger ones being quite equal to a military band. The saloon where they are exhibited is called the *Akustische Cabinet*. Another curiosity of Dresden is the *Frauen-kirche*, the exterior of which is so crowded, as I said, with statues; the interior fitted up just like a theatre, with boxes and pit. It is very ugly, I think, both inside and out.

One miserably wet evening, being unable to do anything else, we took a carriage, and our invaluable *Kutscher* (our guide, not coachman though that is the translation of the word), and drove out to see the encampment of French prisoners. The road, or rather track across the blue-cornflower-studded corn-fields, for road there was none, was in an awful state of mud and it was as much as two horses could do to drag us through the quagmire. The encampment was a large enclosure, fenced round by strong palisades; tree-trunks split into two slabs, set on end, and fixed firmly in their place the tops being cut to a sharp point, and tarred. The huts were very low, wooden buildings, which the French found very cold and draught during the severe winter, and so piled earth against them, thus making them look exactly like those long mounds of turpiss an potatoes one sees on the fields outside Brighton, and, I dare say, elsewhere. A few Saxon sentinels in their small wooden sentry-boxes were keeping watch outside; but there was little fear of the prisoners escaping, because if they had done so, where could they have gone, being so far away from their own country? The noise of our wheels brought a few of the up to the palisades, and, in spite of the rain they stopped to watch us,—in default, I suppose, of other occupation. They had *cafés* and *receiving-room* in the centre of the encampment, were told; and also that they were being returned home very rapidly then, at the rate of 1,000 a day. About 20,000 had been sent in Saxony during the war: 80,000 troops were furnished by Saxony; 20,000 that is in excess of her contingent, which was 60,000.

And here I must conclude for the present, leaving our visit to the arsenal until a future occasion.

R. F. H.

WORKMEN AND MECHANICAL DRAWING.

PROFESSOR FLEEMING JENKIN, in his introductory address on Mechanical Science (British Association), spoke at some length on the subject of drawing:—"I have in many places said (he observed), and I cannot too often, that the great want of the workman is a knowledge of mechanical drawing. Unfortunately I can obtain little attention for the general public to this demand for the workman. Very few persons, not being engineers, know at all what mechanical drawing is. I am sorry to say that some examiners in high places who direct the education of the country, know very little more than the general public, and teachers who should give bread give chaff. have lived much abroad, and come into contact both with English and foreign workmen. I unhesitatingly say that the chief, if not the only, inferiority of Englishmen has been this one branch of knowledge. I must explain what mechanical drawing is. It is the art of representing any object so accurately that the skilled workman, upon inspecting the drawing, shall be able to make the object of exactly the materials and dimensions shown, without a further verbal or written instruction from the designer. The objects represented may be machines, implements, buildings, utensils,

aments. They may be constructed of every material. The drawings may be linear, shaded, coloured, or plain. They must necessarily be drawn to scale, but various geometrical methods may be employed. The name of mechanical drawing is given to one and all those representations, the object of which is to enable a thing drawn to be made by a workman. Mechanical drawing aims at representing agreeably to what already in existence, or which might be, and for the sake of the representation; mechanical drawing aims at representing the object, not for the sake of the representation, but in order to facilitate the production of the thing represented. Now, I say that it is this latter kind of drawing which is so vastly important to our artisans, and hence to our whole wealth-producing population. Very few workmen or men of any class can hope to acquire such excellence in artistic drawing, that their productions will be a pleasure to themselves and others, but a number of workmen must acquire some knowledge of the drawings of those things which they produce, and there is not one skilled workman or woman who would not be better qualified by a knowledge of mechanical drawing to do his work with ease to himself, and benefit to the public. Mechanical drawing is a rudimentary requirement of the nature of reading, writing, and arithmetic. In order that a man may understand the illustrated description of a machine, must understand this kind of drawing. To the general public an engineering drawing is unintelligible as a printed book is to a man who cannot read. The general public can no more put their ideas into such a shape that workmen can carry them out, than a person ignorant of writing can convey their meaning on paper. Reading and writing on mechanical subjects is impossible without some knowledge of the art I am pressing on your attention. This art is taught abroad in every industrial school; a great part of the school is given up to it. In a Prussian industrial school one-third of the whole time is given to it. A French commission on technical education, reported that drawing, with all its applications to the different industrial arts, should be considered as the principal means to be employed in technical education. Now, I deliberately state that this subject is not taught at all in England, and that the ignorance of it is so great that I obtain no attention to my complaints. A hundred times more money is spent by Government to encourage artistic drawing than is given to encourage mechanical drawing; and I say that mechanical drawing is a hundred times more important to us as a nation. Moreover, the mechanical drawing which is taught is not the kind which real draughtsmen very frequently, and with little loss to themselves, are profoundly ignorant. Descriptive geometry and geometrical projection are nearly useless branches of the art, and the little encouragement which is given is most monopolised by these. Mechanical drawing proper is confined to those who pick it up by chance in engineering offices. These draughtsmen are often excellent; and for their behoof I am no other teaching. I speak for the artisan who makes and for him who uses machinery. There are two ways in which our shortcomings may be remedied; first, the schools of art now established in this country should be enlarged, and as to teach real mechanical drawing, and the examinations conducted by the Science and Art Department should be greatly modified; secondly, drawing which is to be taught in the schools under the superintendence of the new school boards may be, and ought to be, mechanical drawing. Freehand-drawing, as a branch of primary education, will, I fear, be a useless waste of time; but whether that be so or not, I am certain that the accurate and neat representation of the elementary parts of machinery and drawings would be popular with the pupils, and would be effectively taught. This kind of drawing educates hand and mind in accuracy; it teaches students the elements of mensuration and geometry; and it affords considerable scope for taste where taste exists. The chief difficulty will be to obtain competent teachers. I should say you too long were I to attempt to show you these must themselves be trained. My chief aim to-day has been to claim attention for a most important and wholly neglected branch of education.

Tramways.—The North Metropolitan Tramways Company have declared a dividend at the rate of 10 per cent. per annum.

WESTMINSTER SCHOOLS, SHAFTESBURY, DORSET.

These buildings are near to Holy Trinity Church, and have been erected at the sole cost of the Dowager Marchioness of Westminster. They were opened on Monday last.

The whole of the walls are built with fine-tooled green sandstone. The plan is in the form of a double L. The girls' school-room is 40 ft. by 20 ft., and is lighted by four two-light mullioned and transomed windows, and an eight-light mullioned and transomed window at the end. There is a class-room, 32 ft. by 16 ft., lighted by three two-light mullioned and transomed windows. At the end of the class-room there is a cloak-room, also lighted by a three-light mullioned and transomed window. The boys' school-room, class-room, and cloak-room are of the same dimensions, and similar in plan to the girls' rooms. The roofs over each of the rooms are of wrought and moulded Memel timber, stained and varnished. The roof coverings are of slate. Three pairs of ribbed principals are used for each room, supported on stone-moulded corbels. Over the principal elevation of boys' school there is a stone gable, with a bell hung in the arch beneath.

All the rooms are boarded 4 ft. high all round the walls. The walls above the boardings are furnished with grey stucco. Each room is fitted up with book-cases formed in recesses of the walls. The rooms are warmed by Gill stoves, set in recesses of fireplaces. At night each room will be lighted with three four-light gas-chandeliers. The whole of the windows are glazed with stout plate-glass, and swing-ventilators. There are proper out-door offices for boys and girls, and each court is private. The playgrounds are neatly laid out, and divided by iron palisades. The contracts were taken by local builders; mason, Mr. T. Williams; carpenter and joiner, Mr. J. B. Miles; plumber, Mr. J. Norton; plasterer, Mr. G. Hardy; smith, Mr. G. Williams; carver, Mr. Musselwhite. Mr. A. Harrison was the architect.

MARGATE JETTY.

The *Thanet Guardian* has published a view of the proposed extension of Margate Jetty, as designed by Mr. Gordon Page, and speaks as if it were about to be carried into execution. The cost named is 15,000*l.*, and the time for completion, 1873. It looks to us a huge and somewhat inappropriate affair; an octagon head no less than 289 ft. in diameter. Surely it would often be found very much in the way? The style of the kiosks and toll-houses is Moresque.

THE PRESIDENT OF THE BRITISH ASSOCIATION ON THE ORIGIN OF LIFE ON THE EARTH.

The opening address of the British Association, at Edinburgh, by Sir William Thomson, was remarkable for a new theory to account for the origin of at least vegetable life upon the earth. He objects to "spontaneous generation out of inorganic materials," but accounts for grass, and trees, and flowers, not by a creative fiat, but by fragments of solid seed-bearing matter, the *débris* produced by collisions between "great masses moving through space, and steered without intelligence." On this subject he said:—

"We must regard it as probable in the highest degree that there are countless seed-bearing meteoric stones moving about through space. If at the present instance no life existed upon this earth, one such stone falling upon it might, by what we blindly call *natural* causes, lead to its becoming covered with vegetation. I am fully conscious of the many scientific objections which may be urged against this hypothesis, but I believe them to be all answerable. I have already taxed your patience too severely to allow me to think of discussing any of them on the present occasion. This hypothesis that life originated on this earth through moss-green fragments from the ruins of another world may seem wild and visionary; all I maintain is, that it is not unscientific. From the Earth stocked with such vegetation as it could receive meteorically, to the earth teeming with all the endless variety of plants and animals which now inhabit it, the step is prodigious; yet, according to the doctrine of continuity, most ably laid before the Association by a predecessor in this chair (Mr. Grove), all creatures now living on earth have proceeded by orderly evolution from some such origin. Darwin concludes his great work on 'The Origin of Species' with the following words:—'It is interesting to contemplate an entangled bank clothed with many a rank and wilding, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other, and dependent on each other in so complex a manner, have all been produced by laws acting around us.'"

We are not aware that Sir William stated

that even a single seed such as he speaks of was ever found in any one of the many meteoric masses which have been known to have fallen on the earth; but one may freely allow the possibility of innumerable seeds having so been scattered through space by cosmical collisions or explosions. All this, however, although it brings us the new idea of a sort of pleasant and neighbourly interchange of botanical and even of zoological specimens that may be going on throughout the planetary systems, sheds no new spark of light upon the origin of life in the abstract. We are still as far as ever from any idea of the possibility of life having had a beginning anywhere, either in the earth beneath, or in the heavens above, to which Sir William would refer us. Indeed, the question is thereby adjourned and removed altogether from beyond the field of human and terrestrial experience, to regions and conditions of which we know absolutely nothing. But the greater probability is, we think, that if life ever originated, it is quite as likely to have originated on this planet as anywhere else,—the own life of the planet, we mean,—animal, vegetable, yes, and mineral. And if the animal originated in the vegetable, quite as likely is it that the vegetable originated in the mineral; for the mineral creation has a life of its own, too, as any one will admit who ever studied the beautiful and often arborescent forms and growth of chemical combinations. No doubt it is easy to say,—"Oh, but that is a different sort of life from vegetable life." No doubt it is; but so is vegetable life a different sort of life from animal life. There is a strong analogy, however, between all three; and that analogy centres in arborescence, as a kind of essential form or principle common to all these regions of nature.

The vine-like sprouting or arborescence of the blood-like bromide of iodine, in certain cases, over the sides of a vial, has all the look of just such a quintessential life-motor as one may readily suppose to be at work in the sprouting and arborescence even of blood-vessels, in the organism of the animal fœtus. We do not claim for it anything like identity: we merely say there is a strong analogy, even a similitude. And look to the curious sprouting into arborescent vegetable-looking forms, out of the soil, as it were, in a vial, of chemical ingredients, such as bromine or iodine and antimony or arsenic, or iodine and tin, and a host of others, in sublimation, forced by "bottom heat" in a sand bath! The element, tellurium, sprouts, by heat of sublimation, into a beautiful fern-like structure, or *organism*, if we may so call it. Brom-iodide of mercury yields, by heat, arborescence with middle-ribbed leaves! Note, too, our lead, silver, and other chemical trees. No doubt, simple chemical accretion has much to do with all this; but is there not accretion in the growth of the more decidedly *organic* forms also, though of a more elaborate and exalted order? Once upon a time, the "growth of stones" was believed in by the vulgar and discredited by the learned; yet now it has been discovered by men of science not only that gold nuggets "grow," but how they grow! Solution of chloride of gold deposits gold upon gold, by simple accretion, and that is how nuggets grow.

In short, if the origin of animal life is based upon and issues from the principles of vegetable life, as Sir William Thomson and other men of science seem to hint, undoubtedly the origin of vegetable life is based upon and issues from the principles of mineral life; and there is plenty of that on the face of our earth itself without any necessity for being dependent upon other worlds for the germs of that vegetable life whence the life of animals is supposed to be evolved.

SCHOOLS FOR LONDON.

At the last meeting of the London School Board, Mr. T. Chatefield Clarke moved the following resolution, viz.:—

"That inasmuch as the Board is about to negotiate for the purchase of sites, with a view to the immediate erection of schools, the Works Committee be authorised, as soon as the agreement for the purchase of the site in each case is completed, to make a selection of not more than six architects, who shall be invited to send in designs for the school buildings, with the understanding that a small honorarium be given to each designer; that no perspective, or merely show drawings, be sent in; that uniformity of scale be observed; that the successful architect be employed on the proposed building, provided that the Board are satisfied that his design can be executed within a reasonable margin of the cost he states to be the estimate; and that all designs be the property of the Board."

Lord Sandon seconded the motion, but sug-

gested that it should be referred to the Works Committee to arrange the amount of the honorarium and other details.

After discussion, an amendment "to refer the resolution to the Works and Finance Committee, with instructions to prepare and bring up a report upon it next week," was carried unanimously.

It was resolved that four additional sites for schools be sought for; one in the neighbourhood of St. John's-street, Clerkenwell, for the accommodation of not less than 500 children; one in the neighbourhood of the Battersea-road, for 750 children; one in the neighbourhood of Kent-street, Southwark, for 1,000 children; and one in the neighbourhood of Drury-lane, for 750 children.

CIVIL ENGINEERS FOR INDIA.

THE Indian Civil Engineering College, Cooper's-hill, of which we gave a plan and some particulars in our last, was opened, as arranged, on Saturday, the 5th inst.

After a speech from the Secretary of State for India,—

Colonel Chesney, the President of the College, proceeded to set forth the system of study which it was intended to pursue there. He said drawing, surveying, mathematics, mechanics, and the principles of construction were things of course; but clearly, for the accomplished engineer, education could not stop there. A man who had to deal with materials of all kinds ought not to be satisfied to remain in ignorance of the essential properties of bodies. This involved some acquaintance with the general laws of chemical philosophy; and their application to various forms of matter. The same thing held equally good with respect to heat and electricity, magnetism, mineralogy, and geology. The experimental and natural sciences had an especial and practical value to the engineer in India, because he had to deal much with the conversion of raw materials. In England, with our extreme division of employments, the engineer looked to the contractor, the contractor in turn looked to the manufacturer of patent stone or lime; and thus a man might get along without diving deep into the nature of things, hiding his ignorance under a good specification. But in India, where the organisation of trade was still in a primitive condition, and work was carried on at a distance from manufacturing centres, an engineer not only had often to run alone almost as soon as he arrived there, but had generally to go straight to Mother Nature for his materials,—to dig and burn his own lime, to make his own bricks, often to fell his own timber. A knowledge of the chemical principles involved in the composition of mortars and cements was in such cases simply invaluable. So was a knowledge of the principles which guided him to the places where suitable stones were to be found; in other words, geology and mineralogy. Although, no doubt, experience would in time teach a man to distinguish between a good and a bad lime without knowing anything about carbonates or oxides, and a man might at last, by a sort of instinct, learn where to dig for a good brick earth, just as, by instinct, a pig was guided where to grub for truffles; that sort of ability was generally bought very dearly by his employers. Defending the study of the language and history of India, Colonel Chesney remarked that a young man, especially a young engineer, plunged into the practical business of life at first starting in India was apt to put off the systematic study of the language for a more convenient season, which never arrived. Now, if he were asked to say from what source the greatest danger to British supremacy in the East was likely to arise, he should say it would be found in the alienation which must naturally obtain between the governors and the governed, when the former were, as a rule, insufficiently acquainted with the language, and therefore with the thoughts and feelings of the governed. He believed there were very few Indian public servants who would not be ready to admit their shortcomings in this respect. It had been well said that those who knew the people of India best esteemed them most, and the converse proposition unquestionably held good; those persons would always be found most pronounced in their contempt for "the natives," and most ready to declare that Indian researches were flat and unprofitable, who knew nothing whatever about them. Answering a possible criticism that as engineering was a practical art the preparation for it should be practical also, Colonel Chesney

explained that a large part of the college course would be in the strictest sense practical; and when the rest of a man's life was to be passed in the practice of his profession, it was not too much to ask that a year or eighteen months, or even two years, should be devoted to preparatory study. The importance of a strictly scientific preparation held especially in the case of engineers destined for India, because there a man had not the same opportunity of making up for lost time which he possessed here in the centre of scientific thought and professional inquiry.

THE ENGINEERING AND SURVEYING DEPARTMENTS OF THE LIVERPOOL CORPORATION.

THE town council of Liverpool have resolved to consolidate the staff of the engineering and surveying departments of the corporation. The question of salary of the chief of the consolidated department has not yet been decided upon, although 1,000*l.* a year to some talented young man who had been engaged on railway surveys was mooted; as also 1,500*l.* to a more experienced person, possessed of local knowledge. The question of salary has been allowed to stand over that the health and water committee may confer together on the subject, and recommend to the council the amount of salary to be paid to the new officer of the department, as well as the duties to be done for it consistently with the health committee's report, adopted by the council at the same council meeting.

Mr. Alderman Morris, at the request of the finance and estate committee, moved that that committee be authorised to take such steps as they might consider advisable to fill up the vacancy in the office of corporation surveyor, and that the salary be 800*l.* per annum.

Mr. Whitty suggested that a salary of 700*l.* would be sufficient at the commencement; Mr. Turner and Mr. Melly thought it should be 600*l.*; and Mr. Alderman Bennett considered that 800*l.* was as low a salary as could be paid to the surveyor.

Mr. Sitt moved as an amendment that the finance and estate committee be requested to consider and report to the council as to the duties which will devolve upon the surveyor, the steps they recommend to fill up that office, and the salary to be given.

The amendment was agreed to.

THE NEW EMBANKMENT AT CHELSEA.

ON Saturday the first stone of a new embankment on the northern side of the Thames, between Chelsea Hospital and Battersea Bridge, was laid by Colonel Hogg, the chairman of the Metropolitan Board of Works. The ceremony was held on the banks of the river fronting the Old Swan Wharf at Chelsea. The Act for the execution of the work was obtained in July, 1868. The designs and contract having been prepared by Mr. J. W. Bazalgette, the engineer of the Board, the contract was let to Mr. Webster for 133,950*l.*, including a portion of the low-level intercepting sewer, corresponding in length to the new Embankment.

The Embankment will continue the roadway to Battersea Bridge, thereby opening up a thoroughfare between the west and south-west of London and the City. The Chelsea Embankment, as it will be called, will reclaim 9½ acres from the river, and this will be occupied by a roadway 70 ft. wide, and by ornamental grounds. It will be three-quarters of a mile long, and will, with the exception of about a quarter of a mile, unembanked between Millbank and the Houses of Parliament, complete one continuous river embankment and roadway 4½ miles in length, from Blackfriars to Battersea Bridge. This roadway varies in width from 60 ft. to 100 ft., and it is hoped that before long the connecting link of Embankment at Millbank will be made. The Embankment wall is to be formed of concrete, faced with granite, being similar in that respect to the Albert, and to the eastern portion of the Victoria Embankment. This substitution of Portland concrete for brickwork will save about 21,000*l.* The granite will be simply hammer-dressed, and the parapet will be of granite. It has been deemed unnecessary to carry the foundations of the wall to so great a depth as in the case of the Embankments lower down the stream. They will extend to 4 ft. below low-water spring tides, and this will enable the work to be executed without the

aid of the whole-tide coffer-dams. The roadway will be planted on each side with trees, as on the Victoria Embankment.

Her Majesty, on the advice of the Prime Minister, has been pleased to confer upon Mr. Bazalgette the distinction of the Civil O.B., in recognition of his services, as the engineer of the Board to the metropolis.

MALT CISTERNS.

SIR,—I take the liberty of encroaching on your space in the *Builder* with a few remarks in answer to your subscriber, "B. A.," in which he alludes to brick and cement being the best material for the construction of a malt-cistern. In this I fully agree with your correspondent. Being a maltster in this city (Dublin), I am anxious to inform "B. A." that I have constructed a malt-cistern capable of "wetting" from sixty to eighty barrels, by which I am enabled to empty on the second floor. The construction is simply, three arches, supported by two piers (brick and slate topping), with cross iron rails to support arches and cistern, built on top. I have had this cistern working for the past maling season, and can vouch for its perfect staunchness.

JOHN BAXTER, Maltster.

RENT AND RATING.

BY A WORKMAN.

SIR,—If ever the history of social and sanitary reform be written, the *Builder* will stand first as the ablest and most earnest of the organs which have aided the movement. It is said that "truth is stranger than fiction," and in the history of social reform no imagination could outdo the strange things which at the present time underlie social existence in London. During the week I passed some hours in reading the work entitled "Another Blow for Life." Although I had read this book many times before, there is always in returning to it some point which strikes me as surpassing strange, although wonderfully true, and the surprise is that so much misery and unwisdom should exist, and that the people should be contented and not recognise their degradation among what is called this highly-civilised nation. For the last forty years a portion of the people have been crying "Reform, Reform!" and during that period the country has witnessed all sorts of reforms; and at last, in poor-law reform the country seems to have reached the point it stood at in 1832. In that year the sum expended for the relief of the poor was 6,068,268*l.*; the sum expended for the same purpose in 1870 was 6,200,000*l.* In 1832 the payments for other purposes than the relief of the poor was 1,224,884*l.*, making a total of 7,293,653*l.* Since that time, in spite of all reforms, the country has made a great advance in local taxation. Burdens which ought to be national are cast upon sections of the people, and no one now knows what is and what is not poor-law rating. Nevertheless, out of the present phase, we learn that local taxation has risen from 7,293,653*l.* in 1829 to upwards of 30,000,000*l.* in 1870.

Amid the curiosities and anomalies of taxation the country may congratulate itself upon its prosperity, although it expends a seventh part of its income in local and imperial taxation, and like amount upon intoxicating drinks. The great London nation is still on the increase. The true law of population is, it is said, the more misery the more people; and, considering how the majority of the people in London live, that would appear to be true. It is, or ought to be, well known, that there is not one-tenth part sufficient houses for the people to live in; so that all the working classes live in tenement houses altogether unsuited to the purpose. The history of these houses, written by some one who from necessity has had actual experience, would, in deed, be a strange one. I am a working man who am, from the incidence of having a family of seven, obliged to be a householder. A few years ago a great rise took place in workmen's houses throughout the metropolis, and I am at the present time paying 45*l.* a year for an eight-roomed house, two of the rooms being kitchens 8 ft. below the level of the road. Since I hired it, a great noise has been made about pauperism, local rating, and assessments. On account of the great inequality which existed in the assessments and rating of houses—some houses at 150*l.* rental being rated at 50*l.*—an Act was passed in 1869 to make the assessments an rating uniform throughout London, and the local busy-bodies who form the vestry-boards, eagerly

formed themselves into committees to revise the anomalies, and, like the actions of our renowned Legislature, I believe, if a proper examination could be made, it would be found they had made the last act in the farce worse than the first. When I hired my house, I was rated at 32l.; the revising committee added 6l., making it 38l.; and when the announcement was made, it was added that the revised lists were complete, and the rate-books could be examined. Thinking that I could learn something, I took the trouble of going to the vestry, and made my business known. It seemed that although the vestry issued the notice, they did not expect any one would have the audacity to go to such a charming place as a local parliament-house.

After waiting some time, instead of a list, a book was brought by one of the busbodies of the vestry, who inquired my name and address, and kindly pointed out the gross value of Mr. Jack Plane's house was 45l., the rating 38l. That was exactly what I knew before, and I wondered why the vestry invited the ratepayers to examine exactly as much, and no more, than they knew before. I wanted to learn what my neighbours paid, and what the street in general paid. Although the whole transaction between the clerk and myself did not occupy but a very few seconds, there was such a great demand for the book, that another clerk stood waiting for it. One thing I found was, that the occupiers of houses next door to mine paid less rent, and under the new list, less rating, although the houses are in all respects exactly alike. And I again wondered how it was that houses all built at the same time, and of one size and plan, could, under a uniformity of assessment, be of less value than mine. I tried to get some information from the clerk, but he did not know more about uniformity of assessment than myself. Since then I have made a few inquiries, and have found inequalities in uniformity. In the next street to the one where I live, a friend has a ten-roomed house in better condition than mine. It is of the same size and plan as mine, excepting the two additional rooms. The rent is 44l., and the rating, under uniformity, is 36l. a year. The water-rate is 2l., while mine, for an eight-roomed house, is 2l. 2s. Across the road is another house, with this difference, the occupier is the owner; the conditions as to size and rooms are equal. The water-rate is for that house, 1l. 12s., and the general rating a large per-centage less than either of the other houses. A relative of mine lives in another ward of the parish. He rents an eight-roomed house. The houses in the street run at from 38l. to 40l. per annum. The house happens to have a plate-glass front, and is called a shop; for that addition he pays a rent of 56l. a year. The size of the rooms is 13 ft. by 14 ft. front, and about 9 ft. 6 in. by 10 ft. back. His rating is exactly 50l. a year. Can any one understand such uniformity? Mine is 45l. rent; 38l. rating. My next-door neighbour's rent is 44l.; rating, 36l. The other side house there is a slight variation, the occupier being owner; but it is to his advantage. The house in the next street, with ten rooms, pays 44l., and is rated at 36l., while the house in the next ward is rented at 56l. and rated at 50l. Could the inquiry be carried further, it would be found that the grossest inequalities exist; that houses which are held on long leases, hired prior to the great demolition, were paying less rates and taxes than the unfortunate occupiers who have hired houses within the last three or four years. I find upon adding up the different items that every room in my house costs me over 4s. per week. The yearly expenses are, rent, 45l.; poor-rates, 9l. 9s. 6d.; water rate, 2l. 2s.; house duty, 1l. 13s. 9d.; materials and labour for repairs, 3l. 8s.; and as London people who live in lodgings are very much like the gipsies,—always on the move,—I have lost by rooms being unoccupied 2l. 10s. The expenses for labour and repairs do not include the cost of cleaning the apartments, which, if added, would give additional cost to the 63l. 14s. 3d., the actual cost for an eight-roomed house in London. I find, further, that on comparing my rate-paper with my friend's in the next ward his total rate for the half-year is 2s. 3jd. in the pound, while mine is 2s. 4jd. It certainly is high time that some general form of government was come to for this nation residing in London. The absurdities which now pretend to regulate it are a caricature of common sense. Local legislation as applied to London is in every shape a failure, and I hope, sir, this communication will find a place in the columns of the *Builder*. I might have added some more inci-

dents; but I think there is already sufficient to show the struggle which the workmen of London have to undergo to keep a decent covering over their heads.

JACK PLANE.

THE MANUFACTURE OF RUSSIAN SHEET-IRON.*

A PARTICULAR kind of sheet-iron is manufactured in Russia, which seems not to have been produced elsewhere. It is remarkable for its smooth, glossy surface, which is dark metallic grey, and not bluish grey, like that of common sheet-iron. On bending it backwards and forwards with the fingers no scale is separated, as is the case with sheet-iron manufactured in the ordinary way by rolling; but on folding it closely, as though it were paper, and unfolding it, small scales are detached along the line of the fold.

This sheet-iron is in considerable demand in Russia for roofing, and in the United States, where it is largely used in the construction of stoves and for encasing locomotive engines. It is there named stove-pipe iron.

Russian sheet-iron has been recently subjected to chemical examination in the Metallurgical Laboratory of the Royal School of Mines, and the analytical work has been executed by Dr. Percy's assistant, Mr. W. J. Ward.

The occurrence of a peculiar carbonaceous mass, left after the solvent action of dilute hydrochloric or sulphuric acid, may reasonably be accounted for, Dr. Percy says, by the method of manufacturing Russian sheet-iron, which he describes. The sheets are interstratified with charcoal-powder, and bound up in packets, each of which is subjected to repeated hammering. Hence, it is easy to conceive how fine particles of charcoal should be beaten in over both surfaces of each sheet; and, if this be so, a relatively larger proportion of carbon should exist in the thin sheet, as is the case. Yet that some of the carbon is combined may be inferred from the fact that distinct hardening occurs after heating the metal to redness, and immersing it while hot in water, and especially in mercury.

In the volume on iron and steel, which Dr. Percy published in 1864, he stated that the mode of manufacturing the Russian sheet-iron in question was kept rigidly secret; that it was made from iron smelted and worked throughout with charcoal as the fuel; that, according to information which he had received from three independent sources, the sheets, after the completion of the rolling, were hammered in packets, with charcoal-dust interposed between every sheet; and that they were subsequently assorted, and the outer ones, being inferior in quality, were thrown aside as wasters.

Our author has since found that the *secrecy* was more dependent on ignorance of the Russian language than on anything intentional; and he now gives various particulars of the process.

The manufacture of sheet-iron in Russia, he says, is chiefly confined to the ironworks on the eastern side of the Oural Mountains. The malleable iron, which is the subject of this manufacture, is derived from pig-iron, obtained by smelting the following ores with charcoal in cold-blast furnaces,—namely, magnetite, carbonate of iron (*sphæro siderite*), and red and brown hematite. The conversion of the pig-iron into malleable iron is effected either in the charcoal-furnace or in the puddling furnace.

The puddle-balls, intended for the manufacture of sheet-iron, are rolled into bars 5 in. wide and $\frac{1}{2}$ in. thick. The iron should be more crystalline than fibrous, and should contain sufficient carbon to render it more like steel than iron. The machinery required consists of one or two pairs of rolls and two kinds of hammers. Reheating is conducted in furnaces of particular construction. The rolls are driven by water-wheels, and should make not fewer than fifty revolutions a minute. The hammers are also put in motion by cams on the axes of water-wheels. The hammer-heads are of wrought-iron, with striking faces of steel. Each anvil consists of a solid block of white cast iron. It is necessary that the hammers and anvils should be so made, in order that they may have the requisite hardness, in default of which the surfaces of the sheets would not acquire sufficient brightness or polish.

The puddle-bars, 5 in. wide and $\frac{1}{2}$ in. thick, are cut into pieces 29 in. long, which weigh

about 15·35 lb. avoird. (10 lb. ?—J.P.). These pieces are heated to redness, and cross-rolled into sheets about 29 in. square; and in order to become thus extended, they require to be passed through the rolls about twelve or fourteen times. The sheets thus produced are arranged in packets of three in each, heated to redness, and rolled, each packet passing through the rolls about ten times. But just before rolling the surface of each packet is cleaned with a wet broom, usually made of the green leaves of the silver-fir, and powdered charcoal is strown between the sheets.

The sheets obtained from this rolling are sheared to the dimensions of 28 in. by 56 in. Each sheared sheet is brushed all over with a mixture of birch charcoal-powder and water and then dried. The sheets, so coated with a thin layer of charcoal-powder, are arranged in packets containing from seventy to a hundred sheets each; and each packet is bound up in waste sheets, of which two are placed at the top and two at the bottom. A single packet at a time is reheated, with logs of wood about 7 ft. long placed round it, the object of which is to avoid, as far as possible, the presence of free oxygen in the reheating chamber. The gases and vapours evolved from heated wood contain combustible matter, which would tend to protect the sheets from oxidation in the event of free oxygen finding its way into the reheating chamber.

The packet is heated slowly during five or six hours, after which it is taken out by means of large tongs, and hammered. The packet is moved so that the blows fall in an order indicated by diagram. After this treatment the surface of the packet presents a wavy appearance, as the striking-face of the hammer and the face of the anvil are both rather narrow. When the packet has travelled about six times under the hammer, in the manner specified, it is removed; and immediately afterwards completely finished sheets are arranged alternately between those of the packet.

The actual cost of manufacturing these Russian sheets is about 12l. 15s. per ton, to which must be added general charges, which raise the amount to 16l. or 17l. per ton, exclusive of profit. The average price of sheet-iron at the fair of Nijni-Novgorod is about 22l. or 25l. per ton.

BARTON'S NEW BUILDINGS, DEANS GATE, MANCHESTER.

DEANS GATE is one of the oldest streets in Manchester, and for many years has, notwithstanding its contracted width, been compelled to afford accommodation for a very large traffic. The importance of the thoroughfare and the amount of traffic, however, became so great that the Corporation of Manchester resolved to buy up sufficient property to widen the roadway from about 25 ft. to 60 ft. This is being done for a distance of 490 yards.

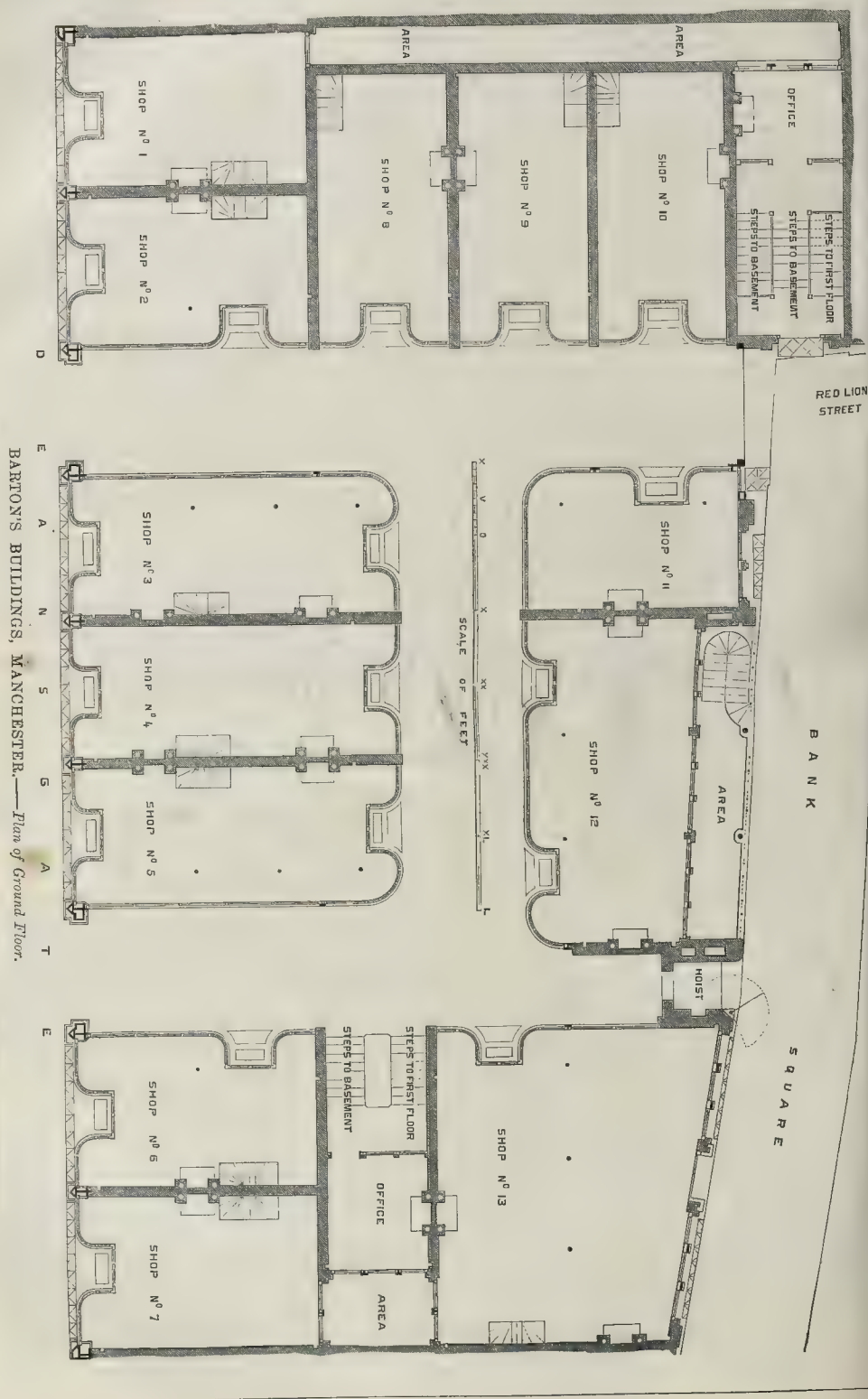
Barton's buildings (the property of Mr. John Hope Barton) are the first which have been commenced on the new line of frontage. The ground appropriated for the new buildings has a frontage to Deansgate of 177 ft., by an average depth of 100 ft. Below the street level an excavation will be made to a depth of 25 ft., down to the red sandstone rock, thus allowing for two depths of cellars. On the street level there will be an arcade, 226 ft. in length, by a width of 15 ft., with shops, &c., on each side, having two entrances from Deansgate and one from Red Lion-street, St. Ann's-square.

Above the shop or ground-floor story, three stories for show-rooms and offices are to be built, and the arcade will be widened to 25 ft., and at a height of 53 ft. above the street level the whole of the arcade will be covered in with an ornamental iron roof and glazing. The buildings will be constructed with fire-proof floors, roofs, and staircases. The roof generally will be flat, and the rooms in the attic or upper central portion are intended as residences for the office keepers and their families; a certain amount of the flat roof being attached to the dwellings as yards for drying-grounds, &c.

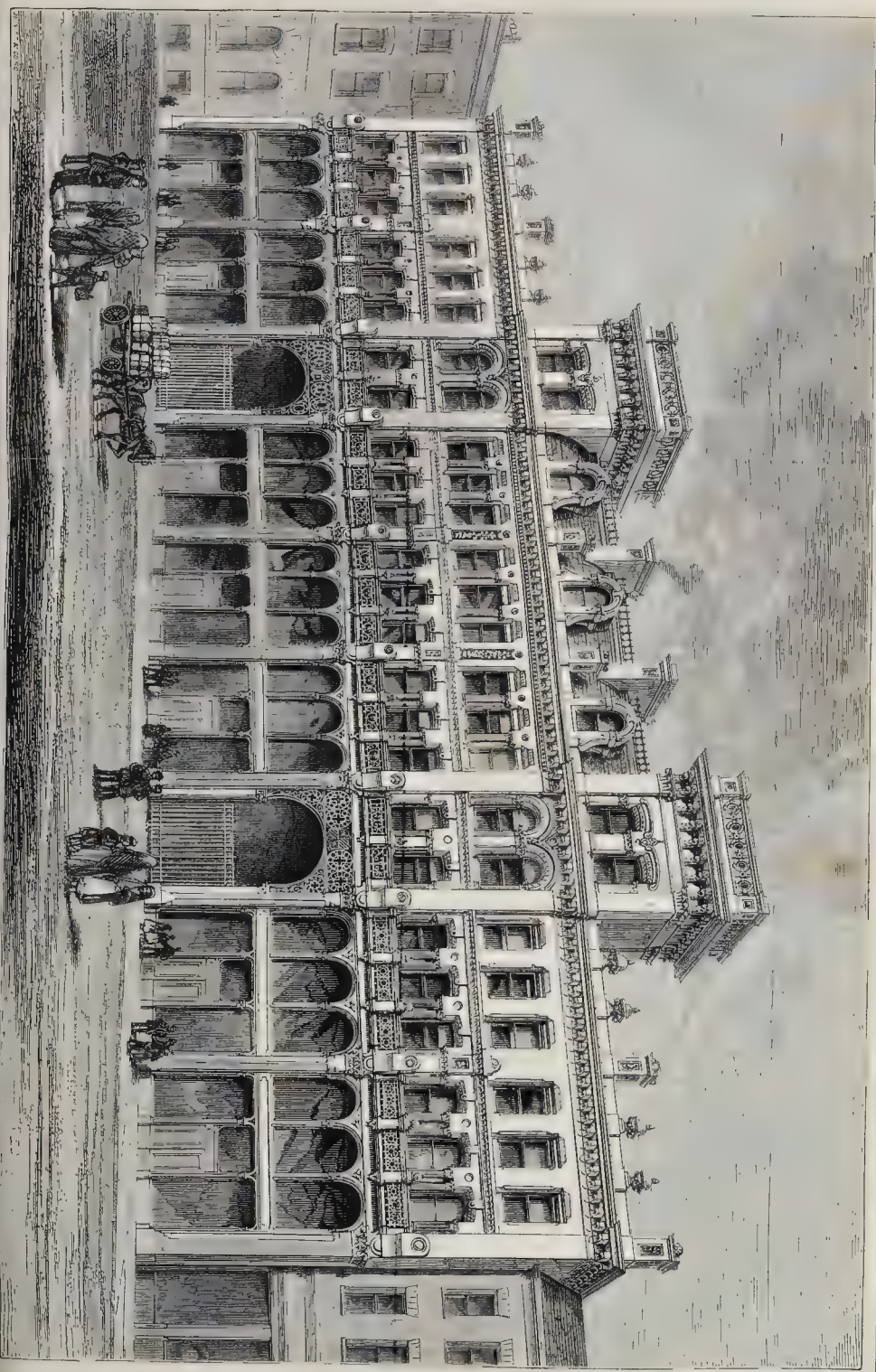
The contract for the excavations, brickwork, and drainage for the sub-basement and basement has been let to Mr. William Healey, contractor, of Salford, near Manchester, for the sum of 4,663l.; and the total cost of the building is estimated at about 25,000l.

The works are being carried out under the superintendence of Messrs. Corbett, Raby, & Swyer, architects, Manchester.

* The Manufacture of Russian Sheet-Iron. By John Percy, M.D., F.R.S., Lecturer on Metallurgy at the Royal School of Mines, &c. With illustrations. London. John Murray, Albemarle-street, 1871.



BARTON'S BUILDINGS, MANCHESTER.—*Plan of Ground Floor.*



BARTON'S BUILDINGS, DEANSGATE, MANCHESTER.—MESSRS. COBBETT, BAYLY & SONS, ARCHITECTS.

A NATIONAL THEATRE.

SIR,—Your correspondent, "Vetus," having courteously mentioned my name in his letter to the *Builder* of Saturday last, as that of one he takes too favourable a view of the prospects of a truly National Theatre, you will, perhaps, allow me to explain briefly what my views really are, as they do not appear to be clearly understood by him. I have no Utopian ideas of the pecuniary success of a theatre strictly limited to the performance of the great works of our English dramatists, ancient or modern. If I did I should not have written the letter which appeared in your columns of April 29th (p. 329), dictated by the happily expressed desire of Mr. George Godwin, that London should possess one "uncontrolled by the predominant taste of the public," because I should in that case still be in hopes, that some manager would see the time was come when it would be to his own interest to return to a more healthful and creditable style of entertainment. It is precisely because such patriotic self-devotion is not to be expected on a manager as would induce him unflinchingly to face even a small continuous nightly loss, that I see the necessity of endeavouring to establish a theatre which should not depend upon the receipts at the doors for its permanent existence. It is therefore that I called upon the noble, wealthy, and intelligent admirers of sterling wit and immortal poetry, to rally in supporting an establishment, the object of which was not to make money, but to educate the people until "the predominant taste of the public" should become sufficiently refined and elevated to render such support unnecessary. At the same time I repeat my conviction that there are thousands of persons who never go to the play because their tastes are not consulted, and that in catering for them we might possibly and even a pecuniary reward. The inference "Vetus" deduces from the receipts in John Kemble's time, might equally be drawn from accounts of the theatres in much earlier years.

There never was a time in the history of the drama, as far as I have been able to ascertain, when spectacle was not more attractive to the general public than the higher class of drama—particularly with such a *mise-en-scène* as was formerly tolerated—except when some great and exponents of its principal characters, male or female, excited the curiosity of the town, and admiration of the critics; but when "Vetus" socially cites the wretched receipts to John Kemble's "Othello," he cannot surely be aware that John Kemble's "Othello" was an acknowledged failure. The cast he gives is undoubtedly grand one, and if it were now presentable, could assuredly fill the theatre, but not for long, such an *Othello*. George Frederick Cooke's Iago, which I have seen, was of fine performance; but played to Pope's *Othello*, as it is on that occasion, few could be induced to witness it. Charles Kemble's *Cassio* has never been equalled; but people do not pay their money to see *Cassio*, or even *Desdemona*, however may act it. But an *Othello* like Edmund Kean could bring great houses with every respectable surroundings. The same might be remarked of many other tragedies; but comedy, for which alone I see a chance at present, the case is far different; and when I am told that our sterling old comedies are unattractive, I would simply ask what has brought public back to the Haymarket over and over again, when novelty has failed to attract them? "The Rivals" and "The School for Scandal" are threadbare as they are, without any social novelty in the cast, or in their stage arrangements. The fact is notorious, and a recent instance was the attraction of "The Rivals" at the commencement of the present season.

But all this is beside the question. I admit with regret that the majority of the public do care for good English or common-sense; but that not desirable they should be taught better, at least that the minority—a considerable one, in my opinion—who do appreciate those comedies which they can enjoy regularly, and not comedically, the best plays, acted with intelligence, and placed on the stage reverentially and artistically?

This is what I earnestly desire to see effected, and do not despair of its being eventually even a financial success. In all his other observations I thoroughly and heartily agree with "Vetus."

J. R. PLANCHÉ.

ST. JAMES'S TOWER, TAUNTON.

AN ingenious Latin inscription was placed under the corner-stone on the occasion of commencing the rebuilding of St. James's Tower, Taunton, as mentioned in our last. The following translations, one literal, the other poetical, have been published:—

"For beauty distinguished, but worn out with years, since the tower crowning this temple of Christ plainly appears to be most prone to ruin,

This, alas how beloved of us, to destroy, and another and the same to build, to the old and noble tower in all respects perfectly similar, not without inexpressible sorrow hath been resolved.

This most pious work—the Right Hon. Lady Anna Eliza Maria Gore-Langton laying the foundation of the edifice in this year of grace 1871, on the 26th day of July, in the presence as well of the Lord Bishop of Bath and Wells as of many others,

William T. Redfern, M.A., vicar,

Arthur Malet, esquire,

Henry Liddon, esquire,

Robert H. Sears, esquire,

Henry James Penny, esquire,

George Cordwain, professor of medicine,

George Gillett, esquire,

Samuel Farrant, esquire,

John Kingsbury, merchant,

rendering thanks to God, have taken care to execute,

Temples crumble and towers fall, and men grow old,

But Christ's word remains ever inviolable."

"Signal in beauty, though oppress with years,

Since the fair tower that crowns Christ's holy fane

Too plainly tottering to its fall appears,

This to destroy—belov'd, alas! in vain,—

Another and the same to build, and again

In all things like to that beauteous one,

It is decreed, and we suppress our tears.

See the good work by worthy hands begun,

See the first stone does noble Anna lay,

While Bishop, Priest, Geste, and Merchant round,

And many a Churchman filling all the ground,

Thankfully for the work in union pray,

Temples and towers fall, and men decay,

But Christ's unbroken word endures for aye!"

KING STEPHEN'S BURIAL-PLACE, OLD FAVERSHAM ABBEY.

SIR,—It may not be generally known that Stephen died at Dover Castle, Oct. 23, 1154, and agreeably to his last dying request his body was conveyed to Faversham, and there laid in the same vault and chantry chapel as that which contained the coffin and remains of his good queen Maud, and his eldest son Eustace. She having been a nun at Romsey Abbey, Hampshire, and dying, was buried in the old abbey here at Faversham, which she so much loved, we are told, when living. Her palace is now turned into a greengrocer's shop; the street is still called Court-street; and the house has quite a number of those iron-studded doors, with old-fashioned wooden bolts, curious stringed latches and slides; great capacious fireplace, with old Dutch tiles, and wide enough in the chimney-stack at the back to roast an ox whole. It is panelled throughout with black oak-carved work, representing lilies, vines, &c.; and the windows are of the old style, looking out to the east towards the old abbey, which stood a little further to the south-east in the same street. The site of the church in which the king was buried is now an orchard, with but three or four aged apple-trees growing therein. The little chapel on the north-east extremity is still traceable in the grass growing short there, and forming a perceptible square, in which was the king's monument, now shown in the parish church at some little distance from the abbey; but it is, of course, quite empty, being a mere Purbeck square marble raised cenotaph, which was removed from the abbey at the Suppression, when history gives out that the tomb of the king was broken open and his bones turned out on to the abbey floor, whilst the lead of the coffin was sold; the king's bones were then cast into the river or creek which flows close by, up which the flood tide rolls alternately every twenty-four hours. But, from a careful inspection of the spot wherein the king's body was taken up, I found to my surprise that there was actually not only a perceptible hollow in the crisp grass, which shows whence the leaden coffin of the king was dug up out of the vault, but there were also a few carved stones, mortar, and glazed tiles, left amongst the debris thrown out of the vault at the Suppression in 1538; and that curiosity or clumsiness had actually induced the sacrilegious robbers of the king's tomb to leave the two broken upper halves of the king's thigh-bones, with part of collar and shoulder bone, &c., also a piece of the yellow decayed coffin-lead, also a nail or two, behind, sticking in the grass, or in a foot-hole near by, also a piece of his knee-cap, evidently out by

the villains' spades, as also a portion of the king's leaden coffin, which was as large as the palm of my hand, and showed several cuts made by the spade upon it. These precious relics of King Stephen, together with a fragment of the stained glass from the east window, I managed swiftly to secure, to my infinite satisfaction and delight. It appears quite evident, from the "History of Faversham," that the queen's coffin and bones, also those of her son, are still lying beneath the ground of the orchard, which is full of grassy hills and hollows, where the pillars and walls of the old abbey stood, so long since demolished, and all but forgotten. The abbey had three aisles, and was, I find by striding it, over 80 yards in length by 40 yards in width; and it had a crypt beneath the choir, also a subterranean passage; also a fish-pond, with extensive pastures and park attached. A gold noble was dug up near the old abbey-wall a short time ago, some pottery, two or three Roman coins, one of Claudius Caesar's, one of William Rufus, and one of Lady Godiva in the Coventry procession; also a handsome silver one of Cesar Augustus, most excellent ones, in first-rate preservation. I found a portion of King Stephen's chain, treble-diamond, steel armour dress, a curious iron Norman twisted hinge, a short Norman table-knife, only 4½ in. in length; also two thin iron monks' plates, part of a Norman black-jug, with head of the king gilt, and flowers worked upon it, besides glass of a curious pattern; and also part of an iron hurdle, with chain linked, and a cowhide network seat, of rudest construction, to fasten convicts to when drawn at horses' tails to the gibbet or place of public execution; these two curious barbarous horse-arms are now lying in the old abbey cart-shed, on Mr. Hilton's farm, and were used by the murderers of Thomas Arden in 1538, whom they had barbarously murdered by tying first a towel around his neck, and then cutting his throat with a broad dagger. They then carried the body out of Mr. Chambers's house, dragged it, bleeding ghastly in dripping gore, through the garden, over the abbey wall, and then cast it into the meadow of the abbey farm, where it was found; and for this they were sentenced to be drawn, and then hanged. I have the two thigh-bones of the king now in my possession.

JOHN MELLOR.

*** We have no reason to doubt the good faith of the writer, but it is obvious that some additional evidence would be required to confirm this statement.

KNOLE HOUSE, KENT.

At the general meeting of the Kent Archaeological Society, held last week at Knole Park, near Sevenoaks, the Rev. W. J. Loftie read a paper "On the History, Architecture, and Furniture, &c., of Knole House," which, he said, was one of those museums of architecture with which the rural parts of England peculiarly abound. In London no considerations of archaeology had weighed to preserve buildings which had lost their use; but when they came to such a place as this, where land and even houses, as in the case of Knole, were measured by acres rather than by square feet, they found houses like that under whose ample roof they were assembled, in which, when one part was antiquated and unsuitable to modern requirements, another part was built, the original not being removed; and a succession of distinct and distinguishable buildings, each in itself an architectural monument, were allowed to grow up side by side without pushing each other out of the way. Thus they would find at Knole specimens of every style which had prevailed in England for the last 400 years, and covering six acres of land. Knole was not mentioned as a residence in the Domesday survey. The first owners on record were the Bethunes or Beaton, one of whom, Balchwin de Beton, called Earl of Aumerle, or Albemarle, was a large landowner here in the early part of the reign of King John. On the marriage of his daughter Alice with William Marshal, Earl of Pembroke, he gave her this manor and certain others. Knole estates then passed, by various transitions, through the hands of numerous possessors. It at length came into the hands of the Archbishop of Canterbury, Thomas Becket. With the archbishop, the history of the present house began. He died in 1186. Knole next passed into the possession of Henry VIII. and Elizabeth, who gave it to Sir Robert Dudley, afterwards Earl of Leicester. In 1603 it became the property of

Thomas Sackville, Earl of Dorset, previously Lord Buckhurst. So far as could be discovered, the earliest part of the existing house was erected by Archbishop Bouchier, who must have pulled down or disguised the remains he found of the residence of the preceding owners. The hall in which they were assembled was entered by a colonnade, over which was a large shield of the arms of Lionel Cranfield, Earl of Middlesex. The colonnade was placed there as a kind of porch, in the reign of William III., whose bust was on the ends, reminding them of the colonnade in the inner court of Hampton Court. The hall was, as usual in buildings of the period, divided by a screen at one end, a minstrel's gallery being over the screen, and the passage leading to a small inner court had the kitchen and kitchen offices on the left hand, and the doorway to the hall on the right. Among the various crests on the screen were leopards rampant, and rams' heads, which seem to have been used by the Sackvilles as crests. The shields on the windows were those of Robert Devereux, Earl of Essex, of Queen Elizabeth, of Vere, Earl of Oxford, of three Sackvilles, and the arms of Bouchier. Knele House was many times visited by Henry VIII. and Elizabeth, besides other monarchs. If they went outside and stood with their faces towards the house, they would see the Gothic buildings of the archbishop on the right. The square towers were very fine. At right angles stood the stables, the upper story of this part was of the Tudor period. It still bore the name of the King's Stable. The portion of the house right in front was composite in character. The lower part was early; the upper bore more distinct traces of Elizabethan and later work. Further towards the south the Stuart period comes in distinctly, and then they had a window which was probably inserted after 1700. The kitchen of Archbishop Bouchier's time was in fine preservation; but the present kitchen was considerably smaller. At the extreme west end was the chapel and a chaplain's room. The chapel extended north and south, instead of, as usual in ecclesiastical edifices, east and west. There was a vaulted crypt, which, although latterly used for the warming apparatus of the neighbouring conservatory, and full of rubbish, would well repay a visit. The north-east side of the chapel contained windows which looked into the organ-room, where one of the oldest organs in England was to be seen. The principal objects of interest were as follow:—The staircase, which is Elizabethan, or Stuart, and the carving of the banisters deserve attention. The Brown Gallery is 88 ft. long. In the windows are to be seen the Prince of Wales feathers and the Tudor rose. It contains some very old furniture. Lady Betty Germaine's Room is remarkable for its panelling, the doorway, an antique warming-pan, and some Monkish tapestry, representing Vandyke, the painter, and Crane, the master of the works. The Spangled Bedroom contains a stool, probably of the sixteenth century; bed-furniture, said to have been presented to the Earl of Middlesex by James I.; ebony cabinet, seventeenth century; Venetian mirror. The Crimson Drawing-room has a beautifully-carved chimney-piece, silver fire-dogs and tongs. The King's or Silver Room has a bed prepared for James I., said to have cost 8,000*l.*, with furniture of gold and silver tissue; two silver tables, masterpieces of their kind; ebony and ivory cabinet. Other rooms were also worth visiting, viz., the ball-room, the cartoon-gallery, the dining-room, the billiard-room, the Venetian bed-room, &c. There were no fewer than eighty staircases in the whole of the buildings, which would give them an idea of the intricate labyrinth of rooms and passages. The best view of the house is obtained from the rose-garden, on the west side.

THE NEW CHURCH OF ST. PHILIP, HEIGHAM, NORWICH.

This church, which has been consecrated by the Bishop of Norwich, is designed to seat 775 persons. The plan consists of a nave, south and north aisles, chancel, with vestry and organ-chamber on the north side. The tower is placed in the north-west angle of the building, and forms a baptistery. At the west end is a narthex or porch. The general design is based upon the Early French style of architecture which prevailed during the thirteenth century.

The materials used in the construction of the building are flint facings, with Corsham Down dressings to the windows, tracery, doors, quoins,

&c. The interior is plastered throughout. The roofs of the nave and aisles are open-timbered, with trusses, the spaces between the rafters being plastered, in order to preserve an even temperature in the building. The chancel and apse roof are boarded throughout. The chancel is paved with Minton's encaustic tiles, and the passages of the nave and aisles with Staffordshire blue and red tiles. At the easternmost bay of the apse is a reredos, carved in Caen stone.

The works have been executed by Mr. John Nelson, of Necton, for about 3,500*l.*; the stonework being let to Mr. Childs, of Norwich. The lighting, &c., was carried out by Mr. Pank, of Norwich, and the heating by Messrs. Boulton, of Norwich. The carving was executed by Mr. Seale, of London.

The upper portion of the tower and the spire, which, when completed, will be 140 ft. high, is postponed until subscriptions have been raised for this purpose. A contract has, however, been entered into with the builder for this portion of the work, which, if carried out at the present time, would only involve an expenditure of about 1,300*l.* It is to be hoped, for the credit of all concerned, that funds will be forthcoming for the execution of this important portion of the design.

The whole of the works have been carried out under the superintendence of Mr. Edward Power, of London, architect.

PUBLIC GARDENS, BUXTON.

THESE gardens, in the centre of the town of Buxton, and which were opened on the 10th, have been laid out on land presented to the Buxton Improvements Company, by his Grace the Duke of Devonshire, who also liberally contributed towards the capital of the company.

On the north side, for the convenience of the visitors, a pavilion has been erected. It is 400 ft. long, and contains a central hall, to be used as concert-room; corridors, flanked by two conservatories at ends, with waiting-rooms, &c. From a terrace running the whole length of the pavilion, the ground slopes beautifully down to the river Wye, which runs through the gardens, and is crossed by a handsome cast-iron bridge, over which the principal walk passes from the centre of the terrace to the band stand, whence the walks diverge in various directions, affording charming views, pleasant lounges, and shady spots. The gardens have great natural advantages, and these have been well considered and utilised. They were commenced in August last year, since which time the pavilion, two miles of walks, and five bridges, have been constructed, two lakes joined, two waterfalls artistically made, and the whole well planted with evergreen and deciduous trees. The pavilion is built of iron and glass, on a stone base, is lighted with gas, and thoroughly well heated by four rows of hot-water pipes running all round it. The building, with these materials, is of course quite modern in style, and this and the gardens have been designed and superintended to completion by Mr. Edward Milner, of Norwood, garden architect. The contractors for the pavilion were the Messrs. Wade, of Manchester.

CONSECRATION OF THE CHURCH OF ST. JOHN THE BAPTIST, LIVERPOOL.

The church of St. John the Baptist, Greenlane, Tuebrook, has at last been consecrated, by the Bishop of Chester, who has refused to consecrate it about twelve months ago on account of some of the ornamentation of the interior. The ostensible objection was made to a carved reredos. This was a triptych comprising a succession of scenes in the Passion, from the Betrayal to the Resurrection. There was a statement, says our authority, the local *Journal*, that this was imported from a Continental Roman Catholic Church; but of its origin nothing is authentically known,—the style, however, resembling that of Albert Durer. This obnoxious feature has been removed, and a substitution has been made of a panel painting representing Christ's baptism. The decorations in the rest of the church remain as ornate as before. The early part of architecture is that prevalent in the early part of the fourteenth century, and the materials used for the exterior are red and white sandstone, intermixed in polychromatic style. The tower at the west end is surmounted by a spire 150 ft. high. Round the parapet of the tower are floral carvings,

and the arms of the Rev. J. C. Reade and Mrs. Reade (at whose sole cost the church has been erected). The chancel floor is inlaid with Minton's encaustic tiles, intermixed with stone and marble, and the walls are painted in diaper work, and the roof resplendent with gold and colours. On each side of the chancel is painted the inscription, "Benedictus qui venit in nomine Domini. Hosanna in excelsis." Over the sedilia is a stained-glass window, the subject of which is a chorus of angels. The hangings on the walls of the chancel are of richly-patterned cloth, designed by the architect. The altar-cloth is in keeping with the hangings and decorations, and is of velvet and cloth of gold. On the chancel arch fronting the body of the church is a painting, the subject being the tree of the cross. The upper part of the walls is diapered. The flooring of the church is of oak blocks, as being warmer than tiles. There are no pews in the church, all the seats being open benches of oak, stained black. The cost of the edifice, exclusive of the land, has been 15,000*l.* The building was erected from the designs of Mr. G. F. Bodley, of London, by Mr. Horsman, of Wolverhampton; the clerk of the works was Mr. Fitzwilliam, and the builder's managing foreman, Mr. W. Hopcroft.

A CHURCH MUDDLE IN KENTISH TOWN.

A CORRESPONDENT writes,—In the *Builder* of June 13, 1868, p. 433, and again at p. 474 of the following number, the question of building a new church at Kentish-town (in place of one in the New-road, which was destroyed by the Midland Railway Company) was discussed. I reside in the neighbourhood of the new church, and from a report which I send, you will see that your prediction has been fulfilled. The building accounts are in a disgraceful mess, and we have got a church which is certainly not an ornament to the parish.

The amounts claimed by the builder, but in part not yet allowed by the architect, stand thus:—

On Church Contract	£9,391 0 0
Extras	1,923 16 3
	£11,314 16 3
Purcentage Contract	2,815 6 0
Extras	1,085 15 3
	£3,901 1 3

Mr. Champney's proposal to make good the deficiencies by bringing an action against the contractor for penalties, appears to me an odd one to suggest, especially when one of the trustees, the Rev. M. Andrews, has got 500*l.* by way of "compensation." The statement made by the persons appointed by the bishop to go into the accounts, that the sum realised by the sale of the fittings of the old church was not contemplated by the Act, is, I think, incorrect. It was specially provided for in the schedule.

I have taken much interest in this affair, and I trust you will think it of sufficient importance to expose the whole transaction in the *Builder*. I may mention that the church is as bare as a barn, the only decoration (and that not paid for) being a stained-glass window. The folly of building a parsonage of such a size and at such a cost, for a living of 200*l.* per annum only, needs no comment.

ARCHÆOLOGICAL EXCURSIONS.

Surrey Archæological Society.—The annual excursion of this society has taken place. The members and their friends assembled at Guildford, and proceeded by train to Baynards, on the Horsham and Brighton Railway, where the hired vehicles for the day's drive. The first halt was at Rudwick Church, which was described by Mr. W. W. Pocock, of Guildford. The next drive was to Alfold, the site of an ancient forest. At the old church a paper was read by Mr. E. Nevill. From Alfold a drive of a few miles took the excursionists to Cranleigh where the chief facts relating to the history of the church were narrated by Mr. A. Heale, F.S.A. From the church the party proceeded to Cranleigh County School, in one of the halls of which Mr. J. Park Harrison gave some information concerning the old Roman road which passes from Ewhurst to Farley Downs, the course of which he traced, and which will in future be indicated on the maps of the Ordnance Survey. Farley Heath, on which the Master Volante Review of 1864 was held, has long been designated as the site of a Roman settlement.

and the discovery of this old roadway confirms the supposition. Mr. Godwin-Austen read a paper "On the Manor of Shere and Vachery." The party had luncheon served beneath a tent. Mr. J. G. Nichols, F.S.A., presided. A more was then made to the Cranleigh Railway station, whence a special train conveyed the archaeologists homewards.

St. Alban's and London and Middlesex Archaeological Societies.—These societies met at Hertford, in the Shire-hall, under the presidency of Mr. R. Dimsdale, M.P. The following was the programme of the day's proceedings. An address was given by the president, and papers were read by Mr. Ridgeway Loyd, the Rev. O. V. Davis, and Mr. Pollard. At the close of the meeting the party were conducted over Hertford Castle, after which an excursion took place to the Rye House, where luncheon was provided in the "baronial hall," and the several points of interest attaching to this place were inspected. From thence, after inspecting Nether Hall, the party divided, some of them being conveyed by water and some by rail to Broxbourne and Waltham; at the former the church and the brasses therein were described by Mr. Waller, and at the latter a public meeting was held in the lady-chapel of the abbey, under the presidency of the Rev. J. Francis, vicar, when a discussion took place on the principal features of interest in the Abbey Church.

DWELLINGS FOR AGRICULTURAL LABOURERS.

Some old cottages in the village of Quatt, on the Dudmaston Estates, in Shropshire, have been pulled down, and are being replaced with blocks of new buildings, arranged on improved principles with regard to health, comfort, and convenience. Each block contains three cottages; each dwelling having an entrance-porch, staircase, living-room, scullery, pantry, coal and wood house, and three upstairs bedrooms, excepting the centre dwellings, which, having been arranged to meet the requirements of smaller families, are provided with two upstairs bedrooms. Each cottage has a baking-oven, sink, pump, hard and soft water supply; is thoroughly drained and ventilated; and is provided with the usual fittings and conveniences. All the internal walls are built of brick, and the external walls of red sandstone raised on the estate, finished with white stone dressings to doors and windows on the Alveley Quarries. The roofs are covered with Staffordshire blue and red ornamental tiling, laid in bands and diamond patterns to designs, with ornamental cresting, having projecting eaves and gables, finished with barge-boards with pendants, and tiles at apex. The front gables of each block are half-timbered down to the chamber floor level, and have a bold projection, similar to some of the old cottages to be found in Cheshire, supported on a neat and simple timber corbel course. The centre cottages in each block have ornamental dormer windows on the roofs, and the entrance porches (that to the centre dwellings being to the front and the others facing the ends) are features, having high-pitched roofs, projecting brackets, stone corbels, and hoods, producing altogether a quaint, simple, and rustic effect. Similar dwellings are also being built on the Broxbourne Estate, in Hertfordshire; the Overton Estates, in Shropshire; the Dirlston Estates, in South Wales; the Blethmorean and Rowfant Estates, in Sussex; and the Crouch and Alford Park Estates, in Surrey; all on the designs and under the direction of Mr. John Birch, of London.

STABLING AT ST. LEONARD'S.

A block of stabling has been built at West Wyalong, St. Leonard's, by the Rev. J. A. Hatchard, apparently with more than usual care. The premises have a frontage of 125 ft. by a depth of 80 ft., divided into three yards. The front is occupied by apartments for coachmen, stablemen, &c. It is three stories in height, affording accommodation for nine separate families. Two of the blocks are united by a central suite (built over the entrance to the middle yard) capped with a mansard roof, with four louvre windows. The frontage is composed of white pressed bricks, on the works of Mr. Henry Brassey, M.P., at Wyalong, Kent; whilst the red bricks used in the string-courses, archways, and window heads, came from Suffolk. The stabling is at the rear, and is built with pale grey stock bricks,

from the yard of Mr. George Smeed, Sittingbourne.

Passing into the central yard, on the right, we find the ground floor occupied with five stalls and two loose boxes. The mangers, corn-bins, &c., are of iron, enamelled; and throughout the specialities in stable fittings manufactured by Cotnam & Co., Winsley-street, Oxford-street, are used. The walls are finished in Keen's cement. The flooring is formed of blue Staffordshire bricks, with bevelled edges; and covered with iron channels are introduced for draining. Ventilating shafts are carried from the stalls to the roof; whilst air-bricks are introduced near the ceiling of the external walls, and the windows are made with special facilities for opening at the top. Gas is laid on in every stable, coach-house, and harness-room; and there is an abundant supply of water.

The open yards have herring-bone brick paving laid on lime concrete. All the sink traps are of iron (Cottam's patent), easily removable and cleansed. Six-inch drain-pipes are used inside the buildings; and 9-in. in the yards, leading to the main drain. Pitch pine is used throughout sized and varnished, so as to avoid the use of paint, and there are fireplaces and grates in every coach-house for ventilation in summer, and for airing and warming the carriages and cushions in winter. Mr. Capron was clerk of the works, and right-hand man of the owner.

HELP THE WILLING HORSE.

Sir,—Water beds have long been a boon to afflicted humanity; a soft uniform pressure or support is obtained. Could it not be applied to horses' collars and saddles? The water-bag could be made extra thick to ensure strength. Galled shoulders and backs would be unknown. The present stuffing is faulty, and the poor horses know it. Could they complain, they, like Balaam's ass, would lecture man on needless pain. K. T.

COMPETITIONS.

Hampton.—The Kingston Guardians, notably those from Hampton, have ordered that, for the present, members of the Board only should inspect the drawings of the new schools, which have been hung on the walls of spare bedrooms in the workhouse. The architects' estimates for constructing the new schools vary from 3,800*l.* to 16,000*l.* In framing the designs the architects have endeavoured to embody therein all the multifarious requirements in what they consider the most economical manner consistent with substantiality of construction, space, ventilation, access, supervision, administration, and general compactness. Each set of plans shows accommodation for 300 children. The school-rooms and class-rooms for boys and girls are 18 ft. wide,—that being the width recommended,—the floor area for each child being 10 superficial feet. In the infants' department there is something like 12 ft. area to each of the sixty children accommodated. Some of the architects suggest the erection of a chapel, but others have so arranged the two principal schoolrooms that they can, by sliding partitions, be thrown together to be used for divine worship. In most of the plans arrangement of the dormitories gives the maximum number of beds that could be expected to be required, and the wall spaces for beds are arranged on a scale recommended by the Poor-law Board. An infirmary is provided,—designed, of course, on the most modern and approved principle,—for between thirty and forty children, which is found in practice to be the maximum number in such institutions that require to be placed in the infirmary at one time. The laundries are proposed to be placed by the architects in such positions that the girls may have easy access to them. The baths, lavatories, latrines, &c., are provided on the scale found by experience convenient in such cases. In most cases there is a general dining-hall, lighted, ventilated, and warmed, of ample size to dine all the children at one time. Of course a kitchen is provided wherein to store and cook the food. Playgrounds are arranged, and in some instances it is proposed to supply them with suitable gymnastic apparatus. Apartments are marked off for the master, matron, and other officers of the schools.

Rotherham.—Some time ago plans and designs for a new market were advertised for by the Rotherham and Kimberworth Local Board of Health, and the announcements were responded to by six competitors, namely,—Messrs. Hill & Swann, of Leeds and Sheffield; Mr. Rees, of London; Mr. Blackmoor, of Rotherham; Messrs.

Barry & Sons, of Liverpool; Mr. Marsden, of Sheffield; and Mr. Thos. Dobb, of Rotherham. Ultimately the plan of Messrs. Hill & Swann was selected by the Board.

CHURCH-BUILDING NEWS.

Ipswich.—For some time past fears have been entertained that the walls of St. Margaret's Church have become unsound, and an examination by Messrs. Luff, Damant, & Hewitt showed that the walls are in a very bad state. Mr. Barnes, the architect, was then consulted by the churchwardens, and made a report, which has been submitted to a meeting of the parishioners. At that meeting it was suggested that instead of carrying out the project of building a district church in High-street, the parish church should be thoroughly restored and enlarged, and Mr. Barnes was instructed to prepare an estimate of the cost of enlarging the building. A second meeting has been held, at which Mr. Barnes submitted four plans: by the first the nave and aisles would be retained as at present, but simply put into thorough repair, and the chancel would be rebuilt, being made as long as the ground would allow, heightened to the same height as the nave, and having north and south aisles added to it. 312 additional sittings would thus be afforded, and the cost would be about 2,200*l.* The second plan proposed that the nave and aisles should be lengthened; the cost would be about 3,000*l.*, and the additional number of sittings 540. The third plan was to open the north and south transepts into aisles at a cost of 2,000*l.*, giving 207 more sittings. The fourth plan was to extend the nave and aisles eastward, and to build a new chancel, giving 300 more sittings, at a cost of 2,400*l.* Mr. Barnes said it would cost from 600*l.* to 800*l.* merely to repair the church. Eventually a committee was appointed to examine the plans and to report to an adjourned meeting.

Butterton (near Leek).—The foundation-stone of a new church for Butterton has been laid. For a long period the church has been in a very dilapidated state; and, indeed, quite unfit for divine service. It was therefore resolved to rebuild it entirely. A committee was formed; it was estimated that about 1,500*l.* would accomplish the work; and over 1,000*l.* having been promised, the committee felt justified in beginning the undertaking. Accordingly, the Earl of Shrewsbury has laid the chief stone.

Cottingham.—This church has been re-opened, after restoration. The work consisted in removing the gallery and all the floors and fittings from the interior; opening the closed-up bay in the arcade; taking down the nave ceiling, thereby exposing an oak roof, which has been retained; removing all the wall plastering; repairing and pointing all the masonry inside and out, rebuilding the greater portion of aisle walls, and renewing three of the windows in the north side; new roof to the aisles, which, with the nave, are covered with boarding, felt, and slates; new glazings and floor to the porch chamber; relaying floors of the porch and alleys in church; new plinth and sub-plinth, with foundations underpinned, built to all the outer walls except the north aisle, where the existing plinth was repaired and refixed. The small pipes and gutter outlets were re-arranged, and new drain-pipes laid, and some of the pillars of the arcade were amputated, and new foundations and bases inserted; new boarded floors and sittings, ventilated beneath by air-chambers; open benches in pitch pine; and new oak doors to the west entrance, formerly blocked up. The pulpit, of modern make, has been reduced in height, and adapted to the ancient stem, which was repaired and refixed; the remains of the old oak screen of the chancel archway have been retained; the windows in the rebuilt portions of the aisles are glazed with squares of pale green and yellow cathedral glass in paterne. An organ-chamber is added to the east end of the north aisle, a stone screen, with Devonshire marble pillar and carved cap and hood mould terminations, being placed in the intervening wall; a large highway to the organ-chamber has been formed in the north wall of the chancel, in the construction of which marble shafts and carved caps are likewise introduced. The windows in the clearstory have been walled up to the springing, the openings now forming triangles, of which each side is the segment of a circle. The paint and colour-wash have been removed from the hewn stone in the interior, the points raked out and pointed, all defects being made good with new

stones. The chancel was an inconvenient modern structure, with plastered ceilings and slated roof, the walls cemented outside to imitate stone. The walls being well built, were retained, the eastern end altered to an octagon, five two-light stone windows, with traciced heads, and a priest's doorway were inserted. The glazing is of yellow and pale green cathedral sheet-glass in geometric patterns. The roof is new, the apse ceiling being formed with circular ribs, which, with battlemented cornice and exposed portion of roof, are of pitch pine; the spaces between are plastered and painted blue; the circular part decorated with gilt stars; the floor is paved with Minton's tiles; the steps are of stone, with inlaid tile risers; the choir seats resemble those in the church. A considerable quantity of old hewn stone was found used as rubble in the walls taken down, supposed to be from the original chancel and other buildings, the foundation of which was discovered during the progress of the work. A rose-window in the west end, exposed by the removal of the gallery, has been filled with stained glass at the cost of Mr. Richard Hartley, Messrs. Hine & Son, of Nottingham, were the restoration architects; the contractor, Mr. Young, of Lincoln; the gas-pipes and fittings were provided by Mr. John Payne, a local tradesman. The total cost of the work, including every contingency, will probably approach 2,000l.

Newsome (Huddersfield).—The foundation-stone of a new church has been laid at Newsome. The church is to be dedicated to St. John. Newsome is in an outlying district of the parish of Lockwood. The site has been presented by Sir J. W. Ramsden, who also gave a sum of 500l. towards the erection of the edifice. The movement was inaugurated by the working people of Newsome, the first contribution of 5l. being given by a woman in a humble position in society. The total amount raised up to the present is 3,511l., leaving 800l. or 900l. to be subscribed to complete the undertaking. The church is to be built in the Gothic style of architecture, supplied by Mr. W. H. Crossland, of London and Leeds, and accommodation is to be provided for between 400 and 500 persons.

York.—St. Crux Church is to be restored. The general features of the contemplated restoration are to remove the cleareatory walls altogether, the columns and arcades being too weak to support them, and to have a new open and high-pitched roof, in which small three-light cleareatory windows will be inserted, and the roof kept sufficiently high at the apex so as not in the least to interfere with the large east window of seven lights. The old square pews will be superseded by the more convenient seats of the present day, and the organ will be removed from its present position at the west end of the church to the north-east corner of the chancel. The tower will be taken down and not rebuilt, and in its place a bell-turret, surmounted by a floriated cross, and springing from the west end of the nave-roof, will be provided. The approach to the Shambles from the Pavement will probably be widened; and therefore it is proposed that, in rebuilding the west front of the church, it shall be erected a few feet beyond the present foundations, and nearer to the chancel. A committee has been appointed, and a subscription-list opened. The architects employed are Messrs. J. B. & W. Atkinson, of York.

Breaston.—The Church of St. Michael, Breaston, in the county of Derby, has been reopened, after the interior of the edifice has undergone considerable renovation. The restoration is of a partial character, comprising the removal of the old box pews, of various shapes and sizes, the fitting up of the nave and aisle with open benches, and the chancel with choir stalls, thereby providing sitting accommodation for about 230; the substitution of a new panelled and traciced front in pitch pine, on a stone base, for the "three-decker" formerly standing against the north wall of the nave, the new one being fixed near the eastern pier of the nave arcade. The fittings generally are simple in design, but of ecclesiastical character, suitable for a village church. A new oak altar-rail, on wrought-iron standards, has been put in the place of the decayed balustrade, and is raised two steps above the level of the chancel floor. The font is removed from the south aisle, and occupies a prominent position in the tower, which is now thrown open to the church by the removal of a western gallery and a brick wall blocking up the tower arch. The latter, together with the walls and window, has been restored. The small western window is filled with painted glass,

representing St. Michael, the patron saint of the church. This window is the gift of the rector, and is from Messrs. Heaton, Butler, & Bayne. The large semicircular-headed window, of a debased period, formerly in the north wall of the nave, is replaced by a new three-light traciced window, in character with the rest of the windows, which are chiefly of fourteenth-century work. New boarded floors have been laid under all the benches, and red quarry floors to all the passages. Amongst the structural works may be mentioned the new lead covering to the south aisle roof, tie-rods, and a new floor in the tower, outside drainage, and the fixing of two new stoves from Messrs. Danks & Nixon, of Nottingham. The architect was Mr. Robert Evans, of Nottingham; and the builder Mr. Joseph Gill, of Draycott, near Derby. The entire cost of the restoration will amount to 430l.

Helporthorpe (Yorkshire).—The Yorkshire wold district is greatly beholden to the Sykes family for the many new churches in the East Riding, of which two, Thixendale and Fimber, have recently been opened, which were built at the sole cost of the present baronet, Sir Tatton Sykes. Weaverthorpe Church, also, has just been rebuilt, and is nearly ready for re-opening; and Sir Tatton has just laid the foundation-stone of a new church at Helporthorpe, having razed the unpretending old Norman structure to the ground. The new building will be in the Early English style, having nave and chancel divided by an arch. Under the east window there will be a reredos of marble and yellow Mansfield stone, carved; on the north side a vestry; and on the south side a porch, which is to be arched over. The whole edifice will be of Whitty stone. At the west end is a tower, with a spire, which will be seen east and west for a long distance. A turret, having a spiral stone stair, will project from the tower adjoining the porch. The design is by Mr. G. E. Street, the designer of the Fimber and Thixendale churches, and the restorer of Kirby Underdale and Weaverthorpe. The church at Luton is also to be rebuilt. The builder at Helporthorpe is Mr. G. W. Booth, of London.

Haddenham.—The parish church had fallen into a state of great decay. The rector and churchwardens raised about 1,400l., and decided to restore the most dilapidated part by way of beginning a much larger work. The north aisle had been barricaded from the church for two years, because it was unsafe; therefore the rebuilding of the north aisle and cleareatory forms the subject of the first contract. The foundation-stone of the new north aisle is laid. The total cost of the contemplated work is upwards of 4,000l. Mr. R. R. Rowe, of Cambridge, is the architect engaged; and Mr. Elworthy, of Upwell, the contractor. Already they have improved the appearance of the fabric by removing the churchyard soil from the walls, which, in the course of ages, had accumulated to such an extent as to keep the church damp and unwholesome.

Haslemere.—The parish church of Haslemere has been reconsecrated and opened for divine service, after having been closed for a period of twelve months. With the exception of the tower and a small portion of the north wall, the church has been rebuilt, and a vestry and a chancel have been added. The walls and roofs have been raised several feet, the galleries and pews swept away, and the body of the church is now seated with plain open benches of pitch-pine, the chancel seats being of carved oak. Between sixty and seventy additional sittings have been provided. The work has been done by Mr. James Harris, of Woking Station, who took the contract for the restoration of Chiddingfold Church. The plans were prepared by Mr. J. W. Penfold, of London, under whose supervision the work has been carried out.

Buxton.—The Bishop of Lichfield has consecrated the new church of St. James, at Buxton. The foundation-stone was laid in October, 1869, by the Duke of Devonshire, who presented the site and a donation to the building fund. The church, which has been built from the designs of Messrs. Medland & Henry Taylor, of Manchester, stands upon the hill behind Broad-walk. The design is incomplete, as the tower and spire have yet to be erected. The walls are of bluish-grey rubble-stone, the dressings are also of a local stone, and the roof is of reddish-brown tiles obtained in the neighbourhood. Internally the church is lined with red brick, relieved with white labels and string mouldings, which are freely used in the apse. The church is to accommodate 790 persons, and it has been arranged

that one side of the building shall be appropriated to visitors, and the other half to residents. The sittings are all free. The contract for the building and the fittings was 3,518l. Mr. W. H. Brown, of Stockport, was the builder.

SCHOOL-BUILDING NEWS.

Cowfold.—The new school here has been opened. The school, with the teachers' residence attached thereto, was built at the cost of Mr. Richard Hoper. The building is of stone, and is 40 ft. by 22 ft., and 14 ft. to the plate, and its class-room is 18 ft. by 18 ft.; it is thus supposed to have sufficient room to accommodate 180 children. The teachers' residence, also built of stone, is a house of six rooms. The ground upon which the school is erected was given by Mrs. Hoper, and the expenses respecting the fixtures, &c., of the school were borne by Mr. W. Borrer and Mrs. Borrer.

Mytholmroyd.—The erection of the new Wesleyan school is now being proceeded with, the plans being by Mr. Jackson, of Halifax. The school adjoins the chapel, and will be in two stories. The principal front gives an entrance doorway with window on each side. Over this, in the second stage, will be a large window, semi-circular in the heading, with mullion in the centre. At the side there are seven windows in each story, those in the upper being circular-headed. On the first floor are two vestries, a large vestry, kitchen, and infants' schoolroom 18 ft. long, fitted with a small gallery. The large room in the upper story will be 20 yards long, by 10½ wide. There will be accommodation for 330 scholars.

Halifax.—Additions and extensions are about to be made to the girls' and infants' school in Church-street, the plans for which have been designed by Mr. Jackson, of this town, architect. The new building will stand at the lower end of the present open playground, to the north of the school, which it will open into. It will be in the Gothic style, and in three stories. The basement will be the covered playground. Over this will be the infants' schoolroom, and in the third story will be the girls' school. A separate entrance will be formed alongside the ground into the new building. When completed there will be additional accommodation for about 20 children.

Books Received.

The Law and Science of Ancient Lights. By HOMERSHAM COX, M.A. London: H. Sweet 1871.

As this is the second edition of a reprint from a periodical, we do not consider it necessary to do more than mention its appearance. We may add, however, that it has been considerably enlarged.

The History of England, from the Accession of James II. By LORD MACAULAY. A new edition, in two volumes.

The Miscellaneous Writings and Speeches of Lord Macaulay. Longmans & Co. London 1871.

IN three compact, cheap, and well-printed volumes we have here the works of one of our writings, popular as they now are, will grow in value and estimation as the years roll by. Macaulay's "History of England," full of knowledge, and heightened with wisdom, is one of the most delightful reading-books in the language. A careful study of the introductory chapter cannot be made by any without lasting advantage. The collection of his miscellaneous writings and speeches now published includes some of the earliest and some of the latest works which he composed.

Lighthouse Illumination: being a Description of the Holophotal System, and of Asymmetrical Condensing and other new Forms of Lighthouse Apparatus. By THOMAS STEVENSON, F.R.S.E. C.E., &c. Second Edition. Edinburgh: A. C. Black. 1871.

THE first edition of this standard work, dating in 1859, and an account of which, at some length, we gave at the time, is now out of print, and the new edition has been carefully revised and corrected, and descriptions are given of the late improvements. The progress of the endeavours to supply lighthouses with minor lights with gas and with electric lights is brought down to the present time.

VARIORUM.

In the current number of the *Contemporary* Lady Pollock contributes a tasteful and interesting article on the "Comédie Française," the close the accomplished writer says,—

English audiences, looking on at performances so excellent as these are wont to say, "Ah! you see the French are naturally a dramatic people; and this is why they act so well;" but this is a mistake. The *Société de la Comédie Française* is exceptional in its perfection, even in Paris,—but it has gradually developed; it is the result of labour, and not of chance. The Théâtre Français because there it can be trained, there it can learn tradition, there it can be rewarded. These conditions could not exist if it could be established there not partly supported by national subsidies, no theatre which is a mere money speculation, never become a great school of art. It is in countries where the playhouses are not dependent upon the favour of the masses that a high order of drama exists as a public entertainment. At Berlin and Dresden there are companies equal in finish to the *Société Française*, and persons still higher in their aims. An Englishman who wishes to see Shakespeare thoroughly well acted must go to Germany. In England, occasional managers have wished to give classical entertainments, but, unassisted by Government, able to live only on the applause of the moment, they have failed, in fact, upon the approbation of the corner taste, to mark the bulk of the playgoing public, they have failed, and the consequence of this deterioration of the stage has been a steadily-increasing deterioration of audiences."

Eight out of the ten parts containing the Official Reports on the various sections of the London International Exhibition have been issued by Messrs. J. M. Johnson & Sons, and will be found of value to those who really wish to derive advantage from the various objects in the collection. The remaining two will be published at the end of this week.—A Seventeenth edition has been issued of Moleworth's very full "Pocket Book, or Useful Formulae and Memoranda for Civil and Mechanical Engineers" (London). What more need be said of it?—We quote from the August part of the *People's Magazine* a sensible paragraph on Indecision:—

Of all people who provoke us, few are more tiresome than those who will never do anything thoroughly. Their indecision is a natural deficiency of brain-force mars their deeds. They leave the door open; always remember something to be done just as they are leaving the house, and spoil the effect and good augury of the departure by running back for a pocket-handkerchief, a memorandum-book, or a final order to the waiter. But right off it, they will not let others do what they themselves cannot do. A matter has been settled. It is a done fact and saving time to accept decisions; it is the way. A small thing done is sometimes better than a big one prepared or in preparation. These hesitations, however, won't let the small thing do. The matter, as I have said, has been settled, decided. Then they say, "Oh! but—" The indecision is caught by the last point of its tail, just as it is about to get out of the room,—caught by the point of its tail, pulled back all its length and rammed to have a smart rubb off its nose."

Miscellaneous.

Visit to Barking Sewage Farm.—By invitation of the managers of the Lodge Farm, Barking, a large portion of which is irrigated, well known, by metropolitan sewage, a number of country gentlemen and well-known agriculturists have paid a visit to it, for the purpose of examining the crops. The impression created upon all the visitors was, as they professed, extremely favourable. The operations are exactly like that pursued at the Lodge Farm, near Romford. This year the crops of the Lodge Farm prevailed upon the people to irrigate adjoining land with sewage; and what struck most observers was the entire bareness of the land. This was explained by the fact that the sewage had been applied by a method not skilled in the art, and it had been badly distributed. One portion of the farm was sown with wheat in succession,—in words, it has grown wheat since the operations began; and this portion was at it to be doing best. The oats also looked well, they sold, on the ground for 50l. per acre. Some of the onions were 17 in. round, and the grass, as usual under sewage, had a good appearance. To this crop 12,000 tons of manure per acre has been applied this year; the crops, amounting to 80 tons per acre, are already being cut. Two more, equal in value, are expected.

Oil in Canada.—The enormous dimensions of the trade in petroleum has assumed in the West are not generally known; and the demand exceeds the supply. The discovery of oil is one of the great events of our time. The export of oil from America and Canada has amounted to close upon 150,000,000

English Watering-places.—The Registrar-General in his last return says,—"As at this season of the year people leave towns in search of health, a special report is supplied of the state of the forty-seven principal English watering-places, which it is gratifying to find are unusually healthy. They are divided into two classes,—thirty-eight on the pleasantest parts of the seashore, and nine inland. Many English people naturally resort to foreign countries to pass their holidays, for various valid reasons; but neither they, nor any others in search of health, can find healthier places than in England. Germany has her Rhine, great as the river of a small continent can be, but without the grandeur, variety, and freshness of the sea encircling the English coast; here the green grass, flowers, and foliage can fairly compete not only with the dry, hot, dusty air of Continental towns, but with the choicest resorts of the country. The proprietors of the English watering-places have much to learn from Continental rivals; and so, perhaps, have the English visitors, who, by opener and easier manners in their intercourse with each other would add greatly to their own cheerfulness, enjoyment, and health. The salubrity of the English watering-places admits, too, of improvement; but all the sanitary arrangements contrast favourably with the inconveniences and insanities abroad, which are likely to be tested by the coming epidemic. With regard to the opious drinking of the various waters, which still survives, under the auspices of German doctors, it has apparently, like blood-letting, lost favour in England; but those who still have faith in the miraculous influences of solutions of the various salts, gases, and sulphur need lack no indulgence in English inland watering-places."

The Sanitary Requirements of Liverpool.—Dr. Stallard, popularly known in Liverpool as the *Lancet* Commissioner, has delivered a lecture in the Royal Institution, Liverpool, on this subject. The meeting, although somewhat limited in number, was a very influential one, being purely representative, the audience consisting of medical men, members of the Liverpool Corporation, the Select Vestry, the West Derby, Toxteth Park, Walton, Garston, and other Local Boards. Mr. Clarke Aspinall presided. In course of the lecture, Dr. Stallard said he had but one principle to offer, by which to raise the standard of public health; but that, he believed, would meet all the requirements of the case,—namely, cleanliness, which in its full meaning included purity also. After dwelling upon this portion of the subject, the lecturer said the municipal authorities must work by example rather than by law. In the two great matters of clean foundations and wholesome sewers, they have been utterly at fault. It is proved beyond dispute that the former do not consist of dry ash and cinders and the detritus of granite, but of the disputed "other matters," liable to decomposition, and offensive even after the lapse of fourteen months. The principle is by Dr. Parkes and Sanderson admitted to be bad, and why these distinguished sanitarians should have then proceeded to sanction it he could not explain. Sewer deposits, cleansing, and ventilation formed the chief subject of the remainder of the lecture, for which a warm vote of thanks was passed to Dr. Stallard.

Indictment as to a Brickfield.—A charge of a criminal nature, of considerable importance from the position of the defendant, has been tried at the Kent Summer Assizes, in Maidstone. It was an indictment for obtaining, by false representations, a valuable security and money, against a clergyman of the Church of England, the Rev. Wm. English, late rector of Milton, near Sittingbourne. He was the owner of a brickfield at Rainham, which he advertised in the *Builder* as being to let; and he entered into arrangements with an inventor of brick-making machines, a Mr. Peter Baynden, for the land. The indictment, as well as previous proceedings, related to the fitness, or rather the unfitness, of the soil to make bricks, and to alleged misrepresentations as to it. After a protracted trial, lasting over the best part of three days, the jury were discharged without a verdict, six being in favour of a conviction and six for an acquittal. This was unfortunate alike for the prosecutor and the defendant.

A New Lighthouse.—The foundation-stone of a new lighthouse has been laid at the Longships off Land's-end. The lighthouse will be 116 ft. above high water, and the light will be seen at the distance of sixteen miles.

The City Surveyor of Canterbury.—A copy of a petition in reference to Mr. Hall, the Canterbury city surveyor, has been served upon every inhabitant, accompanied by a circular from Mr. H. H. Hall, of Winchester, stating that the signature of each person receiving it will be solicited. The petition is addressed to the mayor and corporation, and although somewhat lengthy, the gist of it, says our authority, the *South Eastern Gazette*, is that Mr. Hall is not competent to fulfil the duties of his office because he is selected by so many of his fellow-citizens as their architect in the erection of buildings which they are carrying out. The petition therefore requests the corporation to give its serious and immediate attention to the matter, in order that there may be an equitable arrangement between the council, the ratepayers, and the surveyor. The paper named says:—"We have not heard of any member of the corporation ever having complained of the manner in which Mr. Hall discharges the duties of his office; nor do we believe that he allows his private practice (which the council has permitted him to carry on) to interfere in the least with those duties."

Opening of the New Council Chamber, Macclesfield.—The new council-room of the enlarged town-hall, Macclesfield, has been opened on the occasion of the quarterly meeting of the Town Council. The room is fitted up in imitation of the House of Commons, so far as the seating of the members is concerned. The acoustic properties of the room are said not to be so good as expected, or the council have not yet acquired the oratorical pitch at which their voices can be clearly heard from one part of the room to the other. The building is now complete. The original estimate of cost was 6,000l.; it had reached to the sum of 6,540l. 14s. 9½d., which comprised the extras, including tiles for entrance-hall, 112l.; new staircase, 120l.; and an item of 87l. 15s. 7d. for French polishing. The item of 120l. for a new staircase was occasioned by finding that the old staircase was not fit to put up in the new place, as was at first intended. The business was inaugurated by the consideration of the necessity for a new covered market. The question, however, was not decided.

Restraint of Trade.—A master-builder in Boston, U.S., had a Roman Catholic cathedral to build, and thought it wise to send some of his freestone to New York to be cut. The Freestone Cutters' Association, in Boston, on this imposed upon him a penalty of 500 dollars, and when he refused payment, ordered the workmen to quit his employment. To save time and money he paid the penalty imposed, and then the men were permitted to return to him. He afterwards brought an action against the association for the recovery of the sum he had paid. The judge ruled that the master-builder had no right of action. In the Supreme Court, however, the judgment was reversed. It was held that a combination against an "employing mechanic," such as that which had been resorted to, was illegal, and that if he, apprehending injury to his business, paid money as in this case it had been paid, he may recover such sum, and may compel the associated body to recomp him for whatever additional damage may result from their conduct.

Brickfields under the Factory Act.—In view of the approaching application of the Factory Acts to all brickfields, Mr. G. Smeed and Mr. E. R. Ray, "as respectively the largest brickmaker in England, and the certifying surgeon for one of the most important brickmaking districts," write to the *Times* as to their experience on this subject. The provisions of the Factory Acts, they say, have for two years been strictly and universally carried out in the Kentish brickfields. They have been found already to be productive of much good to the workpeople, and to have caused no unreasonable inconvenience to the employer. This result, they add, has been in a great measure brought about by the tact, energy, and perseverance of their inspector, Mr. F. H. Whympy. They strongly recommend its application to all brickfields, no matter how few the number of hands employed therein.

The Printers' Almshouses.—The ceremony of opening two wings recently added to the Printers' Almshouses, Wood-green, took place on Saturday, in the presence of Earl Stanhope and a numerous assembly of ladies and gentlemen. The new edifices are Gothic in style.

For restoring Nos. 267, 259, 261, High-street,
town, damaged by fire, for Mr. Mensley. Mr. Ke
architect:—

Kelly, Bros.	£143	0
Nann	325	0
Mildwater	253	0

ANTED, by an active and experienced
Young Man, aged 27, a RE-ENGAGEMENT as CLERK and
LECTOR, or MANAGER. Eight years' good character.—
M. E. 92, Kingsland-road, N.E.

The Builder.

VOL. XXIX.—No. 1489.

The Value of Proportion in Architecture.



HAT the pleasure produced by fine architecture generally, and if ever more especially, by the architecture of the Greeks, is largely due to a sense of harmonious proportion, is a common observation, and familiarly accepted as an established matter of fact; it has become established by the admission and experience of successive generations of civilised men, ancient and modern, whatever the prejudices or fashions of art prevalent in their times, and quite independently of particular theories, or any theory at all, respecting the cause. With almost equal consent has this sense of architectural harmony been recognised as essentially, however paradoxically, of the same nature as

the perception of harmony in Music, as the feeling of characteristic composition not only of forms but of colours in painting,—of the fullest satisfaction indeed in all poetic arts, and as due to that quality, however definable, in virtue of which it is that any art can claim to become and evince itself as poetic,—as musical, in the grand original sense of pertaining to the Muses. It is indeed only when a work of architecture successfully evokes a refined sentiment of harmoniousness, that its title can be allowed as a work of fine art,—as something,—as how much?—more than what remains a mere constructive accumulation, however it may possibly be a marvel no less for technical execution than for mass.

The ultimate appeal of Harmony is to Sentiment; and Sentiment, as an active power,—creative Imagination, has, from time to time, proved equal to its evolution, within restricted limits, with no inconsiderable success, even when most certainly unconscious of any scientific theory as to its laws and conditions. The gifted hand traces forms of elegance on a time, as spontaneously as the natural ear guides the un instructed voice, to accompany in time, as the eye, with no acknowledgments to formal training, selects trimmings for a dress, disposes flowers in a bouquet, embroiders a Hindoo cap, or colours a Chinese vase, as though in mere obedience to the influences that adjust the droop of the lily to the curve of its stem, or to the instincts that rule fabric and ornament so unerringly in the nest of the timorous or the chaffinch. More remarkable results should be expected when cultivation comes in aid, and the faculty of progress declares itself by the primary conditions of admitting ignorance,—of feeling after a principle, and evincing eager readiness to grasp whatever of true theory, albeit crude and incomplete, it may be enabled to lay hold on. Thus

were made some of the best and boldest steps in advance in the development of Gothic architecture. As we watch how this went on, we cannot fail to recognise a straining after, which is still better at such an epoch than a reliance upon principle as yet not quite in hand; we cannot mistake in many remarkable works the traces of a system that prescribes some restraining when not prompting maxim, of which the value was recognised, if not to its full scope and implications. Genius, no doubt, has often done wonders, in despite of—in contradiction to its own wrong theories; but it has more frequently avouched itself as genius by evolving a theory to a certain stage, and therewith advancing at a bound to performances that become examples for the admiration of the less enlightened. It is probable that most of what we admire in the arts of barbarous people is due, not to diffused capacities of the races, but to traditions from works of such exceptional individuals. The tendency in a race to persistent copying of a set model, approves the merit of the originator of it as superior to his race; but that he left them, not to say made them, copyists, is so far an impeachment of the sufficiency of his theory or of his frank publication of it. True it is that the sword of Scanderbeg is of small avail without the arm that wielded it, and the palette of Raffaello and even the model of Michelangelo are vain without the masters; the scholars who plied pencils effectively on the broad canvasses of Rubens are as helpless without him as "Cæsar's hand when Cæsar's head is off," but surely when Genius goes out, the eclipses would not be quite so total, if at least so much of its discoveries as is capable of definite statement were on record in set terms.

Hence it is that when we come upon traces, as we assuredly do in the works of the Greeks, both in sculpture and architecture, of the employment of a well-studied and refined theory of proportion, of which the value is avouched by achievement of unrivalled harmony, it behoves us to take no common pains to follow these traces forth and avail ourselves, if we may, of the experiences of centuries,—of the conclusions of highest genius that are before us embodied in stone. It is true that nature also is before us as it was before the Greek, and no less have we opportunities of studying her lessons at first hand; but life is too short for us to forfeit the assistance of an approved predecessor, and out of the vain pride of being entirely self-taught and unassisted, to lose time at every false turn of a labyrinth over again. There is the liability, no doubt, that in giving ourselves up to study under masters engaging or venerable, severe investigation of truth may be diverted to the amusement of our curiosity as to what occupied the ancients, whether right or wrong indifferently, or growing respect for the interpreters may degenerate into worship of their reading of Nature's text and neglect of the ever-incumbent critical watchfulness. Dangers, however, in these directions vanish when they are calmly recognised, and still more certainly when it is recognised that in the course of analysis of the very best success, even more important than the discovery how so much was done, is the explanation of why only just so much and why no more.

It is not in the nature of a truly vital germ ever really to die, and a determination of its apparent activity demands strict inquest for the cause; it reveals itself to us as a motive principle of development that is not the material it works upon, nor any arrangement of that material, nor any consequence of that material when arranged; and, whatever becomes of the organism it originates, it has to be assumed, and if possible traced, existing still after dissolution of that organism, as—being its cause—it must necessarily have existed before it. We are too ready to consider it natural for a Style to commence—to run

its course—through rudeness, vigour, elegance, sophistication, and so forth, till it dies out exhausted and corrupt; but what of the energy that started and sustained it in career? That it eludes observation after the catastrophe is most certain; and, as far as visible and continued operation is concerned, too truly is as though it were not. The golden bowl is broken, the silver cord loosed, the pitcher is broken at the cistern and the wheel at the fountain,—and yet the well-spring is existent still. Nature knows not of annihilation, and as force is eternal it is for intelligence to gain such guidance over it, and such mastery, that this seeming dying out, which is but the torpor of forces that instead of co-operating are simply countervailing each other, should never supervene. But mastery over the living principle of arts, and to this effect, can only be hoped to be achieved by attaining to appreciation of pure theory; by aid of this, if in any way at all, the mind may shake itself free from accretions of habit, of fashion, of prejudice, the encumbrances that really disable Art from recommencing freely and healthily,—can save it from prolonged periods of tame routine or disgraceful crises of resort to frantic oddity in very desperation of a better change.

It stands on record that some Greek architects as well as sculptors,—some architects, indeed, who, like Polykleitos, were sculptors also,—left writings that set forth their theories of proportion. This was done, amongst others, by the architects of two important temples,—of the Doric Parthenon, of all the most important, and of the Ionian temple of Athene Polias, at Priene,—of both of which the later labours of the Dilettanti Society have scoured and have published, or are preparing to publish, measurements. In these cases, therefore, we possess what is equivalent to illustrative drawings of the lost literary works,—the designs that explained the text as much as they were explained by it, and which must exemplify all that was most peculiar and most critical in the stated theory, and ought to yield it up in response to a well-conducted cross-examination. We have the lock open before us, and due scrutiny of the wards should enable us to construct the single form of key that can throw the bolt. Having to find out how a certain problem may best be solved, we are provided herein with some aid in our search from an exemplar solution of very marked, if we hesitate to say before surveying the subject in its fullest scope, with the most absolute success. When we succeed, as we may hope to do as investigation makes its way, in seizing a necessary principle in nature, we may be helped to tracing its capacity of development by an approved application. When we recognise an application so systematic and so happy as to betray the influence of a true principle, we are thrown back with a clue to hold on to, upon scrutiny of wider theory in nature to identify its origin and implications.

Let us, then, endeavour in the first instance to grasp the idea of the Harmonious,—of Harmony, in its very largest sense,—and so to narrow down the definition until we are brought within reach of the cases that we are here particularly concerned with and interested in.

Harmony, or Harmoniousness, implies, we believe we may say, in its widest sense, a mutual or correlative adaptation of parts to form a whole,—of members to complete a system, which shall have a fitness and excellence relatively to a certain ultimate purpose or result. These general characteristics apply whether we have in view an animal organisation, a mechanical contrivance, a social institution, or a work of art—musical, dramatic, architectural; in every case Harmony expresses the perfectly satisfactory effect of a combination of serviceable elements so ordered and proportioned as to conduce to a particular end of specific excellence or advantage.

Harmony, therefore, as equivalent of the power derivable from apt combination, has a value that can scarcely be over-estimated. The difference in its favour, as compared with usual or inept assemblage, is of the same kind as that between a symphony by accomplished musicians and the discord of their instruments voiced at random by children,—between a loose heap of confused fossils from a quarry and the same disposed with congruity,—or, finally, between the broken fragments of various antique statues,—the produce of an excavation,—and the glory of the recombined groups of the Greek sculptor. When incongruous elements are rejected, refractory controlled, and the favourable most favourably disposed for mutual aid and furtherance, the result is a harmony in virtue of which the function of poetic art, of Poetry, like its name, comes into comparison and parallel with creation.

It is perhaps not unnecessary to notice that the word *harmony* is used indifferently for a cause and for its effect,—for the result and for the fact or process of harmonious combination. In this, as in so many other cases, language is too frugal to afford a second word when the distinction can, as usually, be inferred from the context, and when this may not be, helps itself out by circumlocution or is content to risk a mistake.

The ends or purposes for which Harmony is serviceable, not to say indispensable, are subjects of one leading classification, which follows the line of division between the Useful Arts and the Fine Arts. We shall pursue the subject in our next.

DUBLIN'S DIAGNOSIS.

THE capital of Ireland was gay and crowded during the second week in August, and the marine districts in sight of the bay, and many watering-places over the island, were resorted to by numerous parties of visitors. Those who came on the trail of royalty struck out new trails for themselves, and Dublin and Wicklow furnished sufficient charms for the pockets of most, if they did not for the proclivities of all. Leaving the vacation rambles, the sporting and angling tourists, the geological hammer-men, the chirograph antiquaries, and the bog, mountain, and rash artists and botanists to pursue their journeys wherever they list, we will betake ourselves to jotting down our notes by the way in the *Civitas Eblana* of Ptolemy. We walked through many of the old quarters of Dublin on this occasion, as we have done before, and, confining our remarks to these old quarters, we must say that they look more sad and tumble-down and wretched than ever. It matters not that royalty is sweeping by as we write, and that flags, banners, and triumphal arches swing pendant across Sackville, Dame, and Grafton streets. Steal away, flushed-faced visitor, with us, and in ten minutes, yea, in half that time, we will lead you into the back courts and alleys, where rage and wretchedness, and hunger-pinched and whisky-branded features abound. As we traverse the streets, the day is in that condition termed by Dublin folk "melting hot;" there are little heaps of ashes, suds, and night-soil, strewn about the streets we pass through; bare-footed children of both sexes, and of various ages, from the creeping infant to the "goreoon" and "gishra" of ten and twelve, are squatted upon the flags; the thoroughfare is lively enough, but the place is what is called a back street.

Chap Jacks and ragmen are surrounded by groups of children, bartering bits of old cloth, old iron, or a few bones, for sweets, perhaps, or for "coppers," in other instances, and their mothers are awaiting the result. We are now in the north-east part of the town, and on putting the question to a very respectable-looking man as to how often the scavengers are wont to pay their visits to this quarter, we are answered, "Sure, and this street is cleaned often enough, sir, and it's just as bad the next day." On questioning our informant a little closer, he admitted that on some days it was not cleaned at all, though the residents are obliged, or, rather, accustomed, to throw out their house refuse every night and morning on the pavement. Two or three streets of this character are situated within a stone's-throw of the Northern Railway terminus.

Proceeding in the direction of the Courts of Law, we found the streets and lanes filthy and covered with both animal and vegetable refuse. Off church-street, Bow-street, Mary's-lane, Poll-lane, King-street, and round that quarter, the

dirty and filth we saw were indescribable. Along the line of the south side of the river, from the commencement of Townsend-street to Sir John Rogerson's Quay, numerous back streets and courts are in a wretchedly bad condition. On the south side of the city, extending from Castle-street to the end of James street, the back streets branching away on the right hand to the river, and on the left towards St. Patrick's Cathedral, and thence along the Coombe, the majority of these back streets and lanes leading off are all in a very poor state. It would be almost useless in a paper of this kind to enumerate them.

The Liffey is exactly in the same condition as it was seven years since; but on days when the smell becomes intolerable, the corporation sends a few scavengers, when the tides has receded from the river, to sweep the mud from the sides of each embankment into the middle of the stream. While the citizens are suffering under the exorcising agony of this corporate operation, they are wont to exclaim, for the time being, that the cure is worse than the disease. Not many days since in the City Council a determination was come to, after a wrangle, that the Corporation would, at the expiration of the present scavenging contract, undertake the duties themselves. The contract, we believe, expires in September. Now what will be the obvious result of this action. One thing is certain, the Corporation will never perform that scavenging in an effective manner as cheaply as some contractors on former occasions did it. The upshot will be, that new district yards, and stabling premises will have to be built in two, perhaps in four, different places in the city, new offices and new officials will be created, and in the end there will be paid as much for superintending scavenging in Dublin as there is now paid for executing it.

This sum the citizens should be aware will have to be added to the Government loan already contracted for, and by new rates every penny of it will have to be paid by an already overtaxed community.

A cry of "jobbery" is very often raised against the Corporation; but it is unfortunate for those who raise it that they do not "smell the rat" in time. Matters of this kind in Dublin are of immemorial repute; but the animals get off with their booty while the rate-payers are napping, and the cry of "Jobbery" and "Justice to Ireland" is echoed by the sinner and the sinned against at the same time and often with one breath. So much for the illusions of the age.

We have already expressed our opinions on the main drainage scheme of Dublin, and with matured ideas and a sober view of matters upon the spot, we must condemn it as a most incomplete scheme. As it stands intact as a corporate scheme only, and working solely as a measure not only designed for the health of the city, but as one intended to relieve the city of its sewage, and to profitably dispose of it, the measure is a failure. It cannot be effective as it stands. It may please the Dublin corporation to fall back upon the plea hereafter that they only undertook to free the Liffey from pollution by constructing a main-drainage and intercepting sewers, leaving the disposal or distribution of the sewage as a supplementary matter. In that case the citizens need not feel surprised if within the next five or seven years a supplementary or auxiliary loan is asked for and obtained for Job No. 2. Mr. Park Neville, the city engineer of Dublin, and Mr. Bazalgette, will, no doubt, with their accustomed proficiency in figures, make everything as plain as a pikestaff to the Main Drainage Committee; and the Main Drainage Committee, with the endorsement of the engineers, will "floor" all opposition on the score of wilful expenditure that the rate-payers may initiate.

Threatened with a visitation of cholera, whatever be the projects or designs of the corporate officials of Dublin, there is one description of work that cannot brook delay, save at the cost of human life. The weather, as we write, is extremely hot in Dublin, and filth is on the streets in abundance. Verily, many of them are not only not half cleaned, but there is no attempt made at cleaning them at all. We have been out early and late, and we did not meet on the north or south side of the city one single scavenger. In our last day's round through the city, we met one scavenging cart, dry and empty, and the driver was a real "Paddy-go-easy," whose best specific against the cholera, or "wind in the stomach," was a good glass of "Jameson's seven-year old whisky." Our friend assured us

he could take it "full or fasting,"—meaning thereby that he could take it as easily before breakfast as after it. The contractor, of course, is carrying out his contract for scavenging as easily as he possibly can, and the corporation as yet do not feel called upon to bestir themselves until the new arrangements are complete, which will be possibly after some epidemic removes many beyond the range of complaint. The police in Dublin,—a very active body in political matters, and a very inactive one in other matters,—are at present in hot water. Patrolling the street in this weather in the garb of a mailed warrior is not the thing for Pat, whether he be a "poliaman" or a "Patriot." The city of Dublin force have donned a new garb, and they look like a military force, save that the baton takes the place of the bayonet, and that many of the fresh recruits walk very awkwardly in their boots, which are polished, and not greased, as of old.

The building business is experiencing a temporary lull, in consequence of a strike in some of the building trades. A few of the busy employers who are bound to time contract, have acceded to the carpenters' demands, but the majority of the men are still "out." Many of the workmen have betaken themselves to country jobs, where they are at liberty to work under the city wages, and for the purpose of assisting their brethren by a levy of "strike money."

In the matter of street and shop-front architecture Dublin is showing perceptible signs of improvement, and her principal streets are standing forth in fuller relief. Insurance offices, new branch-bank offices, and public-houses, are the principal kinds of buildings that are growing up, and developing on a large scale.

An enterprising victualler is just completing very large premises at the corner of Abbey-street and Sackville-street. The shop within is expensively fitted up. The supporting pillars or columns are cased with marble slabs, with marble plinths and capitals; the counter slab is marble. The base, surbase, and panelling around the walls of the shop are marble, the divisions being coloured marble, and from about 4 ft. high to within cornice depth of the ceiling, mirrors are affixed the entire circuit of the walls. The shop-doors and the framing around the mirrors are mahogany. The shop-fittings in general are well executed. The shop is a novel one of its kind in Dublin, and has attracted many visitors and customers.

The Agricultural Show was pretty well patronised during the Royal visit; and the show of cattle, implements, and machinery was, on the whole, commendable. We have not space in this notice to particularise exhibitors or their exhibits, or to enter into minute theories. Many English houses were worthily represented; and we noticed, during our stay in Dublin, that there was a large constituency of English, Scotch, and even Welsh visitors.

The grounds occupied by the late show are spoken of as likely to be converted into a people's park. They are not unsuitable for that object, as they are situated in a healthy district, on the banks of the classic Dodder, and within view of ranges of the Dublin and Wicklow mountains. The country around in the distance forms a splendid landscape, and the Bay of Dublin is outlying, and within a short range of the eye.

The hotel and shop-keeping interest of the city has been benefited to a large extent; and the public health rises from out of the dust and dirt improved and re-invigorated, we shall all have reason to rejoice, whether our homes are situated upon the Thames, the Liffey, or the Clyde.

The new Gaiety Theatre is progressing rapidly, the columnar supports of metal being attached, length to length, as the walls rise. The entrances front and rear will not be very charming or respectable. The former faces South King's-street, the latter opens into Tangier-lane,—a narrow and rather dirty courtway at present, near the top of Grafton-street. The theatre is to be opened, by announcement, in November. If so, the work must proceed more rapidly than at present, and outside effect will require to be sacrificed to inside necessities if the promises of the proprietor to the public are not belied. Although the site of the building itself is not very well chosen, it is within a short distance of many most respectable districts looking east and north-east, and several most impoverished ones in a southerly and south-easterly direction. The two extremes of the social scale overlap each other in the immediate vicinity of the new Gaiety, but corduroy and mole-skin will be likely to find their entry and exit through Tangier-lane (per-

), whilst Irish poplin and tawny flatter at angle of St. Stephen's Green, and glide in (force) through the central doorway in the diens of dilapidated South King-street. It is curious fact that the old theatres of London Dublin, like the old places of the people's ship in the latter city, were hidden away from public sight, and could only be approached through open nooks and crannies, or at best through open way of disreputable streets.

It is probably economical consideration that some of our modern proprietors and architects of theatres to build them where their architectural beauty cannot be severely criticised, where their faults as to proper ventilation and exposed on the score that the neighbourhood is a thickly populated one, and every bit of ground had to be religiously utilised for the place of the "gods" and "angels."

It is time there were general rules to prevent erection of such buildings, except on proper sufficient sites. Dublin wants a deal of thing to.

A HOLIDAY FOR STUDENTS.

ELY.—LYNN.

WHEN a goodly company assembled in the stern porch at Ely Cathedral, on the sunny afternoon of Monday, July 31st, attention was drawn to the "Guide to the Description of Ely Cathedral," to be delivered to the Archaeological Institute of Great Britain and Ireland, July 10th, 1884, by Mr. Edmund Sharpe, a copy of which was kindly put into the hands of the lecturer. The lecturer proceeded to say that he still stood by all the dates stated there for the several parts of the building, with one exception, viz., that given for the so-called Galilee porch, in which the audience was standing. Regarding, by the way, a well-merited compliment the Rev. D. J. Stewart, then present, the most recent of the laborious historians of the cathedral, for the special excellence and interest of his researches and conclusions.—Mr. Sharpe said he had to thank him for being able, with a hand at rest, to look up now and regard this porch as no longer an architectural puzzle and anomaly. Mr. Stewart had confirmed, with all the authority of the conclusions to which his observation of the architecture of the porch and its mouldings and other detail had previously made many students. For some number of years he has stated that Eustace (bishop of the see 98-1215) built the galilee at the west end. Constructus a fundamento novam galileam . . . rursus occidentem . . . was put forward as very conclusive evidence of the date of this porch. This statement Mr. Stewart has treated with proper respect,—in other words, has not allowed it to interfere with his own judgment, judiciously stating that,—

"Eustace completed the north end of the west transept, the share of the cross being called the new galilee, to distinguish it from the opposite southern arm, which was an old galilee begun by the monks as a continuation of the Norman church."—Page 61.

And again: "It is evident that Eustace had nothing to do with any part of the present cathedral. The galilee which he built has entirely disappeared, and the porch which has gone under that name of late years must be the work of some unknown benefactor, who had probably seen Hugh de Northwold's Presbytery, and determined to strengthen the church westward as it had been extended in the opposite direction."—Page 63.

From all which the moral is to be drawn that possible varieties of meaning of a monkish (or any other) chronicler's statement should be fairly exhausted, in order to confirm, if possible, the theory as to dates and such matters drawn from a building itself; but should never be allowed to originate one. Mr. Sharpe now dates the porch at about A.D. 1235 to 1240.

The lecturer, having thus prepared his audience for his characteristic candour and his desire to put them up in the latest results of everybody's labours, led the party into the church, and to the eastern transept,—pointing out the very earliest work of Abbot Simon, about twenty years after the Conquest, with wide joints and knobbed capitals and shafts on the faces of the piers (not yet properly in the nooks),—taking occasion to enforce once again the necessity of attention to one of the principles of fully-

developed Gothic,—the transmission downwards of the thrust of the successive orders of arch-mouldings through special shafts or sets of mouldings. The purely circular shaft, with wide single soffit, supposed rather a favourite arrangement now-a-days, being pronounced an anomaly when "in its usual context," having an expression differing widely from that of true Gothic architecture, "with its all-pervading principle of subordination." Credit was given to Sir Christopher Wren for replacing or copying the old work at the north west angle of the transepts so well inside that no special attention is called to his restoration, though he seemed forced to put his mark in an unmistakable way on the building outside, by a rusticated doorway, with one of his favourite keynotes. The charge of the works here had better results than this, in the long run, if it be true, as every one seems agreed, that the spacious central octagon supplied the first idea that grew into the still more spacious central dome and the thoroughly continuous aisles at St. Paul's.

The later Norman work was then followed chronologically, and the complete plan of the church of the Transitional period brought into being again; the octagon, and the choir, and the great masses by which the western piers were strengthened in the fifteenth century, all disappearing; and a central tower with massive piers, and a three-bayed apsidal-ended choir, starting up in their place. (The plan of the original apse is figured in Mr. Stewart's book.) Naturally something was said as to the manner in which the great western arch of the west tower was originally finished,—one of the yet unsolved problems here. The arch shows itself, being at the same level as the three other great arches, on the outside, when you look at it from the walls of the west porch; and no traces seem visible of a roof or any other construction covering it in,—abutting against it from the west.

Mr. King (Murray's "Eastern Cathedrals, 1862," page 179) states that "Bishop Riddell's original plan embraced a western transept" (meaning by this evidently an arm westward of the West Tower). One would be glad to hear or discover anything seeming likely to establish this. Some slight marks of the now-destroyed roof of the existing lancet porch,—which of course was not properly prepared for in Transitional times,—hardly reward sufficiently the clamourer who has been, perhaps, a little disenchanted by the sight of the well, surrounded by screen-walls, now pretending to be the upper story of the western porch. Were the monks so hearty, so fond of the open air, or so desirous of body-mortifying opportunities, that they took no pains to close in this great western arch by wall or screen? Mr. Sharpe suggests the case of the western arch at Tewkesbury as parallel; certainly both very grand arches, and, oddly enough, both filled in with Rectilinear windows. No better work could be undertaken by a possessor of leisure than the preparation of large-scale plans and sections from actual measurement of the whole western end of the cathedral,—now that he would find the scaffolding and the goodwill of the authorities, architect, and builder giving him ready access to almost every portion. If new light was thrown by such drawings on the matter, and the theory of the perfectly open arch well supported, it would be proper, one fears, to consider the western porch and chamber over, erected after the lapse of more than half a century, as a very clever (and beautiful) draught-excluder,—one of the indications of the progressive decline of austerity that led Hugh de Balesham (Bishop, 1257-1286,—the founder, by way of compensation, of Peter House, Cambridge), to obtain a dispensation from the Pope to the monks of Ely, "in consideration of their cathedral church being situated on an eminence, and exposed to cold and sharp winds, to wear caps suited to their order." (Bentham's "Ely," 1812, p. 150.)

The Transitional period is resorted to when the party walk on to the green sward outside the west end, to look together at "the grandest design of the Transitional period now existing in England." Certainly, for a special virility, combined with fair proportions, a most rare work. Truly, when the northern arm of the west transept was complete (if it ever was), as the southern arm is now when the central western tower had a lancet spire on the top of it (Bishop Northwold is said to have put one); when the grand angle-turrets had their terminal spires, themselves far exceeding what a large parish church could demand (again if such spires were ever erected); before the Galilee Porch was built

to injure the unity of the front, and prevent the full majesty of the tower from filling the eye in the centre of the picture;—when, in short, the west front was complete in idea, and realised, at any rate in part, no one can wonder that the good monks of Peterborough—stirred for the honour of their house,—projected that cavernous rock-hewn portico which now outdoes in completeness, if not in character of design, the work it was erected to emulate.

A little circuit brings us through gates specially opened for us into the old cloister-garth, now a garden. From the trim turf of one portion, looking sadly like a croquet lawn, a fair near view of the sunlit side of the nave can be got from ground to roof-tree.

The infirmary of the monastery, situated parallel to the church to the south-east, recalls the generally similar arrangement in a building, also with nave and two aisles—of Geometrical date, similarly situated at Peterborough; another probably of the not ungenerous exhibitions of a spirit of rivalry chronic in the two communities. Here the whole design is Transitional—of a variety and vigour confirming the oft-repeated legend that "the men of this period were really the most inventive of English architects." The nave, originally the patients' airing-space, is now a kind of street, a mass of cool shadow, leading you to these comfortable houses built in the aisles, in which the beds of the patients were ere while placed: their fronts being tucked between the pier arches. A staircase window, a hall doorway, and a vaulted book-lined study for the archdeacon, are among a few of the oddly adapted relics of this building that have lent themselves *in situ* to the ingenuity of more recent constructors.

After attending afternoon service—absolutely necessary, among other purposes, says one of our members, for getting the true feeling of any grand architecture—the assembly goes through the presbytery, choir, octagon, Trinity chapel, stopping by the way to note the excellent specimens scattered here and there of the distinctively English art of mouldings; the value of the Parbeck marble in shafts and parts adjoining giving a dignified sobriety and simplicity—if possible looking a thought too black and glossy on this bright summer's day, when the ordinary building stones seem filled with sunshine in every grain; remarks also being made on the clunch filling-in of the choir vaulting, its pure untanned whiteness showing up the architecture of which it forms a part;—not frightening by a fierce background of shouting colour such as unfortunately now (till the restorers have reached that part of the buildings) makes the eye turn with some satisfaction actually away from the exquisitely-designed triforium of Bishop Hotham's part of the choir,—part of piece of architecture justly praised by Mr. Ferguson for "general beauty of design,"—"with details equal to anything in Europe for elegance and appropriateness." ("Handbook," 1871. Vol. ii, p. 870.)

The nave roof, of course, comes in for its share of notice, and its subjects and history. Seeming to have received its gentle tones of colour on a scale having the soft blue of the sky of an English summer as its keynote,—allowing the eye to rest on it easily without being at any time involuntarily dragged to it,—nevertheless it wants as an architectural work that connexion with the walls and defined form in itself, that so satisfies the mind, through the eye, in receiving the impressions of sound visible articulated structure from a true Gothic vault; unfortunately, also, it is wanting, considering the structure of the average human neck, in suitability for careful observation,—without an effort too painful for any one to make who does not readily find, as many do to their cost thereafter, that scrutiny may be made again and again with an ever-increasing pleasure. A visit to some of the other remains of monastic buildings and to the Chapel of Prior Crawden, restored 1845-48, with masonry in block, and groined in wood,—Mr. Stewart's plan for keeping the shadow of the remaining original portions; then to "pastures new," where the dean and archdeacon gave in speech the hearty welcome already given in not; and shown still farther in the evening, when the cathedral was opened, and a fair sprinkling of other visitors came with us to listen in the darkness to the well-known author of "Naomi" on the great organ; and then to see the lighting up of the reredos and of the Trinity Chapel,—of course, thus seen in detail as they cannot be in the daylight.

* See p. 619, ante.

"The Architectural History of Ely Cathedral." By the Rev. D. J. Stewart, M.A., formerly Sacrist of the Cathedral. Van Voorst, 1888. The illustrations herein and the monograph of Prior Crawden's Chapel (once elaborately prepared for publication, but never really published), show that—if one may so reason from the known to the unknown—Alan of Walsingham (also "a former monk") may, after all, have himself been a very able draughtsman and a not incompetent designer.

We may say here, before leaving the cathedral, how much the observation of work in ties and bracings—done aforesaid and now in course of execution—to the western tower will repay the student. The awful rent in the south-west angle and the weak places elsewhere, part of a long-continued history of threatened ruin, beginning in the fifteenth century—if not before, will drive it home to the most casual of observers that this fen country would to a certainty lose its majestic every-where-visible landmark,—if from time to time vigorous measures were not taken to give it new chances of endurance.

Tuesday, August 1st.—The "rosy-fingered Dawn," albeit not a sluggard just now, had but a slight start of the most active of the band, for whom *Time* was all-too-short. Train towards Lynn we leave at Watlington: visit St. Mary Magdalen, Wiggenhall—just a little to the west of the Ouse river. These Rectilinear churches contrive to look a good deal of cheerful dignity; a west tower, in three stages, largish turrets (containing staircases) at the east end of the nave; sancto bell-cote, and interesting seats. These being also throughout this Marshland district the favourite special arrangements; often also a room over the porch, chantry stairs to the chancel; and a general predominance in mass of Rectilinear buildings,—little Geometrical and Curvilinear. Boats wait at the bridge, and we pass the second Wiggenhall (St. Peter), just above us on the bank's edge. Get out at St. German's, to find a pretty little bit of Lancelot tower, some good seats, and a Jacobean pulpit. Again landing, just by the sluice that burst and wrought havoc a few years ago, a run over fields of richest grass brings us to the other Wiggenhall (St. Mary the Virgin). "Fome of the finest seating in England," of good solidity (3½ in.), and carved with some spirit, with finials, standing figures, and panels; especially grateful also to the imagination for the ample provision for sturdy, fully-developed frames, nurtured on the produce of this fruitful land. 3 ft. 7 in. from centre to centre is an idea to revel in now-a-days. A quaint little hour-glass stand, laid down loosely in the angle of a pew, would have led one years ago to suggest *housing* into the pulpit, and an iron band round it, firmly screwed, but happily the "manners" of antiquaries are now well mended. Lynn comes into sight, to be reached shortly by the help of stout arms, and of the well-meaning wind, seeking to nestle in the already distended sails, formed by cleverly-hoisted umbrellas.

Through the town, and by train to Dersingham (on the rail to Hunstanton), where vehicles meet us; and we find at the church good Curvilinear windows, whitewash of the thickest and best quality, and one of the puzzling low side windows (under south-west window of chancel). The three-bayed sedilia, with piscina adjoining, only just opened, aforesaid solidly cased in masonry,—a pretty work of very early Curvilinear date,—was all carefully measured and cyromgraphed before our start for Sandringham. The new house (of red brick and stone of the "modern Elizabethan" type outside and an elegant Italian within;—a little stiff and raw at present, (not yet fit for full occupation) but likely in three or four centuries of good usage to tone into a very pleasant and servicable memorial of the nineteenth century. Part of the grounds laid out with artificial rockwork and a lakelet,—the native rock all transported to its present position, peeping out an inch or two at its edges through the green turf—a most artistic work of deception (it did deceive). The church in no way remarkable, built of the local brown rag in the thinnest of courses, almost like roofing tiles, not pointed up to the face: a good Rectilinear font-cover and a very thorough restoration. A little drive brings us to Castle Rising, with its well-known west and south fronts of late Norman date, in quite youthful preservation; the whole church, indeed, in good condition, and evidently the subject of much healthy pride and care-taking. Trinity Hospital, for twelve "unmarried" sisters,—where enough spinsters cannot be found, widows being accepted on the *cypres* principle,—detains the party a little, unaltered as it is since founded.—*Temp.* James I. It furnishes its inmates with lodging, and a stipend and other blessings, and also with a costume doubtless well-fitting ten generations ago; though the steeple-crowned beaver, perhaps the rest as well, would certainly not be wisely retained in paying a visit to witch-fearing Manningtree. The great big castle-keep stands on the steepest of banks—out so steeply as to be difficult to mount—a height of courtesy for

the good of certain visitors, in contrast with the watery welcome usually provided, but not to be found here. Painters may find plenty of bits to their hearts' wish in the ruined, roofless bulk; and architects may see how here, as elsewhere, a plain almost unbroken wall was compossible with, if not absolutely in itself producing, great grandeur and dignity. After this we return to Lynn,—and break off for the present.

TO, AT, AND FROM BERLIN.*

STRASBURG.

THE Arsenal at Dresden we were able to see very thoroughly, through the courtesy of some high officer who chanced to be present when we arrived. He was walking with another person,—a petty officer, but big man,—when Katscher accosted him, hat in hand, and explaining we were foreigners who took great interest in such things, begged permission to take us through portions of the building not usually shown. He immediately consented, and more than this, sent the sub-officer who was in attendance on himself to conduct us, evidently giving him instructions to explain everything: for most obliging, good-tempered, and intelligent we found our new guide to be. We again saw rows and rows of captured French cannon, and besides these we were shown invalid carriages, with the mattresses used; ambulance carriages and their interior fittings; gun-carriages, the arrangements for seating the gunners, and their little square cushions; field forges; cooking apparatus; and then, on an upper floor, all the requisites for three or four field-batteries, everything in perfect order (even to ropes, pulis, lanterns, &c.), ready to take the field at a few hours' notice. One battery that had been much used and injured during the war was having all its damaged portions replaced by new. In another apartment were piles of *Chassepots* just as they had been picked up on the field of battle, excepting that the metal parts had been greased to prevent them from oxidising any more. There were long racks of needle-guns; one perfect one was taken down, and the lock opened, to show us how the needle acted, and, lest we should not quite comprehend the mechanism, this was done twice over. Other long racks contained needle-guns damaged in the war, the bayonets bent and twisted out of all shape by the balls; in one instance the wooden stock was completely broken in two, and only hung together by the leather sling strap beneath. I wonder what became of the poor fellow who carried that gun when it was thus shot to pieces!

Outside the Arsenal a file of French prisoners was standing receiving, or delivering up, the tools (spades, mattocks, and so forth) with which they had been working or were about to work; close to them stood a long row of new-looking guns, prisoners likewise. Returning to the hotel, we came upon another batch of prisoners, about a hundred, who had been marched into the town with a provision wagon, to carry out the day's allowance of food to the palisaded prison-encampment described in my last. It is said that when the French were first interned here they were extremely dirty in their habits, utterly repudiating ablutions of all kinds. Upon being asked, after some time, if they were well treated by their captors, they replied, "Oh, yes; we've only one thing to complain of; these horrid Germans will make us wash ourselves." Thinking and talking over the half-million of prisoners taken, I was puzzled to know how they could have been clothed for so many months so as to preserve their identity,—for, of course, the materials used in German uniforms are utterly different from those of the French: on inquiry, I learned that such immense stores of military cloth, and also of clothes, had been captured at Metz and Strasburg that there had been no difficulty in keeping them well supplied with their national army-costume; so the "red breeches" are apparently as flourishing as ever, and have, doubtless, frequently made their wearers unobscurely conspicuous.

About a mile from Dresden lie the fields that were the scene of the French bombardment just before the retreat of Napoleon I. to Leipzig, to fight the, to him, disastrous battle which was the beginning of the end.

The tiled house-roofs in and around Dresden are so quaint, they must have a few words of comment. They usually have tiny little dormer-windows in them, mostly only one small

pane of glass high, and two, or sometimes three, long; no projection to speak of is made, for the window is not built out as with us, but the tiles are laid straight along the roof, and just waved up, so to speak, over these tiny windows. When there is the very usual number of two windows in a roof, the effect is quite laughable, for the tiling looks just like eyebrows, the windows forming the eyes beneath. We always called them "those eyebrow roofs."

Another less amusing custom of these worthy Germans is, the great extent to which they use dogs as draught animals. In Berlin especially, where our windows looked on to the principal thoroughfare, we continually saw dogs dragging tolerably large carts filled with vegetables, bread, milk-pans, and such-like, and occasionally even with pieces of furniture. We judged the loads much too heavy for the poor teams, particularly during the hot weather; it was very painful to see the poor beasts lie down on the pavement directly the cart was stopped, and pant and pant, with tongue lolling out of the mouth. We remarked upon this to some one, but were assured the animals did not mind it at all; and that their usefulness made their owners take much more care of them, and feed and treat them far better than they would otherwise do. Possibly; but we "hold the same opinion still."

Tourists usually devote at least two days to an excursion into the so-called Saxon Switzerland, before leaving Dresden. From all accounts this is a most delightful little trip amongst lovely scenery; but we had two irrefragable reasons for not making it, namely: want of time, and want of fine weather.

At 5 minutes before 4—3.55 that is, which sounds so much earlier!—we had to get up the morning we left Dresden, for the train started for Frankfurt at 6 o'clock. Our nice guide, Katscher, accompanied us to the station to start us off comfortably, and seemed quite sorry to part from us. At *Coswig* station, a man on the platform, a lounge, had his hair frizzed out at the back in Raffaellesque-chignon-fashion that looked so peculiar: "A *propos* of the name of the place," said one; "Coswig."

Approaching *Leipzig*, flowers, so singularly absent in Prussia—with the exception of the blue corn-flower,—begin to appear: bright rose-coloured stocks of most lovely hue, roses, and others; besides the numerous wild flowers with which the fields are literally covered, and which are truly charming. Arrived at Leipzig Station, we had to wait an hour and a half to change our line of rail. The University, founded 1409, is the great point of interest in the flourishing old town. Other noteworthy objects are,—the town library, containing some rare books; Auerbach's cellar, in which Goethe laid a scene of his tragedy of *Faust*; the grave of Gellert, the poet of the Königsbans, where Napoleon I. stayed during the battle of Leipzig,—October 16, 17, 18, and 19, 1813,—and in which he had his last interview with the king. Marshal Schwarzenberg died here 1820, and a large monumental block of granite was raised to his memory on part of the battle-field. A bronze figure in honour of Hahnemann, the homoeopathist, is erected on the Theater-Platz.

At *Weissenfels*, the next station, Napoleon slept the night after the battle of Leipzig. *Hierher* was brought the body of Gustavus Adolphus after the battle of Lützen (November 6th, 1632), to be embalmed. It had eight wounds. His widowed queen came here to receive it. The heart only was taken to Stockholm. At a later battle of Lützen, fought on the 2nd of May, 1813, between Napoleon and the allied armies, General Scharnhorst, of Prussia, was killed. A curious effect is produced along some portions of the route by the long lines of dark poplar-trees planted at short distances on each side of the roads, stretching across the country for many miles, and looking at a distance like long rows of gaunt, black, silent sentinels.

At *Gotha* Station we were thankful to find some food awaiting the passengers: excellent roast beef and veal, with *et ceteras*; and though somewhat in the rough-and-ready style, yet with clean table-napkins and table-cloth. We were told we had "*swanig minuten zu erwarten*;" but the train drew up on the centre rails of a large station, ever so far from the platform: so it was a *rush*. The country from here becomes very picturesque, shut in by a high range of thickly-wooded, bold hills. Gotha is a revered name to Englishmen, from grateful memory of their late, lost, and still lamented Prince Albert of Saxe-Coburg and Gotha.

* See p. 621, ante.

Bisenach is charmingly situated on a level plain at the foot of the Wartburg, with the title of that name perched on the summit. In a castle Luther was confined by his friend the prior of Saxony, who had him seized in the Wittenberg Forest, as he was returning from the lot of Worms, May 4th, 1521, in order to rescue him from the prelates whom he had offended by his bold speaking, which had brought down on him the excommunication of Pope Leo X. *Bisenach* must be a delightful place at which to take a short stay, for its beautiful hanging woods present most enticing paths for rambles on foot or horseback.

At one large station, of which I did not see the name, was drawn up a train full of Prussian soldiers on their way home, packed together very closely in the vans. People were giving them farewells by hand; then waiting to see that they were sufficient for every man to have one. Several picturesque old ruins are perched on high points on each side of the railway throughout the hilly range of country, and presently *Fulda* reached. The town seems large; and, from the railway we could perceive two interesting, altar-looking churches. Soon afterwards the long avenue of tall poplars, similar to that marked at Weissenfels, appears; but soon comes a cruel break made in it by the railway, the line cutting across the avenue. Clear is the enemy, it runs on again for a long distance from the town; then, making a wide semicircle, it almost comes down upon the line again, stops short, as if dreading the re-encounter. For three hours until now we had had nothing but mist and fog, which entirely shut out all distant objects from our view; now they came into heavy rain, which was still more agreeable, as it compelled us to shut up the windows.

At *Elm* the storm of wind and rain had become perfectly terrific, and the noise on the bridge-roofs was stunning. The train ran into a station, and then backed out on to a line much lower level, descending by a steep "incline." From *Steinau* a splendid rainbow accompanied us, in perfect semicircle, and with arches of reflected and reversed colours. The scene brightly on the right, and blue sky ahead before us; and soon we came upon another river, which was, however, quickly brought to an untimely end by the inimical way.

At *Gelnhausen* a strangely-constructed church tower, which looks just as if it were surmounted by two or three Kentish out-houses. It is called the *Pfarr-Kirche*. Its tower and cupola, as if twisted by lightning. It was built at 1210 to 1220, and shows the transition from *Round to Pointed*, and the introduction of the latter style into Germany. Ruins of *Barnes's Palace*,—1144,—still exist on an island between the *Kinzig*, and exhibit traces of *Byzantine*. Before reaching *Hanau* Station is the battle of October 30 and 31, 1813, where Napoleon, coming from Leipzig, cut his way through the *Austrians* and *Aussians*, on which occasion a million, seeing the German infantry hard pressed by French cavalry, suddenly let the river into his mill-dam, and thus cut off the French. A very Rhinish-looking tower is seen from *Hanau* from the railway.

We arrived at *Frankfurt* a little after eight o'clock (having had a day's journey of more than twenty hours), and drove to the comfortable *Hotel de Russie*. During the evening a thick fog strode along the street obscuring the scene, and dimming the gas-lamps; and the morning the atmosphere was dull and foggy. We drove away to the railway at ten o'clock, passing under a handsome temporary triumphal arch, consisting of a large building in the centre for carriages, and a small one on each side for foot-passengers. On the way was placed an excellent standing figure of *Henry*, holding out a laurel-wreath in each hand towards the returning troops.

Spacious, tall flight of broad steps leads up to the railway station, and on this occasion, the station itself, were crowded with people jostling throng of eager, arriving and departing, travellers. At the foot of the steps, jumping hopelessly up to the top of the flight, and a poor wounded soldier on crutches, his head bound up in thick rolls of rag; he was accompanied by an elderly working-man in a top hat, but both saw it was utterly useless to attempt the ascent of the steps without further assistance. They stood there several minutes, gazed about by the crowd, and I was beginning to wonder what could be done for the poor fellow,

when a tall, stalwart Englishman, or American, with a young wife, who was standing beside me, also looking on, suddenly threw his wife's *Stout-plaid* across his shoulder, ran down, and, taking hold of the poor fellow under one arm, and the countryman supporting him under the other, they managed between them to get him up the cruel steps, but not without sad agony. I fear, to the wounded limb; the poor creature looked so pale and suffering when he reached the top step, as he sighed out a grateful "*Ich danke Ihnen*" to the good Samaritan, who patted him gently on the back, saying,—"*All right, old fellow!*"

At *Darmstadt* we saw from the station, again a triumphal arch, and, beyond, a long road gaily decorated on each side with masts covered with flags and garlands. Soon after we passed an immense train filled with artillery. The national colours here are black, red, and yellow. The "good Samaritan" and his wife were our travelling companions, and we had much pleasant chat. A very fine range of castle-crowned hills runs along the country from *Darmstadt*, and forms the eastern boundary of the *Rhine*. The *Odenwald* throughout is extremely picturesque, and its beauty was heightened to us by a tremendous storm of rain, followed by a gleam of sunshine; the effect of the heavy storm-cloud, caught and held fast among the many slopes of the mountains, was extremely grand. At *Darmstadt* Queen Victoria has built a palace for her daughter, the Princess Alice, and her husband, Prince Louis of Hesse, at the cost of 20,000*l.*

Zwingenberg Station, and, overhanging it, the *Melibocus* Wood and *Belvedere*. The *Melibocus*, called also *Malochen*, is a conical hill of granite; there is a fine view from the summit, and a delightful walk over the *Felsberg* to *Felsenmeer*. A gigantic column, of unknown origin, lies near the *Jeghhaus*; also an incised *Riesenhalt*—giant's altar,—bearing marks of the saw. A suggestion was made to erect the column on the field of *Leipzig*; but how? Not far off is the *Castle of Rodenstein*, the scene of the *Wild Huntman* legend. When he and his fellows are heard and seen, evil to Germany is sure to follow. On the heights above *Weinheim* rises the castle of *Windeck*, with round donjon tower. At *Friedrichsfeld* Station the Prince of Wales saw the Princess Alexandra for the first time. On the left stands the ruined castle of *Strahlenberg*. Under the *Königsstuhl* lies *Heidelberg*, but having already twice visited this interesting town, with its romantic castle and delightful surroundings, its river *Neckar* and its verdant fields, we on this occasion merely recognised it familiarly—as one does with an old friend,—and passed on. There is very little to interest hurried travellers in the flat country that extends south of *Heidelberg*, and the wretched weather rendered it even more idea-less to us; but at *Darbach*, an old ruined castle, with bold watch-tower, rises proudly from the *Thurnberg*.

Carlsruhe.—Charles's Rest,—a former hunting-seat of the Margrave Charles, of Baden, has a handsome railway-station; but which, with its other objects of note, is too well known to need comment here. *Rastadt*, now a strong fortress, is the next important place passed; when, on the left, is seen the château built by *Sybilla*, wife of *Louis* of Baden,—he who, with Prince Eugene fought against the Turks. In her youth *Sybilla* was very worldly-minded and frivolous; but in her later years, she became an ascetic, and would seem to have lost her reason, from the strange things, doubtless meant to be very pious, which she was accustomed to do. At *Oos* the little Baden railway branches off; and here the "good Samaritan" and his young wife left us, to spend three days in the pitiless rain at a place which most especially needs sunshine and bright cheerful weather! On the left the *Castle of Yburg* is presently seen; and at *Steinbach*, which lies at the foot of the hill of *Yburg*, *Erwin* von *Steinbach*, the architect of *Strasbourg Cathedral*, was born,—I do not know in what year, but he died in 1318. At *Appenweier* the railway turns to the right, towards *Kehl*! Oh, what a world of interest, excitement, fear, hope, dismay, and triumph centred around that little town and its blown-up bridge this time last year! And with what eagerness did we now crane our necks out of the windows, to see everything that could possibly be brought within our ken, as we slowly steamed across the bridge. Its iron lattice-work lay a tangled mass on the border of the *Rhine* below; its stone

parapet was all bruised and shattered; and its roadway, where, injured, was replaced by beams of timber. But the railway-station itself, and the houses near it, what a wreck! Roofs gone, side walls shot clean away, not a vestige of a window to be seen, save the gaunt, gaping holes; while the fresh-looking stonework of many of the buildings made the ruin everywhere still more noticeable as it impressed one so sensibly with the fact that force, and not age, had worked all this wreck and desolation.

The railway to *Strasbourg*, like that to *Verona*, takes an immense sweep, encircling the city: this arrangement is doubtless very satisfactory in a strategic point of view, but is particularly annoying to travellers weary of their long journey, and eager to arrive at their destination in time to see some of the deeply-interesting, though dreadful, effects of the late bombardment, before nightfall. *Strasbourg* Station had somewhat "risen from its ashes," so far as clearance went; but the scarred walls, blistered paint, and broken lamps, here and all around, still attested the havoc that had prevailed. Hastening to the *Ville-de-Paris*, we secured beds, deposited our luggage, and then took a drive "*pour voir le bombardement*," (in the familiar phraseology of the young sandy-haired commissionaire of the hotel, who was habited in a wondrous livery of green and yellow). According to our computation, about a twentieth part of the town has been destroyed; but of this part the utter wreck is fearful. To say that "not one stone stands upon another," gives but a faint idea of the jumbled mass of rubbish that encumbers the ground where stood rows of fine houses before the outbreak of the war; the stones are crumbled into morsels; bricks and mortar lie piled up in indistinguishable heaps; iron bands, pipes, and what not, are twisted, wrenched, and given into indescribable contortions; and the wood-work of the houses, even to the beams and joists, has utterly vanished. This latter circumstance was accounted for by the fact, that the shells set fire where they fell, burning everything combustible within reach; and the sad scorched and smoked appearance of the walls, where left standing, all around window openings, attest the fierceness of the flames that raged within. The *Marais Kageneck* and the *Faubourg de Pierre* are the most utterly shattered portions of the town. Passing out of the *Porte de Pierre*, and gazing upward at the massive walls and fortifications, one is astounded at the force and perseverance that must have been brought to bear upon them, thus to pound away their stubborn casing into the useless rubbish lying at the bottom of the deep ditch. "The breach was all but practicable," some say; others aver that General *Uhrich* might have held out still longer. I greatly wished to know the opinion of the townspeople themselves; but, even at this lapse of time, it seems so much undecided as ever. One gentleman said, "We might have gone on fighting, but we had nothing to eat, no meat, nor vegetables; we had plenty of flour, it is true; and we might have eaten the horses; but what then?" He and his wife had had to change their abode four times, having their first home literally tumbled about their ears. Madame, a very charming person, speaking several languages, was German by birth, but all her sympathies were for France; her husband was French. When I remarked how sad it was such a fine library as that of *Strasbourg* should have been destroyed, she replied, "Yes, but why should it have been so? If we had a bad Emperor, that was not our fault; why should they fight us? Never before was a town so bombarded." I thought it was convenient for her to forget what her adopted countrymen had done to almost every other civilised nation; but of course I held my tongue, and only remarked, "But why were not the books, manuscripts, and other treasures removed into the cellars when the Prussians came so close, and when they threatened to bombard the town?" "Oh! we never thought they would do it," she replied. Just the same false security that has all through been the ruin of France! The gasworks, it may be remembered, were among the first of the large buildings destroyed by the German shot and shell; being situated close to the walls, they were utterly annihilated. We went to see the works, but the incessant rain prevented us from going over them; so we had to content ourselves instead with a long chat with the gentleman who superintends. As is well known, the *Strasbourg* gasworks were founded, and are con-

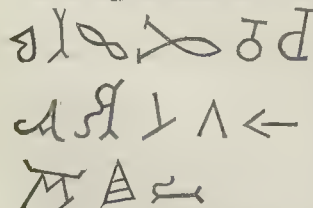
* A View of it will be found in the *Builder*.

ducted, by an English company. When the Germans had gained possession of the town, and were endeavouring to re-establish order, they felt that one of the first necessities was to have the streets lighted; so they sent to the gas-director an imperative request to that effect: he, nothing daunted, replied that that was utterly impossible; for the Germans had destroyed all the works, and had taken the workmen prisoners, they having had to become soldiers during the siege. Of course the commandant, being a German, was equal to the occasion. "One of my staff-officers," said he, "is a gas-engineer; I will send him to you with as many men as you require," which he accordingly did, and now the poor ruined gasworks are rapidly rising, Phoenix-like, from their ashes into a new existence.

The cathedral is thought by the Strasburghers to be badly damaged; perhaps the fact that the Germans have taken possession of it, is considered by them as only a trifle less horrible than if it had been actually razed to the ground; but I must confess that to stranger eyes it looks, externally, much as it did eight years ago. When the effect of the balls was pointed out, one could of course perceive that here a statue had lost an arm or leg; there a long piece of parapet was shot away, and, farther on, the mullion of a window was splintered; yet, as I said, these misfortunes were not very noticeable to the eyes of strangers. But on going within the beautiful edifice, we were greatly grieved to see the fearful gaps—now closed by boards—and numerous speckings all over the grand coloured glass of the windows. The one most seriously damaged is in the clerestory of the nave, immediately facing the organ. The large cinque-foil in the head of this is entirely shot away, and great damage is done to other portions of this and the neighbouring windows. A horrible "boom"—a huge pointed cartridge—came crashing through the glass, flew across the nave of the cathedral, and, smashing in the organ-pipes—lodged in the organ itself; here, wonderful to tell, it remained without exploding! Had it burst, of course annihilation of not only the beautiful organ, but also of great part of the cathedral itself, must have been the consequence. The custodian of the tower has had the dreadful missile mounted on a foot of marble, and on it is fixed a brass plate telling the day, or rather the night, month, and year, when this fearful hail of iron and fire fell on the devoted town. The organ-pipes have not yet been replaced, but white linen blinds are drawn down over the crucial gaps. More than half of the organ is so covered, thus showing the extent of the damage done.

The marvellous mechanical clock is apparently uninjured; a large crowd was gathered before it at mid-day as of old, to witness its various performances, the only difference being that about half the spectators were Prussian soldiers. At the same time, service was going on the other side of the crimson curtain drawn across the arch of the south transept; the organ played at intervals, and ever and anon the harmony was enriched by a grand, yet sweet and subdued, military band. The high-soaring, swelling, and sustained strains of sacred music, proceeding thus from unseen musicians, had a strangely unearthly, holy influence on the mind and heart. I never remember experiencing anything more touching, more soul-elevating.

The window immediately above the aforesaid clock has likewise suffered severely from the German shot, but not to the same extent as that in the nave; still, several planks are required to cover the holes in the glass, and a large piece of the stone frame at the side is gone. In an account of Strasburg Cathedral, in the *Builder* for the year 1863, many of the interesting masons' marks thickly scattered on its walls are there shown; on looking through them, I do not see the following, and therefore send them to



add to the list. They were copied from the outside wall, under the glazed, temporary, shed-like entrance on the north side.

On the balustrade to the pulpit-stairs is sculptured, as centre to the open quaterfolds, a row of half angels bearing scrolls; on the scroll of the first is the date, in old Arabic numerals,

1-2-8-7.

On that of another, the same date in Latin numerals,

an cccc lxxxvii

but there not being any more space on the scroll (the "V" coming quite to the edge where it bends under), the double "I" is obliged to be omitted. On a larger scroll, under the pulpit, is again carved

1287.

The simultaneous use of both sorts of numerals seems to me particularly interesting, as showing, what the *Builder* has before remarked, that the Arabic did not come into general use earlier than the middle of the fifteenth century.

From the church to the burial-ground seems a "natural progression." It will be remembered that during the siege the Strasburghers were unable to use their cemetery for interment, and therefore appropriated the Botanical Gardens for the purpose. When we drove round, *pour voir le bombardement*, we were, of course, taken thither. A party of friends of a deceased person had just come to fetch away the corpse for reinterment elsewhere.

There is, I should say, from what we saw, scarcely a house in this capital of Alsace which does not bear some mark of the fearful *pluie-de-fer* that rained on the town for three days and nights. Deep dents are seen in the asphalt pavement where shells have fallen, and the houses near are all pitted and scarred by the fragments that were scattered thickly around as they exploded. Patches of new tiles on roofs, chimneys partially or wholly rebuilt, streaks and daubs of new mortar on old walls, these are among the signs of trifling repairs. The least important damages seem to have been first set to rights, and after that the more serious ones were taken in hand. Some of the small shopkeepers are carrying on their more-than-ever-needed trades in hastily-patched-up ground floors, with the upper portion of their abodes in the terrible state of ruin, frequently windowless, and with great holes in roofs open to the weeping skies. Two bridges over the river, which look like twins, so much alike are they, appeared to have had their open stone parapet shot away by one shell, which, skimming along the short space between them, may have shattered both with one stroke. The handsome library, so much deplored for the loss of its invaluable collection, is a roofless shell; its fine window-arches are shorn of their mullions, and its treasures lying an indistinguishable calcined heap within. A bronze statue, which stood in dangerous proximity to the river and the walls, has several large shot-holes clean through it: one on the left cheek, and two on the right leg, passing through the drapery at the back. This statue bears on its pedestal, "Le Département du Bas-Rhin à son ancien Préfet, Marquis de Lezay-Marnéfié. — 1810 à 1814. Décret du 3 Décembre, 1863."

Our hotel, — the *Ville-de-Paris*, — seemed so neat and orderly that I inquired if it had received any damage during the bombardment, and was told that the glass in every window of the building had been more or less smashed, and that four rooms had been entirely burned out, walls, beds, and everything. The commandant of the town, General Hartmann, was residing in the hotel, and on Sunday morning a military band came and played under his windows for about half an hour, commencing with some beautiful hymn-like melodies, then playing operatic music, and winding up with waltzes and marches. Our national anthem, which we call "God, save the Queen," is, I am told, the national air of Hesse also: which would be an additional reason why it was played in Berlin during the triumphal entry of the German troops.

The following morning we started for Metz; but the notice of that part of our journey must be reserved till next week. H. F. H.

INTERNATIONAL EXHIBITION AND WORKING MEN.

Sir,—Will you allow me, as a working man, to protest against your correspondent "Jack Pine" and other treating working men as paupers. A similar tone was adopted by Sir C. Trevelyan at a meeting lately held of the Working Men's Clubs in Exeter Hall. That gentleman delivered an address that must have been prepared for the Society for Organisation of Charitable Relief, so patronising and insulting to the independence of working men were the terms used. But, in reference to the exhibition, the thoughtful portion of the working men who take an interest in exhibitions of this kind are quite willing to pay one shilling if they are in work; if they are out of work they do not want to go. All that is required is, that the Commissioners would keep the Exhibition open Mondays and Saturdays till nine or ten, and thus enable those who have the half-holiday to spend four or five hours in the Exhibition. JOHN BLUNT.

THE CENSUS.*

THE preliminary report which was lately published refers to the population at home on the census day.

As it was evident that the 2,197 registrars in England could not enumerate the population in one day, the kingdom was divided into 32,606 districts, to each of which a special enumerator was appointed. Each enumerator was paid a fee of 1l. 1s., instead of 1l., paid on the census of 1861; and 2s. 6d. instead of 2s. for every 100 persons enumerated over the first 400. For their services the enumerators received 53,919l. 15s. 6d. The whole of the local officers employed have been paid 78,299l. The enumerators all sent in their books in time.

The 32,606 enumerators had districts of less than two square miles in area, containing 131 houses, and 696 people on an average; but the size, and the numbers of the people, in these districts varied greatly. A wide moor, with sixty-four people and a few scattered cottages was a district populous enough for one man while in London one enumerator counted 3,599 souls, another 3,860, and a third 4,800. Enumerators were allowed to appoint authorised assistants in certain cases.

The Number of Acres, Inhabited Houses, and Population in England and Wales to an Average Registration District, Registration Sub-district, and Enumeration District.

	Acres.	Inhabited Houses.	Population.
England and Wales	37,324,583	4,269,032	22,704,108
To one average district.....	60,529	6,793	36,211
To one average sub-district.....	16,939	1,930	10,353
To one average enumerator's district.....	1,146	131	696

The enumerated population of England and Wales living at midnight on April 2nd, 1871, was 22,704,108 souls.

This is an increase of 2,637,884 over 18 numbers living at the last census, and exceeds the expectations of the reporters. For the increase from 1861 to 1871 was 2,138,816, and the rate of increase was 12 per cent. in the ten years that ended in 1861; whereas the rate of increase in the last ten years has been 13 per cent.

To the above numbers the army, navy, and merchant seamen abroad have to be added, and the numbers and proportions appertaining to England and Wales are known. Foreigners now numerous in England, are a set-off against the numbers of Englishmen of other classes abroad.

The population of England and Wales home in 1801, when the first census was taken, was 8,892,536; and the mere increase of Englishmen since the year 1831 is very nearly equal to the whole of those existing in the year 1801, when the country was engaged in the great conflict with France, and with the armed sovereignty of the north of Europe.

The urban districts have in the last ten years grown more than twice as fast as the country districts: they contain 12,900,297 people, a increase at the rate of 1-67 per cent. annual by birth and immigration. The rural districts have also grown more rapidly in population than at the '61 census, but this implies that many of them are assuming the character of towns. Including the small towns and country parishes the population of the rural districts is 9,803,811.

* Census of England and Wales, 1871: Preliminary Report and Tables of the Population and Houses enumerated in England and Wales, and in the Islands of Great Britain, on April 3rd, 1871.

The number of women and girls enumerated was 11,663,705; of men and boys, 11,640,463; there was an excess of 633,302 women and girls in England and Wales on the census night. The men may be added a certain number on board in the army, navy, and merchant navy, which may be for the moment estimated at 149,254. By adding this number to the males, they become 11,889,657; and the disparity reduced to 474,048.

The following table shows at a glance the population of the whole of the British Isles, including Scotland, as well as England and Wales, Ireland, the Isle of Man, the Channel Islands, &c.:-

	Area in Acres.	Population on April 3rd, 1871.			Proportion percent of the Population residing in the several parts of the Kingdom.
		Persons.	Males.	Females.*	
United Kingdom	77,513,595	31,817,108	15,649,271	16,267,837	100·0
England	32,599,397	21,487,688	10,437,053	11,050,635	67·5
Wales	4,734,436	1,218,420	613,353	605,070	3·8
Scotland	19,649,377	3,338,613	1,611,633	1,726,980	10·6
Ireland	20,332,641	5,432,750	2,634,133	2,798,617	17·0
Isle of Man	180,000	53,397	25,691	28,176	·2
Channel Islands	46,634	90,563	47,223	50,340	·3
Army, Navy, and Merchant Seamen abroad	—	207,193	207,193	—	·6

Should the present average rate of increase continue, the population of the whole kingdom will be doubled in fifty-six years. The rate was as between 1851-61 than it had been between 1841-51; but it has now again risen to 1·24 per cent. per annum, or 1·38 per cent. in ten years. The natural rate of 1·173 a day at which the population increases, 468 emigrate, and 705 go to swell the population at home. In the last twenty years the nation has strengthened itself by adding 4,000,000 to its numbers, while, at the same time, it has sent out almost as many more millions to the British colonies and British America.

The following table gives the number of houses, inhabited, uninhabited, and building, in England and Wales, in 1871 and also in 1861:-

Date.	Houses.		
	Inhabited.	Uninhabited.*	Building.
1871 (April 3rd)	4,259,732	280,178	37,897
1861 (April 8th)	3,845,555	184,894	27,306
Increase between 1861 and 1871	519,527	75,484	10,592

The term "uninhabited" is applied to houses in which no person dwelt or slept on the Sunday night preceding the enumeration. In towns many of the houses were occupied for business purposes during the year.

The enumerated population of London on the night of April 2nd, 1871, was 3,251,804. But this is not only a part of London; its population, in intimate fusion and close relation, has overflowed these bounds; and, within the radial lines of the Metropolitan Police District, drawn from 12 to 15 miles around Charing-cross, the population is 3,883,092. This embraces, indeed, several towns, and covers 687 square miles, equivalent to a square of territory of 26½ miles the side. Beyond these limits men reside no visit London daily; and this will partly account for the rapid increase of Tunbridge, Hastings, Brighton, and other outlying places. The police circle round Charing-cross, however,

contains all that can be reckoned as properly within the limits of London; and is indeed too extensive for a natural boundary. For many of the parishes within the police district are entirely rural, and are quite sequestered from the great city. To the eye, from Holwood in the south, near the source of the Ravensbourne, and by the ruins of an old Roman city, the dome of St. Paul's and a thin cloud of smoke are almost the sole signs of the millions living along the valley of the Thames. The larks and the night-ingales sing in the surrounding glades; while around all the railway stations houses are springing up; and at several points are large towns, of which Croydon is an example, chiefly bound

THE ERECTIONS OF CONCRETE AT WEST BROMPTON.

A FEW weeks since some particulars were given in the *Builder* concerning the use of concrete, upon a large scale, for the walls of several spacious structures that are being provided at West Brompton for the accommodation and repair of the rolling stock of the Metropolitan District Railway Company. A serious accident, that might have been foreseen, occurred not long after the commencement of the works, in the fall of one of the walls. This arose from the use of unprotected blue lias concrete for the foundations, and of concrete in Portland cement for the upper walls. The ground had to be made up to about 3 ft. above the natural level, which had not been done when the wall was erected; but even although it had been, adequate support would not have been afforded to the foundations by the "made ground," the lias taking so much longer to set than the Portland concrete does.

Satisfactory progress with the works may now be reported. The boundary-wall, about 300 yards in length, 7 ft. high, and 10 in. thick, has been completed, and seems as hard as if it had been finished for a year. More severe trials from alternate contraction and expansion, through atmospheric changes, may be awaiting it than it has sustained as yet; but hitherto it has shown no symptoms of bulging or cracking, and is, throughout its entire length, plumb and solid. With the more extensive and important erections in concrete great progress has been made, two of the three blocks being roofed in, and the third being in a forward state.

The premises will be entered by engines and carriages from the direction of Hammersmith-road Station on the north-west. The first of the buildings reached from the line is the running-engine shed, now very near completion. The shed will have four lines of rails, and has four arched openings at each end for the ingress and egress of the engines. The pillars between the openings are 3 ft. square, on foundations of lias concrete, which are carried across the whole width of the building at each end. It may here be mentioned that the lias concrete is not in any portion of the works carried above the natural surface of the ground, but is packed solidly into the trenches that were taken out for the foundations. These are 3 ft. 6 in. thick, and for other 4 ft. in height the walls are of Portland concrete, 2 ft. thick, of the proportion of 4½ to 1, the proportion for the upper portions of the walls being 7 to 1. The lias concrete is of the proportion of 5 to 1. The side walls of the running-shed are divided into eleven bays by pilasters of about 3 ft. broad, projecting 6 in. upon the face of the walls, which gives a thickness of 2 ft. of wall at these strengthened portions; the thickness of the walls in the panels, between the pilasters, is uniformly 18 in. The gables of the running-shed are at the ends of the building, and the principals are set longitudinally, supported by iron columns at their feet, under the gutters of the cross roofs. The tie-beams are 10 in. by 4 in., and the parlines 6 in. by 4 in., 3 ft. 6 in. apart, and covered with 1 in. slate boarding. The running-shed has a skylight carried along the whole length of the building at the crown of the roof, 10 ft. wide on each side, and open at its under edges for ventilation. The gables of the running-shed are 32 ft. high above the rails. Side-lights in the shed would, we venture to think, have been an improvement.

The second block of building, which is least advanced, includes a repairing-shop, a tool-shop, and a smith's shop, the whole length of the building being 239 ft. It has five gables on each side, the two that belong to the repairing-shop being 40 ft. high above the rails. The three gables of the adjoining shops are 29 ft. high. The repairing-shops will be connected with the running-shed by a traverser, and will have four lines of rails.

The third block, which may be pronounced complete, the roofs inclusive, is the carriage-shed, which is 280 ft. long, and will have five lines of rails. In addition to the continuous ventilating skylights along the crown of the roofs, this building is lighted by a range of fifteen windows, 10 ft. by 4 ft. 6 in., of cast-iron, with semicircular heads. The openings are cleanly formed in the concrete, and the use of timber is entirely dispensed with, the windows being held in place by lugs cast upon their

to London by the daily intercourse of their populations.

On the census night the population within the municipal limits was 74,732; within the tables of mortality, 3,251,804; within the Parliamentary boundaries, 3,008,101; within the limits of the Metropolitan Local Management Act, 3,264,530; within the London School Board district, 3,265,005; within the police circle, 3,883,092.

The population within the City has decreased; the population within the tables of mortality has gone on increasing, at a decreasing rate, because the building area is limited; but the actual population within the 12 to 15 miles radius has increased rapidly and steadily, or rather at a slightly increasing rate. The increase is now going on within that wider area at the accelerated rate of 1·88 per cent. per annum, and shows no sign of abatement.

The population of the ring round the district of the Metropolitan Board of Works has increased 4·19 per cent. per annum, or more than 50 per cent. in ten years, and there being no adequate provision for the sanitary purification of this area, which is shut out from the system of sewers lately created, it is in imminent danger.

"Looked at in any light," remark the reporters, "the magnitude and growth of London are marvellous; and the causes invite the careful scrutiny for which the subject analysis of the facts collected at the census will serve as material. It has endured many struggles since its first obscure origin; it was not accepted without trial as the capital of the kingdom; at every increase it had to encounter some fierce epidemic; pestilences of various kinds infested it; the black death did not spare it, nor the sweating sickness; great plagues pursued it through the seventeenth century; great fires burnt down its combustible dwellings; Queen Elizabeth endeavoured to stop its growth, so did the first Stuarts; it was long left imperfectly supplied with water, light, police, government; its air was soiled with smoke; its sewers as first were badly made, and then cesspools were discharged into the river from which its waters were drawn, and thousands died of the last Asiatic plague; it was prized by Shakespeare and Milton, but Cobbett nicknamed it 'The Wren,' Price called it one of the graves of mankind, and the State showed it no favour; yet here, unsurpassed by any city in health, full of riches, and rich above all things in men, in the year 1871 she stands by her river, her railways, her public edifices, her grand embankment, her magnificent bridges, the Queen City of the world."

The following table gives—

The Number of Houses and Population in 1861 and 1871 within the Limits of the London School Board District.

SCHOOL BOARD DIVISIONS.	1861.		1871.	
	Inhabited Houses.	Population.	Inhabited Houses.	Population.
City of London	13,294	112,268	9,319	74,974
St. Giles	24,440	173,615	34,658	257,390
St. Paul	44,167	394,931	49,749	431,321
St. Andrew	28,196	198,442	37,152	235,653
St. James	41,155	311,152	49,410	362,427
St. Mary	68,934	390,155	75,514	637,345
St. George	67,519	455,353	58,079	518,538
St. John	25,659	183,693	26,941	217,235
St. Peter	44,155	336,693	51,322	391,568
St. Martin	26,550	256,597	25,639	218,166
Estimate	360,789	2,899,004	419,373	3,265,005

* Including the hamlets of Pease and Mottingham.

edges. The mode of operation in raising the walls of the running-shed was by 3-ft. lifts, which have the disadvantage of being plainly apparent in the finished work. With the other buildings the walls were carried up continuously, by the addition of boards on the side from which the concrete was worked in.

The weather, it need scarcely be said, has been for some time past as favourable as could have been desired for the prosecution of these structures. Mr. Fowler, the engineer, and his assistants may be congratulated on the prospect that they now give of fair promise to prove as successful as the other expedients resorted to in surmounting the engineering difficulties encountered in the construction of the Metropolitan and Metropolitan District lines. The works are under the direction of Messrs. Walker & Son.

A NEW SCIENCE SCHOOL FOR SOUTHAMPTON.

THE foundation-stone of a science-school, museum, and art-gallery, now being erected in connexion with the Hartley Institution, at the rear of the main building, and contiguous to the School of Art, has been laid by the Mayor (Mr. T. P. Payne). The buildings are to comprise three class-rooms for the use of the students preparing for the India Civil Engineering, Forest, and Telegraphic services. Two of the rooms will be 50 ft. 4 in. in length, and the other 32 ft. 5 in. in length, by a uniform width of 16 ft. 6 in., and 16 ft. in height; and they will be approached by a corridor on the south side, 150 ft. 6 in. in length, in communication with the entrance-corridor to the Lecture Hall of the Hartley Institution. This arrangement will be similar to that of the present School of Art. The school will be fitted with lavatory and other conveniences. Provision for ventilation has been made to each room by means of zinc tubes through the roof for the exit of the vitiated air, an upward draught being created by gas-jets, and archimedean ventilators, the fresh air being admitted by cold-air shafts, formed in the thickness of the external wall, and connected with the hot-water chambers below the floor-line, whence it will pass (slightly warmed in winter) into the rooms. On the space between the present School of Art and the proposed School of Science the Museum and Art Gallery will be erected, thus covering the whole of the land, except a portion in the immediate rear of the Lecture Hall, about 57 ft. 10 in. by 26 ft. 6 in., specially reserved for a future extension of the hall or the erection of an additional museum; and the small portion at the east end, next Back-of-the-Walls, will be kept open as a paved yard. The Museum will be 41 ft. 5 in. in length, and the Art Gallery 43 ft. 5 in. in length, by a width in the clear in each case of 20 ft., and a height of 19 ft. 7 in. to the under side of the glass ceiling. Attention has been given to the lighting and ventilation, matters of considerable importance in a picture-gallery. The Museum and Art Gallery will be constructed on the same principle, so that both rooms can, if required, be used for hanging pictures. The lighting will be from the roof. The ceiling will be covered and panelled at the sides and ends, the centre portion being formed with moulded horizontal bars and obscured glass. Above this glass ceiling there will be a skylight the whole length of the roof, raised above the level of the slates, having louvre-boards on both sides for the exit of vitiated air. Between the glass ceiling and the roof there will be gas-jets for the whole length, the object being to prevent the gas damaging the pictures, to create an upward draught from the rooms, and to provide a soft, subdued light through the obscured glass, in lieu of the glare from gas-lights when placed in the rooms themselves. Below the ceiling-line exit is provided for the vitiated air from the rooms by perforated zinc panels running the whole length. The admission of fresh air is provided for by cold-air chambers below the floor the entire length of the rooms, connected with the external air by vertical shafts in the east wall. These cold-air chambers are placed parallel to the hot-water chambers, with communications thereto at various points. The fresh air will thus pass through the cold-air chambers into the hot-water chambers (where it will be slightly warmed in winter), and through the floor-gratings into the rooms. Access to the Museum and Art Gallery will be obtained by means of a temporary passage from the corridor of the School of Science. There will also be communication

therewith from the School of Science and also from the School of Art. The whole of the buildings will be warmed by hot water from a separate boiler, to be placed below the Lecture Hall. The cost of the works, exclusive of warming, will be about 2,000l. The Government will make the usual grant towards the School of Science, which will be in reduction of the sum named. The design and estimates were prepared under the direction of Mr. James Lemon, C.E., the borough surveyor, and the contract has been accepted by Mr. John Crook, of Southampton.

"MAY DIFFERENCE OF OPINION NEVER ALTER FRIENDSHIP."

THIS ought to be the standing toast at all convivial meetings of builders, one might think, considering how remarkable their difference of opinion often is. We will give some examples from a bundle of lists of tenders sent in for works to be done at different places for Mr. G. Russell, Mr. A. J. Rouse being the architect. Thus:—

For finishing No. 7, Elgin-road, Notting-hill (quantities supplied), giving only the highest two and lowest two of seven tenders:—		
Batson.....	£750	0 0
French.....	699	0 0
R. Johnson.....	277	0 0
Gribble.....	345	0 0

For finishing No. 8, Elgin-road, Notting-hill. Quantities supplied:—		
Batson.....	£247	10 0
Lumley.....	745	0 0
Jory.....	468	0 0
Gribble.....	426	0 0

For finishing No. 21, Kensington Park-road, Notting-hill. Quantities supplied:—		
Phillipson.....	£198	14 0
Johnson.....	155	0 0
R. Johnson.....	88	10 0
Calverley.....	70	0 0

For finishing No. 35, Blenheim-crescent, Notting-hill. Quantities supplied:—		
Phillipson.....	£230	0 0
Lumley.....	550	0 0
Crook & Wall.....	390	0 0
Gribble.....	262	0 0

In the case of the new Music-hall in Edward-street, High-street, Deptford, at the West Kent Yeoman Tavern and Music-hall, Mr. Lankton, architect, the highest and the lowest run:—		
Peacock.....	£1,230	0 0
Jocelyn.....	475	0 0

And then comes one for alteration and repairs to house, No. 17, Upper Bedford-place, Russell-square:—		
Seale.....	£151	10 0
Hill.....	50	0 0

We will add as a climax a list of tenders sent in a few days ago,—

For cleansing and whitewashing the several wards, &c., of the Small Pox Hospital, Horse-paths, &c.:—		
Barber & Co.....	£226	0 0
Burrows.....	367	0 0
Reps.....	345	0 0
Nichols.....	160	0 0
Baylett.....	98	0 0

Readers may possibly think this last list a joke on our part. We can assure them, however, that it is a perfectly serious document, and that the tender at 160l. has been accepted.

THE POLYTECHNIC EXHIBITION OF 1872, AT MOSCOW.

THE programme of this Exhibition of the Natural and Physical Practical Sciences has been issued. Objects intended for the Exhibition must be addressed to the committee of the Polytechnic Exhibition, at the University, Moscow. They are declared duty-free by the Russian Government, and will be forwarded over the Russian railways at half the usual rates; for which, however, it is useful to have the certificate of the committee in Moscow, provided also that the articles are announced during the present year, and arrive before the 1st May, 1872, in Moscow.

Those persons who desire to have fuller information, whether as to the organisation of the Exhibition, or as to the special articles, are requested to apply personally or by letter to the committee of the Polytechnic Exhibition (Zoological Museum of the University of Moscow), or to the president of the Technical Section, Professor Archipoff, Pakrowska, Wiedenskaia Prédulok, Moscow.

The programme states that "the objects exhibited ought to form collections, more or less complete and systematic, of all that will facilitate the study of the practical sciences; besides

which, these collections, composed of machines and apparatus relating to all branches of industry, will doubtless attract, by their perfection or by their ingenious combinations, the attention of Russian manufacturers and artisans."

THE THAMES EMBANKMENT.

It has been asserted without contradiction, that a club-house is about to be erected on the plot of land between Westminster Bridge and Richmond-terrace, coming close up to the paved way of the embankment. Mr. Newton drew the attention of the Metropolitan Board of Works to this alarming statement, and the solicitor (Mr. Smith) said no authority had been given by the Board for the erection of this building, and he was instructed by the Works Committee to take any steps which he might deem desirable in the interests of the public, to prevent any breach of the law in respect to the line of frontage in connection with the proposed structure. If there be no special arrangement in this respect, we should be very doubtful of the sufficiency of the power given by the Metropolitan Management Act. Some public movement may be necessary.

The attention of the Board has also been called to the desirability of continuing the Victoria Embankment in front of the Houses of Parliament, and the Works Committee has been directed to report on it.

Great regret is felt in many quarters that the position given to St. Thomas's Hospital prevents the continuation of a river road on that side also.

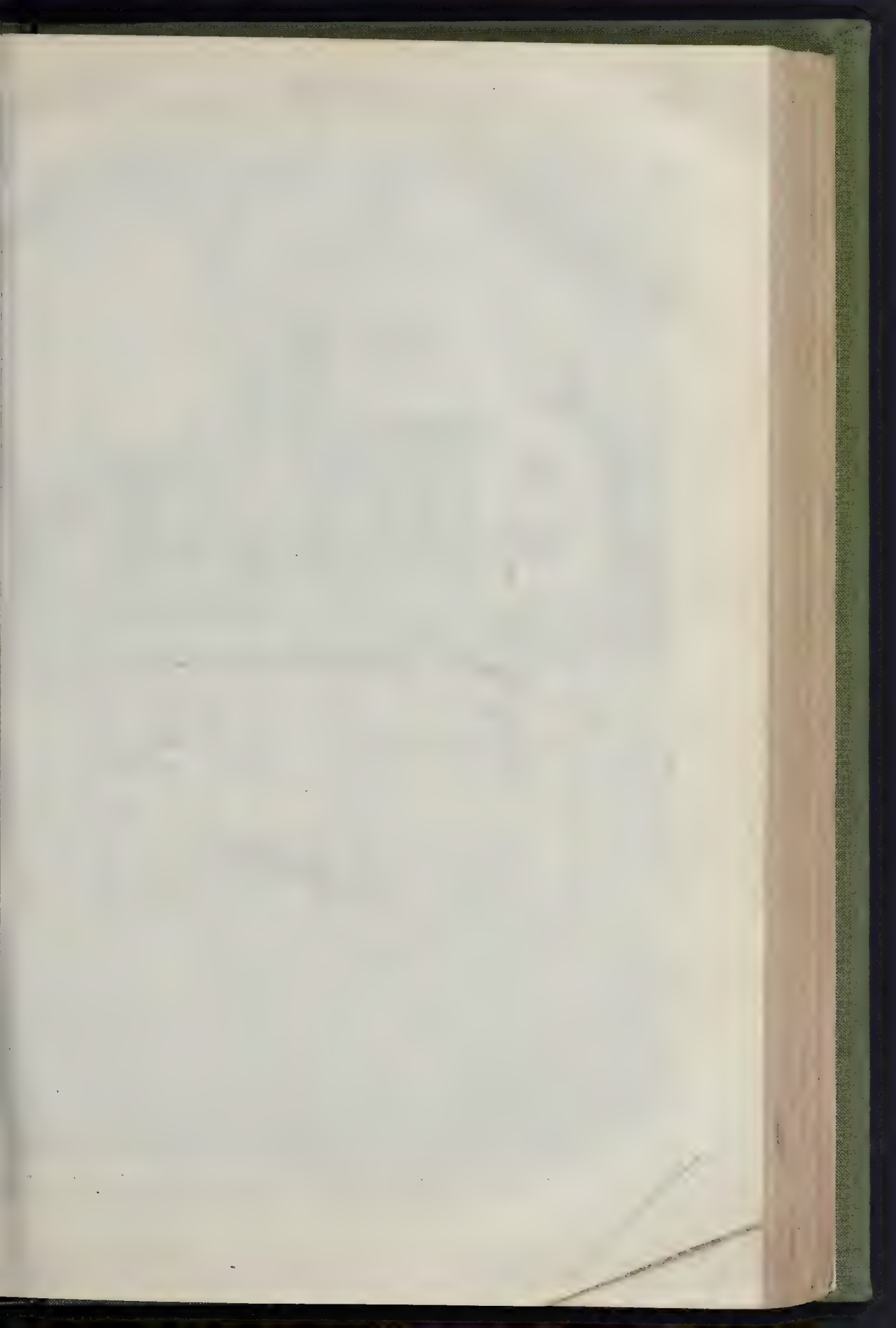
THE BUILDINGS UPON THE ROCK OF CASHEL.

We mentioned, some short time ago, that a committee had been formed with a view to the preservation of the remarkable group of buildings on the Rock of Cashel, Ireland. We now learn that the Church Temporalities Commissioners have decided to vest the ruins in the secretary of the Board of Public Works as a national monument. The *Kenny Moderator* says, commenting on this,—

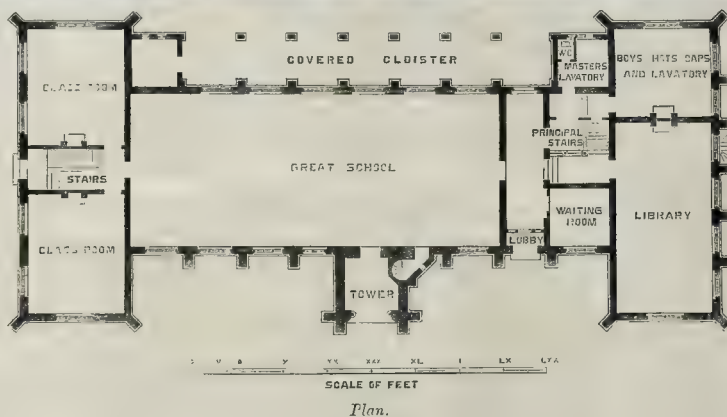
"Are our ancient buildings to be subjected to the ordinary Board of Works routine? Heaven forbid! If they are they might as well be handed over at once to the tender mercies of any 'committee of gentlemen,' whether 'Catholic,' 'Protestant,' or 'mixed maddling.' To safeguard those monuments for posterity, there should be associated with the Board of Works at least a properly qualified superintendent, or inspector, or controller,—a man what you will, so that he will be the right man in the right place,—of national monument, not a mere Board of Works architect or a Board of Works engineer, as we have hitherto had experience of, but a man who whilst possessing a proper architectural knowledge, is genuine Irish archaeologist, in whom the nation could put the fullest trust."

WANT OF TEACHERS.

ABOUT the time of the establishment of the School Boards, a probable difficulty from the want of trained teachers was noted in our columns. This difficulty is now manifesting itself more clearly, and it is full time that a extensive training of teachers for elementary schools was going on. An excellent means of obtaining a respectable livelihood is now open to fairly-educated persons of both sexes. Time was when the office of teacher in an elementary school was looked down upon as something almost menial, and always as implying poverty. Hence the present scarcity. But it is otherwise now. The teacher must be a person of good education, and will hold a respectable position, and a good income. The demand is likely to go on increasing; so that there is a little prospect of the market being overdone. The school teacher even now stands in broad contrast with nearly every other person who has to earn a living. He can almost make his own terms, because he knows that while capability and character remain in him there is little or no prospect of his being thrust aside by the force of competition. A further inducement to young persons to devote themselves to this work found in the easy terms on which they can acquire the certificate, which stands to them in the place of a degree. A good elementary instruction in an ordinary National School will enable a candidate to pass the Government matriculation at a training college, and the scholarship thus obtained will pay nearly all the expenses of the college course. At the expiration of two years the examination for certificate takes place, and then the successful candidate finds himself started in life with every prospect of continuous and well-paid employment.



WHITGIFT HOSPITAL SCHOOL, CROYDON.—MR. ARTHUR BLOMFIELD, ARCHITECT.

WHITGIFT HOSPITAL SCHOOL,
CROYDON.

THIS building is erected as a middle-class day-school for 300 boys. It has been built under the sanction of the Charity Commissioners, by the governors of the Whitgift Hospital, at a total cost of about 15,000*l.*, and was opened in May last. The general arrangement and style of the building will be seen from the illustrations. The materials are red brick and Bath stone. Mr. Arthur Blomfield was the architect. The school stands on a remarkably fine site, on the highest ground in the town, facing the street, a little distance north of the Whitgift Hospital. At the back is a very good playground. Five courts are about to be added on the north side.

The contractors were Messrs. Marsfield & Price.

IMPERIAL OTTOMAN BANK.

THESE premises are nearly completed. They occupy a plot of ground adjoining the Drapers' Hall, having a frontage of 30 ft., and an average depth of 72 ft., extending from Throgmorton street to Austin Friars. The basement contains strong rooms (with a book-lift to ground floor), clerks' lavatories, &c. The ground floor, which is about 18 ft. in height, contains the general office, with a counter on each side of a central passage, and manager's and sub-manager's rooms behind. The partitions on this floor are constructed of light rolled-iron framing filled in

with slate panels below and glass above. The first floor is occupied by the Board-room, committee-room, secretary's room, and waiting rooms. The upper floors contain additional committee and clerks' rooms, and accommodation for the housekeeper. The floors and roof throughout are fire-proof, on the principle introduced by Messrs. Phillips, of the Coal Exchange. The floors are finished in cement. The stairs throughout are of stone. The front is of Portland stone, from the quarries of the Portland Stone Company. The columns and panels are of red Mansfield stone. The small circular panels and bosses are of red granite and serpentine.

Messrs. Myers & Sons are the contractor the sum being about 8,000*l.* The architect Mr. William Burnet.



THE IMPERIAL OTTOMAN BANK, THROGMORTON-STREET, LONDON.

MR. WILLIAM BURNET, ARCHITECT.

THE PROPOSED STATUE OF O'CONNELL,
DUBLIN.

Mr. FOLEY, the sculptor, attended at a special meeting of the O'Connell National Committee, held in the City Hall, Dublin, on Tuesday, last, for the purpose of affording information as to the progress of the intended statue. Dissatisfaction having been expressed by the contributors to the fund and the public at large, it was deemed advisable that an announcement should go forth at once as to the state of the work at present. Mr. Foley's statement may be summarised as follows:—The most advanced portion of the work the central shaft of the pedestal. The full-length figures around the pedestal are to be eleven in number. The majority of these, Mr. Foley assured the committee, were nearly finished. The heads of the four winged Victories far advanced, and the full-sized head of the "Liberator" is in a forward state. The sculptor did not fear the public expected that the statue should be executed in a much shorter time than that was possible. His illness had delayed for time the progress of the work; but he hoped the committee that henceforth the work would proceed without any unnecessary delay. The height of the testimonial will be about 10 ft., the figure of O'Connell will be about 10 ft., and the four Victories about 10 ft. each. The central figure of Erin is 8 ft., and the other attendant figures around the circle are each 7 ft. height.

In answer to interrogatories as to the precise time when the statue might be expected to be finished, Mr. Foley would not guarantee that he could complete it before three years more. He wished to complete it before that period, the sculptor said that he might manage to do so; but he would not promise, in that case, to put his name to it.

COUSINS'S BILLIARD-MARKER'S
REGISTER.

In the vestibule of the court for new inventions at the International Exhibition will be a patent billiard-marking machine, which, in addition to its use as an ordinary recorder of the game as it progresses, registers it also on an aerial apparatus. The machine being set, it prepared to score 100 games on a piece of paper marked for the purpose, and in cases of dispute the scoring-paper (which is beyond the control of the living marker, and under lock and key) can be immediately appealed to for a decision. The principle is worked out by attaching a string-point to the scoring-handle, which, by passing a blackened sheet of paper on to the scoring-paper behind, records in concentric circles each game and each point of the game as they are played. A billiard-table proprietor who employs his scoring-machine locked knows on inspecting it internally the exact amount due to him, whilst the player has the best guarantee thereby of accurate scoring.

COTTAGE HOSPITALS.

Fowey (Cornwall).—The building in use has come too small for the requirements. This hospital, during its existence of eleven years, has been, and still is, almost self-supporting. An eligible site having been obtained, at a nominal ground-rent, from the Treffry estate, a suitable new building has been erected, at an outlay of £10,000. It is to be worked on the same plan and on the same one which has been in active operation. The medical officer does not receive remuneration under any circumstances out of the funds of the institution. Every requisite, except personal clothing, is provided in the hospital, and the amount to be paid by the patient is to be fixed by the medical officer, or one of the trustees. An appeal is made to the public to £100.

Lytham (Lancashire).—Mrs. Clifton, wife of the lord of the manor, has opened a new cottage hospital at Lytham, which had been erected solely by her husband, at a cost of £2,000. The building is situated at the east end of the town and facing the water. It consists of two wards on the ground floor, and two on the upper story, and contains twelve beds. There are also on the ground-floor matron's room, bath-room, wash-room, surgery, and in the yard a mortuary and dressing-room. Mrs. Clifton having formally opened the building, transferred it to the committee of management.

Crook (Bishop Auckland).—As a fitting memorial to a deceased medical man, Dr. Kelly, it has been decided that a cottage hospital be built, at a cost of from £600. to £800., to be open to all cases, except infectious ones. The hospital will involve an annual outlay of from £50. to £80., but this is expected to be defrayed by the colliery owners and manufacturers in the neighbourhood.

WANTS IN WEYMOUTH.

Sir,—I see by your paper (of the 22nd of July), the proceedings of the members of the British Archaeological Association, on their intended visit to Weymouth and its neighbourhood. There are one or two curious places in the town which appear to have been forgotten, and yet they are worthy of note. First, there is the Town Clerk's Office, a building well worthy of inspection; next to that there is the Office of the Collector of the Local Board of Health Rates; then comes the Office of the Borough Surveyor; and last of all comes the old Poor-house.

Now, Mr. Editor, would you believe that Weymouth, with all its boasting of what it possesses, does not possess and will not afford the borough surveyor and local rate collector an office? These gentlemen are obliged to convert a room at their own dwelling-houses into an office, and get very little pay into the bargain; in fact, they get nothing extra for their rooms.

Weymouth has a fine guildhall, and yet the Corporation cannot see the necessity of placing the town clerk's office and offices of all the borough officials under one roof. Perhaps they will say they cannot afford it; but there is plenty of money spent every year, which, if applied to these objects, would be much more beneficial. I trust the visit of the above society will be the means of drawing the attention of the Corporation to the necessity of congregating the offices of all the borough officials into one handsome building.

READER.

THE TRADES MOVEMENT.

Leeds.—A conference between the masters and men has been held. The conference extended over six hours, but ultimately several alterations in the rules were agreed to by mutual consent. In substance they are as follows:—That all work be paid for by the hour; that 7d. per hour be the standard wage; that carpenters and joiners working on unprotected buildings be paid a halfpenny per hour extra; that fifty hours per week be considered a week's work. Arrangements were also made with respect to Saturday and Sunday work. The latter day's work being a work of emergency, walking time is to be allowed to the place of work, at the rate of three miles per hour. The other arrangements made and duly subscribed to by the conference were of a purely detailed character. A meeting of the Leeds bricklayers has been held, at which a resolution was agreed to that the masters should have a fortnight's notice of a request by the men for nine hours' work a day, and 7d. per hour; that they should have six months' notice of a request for 7½d. per hour and nine hours; and in the meantime that a branch society should be formed in connexion with the Sheffield Unity, late Manchester. This resolution had fifty-six supporters. Another resolution was proposed to the effect that the masters should have six months' notice of a request for 7½d. per hour, nine hours a day to be the maximum and eight hours the minimum working time. This resolution had fifty-four votes, so that the first resolution was carried by two votes.

Sheffield.—The carpenters and joiners have held a meeting, and instructed their delegates to demand next spring an increase of wages, and the adoption of the nine-hours system. The amount of increase was left with the delegates.

Nottingham.—A meeting to consider the nine-hours movement has been held in the Mechanics' Hall, Nottingham. Mr. Coroner Heath presided, and there was a large attendance of working men. Three delegates attended from Newcastle, and gave a detailed account of the strike in that district. Resolutions, expressing regret that the employers had refused to meet the men on equal terms to discuss the matter with a view to be settled by arbitration, and pledging the meeting to use every legitimate means to bring the struggle to a successful issue, were unanimously agreed to.

Derby.—A public meeting favourable to the nine-hours movement has been held in the

Temperance Hall, Derby. Mr. Councillor Johnson occupied the chair. The hall was densely crowded. Two deputations from Newcastle and Nottingham addressed the meeting, which was very enthusiastic. The meeting pledged itself to support the Newcastle men.

Carlisle.—There is a great want of navvies on the Settle and Carlisle branch of the Midland Railway, now in course of construction along its whole length of seventy miles. The works were let in four contracts in 1870. All of them are well opened out, and each contractor has expended from 50,000l. to 100,000l. in plant on his contract, and has engaged a sufficient staff to carry on the works vigorously. The contractors are short handed, and 4,000 additional men, it seems, could be employed with advantage for the next eighteen months. The men required are principally navvies at 3s. 6d. a day and upwards, stonemasons and miners at corresponding wages. The contractors have each of them incurred a heavy outlay in the erection of comfortable wooden huts for the accommodation of the men, and shops are opened for the supply of provisions on reasonable terms at convenient places on the works. Many of the huts are at present unoccupied.

WESTMINSTER ABBEY TOWERS.

"W. P." writes in *Notes and Queries*:—Who designed and executed them? The question is thus put, as they are usually attributed to Sir Christopher Wren. As I think there are doubts on the subject, I submit the following notes:—Cunningham ("Handbook of London"), merely observes, as do most writers, "the western towers erected from the designs of Sir C. Wren." My note-book suggests that their lower portions were executed 1718-22, under the directions of that talented architect; and that the upper portions were, after his death in 1723, entrusted to Nicholas Hawksmoor, who then directed the works of the abbey up to 1735. The towers are said not to have been completed until 1745. In a biographical notice of Hawksmoor, it is stated:—

"After the death of Sir C. Wren in 1723, he was appointed Surveyor-general of Westminster Abbey, and continued the building of the two western towers (intended to have had spires 14½ ft. high); and completed the works in 1735. W. Dickenson being surveyor until Jan. 29, 1725, when he was succeeded by John James."

This latter architect (James) drew "the north-west prospect of Westminster Abbey, with the spire designed by Wren," which was engraved by Fourdrinier; and by Toms, for Maitland's "History of London," 1756.

The division in style, of that which may be considered to have been executed under Wren's direction, and that executed under Hawksmoor's, is clearly distinguishable at about half way up the towers. As towers they may be considered to have originated from Wren's design, but their execution was left to the directions of the inferior hands of the surveyors under and after him. Wren's Gothic work, in outline and feeling, is, I think, not so bad as is generally considered. The detail, however, may not be worthy of commendation; yet he knew more about it, perhaps, than any other architect or amateur of his day.

SEWAGE FILTRATION AT NEWCASTLE-
UNDER-LYNE.

An injunction having been obtained some three years ago to prevent the Stoke Board of Guardians from polluting the river and canal which ran past Trantham, they adopted Wren's charcoal filtration. The workhouse contains 800 inhabitants, and all the sewage of the house, two hospitals, stables, and piggeries, the surface water, and the overflow of a large pond, pass through the filters.

The first, or rough carbon tanks, are large underground chambers, into which the sewage flows directly, and these are fitted with movable cages of perforated sheet iron, filled with a mixture of charcoal and "cokes." The charcoal placed in this tank is what has already passed through the lower series of tanks, known as the "deodorisers"; so that as the charcoal is removed from the third tank to the second, and from the second to the first, it gets more and more charged with the material useful for manure. The sewage fluid leaves the rough carbon tanks by a 12-in. main, as a semi-transparent opalescent fluid, with a slight smell of sewage. This main leads it to the first deodoriser, into which

the water enters over a lip, and spreads over a table of perforated sheet iron intended to break the stream into a rain, for the oxidation of the objectionable matter—the real secret of filtration.

From the first deodoriser the water passes into the second, which is a small tank, 4 ft. square, and has three layers of filtering material, each 1½ ft. thick, composed of half carbon and half fine ashes, each bed resting on a perforated iron plate, with a clear space of 1 ft. between the plates. The intention of this arrangement is again to secure the oxidation of the water, and to prevent channelling. At the bottom of all is a filter cloth, to prevent the loss of charcoal dust. As the water leaves this tank it is said to be bright and sparkling, and free from smell or any objectionable taste.

The charcoal used is made from wood, and does not cost more than 35s. a ton; but the charcoal which it is proposed to employ, and which would be at once cheaper and better, is peat charcoal.

The charcoal fully charged with fertilising material is carted to a yard for manure manufacture, within the borough of Newcastle, within a few yards of the residence of the medical officer of health, and surrounded by a number of other houses. The medical officer assured a commissioner of the *Birmingham Morning News*, who reports very favourably of the whole process, that the yard is not a nuisance in any sense. The phospho-carbon manure (as the sewage of the Newcastle Workhouse is called, after its treatment in the yard) commands a very ready sale at 80s. a ton, and the demand has far exceeded the supply. The 800 inmates of the workhouse produce annually a little over 200 tons of manure.

STONE WORKING.

SIR,—Reverting for a moment to the question of stone-working, there are, it appears to me, three propositions at least which are almost axiomatic in their application.

The first of these is the oft-stated one, that all stone whatever should be laid on its natural bed; no matter whether the stone be obviously laminated or not, the planes of its laminations should be at right angles to the line of pressure. In ordinary walls this line is, of course, in a vertical direction, and the laminations are horizontal; but, in the case of an arch, the laminations should also follow the same rule, and be at right angles to the pressure, which is not always the case in practice. It is sometimes exceedingly difficult for even an experienced man to say of a particular stone which is its bed way, but a visit to the quarries from which it was obtained will generally reveal some vein or appearance indicative of position.

The second axiom is this. That under no circumstances whatever, should any two lines or planes make an angle of less than 90°, or a right angle. In the case of a curve then its tangent is to be one of those lines.

Let us see where this proposition will land us. In all trabecated architecture we shall have no difficulty in showing that the planes of the face, beds, and joints almost always make angles of exactly 90° with each other, never less, though sometimes more. But in archaic architecture, especially the Gothic of the twelfth and thirteenth centuries, we find the builders constantly cutting planes which make with each other angles of less than 90°, as in the lately condemned vertical joint of the pointed arch. This joint should never be made. Mitreing, therefore, as joiners understand it, should never be permitted in stonework.

The third proposition or axiom is, that the beds and joints should always be planes, never curved. Here, again, we are at variance with the ancient builders, and their modern copyists. But this proposition follows almost as a consequence of the preceding. Let us take a pointed traceried window as example. In both ancient and modern practice, the vousoirs of the arch are invariably worked to a curve on its outer edge, and where a hood-mould covers it that is also wrought to a curve both inside and outside, so that when set the wallstones have also to be wrought to a curve to fit up against the same, thus making the upper angle less than a right angle in all cases. Now I maintain this should not be so.

Good masonry requires that the hood-mould should be wrought out of the same piece of stone as the vousoir, and that above and beyond the hood-mould there should be sunk back to the plane of the wall-face a part of the same stone,

on which should be formed a vertical joint and a horizontal bed, thus permitting proper bond to be made with the wall, and not as now, a mere joint only.

I put forward these propositions with some diffidence, though I am convinced of their truth. I am not sure whether the "True Principles of Masonry" have not yet to be stated. But if the foregoing helps forward the task, my labour will not have been in vain.

E. G.

A GRIEVANCE.

MR. FAGON WATSON, of Piccadilly, has written us a letter in which he complains bitterly that two of his best drawings submitted by him to the Committee of Selection for the International Exhibition of 1871 were refused as unworthy of a place.

Mr. Watson has perfected a peculiar mode of water-colour painting, and some of his pictures that we have examined are most remarkable specimens of truthful delineation, with at the same time general harmoniousness, and we can scarcely believe that the committee in question could possibly have refused his two pictures on their merits, knowing as all do how much work of very mediocre character they found it necessary to accept.

We would rather infer that it was inattention to some special requirement or regulation that caused their rejection, the injustice of which he might otherwise very fairly complain of.

STATUES AT WESTMINSTER AND THE CHIEF COMMISSIONER.

MR. AYTON certainly had the best of it, the other day, in his passage of arms on this subject with Lord Eloho, who called on the Prime Minister to ensure courtesy to those who were interested in matters of art. Lord Eloho's inquiry was as to the intended setting up of statues in Palace Yard. Mr. Aytton, after a gentle reproof of the tone in which courtesy was asked for, said he had already told the noble lord there was no question of eight or ten statues, were those of Lord Palmerston, Lord Derby, and Sir Robert Peel. With regard to the statues which the noble lord had said were condemned, surely he ought to have informed himself of what was going on before he used phrases which must be extremely offensive to the committees engaged in the erection of the statues. The noble lord thought nothing of describing the works of the most eminent sculptors as "rubbish that ought to be carted away," and thought nothing of wounding their feelings, because perhaps if the noble lord were to speak in more temperate terms, he would not put himself upon that pinnacle from which he seemed to look down on all others in matters of art as an infallible judge. He (Mr. Aytton) did not profess to have a very profound knowledge of every branch of art, his professions being of a most humble and moderate kind. In fact, he would confine them within the limit of the assertion that he knew of these subjects about as much as the noble lord. The principle upon which he had proceeded, however, had given great satisfaction to some of the most eminent professors of art, whether sculptors or painters, and not a few had used the phrase that "the fine arts are beginning to look up," because he had not assumed that exclusive and extraordinary knowledge of all matters of art which some people did. He had thought if he had to deal with matters of architecture, painting, or sculpture, the true mode of dealing with it was to place it in the hands of those who made the particular pursuit their profession; for a gentleman who had devoted all his life to a profession must know more about it than some *distant* gentleman who knew something about it in a loose and general way. Though a man in the expenditure of his own money might give expression to his own ideas and fancies, the Government had no right when expending the public money to give themselves up to caprices. If they were dealing with sculpture it was not their duty to go about the town asking Lord This or Mr. That what he thought about it; but they should go to sculptors, and if they found among them a conflict of opinion, they were enabled, by inviting them to meet together, to arrive at a sound conclusion. With regard to the statues about to be erected, he invited two sculptors who were engaged in putting up the statues of Lord Derby and Lord

Palmerston to meet together and arrange the technical details which had to be considered, and they were assisted by the director of the National Gallery. A meeting of that sort was, he thought, more likely to lead to a satisfactory solution of all questions that might arise than if he had gathered together half a dozen gentlemen who professed to be great connoisseurs of art.

THE SANITARY CONDITION OF LIVERPOOL.

Drs. PARKES and SANDERSON have presented the second part of their report on the questions referred to them in December last by the town council. In this section inquiry is made into the causes of the high mortality which has existed for so many years in Liverpool, and the inquiry is divided into the following heads.—1. The mortality of Liverpool as compared with other large towns. 2. The comparative mortality of districts in Liverpool itself. 3. The comparative mortality in certain streets in Liverpool. 4. The sanitary condition of those streets, and, by inference, of others like them.

The report states, under the head of recapitulation, that the extraordinary death-rate prevails in those years in which there is an unusual spread of certain epidemic diseases, viz., typhus, small-pox, cholera, relapsing fever, &c., and, among children, scarlet fever and measles. The reporters think it necessary to adopt measures for isolating emigrants from the stationary population, and for removing as early as possible persons affected with any of the above diseases from among the population, either fixed or migratory. It is considered certain that cholera, typhus, or relapsing fever, or any other disease capable of being carried by human beings, will almost certainly be introduced into Liverpool if it prevails epidemically in North or North-Western Europe, or in Ireland.

In the general statement of proposed measures, the reporters say:—For the amendment of the moral and physical evils which the existence of a degraded population in her very midst entails upon Liverpool the powers of the local authority are at present limited to the abatement of overcrowding, the carrying out of certain constructive improvements, and to enforcing on owners the maintenance of their houses in a state of sanitary repair and cleanliness. Larger measures are required. In some way surface overcrowding should be lessened. The reporters suggest the opening of wide and straight streets in such directions and to such an extent as may be determined after consideration of all the circumstances. If gradually carried out, this would displace the population from some part of the worst quarters, and would prepare the way for improvement of the houses that remain. The second suggestion is to provide extra means of transport for the workmen who would by such displacement be further removed from their work.

ARCHÆOLOGICAL EXCURSIONS.

The Sussex Archaeological Society—Thursday in last week was fixed for the annual "day out" of this society, and the trying-place was Chichester, the cathedral town of Sussex. The weather was excellent, and a very inviting programme had been made out of places to be visited, in spite of which the gathering was unusually small, which has been attributed to the fact that the same ground has been explored by Sussex archaeologists on two or three previous occasions. The members of the society and their friends were conducted through the cathedral by Canons Swainson and Farrington, who pointed out the chief points of interest, paying particular attention to the manner in which the spire had been restored. Mr. Parker, of Oxford, rendered assistance in this part of the proceedings. On leaving the cathedral, the party broke up into small groups, and visited the various places of interest in which the city abounds.

The North Oxfordshire Archaeological Society.—This society has had an excursion, terminating at Bampton. The excursionists assembled at Duckington Rectory, where the hospitality of the new rector, the Rev. W. D. Macray, and his wife, was manifested in a substantial breakfast. The party proceeded in open carriages to Cokerthorpe Park, and examined the little church, or rather chapel, therein. The pictures in Cokerthorpe House were next examined, and afterwards the party proceeded, by Standlake and Yelford, to Bampton Church and Castle. They

ned at the Talbot Inn, and then returned to itney.

Essex Archaeological Society.—The annual gathering in connexion with this society has taken place. The proceedings consisted of a meeting for business purposes, and to hear papers read, at the Shire-hall, Chelmsford, followed by luncheon at the Saracen's Head, and ending up by an excursion to Broomfield Road, Leigh Priory, and Pleshey Castle. At a meeting in the Shire-hall, the Venerable Archdeacon of Essex was chosen to preside. The day was fine, and the excursion a pleasant one.

COMPETITIONS.

Billingborough.—A vestry meeting was held at Billingborough, on Thursday, the 27th ult., to receive designs from architects for the new school and head-master's residence, to be erected in the parish. After a comparison, the design of Mr. Hall, architect, Belgrave-chambers, Leeds, was chosen, subject to the approval of the Education Department.

THE NATIONAL PROVINCIAL BANK BUILDINGS, NEWCASTLE-UPON-TYNE.

THE new premises in course of erection at the corner of Dean and Mosley streets, Newcastle, for the use of the Branch of the National Provincial Banking Company, are now far advanced towards completion. The building is in a Classic style, designed by Mr. John Gibson, of Westminster. The external front into Mosley-street is 35 ft. 6 in. in length, the Dean-street front is 14 ft. 6 in. in length. The elevation is 14 ft. 6 in. The building is constructed with Kenton stone, and is fire-proof throughout. The principal apartment in the banking-room, situated on the ground floor, and entered from Mosley-street, is 72 ft. in length by 27 ft. 9 in. in width, and with a height of 22 ft. It is lighted by seven windows, the glass of which is protected and protected by grilles. The artificial lighting is by three sun-burners, manufactured by Mr. Strode, of London. The ceiling is groined. The banking-room and the building generally are heated by hot-water apparatus, manufactured by Mr. Wilson W. Phipson, O.E., London. The fittings in this principal apartment are of Honduras mahogany, with panels of Spanish mahogany, by Messrs. Sopwith & Co., Newcastle. The treasury is lined with iron; and on the right and left are iron safes. The whole of the treasury is fire-proof, and arched above and below. The fittings are all of metal, by Messrs. Chubb & Co., of London. It is secured by a fire-proof door and iron grate outside, and, in addition to the locks, a night bolt passes down into the door from the sleeping-room of the clerk in charge. There are about 10 tons of iron in the treasury, the door itself containing about 6 cwt. Below the banking-rooms are three strong rooms, each reached by distinct staircase. One of these rooms is 15 ft. 10 in. in length, by 12 ft. 6 in. in width, is enclosed with fire-proof walls, and arching; and is filled up with iron shelving by Messrs. Lamb. The purpose of the room is the deposit of "books, and customers' plate, &c., and a separate portion, capable of being locked, is assigned to the latter class of valuables. Adjoining this is the principal strong room is a store or stationery. The other two strong rooms are in the rear of the building, and are of smaller dimensions, and for similar purposes. They are also fire-proof, and heated with hot-water, and have distinct ventilating-shafts. A hoist communicates with the banking-room. The two upper stories of the main building will be occupied as offices for mercantile and legal business, and above these will be attics. Mr. Joseph Elliott, of North Shields and Newcastle, is the contractor for the whole of the works, and has carried out nearly all of them, the only subcontractors being Mr. Somerset, of Newcastle, the ironwork; for the carving, Messrs. Walker, Hey, & Beal; granite columns, Messrs. Fraser & Co., Aberdeen; locks, Mr. Samuel Thomas, Birmingham; sunburners, Messrs. Strode & Co., London; and hot-water apparatus, Mr. Wilson W. Phipson, London. The whole has been erected under the superintendence of Mr. William Glover, clerk of the works. The cost of the building and fittings will be about 14,000l. The contractor has had to encounter the difficulties arising out of the joiners' strike, and has had to bring men from the south of England and from

abroad, and to keep them from being tampered with and molested after their arrival. The same banking company have a similar building in course of erection at Gateshead.

ARCHITECTURAL EDUCATION.

THE report of the Manchester Society of Architects, read at their last annual meeting, has been just now printed. In it the council say the education of the pupils and assistants in the offices of members of the profession in that city has engaged their attention.

"They found that an attempt had been made within the last few years by a kindred society to establish classes for the study of drawing, mathematics, and other matters appertaining to the technical education of the architectural student; that the project had failed, not from any want of exertion on the part of its promoters, but by reason of the unwillingness on the part of the students to go through the labour necessary to the acquisition of this particular kind of information,—that, in fact, though the opportunity was offered, there was so much lukewarmness on the part of those whom it was calculated to benefit as to discourage the promoters.

From the information thus obtained, your council came to the conclusion that little success would be likely to attend any attempt to carry out a proposal made at the last annual meeting, viz., to hold a series of *conversations*, at which architectural drawings, &c., should be exhibited, and a few remarks on a chosen subject made by a practising member, with the view of promoting a discussion in which the students and assistants should be encouraged to take part. They felt that those for whose especial benefit such *conversations* were proposed to be held should first have the opportunity of cultivating themselves by study to take a part in them. Such study can only be pursued in extra official hours; for it is certainly not too much to expect that a young man entering upon a pupillage for a term of years in an architect's office shall devote other time than that required from him for office attendance, in order to make himself acquainted with the theory and literature of his profession; that, in order to fit himself for the business of life, he must be prepared to give as much time, and bestow as much application, as he would in pursuing a University career, where it is well known that those desirous of achieving success must study in their own rooms, as well as attend at the appointed time in the lecture-halls. The architectural student who intends to succeed, cannot too soon acknowledge the fact that his employment during office-hours should make him acquainted with the practical part of his profession, and that his own time, as it is called, should be devoted to the pursuit of its other requirements, such as the study of ancient and modern examples, the history, science, and literature of architecture, &c. There are, as is well known, numerous prizes open for competition amongst students in all parts of the Kingdom, offered by the Royal Institute of British Architects, and other bodies, and that so far as concerns those located in Manchester, there are opportunities afforded by the School of Art, Owen's College, and the free libraries, for study. A prospectus was accordingly drawn up, and copies forwarded to every architect practising in Manchester, whether members of this society or not, for distribution amongst their pupils and assistants, setting forth the distinctions and opportunities, and giving every information concerning terms, hours of attendance, &c. A list of books recommended for study and perusal formed a part of this prospectus, many of which are to be found in our admirable free library.

Your council has made inquiries, and has reason to believe that several students have derived benefit from the information afforded in the prospectus.

The following members form the council for the ensuing session:—Messrs. E. Salomons (president), J. Stevens (vice-president), W. H. Brakspear, L. Holder, J. Lowe, A. W. Mills, T. Worthington, and J. Murgatroyd (honorary secretary).

EARNINGS OF THE WORKING CLASSES.

In the course of a paper read by Mr. William Taylor, at the recent congress of the British Association, "On the Manual Labour Classes of England, Wales, and Scotland," the writer, having given the aggregate of the census, proceeded to divide the manual labour classes in the kingdom into three, giving an estimate of their numbers and earnings. The first class he described as the higher skilled in labour and manufactures; the second, as the lower skilled in labour and manufactures; and the third, agricultural and unskilled labourers. The estimated number of these classes in England and Wales, inclusive respectively of men, boys, women, and girls, was, first class, 1,178,000; second class, 4,069,000; third class, 2,957,000; total in England and Wales, 8,144,000. The estimated annual earnings of each class, less all deductions for sickness, want of work, &c., were as follow:—First class, 59,000,000l., being from 60l. to 73l. to each man; second class, 134,500,000l.—average for men, 46l. to 52l.; third class, 73,500,000l.—average for men, 20l. to 41l. The total earnings by the labouring classes in England and Wales reached the large total of 267,000,000l. The author gave similar statistics as to the numbers of the labouring class in Scotland, and their earnings. In the higher skilled class the total number was 145,000; lower skilled class, 580,000; agricultural and unskilled

labour, 431,000; total, 1,156,000. The earnings in Scotland, less same deductions as in England, were as follow:—First class, 6,760,000l.—from 56l. to 68l. 10s. for men; second class, 17,200,000l.—41l. to 48l. for men; third class, 8,850,000l.—16l. 10s. to 32l. for men. The total earnings of the labouring class in Scotland were 32,810,000l. It was a sad fact, he said, that in the United Kingdom as much as 89,000,000l. a year was expended in ardent spirits, 58,000,000l. of which were spent by the working classes.

"HELP THE WILLING HORSE."

Sir,—Under this head a short paragraph appeared in last week's *Builder*. I beg to say that soon after Dr. Arnott's most useful invention of the water-bed came into use, I suggested to a leading firm of West-end saddlers and harness-makers the application of this principle to saddles and collars, either using water or air, instead of stuffing; but after very many attempts to utilise the idea, they abandoned it; for the collar, &c., pressing so uniformly upon the animal's skin, and adapting its surface to all the little irregularities, it so completely excluded the air that it acted like a boy's "sucker," and channelling or corrugating the surface to prevent this destroyed its utility.

R. L. ROUXIEV.

INIGO JONES'S WATER-GATE.

Sir,—I see with regret the water-gate of Inigo Jones, at the end of Buckingham-street, stands half buried. If it and its steps were raised, it would become an ornament to the Embankment enclosure, and also afford another and convenient entrance.

It would really be a great pity if this relic of a past time should suffer through neglect. The march of improvement has left but too few relics of the past. Surely the question of ownership cannot stand in the way of its preservation.

W. C.

PAVING.

Sir,—Will any of your correspondents inform me of a method of paving a large court-yard so as to keep a good and even surface? Stone and asphalt are objected to on account of the cost, and the ordinary tar-paving on account of the smell, &c., arising from it in summer. If laid of gravel, what means could be adopted for binding the surface closely together, so as to prevent the breaking of it up?

D. W.

HONOUR TO WALTER SCOTT.

NEARLY all the London newspapers have mentioned as amongst the successful incidents of the Edinburgh banquet at the Scott Centenary a song written for the occasion by Mr. Jas. Ballantine, but none of them have printed it, so far as we know. Our readers interested in the production of stained glass so often hear James Ballantine's name "in that connexion" that we are tempted to record this last effusion of his pen. Mr. Ballantine has long been known as one of the Edinburgh song-writers, and we have pleasant recollections of some agreeable outings from Edinburgh in earlier days with himself and a genial circle of writers and artists, most of whom have passed away:—

Come, let us raise a grateful song,
On this our Minstrel's Natal day;
And all the world shall round us throng,
Heart homage to his name to pay.
One hundred years have pass'd away,
Since first awake that watchful eye;
Whose sparkling glance and genial ray
Have kindled light that ne'er can die.
See his glory brightly shining,
Over Palace, Hall, and Cot;
See the Myriad Nations twining,
Laud wreaths round Walter Scott.

Immortal strains of Lord Lang Syne,
Are floating on the ambient air;
While Fame and Time straw flowers divine,
Around the Wizard Minstrel's chair.
Who in his hundredth year sits there
With songs and stories as of yore;
Still charming all the brave and false,
Still lulling hearts for evermore.

See his glory, etc.
Statesmen and Warriors gather round,
And Prince and Peasant swell the train;
The sky-clad hals, the glens profound,
Prolong the universal strain.
O'er all the World the loud refrain,
Of grateful joy spreads wide and far;
And Scotland's radiance ne'er can wane,
Illumed by such a lustrous star.
See his glory, etc.

CHURCH-BUILDING NEWS.

Hammersmith.—St. Matthew's Church has been opened for divine service. It is situated in an open tract at the extremity of the Masborough-road. The site is the gift of Dr. Bird. Mr. B. Bird has furnished it with a font and a pulpit of Portland stone, and a lady of the parish—Mrs. Smith—has presented it with a stained-glass window. Accommodation has been pro-

vided for 500 persons, and this has been done for a cost of 5,000*l*. Architectural adornments had therefore to be avoided. The architect was Mr. Blomfield. The style is Early English. The aisles are separated from the nave by five pointed horse-shoe arches, supported on pillars with plain capitals. The windows corresponding to the openings are capable of being made ornate in the future, each being divided into three compartments, separated by mullions perpendicular with the top, where they branch off to cinque-foils; but the glass at present used is necessarily inexpensive, being simply quiet contrasts of subdued tints of blue, green, yellow, and white. The roofings are ridged, those of the aisles at either sides of the nave presenting the appearance from the gables of two smaller triangles flanking a larger. The walls are of yellow brick, relieved with courses of red.

Llandrindod.—Christ Church here has been opened for divine service. Some 2,500*l*. have been expended on the work. The architect, under whose directions the building has been raised, is Mr. T. Nicholson, of Hereford, and the contractor is Mr. Gough, of Bishop's Castle. The style is Early Decorated, and the church is built of the stone of the country, with freestone tracings, and open timber pitch-pine roof left in its natural state, bordered and covered with Narberth green slates. The nave is divided from the north and south aisles by arcades of four arches, carried on pillars with carved capitals. The chancel has chapels on each side for sacristy and organ-chamber, and is separated from the nave by moulded arches, carried on clustered corbels. The nave, aisles, and chancel are covered with tiles, being most decorated in the latter, and the chancel floors rise by gradation from the level of the nave to an ultimate ascent of 3 ft. 6 in. The inside walls are ashlarred with freestone. The body of the church is seated with chairs, and the chancel has fixed stalls. The dimensions of the nave are 62 ft. in length by 42 ft. in breadth, and the chancel measures 32 ft. by 20 ft. The substructure of the tower is built at the south-west angle of the south aisle, and it is hoped that means will eventually be found to carry up the tower and steeple in conformity with the plan of the architect. The warming of the building is effected by means of an underground stove, after the plan of the Patent London Warming Company. The pulpit is of considerable size, and carved in stone, and the front is also a carved specimen of Early Decorated art. The chancel wall behind the altar is decorated with a series of ornamental pattern in encaustic tiles.

Lonestoff.—The old parish church of St. Margaret has been re-opened for divine service. The south and east windows are filled with cathedral glass of varied tints. The seats of the nave and aisles are open, and of pitch pine, with tracery panels in the ends; every bench-end—200 in number—has a different design. The seats in the chancel are of English oak, four of which are intended for the accommodation of the choir—forty-eight in number. The pulpit is of oak and stone; the upper part composed of tracery panels, buttresses, and pinnacles, and the base carved and moulded stonework. All the sepulchral slabs have been relaid in their original positions as nearly as could be arranged, and an ornamental bordering of Messrs. Maw & Co.'s encaustic tiles runs round all the aisles. The chancel and also the risers to the steps are laid with various coloured encaustic tiles in patterns. The font has been restored, as far as the injuries by Francis Jessop—who visited the church in 1644 under a commission from the Earl of Manchester—would permit. The crypt now forms the vestry, having been restored, and the porch has also been restored, and there are new windows, paving, doors, &c., at the expense of General Wingfield, B.A., and Mrs. Wingfield, of Gunton Old-hall. The first part of the work—taking down and rebuilding the south aisle and south arcade—was executed by Mr. Chas. Godbolt, of Harleston, builder. All the rest of the works have been done by Messrs. Lucas Brothers, of London, builders. The whole of the works have been carried out under the superintendence and from the designs of Mr. J. L. Clemence, architect, at a cost of nearly 4,000*l*. The organ is placed in the eastern bay of the south aisle. It occupies a space of about 15 ft. wide, 10 ft. deep, and 18 ft. high, and is enclosed in case work (designed by the architect) of selected pitch pine. The builders were Messrs. Foster & Andrews, of Hull.

Bathford.—For the past few months works of

restoration have been in progress in the parish church of this village. The present work is being carried out under the direction of Mr. Preedy, of London, architect, and the cost is estimated at about 1,620*l*. The work consists of the rebuilding of the south aisle, which has been pulled down; the addition of a chancel aisle, the repaving of the entire church, and the putting in of a new high-pitched roof to the nave. It has also been determined to erect a new organ, the cost of which will be about 150*l*. to 200*l*., and the greater part of the money has been raised. It may hereafter be deemed necessary to rebuild the tower.

Ockley.—Col. A. M. Calvert, with his brother, Mr. C. Calvert, have undertaken the restoration of the Church of St. Margaret, of Ockley, at their own expense. The tower is to be strengthened by buttresses at the corners. The plans show that both the galleries are to be taken down; the nave and chancel to be extended in width doubly; the pulpit to be near the centre of the chancel. The organ (which is to be a new one) is to be placed in the chancel. The church is to be heated by hot-air pipes under the flooring. Another improvement is contemplated at the school-room; that is, an addition to it of a class-room for the younger children of the school.

Manchester.—The first stone of St. Martin's Church, now in course of erection, in German-street, Oldham-road, has been laid. Many architects applied for the conduct of the new works; and, after consideration, the plans of Messrs. Price & Linklater, of Manchester and London, architects of the large church at Fallowfield, Merston Church, &c., were finally adopted. The church consists of a lofty nave and chancel, with side aisles. A tower with slated spire, is placed at the corner of German-street and Primrose-street, and contains the principal entrance and street front. A second entrance from German-street is front. A second entrance from Silk-street. The provided into the aisle next to German-street, which is finished in Pierre Point walling, with red Raconorn stone, dressings to windows, doors, &c., is pierced by a pair of traceried two-light windows, divided by a buttress surmounted by a canopied niche. Above the canopy, and between the heads of the main lights, is a large rose-window. Each face of the belfry-stage of the tower contains a two-light traceried window, filled with louvre boards, under a gable. These gables abut against octagonal turrets, occupying each angle of the tower, and terminating above in small spirelets roofed, with the main slated spire rising from their midst. The style of the architecture is a mixture of Early English and Early French. The chancel is placed at the end of the building remote from German-street, having the vestry, with heating-apparatus below, next Primrose-street, and the organ-chamber on the opposite side. The church will accommodate 500 or 600 persons, and a large number of the seats will be free and unappropriated. The contract has been let to Mr. James Herd (late Herd & Eadie), of Cheetham, Messrs. Scarlett, Brothers, doing the stonework, and Mr. Higgins the excavating and brickwork.

Southport.—The memorial stone of the new St. Andrew's Church, Eastbank-street, which has been in progress for some time past, has been laid. The new church will owe its erection chiefly to Mr. W. Atkinson, J.P., whose offer to contribute a large proportion of the cost of the building has met with a liberal response from the residents in Christ Church, and the other parishes of the town. The site is at the junction of Eastbank-street and Park-street, the latter of which streets is about to be opened out into the town. Half the seats will be free. The church is cruciform in plan, and consists of a nave, 89 ft. 9 in. by 28 ft. 6 in.; north and south aisles, 61 ft. 6 in. by 13 ft. 6 in.; north and south transepts, 28 ft. 3 in. by 27 ft. 6 in.; chancel, 30 ft. by 24 ft. 8 in.; with organ-chamber and vestry on the south side. The tower, through which is the principal entrance, is placed in the angle between the chancel and north transept, in order to suit the peculiarity of the site and approaches. There is also a porch and entrance in the north aisle. The design is in the Gothic style of the Geometric Decorated period, the principal feature being the tower and spire at the north-east, and simplicity of treatment is the general characteristic of the whole. Internally the nave will have an arcade of four arches on each side, the shafts being of polished Shap granite, with moulded and carved capitals. These arches support a clearstory pierced with two-light tracery windows, and opposite the

transept, on each side, is a large arch, the apex reaching to the top of the clearstory. The arches east and west of the nave will be supported by moulded and carved stone brackets. The chancel will have a tracery window of five lights, and a rosette of Caen stone, with five shafts. The chancel arch will be of large proportions, and will be supported by moulded and carved brackets. The organ-chamber will open by an arch into the chancel, and also into the aisle. The large window at the west end will be of six lights, and those of the north and south of transepts of four lights, traceried. The aisle windows will be of three lights toward the west, and of two lights at north and south. The roof timbers will be dressed and chamfered in panels, the panels being finished for the present in plaster. The building will be constructed with brick walls, faced with Upholland parapets in courses. The stone for the exterior is from the Cefn quarries, near Raconorn, and that for the interior is to be white Stourton. The floors are to be of tiles, those in the chancel laid to a pattern. The joiners' work is to be of selected pitch pine, varnished. The windows are to be glazed with toned cathedral sheet glass, in lead quarries. The contractors for the several works are,—for the brickwork, Mr. Smallshaw; for the carpenters' and joiners' work, Mr. Greenwood; for the slaters' and plasterers' work, Mr. H. Robinson; and for the plumbers', painters', and glaziers' work, Mr. Boyd, all of Southport. The building will contain 995 sittings, of which 498 are free; and the entire cost, exclusive of aisle and fence walls, will be 4,600*l*. The architects are Messrs. Thomas D. Barry & Sons, Liverpool, their plans having been selected in a limited competition of architects from Southport and Liverpool.

Childswicham.—The ancient church of this parish has been re-opened. The work of restoration includes the taking down of the walls of nave, and rebuilding the same, in the style of the fifteenth century, similar to the tower, there having been nothing of the old work which was considered worth preserving. The windows were of various dates, with huge buttresses built as necessity demanded to keep up the tumbling walls. The fifteenth-century style was adopted as giving windows of larger size, admitting the more light, and being in accordance with the chancel arch and tower. The old Norman doorway at the west end of the nave has been restored and retained. The new walls are built upon concrete, with Broadway-hill stone and Bath stone dressings to windows. The new roof consists of curved braced principals, 7 in. thick, stained and varnished, resting on moulded Bath stone corbels, and coiled between the rafters, which were not flatways, as in old examples. The seats are of pitch pine, 2½ in. thick, and well moulded, the whole being stained and varnished. The few old seat-ends that remained were made into a pulpit and reading-desk, the funds not allowing of the new to be made similar to the old, on account of the carved tracing. The floor is paved with buff and red tessellated tiles. A new ringers' floor was put in the tower, and the windows of tower entrance re-glazed. The upper part of the spire having been rebuilt in an awkward manner at some previous time, Mr. Frith, of Coventry, better known as "Steeple Jack," was engaged to rebuild the same in true line, and otherwise repair the spire from top to bottom. This he did just a year ago, the church being opened on the anniversary of the day he made his first ascent. A few matters, such as were undertaken in the north transepts, such as a new floor and forming a vestry, and the walls and roof repairing where necessary; but for these works the architect is not responsible, they being undertaken quite independently of him. At some future day, when the funds will admit, the transept, and it is hoped the chancel tower, will be restored properly. One of Birmingham's underground hot-air heating apparatus has been put in. Mr. George Hunt, of Evesham, was the architect, under whose superintendence the restoration has been carried out, by Mr. Gill, of Bourton-on-the-Water, the contractor. It is matter of regret that the chancel, which belonged to the Impropiator and Lord of the Manor, Sir Thomas Philippe, bart., should be allowed to remain in its present dilapidated state, while the other parts of the church have been restored.

Hazlemere.—The renovated church has been consecrated. In order to carry out the work the church has been closed for the last twelve months. The work in detail comprises almost the entire rebuilding of the edifice, with the

ception of the north wall and the tower, and a addition of a vestry and chancel. The pitch of the building has been raised several feet, and additional accommodation has been provided by substituting for old-fashioned cambrus pews a series of neat open benches of pitch pine, for which material oak has been substituted in the panel. The galleries and many other details of the "chambravand" period have been swept away, and the church has been enriched by gifts. The work has been ably carried out by Mr. J. H. W. Penfold, of London, architect, at a cost, we believe, of about 3,000l.

ESSENTIAL CHURCH BUILDING NEWS.

Blisworth.—The members of the Baptist congregation at Blisworth have determined to extend the chapel, and to erect a new schoolroom, and have laid the chief stone of the additional building. It is but six years since the cost of 1,200l. was obtained for the purpose of extending the minister's house and raising the graveyard, on the south side of the chapel, 10 ft. 15 ft., and the extension and erection of windows now commenced are undertaken at a contemplated expenditure of between 700l. and 800l. It is intended to enlarge the chapel towards the front by about 15 ft., by which additional accommodation will be provided for persons. The gallery of the chapel will be altered by a staircase leading from a lobby joining the proposed class-room, by which arrangement twelve or fifteen additional sittings will be provided. The roof of the chapel to be raised 3 ft., to make the building of proportionate dimensions, and the edifice is to be entered from the front by two doors, to be approached by steps. It is also to be heated by warming apparatus, supplied by Messrs. Den & Sons. The projected school-room is to be built on the north side of the chapel, the dimensions being 26 ft. 2 in. by 21 ft. 6 in., clear, and affording accommodation for 180 children. The building is also to be devoted to purposes of public meetings, evening lectures, &c. A class-room, 7 ft. 3 in. by 6 ft. 6 in., the lobby above referred to, are to adjoin school-room. The chapel and school-room to be divided by large low windows, so constructed as to admit of the buildings being used as one room on special occasions. A cottage for chapel-keeper is also in contemplation. Mr. Nelson, of Collingtree, is the builder; and Mr. H. Vernon, of London, the architect.

West Hartlepool.—The first stone of a new chapel, in Cambridge-terrace, West Hartlepool, the use of the Wesleyan Methodist body, has been laid. The building is designed by Messrs. G. & Swan (Leeds and Sheffield), architects. It is to be in the Italian style, with a front composed of stone, supported by four Corinthian pillars, and approached by a flight of steps. The walls and end of the edifice are to be composed of brick. Accommodation will be provided for 1,000 adults, and beneath the chapel to be a school-room for half the number of children. Mr. Jas. Pardon is the contractor for masonry; Messrs. Bridges & Robinson for joiner's work; Mr. Salmon for the slating; Walter Seal for the plumbing and glazing; Mr. H. Cockton, Middlesbrough, for the painter's work. The total cost will be about 400l.

Stoke Newington.—The Devonshire-square Baptist Chapel, at the corner of the Bedford-road, Stoke Newington, has been closed for divine service. The old chapel was situated in a neighbourhood contiguous to the various Petticoat-lane; and the cries and rattlings of the Jew clothesmen interfered awfully with the service. Fortunately the premises were purchased by the Metropolitan Railway Company, for their Tower-hill Extension, and a site for another church was secured at Stoke Newington. The old chapel was founded about the year 1638. The new chapel, of which the memorial-stone was laid, by Lord North, in the autumn of last year, is so constructed, by placing the tower and spire at an angle, publicity is given to the edifice. The approach is approached from the main road by a porch, surmounted by excellent carvings of stone, the ground floors being approached by a flight of steps, and the galleries at either side. The building consists of nave, aisle, communion-recess, fitted with galleries on three sides of the interior; and underneath there is a large lecture-hall or school-room. The length

of the building is 93 ft., with a breadth of 54 ft., and a height of 45 ft. to the nave, the tower and spire rising to a height of 125 ft. to the top of the final. The height of the lecture-hall underneath is 13 ft. The nave-arches are supported by light cast-iron columns, with corbels for the roof springing above the same, and with an arched roof formed with ribs and boarding, so as to have the advantage of height without draught. The building throughout is in style Gothic, of an early character. The cost of the building, inclusive of the minister's residence, which is a part of the same block, is about 7,500l., exclusive of the ground. The building has been erected from the designs of Mr. T. Chatfield Clarke, of London, the works being executed by Mr. W. Higgs, of Lambeth, under the superintendence of Mr. Unions and Mr. Seward.

Walsall.—The United Methodist Free Church, Blakenhall, near Walsall, has been opened for services. The size, on plan, inside is 27 ft. by 40 ft., and, with gallery over entrance, it will accommodate 280 people. The seats at the side are arranged to be movable, so that they can be used for Sunday School purposes, and sufficient land is secured for a school at a future time. To be attached to the church is a vestry, 14 ft. square; behind is an auxiliary room for tea-parties, and other conveniences. Semi-detached from the church is a small residence. The buildings are enclosed with brick wall and open palisade fencing, and are built of red bricks with bands of white bricks, and the roofs are covered with tiles. The style is of a Gothic character. The outlay will be about 650l. Mr. Ralph Chamberlain, of Walsall, is the architect, and Messrs. Tonge & Son are the builders, who have carried out the work. A terrace adjoining, to be known as "Booth-terrace," is being proceeded with, in the hands of the above parties.

Bolton.—The new Wesleyan school-chapel in Fern-street, Bolton, has been opened. The corner-stone was laid in September last, as intimated in the Builder of October 29th, 1870, when an architectural description of the building was given. Mr. William Donaldson was the general contractor for the principal works, and the sub-contractors were as follow:—For foundations and mason work, Messrs. Pilkington & Smith; brickwork, Messrs. J. & H. Brown; slating, Mr. John Hudson; plumbing and glazing, Mr. Thomas Nelson; plastering and painting, Messrs. C. & J. Stewart.—all of Bolton. A few of the class-rooms are warmed by opened fireplaces, the remainder, as also the chapel, by Messrs. Whitaker & Constantine's warm-air apparatus. The gas pipes and fittings have been supplied and fixed by the Bolton Gas Company. The pulpit, communion, singing-pews, and sixteen pews (fixed in the body of the chapel), all of which are of pitch pine, lightly stained and varnished, have been contracted for and fixed by Mr. Charles Dickinson, of West Houghton. The space of the chapel not occupied by pews, communion, aisles, &c., has been furnished with movable pitch-pine benches, having cast-iron standards supporting a rail for back rest. These have been supplied by Mr. J. Heywood, of Manchester. The total cost has been upwards of 1,400l., including value of old materials, also pews, pulpit, furnishing, lighting and heating, &c. The whole works have been executed under the personal supervision of the architect, Mr. Thos. Ormrod, of Bolton.

FROM SCOTLAND.

Edinburgh.—The foundation-stone of a new free church at Viewforth has been laid. The new church, situated at the end of West Gilmore-place. The plans for the erection of the building were provided by Messrs. Pilkington & Bull, architects. The style is Geometrical. A tower, facing the north-east corner, and 120 ft. high, will form a noticeable point in the building. The chief elevation will face the south, in a line with West Gilmore-place, and is made up of the front of the tower, a large central gable, and a smaller one on the western side. The main entrance to the church will be at the bottom of the tower front, and a smaller entrance will be placed at the foot of the smaller gable to the western side. The centre gable will be pierced by a four-light window, and a two-light window will be placed in the smaller gable. Both windows will be ornamented after the Geometrical fashion of Gothic window tracery, and the gables will be separated by a pinnacle. In the eastern wall of the church, running from north to south in a line with Viewforth, there

will be three gables, to the north of the tower. The centre gable will be the largest of the three, and will be pierced with a three-light window; while the smaller gables will be pierced by two-light windows only. The western wall will be built after the same fashion,—the geometrical ornamental tracery being carried out in all the windows. In the interior the building is rectangular. There will be accommodation for about 1,100 sitters. Below the church, on a sunk story, a schoolroom, vestry, &c., will be provided. The whole work is estimated to cost about 4,500l., the tower taking nearly 1,300l.

Coatbridge.—St. John's Episcopal Chapel, Coatbridge, has been for some months closed for repairs and additions. The whole of the interior fittings, including the gallery (in which the organ was placed) have been removed. The plaster ceiling has been taken away, and the principals of the roof, which were originally left undressed, have been boxed over where visible, and stained and varnished, and the rafters are now covered with stained and varnished boarding as far as the collar-tie, thus giving an additional 6 ft. of height to the interior. The church is entirely reset, and a new porch has been built out at the west entrance. The new chancel, organ-chamber, and vestry have been built out to a depth of 20 ft., at the east end of the nave, and the whole of the building has undergone a repair. The cost of this was altogether above 1,000l., the burden of which was chiefly borne by Col. D. C. R. Carrick-Buchanan, of Drumpellier. The carving was executed by Messrs. Mossman, of Glasgow; the heating, lighting, and ventilation were arranged by Messrs. Joseph Gibson & Co., of Glasgow; and the architects were Messrs. Kennedy & O'Donoghue, of London, Glasgow, and Bangor.

Cupar-Fife.—Crawford Priory, which having been unoccupied since the death of its founder, Lady Mary Lindsay Crawford, had fallen into a dilapidated condition, is presently undergoing extensive alterations preparatory to its occupation by the owner of the estates, the Earl of Glasgow. A large addition has been made at the east side of the building, the most prominent feature of the new work being a Gothic tower with spire 115 ft. high. A new carriage-porch and vestibule have been erected in front of the entrance facing the south. The eastern side of the main building has all been either remodelled or rebuilt. The interior of the building is undergoing a complete overhaul.

Rothsay.—The esplanade at Rothsay, which will occupy a large part of the beach between the pier and the Gallows Craig reclaimed from the sea, and which previously marked the curve of the bay, and has, besides, a sort of receptacle for sewage in front of the principal promenade, will soon be completed. The portion of it west of the lade, which was estimated at 17,576 cubic yards, has been filled up, at a cost of under 1,000l.; and the portion east of the lade, estimated at 23,527 cubic yards, is being rapidly filled, and, at the same rate, should cost about 1,350l., making in all, for filling in, 2,350l. The Town Council, by getting the work done under their own superintendence, will thus effect a saving of 741l., as the lowest offer for it was 3,091l., and the highest was somewhere about 6,000l.

Miscellaneous.

Bursting of a Water Main.—Considerable alarm was occasioned in High-street, one of the principal thoroughfares of Leicester, on Friday morning, by the bursting of one of the mains of the water-works. These mains are over 2 ft. in diameter, and the loud report, accompanied by the sudden upheaval of the ground, followed by the issue of a thick column of water to the height of about 60 ft., naturally caused much consternation. The pavement for some distance around was torn up, the stones being hurled into the air, while so vast was the issue of water that soon the locality was flooded—cellars filled, and the streets in many places over a foot deep in water. Considerable damage was done to the house of Dr. Lankester, the water falling with great force on the roof, which was broken in, as also several windows, and nearly every room deluged. As soon as possible the water was turned off, but the vast column of water continued to issue for over an hour, flooding not only the locality, but also the low-lying districts adjacent. Consequently the repairs, Leicester was on Sunday without a water supply, and great inconvenience was experienced.

The Improved Industrial Dwellings Company, Limited.—According to the Report and statement of accounts, prepared for the sixteenth half-yearly meeting of shareholders in Sir S. Waterlow's Company, at the Mansion House, on the 11th inst., the total expenditure on capital account is now 195,779l. 16s. 7d. The rents during the half-year amount to 8,444l. 1s. 3d.; total income, 8,632l. 6s. 1d. The total expenditure has been 4,370l. 1s. 10d., leaving a profit of 4,261l. 19s. 3d. A total of 6,695l. 7s. 11d. was available for the usual dividend, the directors recommended that the usual dividend, at the rate of 5 per cent. per annum, free from income-tax, be paid, absorbing 3,224l. 8s. 3d.; the balance, 3,470l. 19s. 8d., being carried forward.

There having been a large number of empty dwellings in one of the blocks at Derby-buildings, in which only one scullery, &c., was provided to every three dwellings, the directors have, by throwing two dwellings into one, provided separate domestic conveniences to each dwelling in the block; and these dwellings are now all let. Since the last meeting the directors have negotiated for leases of three important sites. The first is in George-street, Grosvenor-square, on which a block of dwellings is being erected, to contain accommodation for thirty-eight families; the second is in Goswell-street (Compton-street and King-street frontages), Clerkenwell, on which two blocks of dwellings are being erected, to contain accommodation for forty-eight families; and the third is in Crabtree-row, Shoreditch (near Columbia-market), on which five blocks of dwellings are being erected, to accommodate 112 families. These buildings are being erected by Messrs. Allen & Son, of Finsbury, and, when completed, will afford accommodation for about 1,000 persons. The total cost will be about 32,000l. The directors are also in negotiation for the lease of an additional site in Ebury-square, Finsbury, which will enable the directors to give additional accommodation for about 300 persons.

Machine-made Tubing.—A number of engineers and other gentlemen interested in this subject have inspected a newly-invented machine, in Cannon-street, City, for manufacturing copper tubing from strips of metal. The machine was worked for the time by two men. The flat strip of copper was placed in the machine, and its progress to the complete tube could be closely watched, owing to the slow movement of the machine. The metal passed along between rollers, being first bent down at each edge, then hollowed in the middle, next caught by projecting pieces, which turned it so as to enclose an iron cylinder, while the two edges which had been turned down met together and projected; this projection was next bent down and doubled over, while a groove in the iron cylinder allowed of its being so pressed down as to leave the outside of the tube almost smooth; small points projecting from the last of the rollers further pressed the edges together, producing the effect of riveting. One of the finished tubes, to the end of which a metal stopping had been soldered, was subjected to a pressure of nearly 300 lb., which eventually burst off the end, but did not sensibly affect the tube or its long joint. Mr. E. J. Reed, late chief constructor of the navy, and General Boileau, expressed themselves much pleased with the machine and with the work turned out by it. The speed with which it can finish copper tubing is stated to be at the rate of 1 ft. per second, and it is adapted for working iron, zinc, or other metals, as well as copper, and a company will probably be formed to work the patent.

Educational Collection: International Exhibition.

The reports published by Messrs. J. M. Johnson on this part of the Exhibition at Kensington are,—“School Buildings, Fittings, &c.” by Alfred Chas. King; “Books, Maps, Globes, &c.” by E. P. Bartlett; “Toys and Games,” by G. C. T. Bartley; “Materials for Science Teaching,” by J. F. Iselin; “Materials for Art Teaching,” by George A. Stewart; “Musical Instruments, Books, &c.” by John Hullah. The reports on specimens of school-work are by various writers, as follows:—“Examination Papers,” by the Rev. Muirhead Mitchell; “Drawing and Design,” by George A. Stewart; “Needlework in Schools,” by Mrs. Le Neve Foster; “Work in Prisons, &c.” by Capt. E. F. Du Cane, R.E.; “The Blind and the Deaf and Dumb,” by Edmund C. Johnson. Some of the reports, we are forced to say, are very slight.

The New National Provincial Bank, Middlesbrough.—Last week the corner-stone of the new National Provincial Bank of England was laid. Mr. John Gibson is the architect; and the contractors for the erection of the edifice are Messrs. Potter & Wilson, of Middlesbrough; Mr. William Glover being appointed clerk of the works. The three fronts, viz., the principal or entrance one in Cleveland-street, which will be 72 ft. long, and those facing Gosford and Garbutt streets, which will each be about 60 ft. long, will be faced with Stainton stone. The architecture will be Italian in style, with attached columns and pilasters, and a pierced parapet at the top of the building,—the whole to be surrounded by a balustrade. Ten circular-headed windows will light a banking-room, 66 ft. long, 30 ft. wide, and 22 ft. high, which will ultimately accommodate about forty officials. There will be convenient waiting and manager's rooms, a large strong room for books, &c., and a treasury of substantial character on the ground-floor; and there will be every appliance to carry out the business of a large establishment. In the basement will be the clerks' lavatories, a resident's kitchen and other offices, and strong rooms under those on the ground-floor for customers' plate, &c. The rear of the building will be of three stories, for the accommodation of the resident and messenger.

A Presentation Bible.—A very handsome Bible, subscribed for by Church of England Sunday Schools, has been presented to the Princess Louise. The sides are of vellum diapered in gold, with tooling of appropriate devices, and enclosed in a mounting of silver, perforated with foliage, set with jewels, and enriched with scroll wirework, having gems for the flowers. The sides are strengthened with applied mouldings, and united to the back by continuous silver hinges. The back is also of silver gilt, moulded into a very elegant form, with plates at top and bottom, to protect and conceal the actual sewing of the printed sheets, and is adorned in *repoussé* work, with the sacred monogram, the title and date in ornamental characters, with foliage and jewels in appropriate settings, and in the lower part with niches beaten in the silver, containing the Princess's initials entwined with her coronet, and the ancient ship which is borne on the shields of the Dukes of Argyll for the lordship of Lorne. The composition is united and completed by tabernacle work mouldings and foliage. The whole is of Medicean character, beaten by hand out of silver plates. The work was designed by Mr. S. J. Nicholl, architect, and executed by Messrs. Cox & Sons, of Southampton-street, Strand.

Dorking Public Hall Company.—The prospectus of this company, which has for its object the building of a public hall and assembly-room, on the site at present occupied by a large block of buildings belonging to Mr. G. Cubitt, M.P., in West-street, will shortly be issued to the public. The company is to have a capital of 6,500l., in 1,300 shares of 5l. each. Mr. Arthur Powell, J.P., of Milton Heath, is the chairman. It is proposed to build an assembly-room capable of accommodating from 700 to 800 persons, with a corresponding space underneath, suitable for a market, offices, or stores. There will be other large rooms for public meetings, lectures, &c.; library and reading-rooms, and necessary offices. The directors anticipate that the public hall will be used by the magistrates for their judicial meetings, for the holding of the county court, educational and other meetings, committees, sales by auction, concerts, balls, and other entertainments. Mr. Chas. H. Driver, of Westminster, is the architect engaged by the directors to prepare plans of proposed alterations and for the erection of the new hall; whilst the building operations will be undertaken by Mr. William Shearburn, of Dorking, whose tender was the lowest received.

New Vestry Hall for Camberwell.

After a discussion extending over a long period of years, the Vestry of Camberwell have decided that a new Vestry Hall shall be erected, at a cost not to exceed 8,000l. The Vestry at present has to provide accommodation for its officers at two distinct establishments,—a plan which entails great confusion and annoyance. The officers are inconveniently crowded together, and the Vestry Hall is small, ill-ventilated, and very injurious to health. The Metropolitan Board of Works will be applied to to allow the money required for the erection of the building to be borrowed, the repayment to be spread over a period of twenty years.

A Gift to Maidstone.—Through the kindness of the late Mr. Randall and other gentlemen, aided by the Town Council, Maidstone possesses a museum. Since the opening of the new wing at Chillington House, gifts have poured in from all quarters, so that the present building is becoming insufficient for its purpose. The natural history collection of Mr. Julius Brencley has been for many months unavailable to the general public for this reason, and has been stored in the unused wing, which, through the liberality of the executors of Mr. Randall and the Messrs. Mercer, has been made to raise a sufficient sum to entirely rebuild this portion of the structure, and gentlemen have come forward for the purpose. It is now proposed by Mr. Julius Brencley to present to the town some four acres of land, each communicating with the grounds of the ancient Manor House. A road is to be constructed, leading into Week-street, through Bone-alley; and St. Faith's-green, which is the property of the town, is to be thrown in, and the whole will be laid out as a public garden.

Iron Forts.—A plan of “an iron fort and new system of fortification,” invented by Thomas Welton, of London, has been sent us. In his explanation, the inventor says,—“I propose to build below the surface of the earth a series of arches, each communicating with the other by proper openings, and to lay a tramway on the floor of the said arches for the convenient removal of weighty goods, and above them (the arches) erect an iron fort in segments, so that each segment shall cover the joint of the next one, and so on in continuation. It is evident that when all these segments are bolted or riveted together, they would be of much greater strength combined than a similar thickness of iron in one plate.” He also proposes to cover his fort with an iron dome in segments, and which may rotate, and have sloping apertures for mitrailleuses or other ordnance, mounted inside; and a spiral gallery, hydraulic lift, magazine under water, &c.; but the explanation is too long for our columns.

Damaging Waste.—According to returns furnished by the engineer of the Metropolitan Board of Works, the daily average quantity of sewage pumped into the river Thames at Crossness was 225,443 cubic metres, and at Barking 244,559 cubic metres, equivalent to about as many tons by weight. With reference to the average daily quantity of sewage pumped into the Thames at Crossness and Barking, which last week was about 468,002 tons, the following interesting note has been furnished by Mr. R. Rawlinson:—“Chemists value this sewage at 2d. per ton. The farmer's value all the year-round is set down by Messrs. Lawes & Gilbert at 3d. per ton. This means that above 1,000,000 worth of manure per day is wasted; or a farmer's value of about 365,000l. a year. The waters of the Thames are in the meantime indescribably fouled, and many acres of putrid mud-banks are exposed betwixt high and low water each tide. In twenty years 365,000l. per annum would amount to 7,300,000l., exclusive of interest.”

Sketching under Difficulties.—At the Windsor County Court, Mr. Alfred Young Nutt brought an action against Mr. Gristwood, a farmer at Clewer, for an assault. The damages were laid at 50l. The plaintiff stated that he was an architect, and had held an appointment at Windsor Castle for three years as a half. On the 15th of July, he was standing in the Clewer fields sketching, when he was accosted somewhat roughly by the young Gristwood, who desired to know what business he had there. An altercation followed, he was charged with trespassing on their ground, and the affair culminated in Mr. Gristwood, his son, and a labourer seizing plaintiff and dragging him along nearly 100 yards with the intention of placing him in Clewer lock-up, although he repeatedly offered his name and address. His picture, colours, and materials, were also thrown down and damaged. The judge awarded Mr. Nutt 10l. damages for his property, and 20l. for the assault, defendant also to pay the costs.

The Metropolis Water Bill.—This Bill was passed through Committee in a House, less than fifty members, in the small hours of Wednesday morning, 9th inst. Notwithstanding a long list of amendments which had been placed on the notice paper, the Bill now stands virtually the same as it was left by the Select Committee. It is being hurried through the Lords.

royal Polytechnic Institution.—At the yearly general meeting, held on Saturday the 12th inst., the directors' report was read, and the dividend of 4 per cent. for the year, or at the rate of 8 per cent. per annum, declared. A report of the position and progress of the Institution was read by Professor Per, which congratulated the shareholders on continued success of the Polytechnic, notwithstanding all competition. 10,212 more people had paid for admission during the six months ending June 30 last than during the corresponding period of last year. In 1870-71 students' fees amounted to 3331, which is more than in the previous year, and 1301 more than in 1862-63. The reports were adopted. The chairman stated that the increased dividend arisen in a large degree from economical management. Thanks were voted to Professor Per, the honorary director of the institution, the officers generally, and to the chairman and clerks.

accidents.—A fatal accident has happened at Wilmslow, near Manchester, by which six men were killed. Workmen were excavating at a depth of fully 20 ft., preparing foundations for a gasometer, at the back of the local gasworks, when the sides of the excavation suddenly gave way, and buried five of the men who were in, also the engineer of the gasworks, Mr. Richards. The soil is of pure soft sand, and inquest on the bodies has since been held at Wilmslow. The jury found that the deceased was suffocated; that the sand fell in consequence of undermining the sides of the excavation for a gasometer, and that the outer side of the trench was not sufficiently boarded. A wall in the cotton-mill of Messrs. Threlfall & Sons, at Threlfall, Preston, which is being rebuilt, has lately fallen, killing one man and injuring several others.

The Drinking Fountain Association.—An appeal is made by the Marquis of Westminster, on behalf of the Metropolitan Drinking Fountain and Cattle Trough Association, of which he is the president. A circular issued by the association shows how wide and beneficial has been its working. In one day 4,142 horses were at four troughs; and 8,000 persons at one main. In hot weather like the present it is estimated that 300,000 persons daily avail themselves of the waters supplied to them in London. The association has erected and supplies with water 1,301 troughs and 144 fountains. It is supported by voluntary subscriptions; and as the supply of water to a single trough sometimes costs 1/30l. in the year, it will be seen that the sum required for its operations by the association is considerable.

new Lighthouse.—The foundation-stone of the new Longships Lighthouse, off the Land's End, has been laid by the resident engineer, Mr. Peaseley. The stone, which is of granite, weighs 2 tons, and is the first or lowest course of the tower, and is laid into the rock. The new lighthouse is of a shape which are being constructed by the City House, and of which the Bishop's Rock, the Wolf Rock were the first examples. The new Longships Lighthouse is about a mile from the Land's-end.

the Mont Cenis Canal.—It is pointed out in the Italian journals that the great tunnel for the Mont Cenis, which is to be opened on the 1st of next month, will then have been completed three months before the time stipulated in the contract, viz., December, 1871. The works were commenced in 1857, and have thus lasted fourteen years in hand. The rate of progress has been about three yards per day. On the French side there is still part of the connecting line—about six miles in length—remaining. This will not be ready until a month after the opening of the tunnel.

Central National Art-Training Schools for Teachers. at South Kensington, have been closed for the summer vacation. The schools will be re-opened on the 2nd of October when all new candidates for admission will be required to pass, or to have passed, an examination in freehand drawing.

International Exhibition of 1872.—The commissioners have issued the rules and regulations that will apply to the Exhibition of 1872. Exhibitors should apply and obtain admission. Some considerable alterations should be made in the locale before the next gathering, and the fatigue involved in the management of a chorus of complaints.

Fall of a Bridge at Morpeth.—A serious accident has taken place at Morpeth. A number of persons had arrived by train in the course of the day to attend a band contest. About seven o'clock a crowd of persons were passing and repassing a swing-bridge which crosses the river at the foot of the town, when it suddenly gave way, and its occupants were thrown below. On the debris being cleared away, it was found that a number of persons were very much injured. Two ladies had their legs fractured, and several children and men were seriously hurt; one of them is not expected to survive.

St. Bridget's Church, Wavertree, Liverpool.—Mr. Edward Haffer has sent us a large amount of correspondence to justify the statement made in our pages that he designed the clerestory windows in his church, St. Bridget's, and which was contradicted recently by the glass painter (p. 584, ante). It is quite out of our power to go into the question: a glance over the letters sent serves to show that, at any rate, the general scheme and very full instructions were given by the architect, whoever may have drawn the ultimate cartoons. We cannot carry the matter further.

Statue of Sir James Outram.—Mr. Noble's statue of Sir James Outram, which has been erected on the Thames Embankment, at the end of Whitehall-place, was publicly unveiled at one o'clock on Thursday, 17th. We shall take an early opportunity to speak of it.

Hyde Park.—The portion of Hyde Park between Albert Gate and Apsley House, affords just now an example of the beauty that may be obtained by the form and colour of foliage alone, and without recourse to flowers.

Church of St. Clement Danes, Strand.—The probable removal of this church, to improve the approaches to the Law Courts, is being discussed: and with strong objections.

TENDERS

For new business premises in Ranelagh-street, near the New Central Station. Mr. Penny, architect. Quantities supplied:—
Evans & Son £5,143 0 0
Tomkinson & Son 4,577 0 0
Truslow 4,553 0 0
Wray 4,547 0 0
Nay 4,515 0 0
Pollock 4,383 0 0
Nicholson & Ayre (accepted) ... 4,237 0 0

For the enlargement of National School and master's house at Bayers-common, Sussex. Messrs. Goulty & Gibbons, architects:—
Anonimo £304 0 0
Nell & Luxford 350 0 0
Nash & Co. 248 0 0
Hollands (accepted) 299 0 0

For new schools for the parish of Thelotham, Suffolk. Mr. R. M. Phipson, architect:—
Hedland £470 0 0
Grimwood 468 0 0
Tooley 440 0 0
Cornish 437 10 0
Hawes 426 0 0
Bishop (accepted) 415 0 0

For schools and school-house, Garboldisham, Norfolk. Mr. R. M. Phipson, architect:—
Bishop (accepted) £235 0 0

For benching Thelotham Church, Suffolk. Mr. E. M. Phipson, architect:—
Hawes £490 0 0
Tooley 401 0 0
Cornish 384 0 0
Grimwood 374 0 0
Bishop (accepted) 345 0 0

For a residence at Fuddenhall, Norfolk. Mr. R. M. Phipson, architect:—
Hales (accepted) £565 0 0

For block of dwellings in flats of fire-proof construction, proposed to be erected at Hastings. Mr. G. Friend, architect:—
Skinner £3,740 0 0
Howell 3,669 0 0
Stephenson 3,693 0 0
Kelsey 3,669 0 0
Gear 3,468 5 0
Blackburn 3,407 0 0
Russell 3,363 14 2
Barnes & Mondy 3,310 0 0
Dover, Dowel, Mills, & Co. 3,300 0 0

For fitting up certain railway arches as stables in Porchester-street, Walworth-road, for the London Traction Company. Mr. James Edmondson, architect. Quantities supplied by Mr. Thos. Archer:—
Roberts £1,150 0 0
Abrams 1,125 0 0
Cowland 1,110 0 0
High 1,048 0 0
Taylor 1,027 0 0

For taking down and rebuilding two shops, Nos. 121 and 123, Oxford-street, Manchester, for Mr. Thomas Barber. Mr. G. S. Courrie, architect. Quantities not supplied:—
Barber & Gibson (accepted) £1,300 0 0

For residence, with stabling, conservatory, &c. for Mr. J. H. Deakin, at Cheside, Cheshire. Mr. James Bayley, architect. Quantities supplied:—
Barber & Gibson (accepted) ... £2,699 1 10

For raising the roof of No. 9, Montague-street, for Mr. Lavers. Messrs. New & Cumming, architects:—
Mark & Co. £450 0 0
Fearnman 470 0 0
Phillips & Son 463 0 0
Harris & Co. 455 0 0
Brown 450 0 0

For Birkdale sewerage, Lancashire, Contract No. 2, for completion of main sewerage works. Messrs. Besse & Goodson, engineers. Quantities supplied:—
M'Gregor & Badman £16,700 0 0
Godfrey 13,994 8 6
King 11,483 4 8
Rison 11,330 0 0
Morris 10,695 0 0
Smith & Fawkes (accepted) ... 9,618 10 8
Lee 9,342 0 0

For residence, with stabling and boundary-walls, &c., for Mr. Robert Smelt, at Withington. Mr. James Hull, architect. Quantities supplied:—
Southern £3,675 0 0
Harrison & Shaw 2,639 12 0
Barber & Gibson (accepted) 2,669 12 8

For Madeley Union Workhouse. Messrs. H. & G. Haddon, architects:—
Yates £8,638 10 0
Wish & Son 8,383 0 0
Jeffery & Ertchard 8,639 0 0
Wilks 8,050 0 0
Wood & Sons 7,837 0 0
Millington 7,500 0 0
Bowers 7,281 0 0
Esley 7,750 0 0
Inwood 7,703 0 0
Burrell 7,533 12 8
Moreland 7,323 0 0
Everall 7,462 10 0
Burkitt 7,490 0 0
Nevitt, Bros. 6,930 0 0
Nelson 6,859 0 0

For erecting warehouses in Sheppey-ward, Minorities, for Mr. W. Nokes. Mr. J. Bradbury, architect:—
Leggett £1,070 0 0
Harvey 1,048 0 0
Cox 1,028 0 0
Sawyer 961 0 0
Merritt & Ashby 973 0 0
Whitlock 890 0 0

TO CORRESPONDENTS.

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We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the names and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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The Builder.

VOL. XXIX.—No. 1490.

The Value of Proportion in Architecture.



ARMONIOUS combination is applicable to promote ulterior purposes of usefulness, as in construction of a complicated musical instrument; or to production of ultimate enjoyment,—a sense of the beautiful, as in the performance of a symphony upon the instrument when made. In certain arts—the Useful, the harmony of Use; in others—the Fine Arts, the harmony of Beauty, is all but exclusively in requisition. There are reasons why the line can perhaps never be drawn with absolute strictness; it is characteristic of architecture that it is not only at the same time a Fine and a Useful Art, but that when it is useful in the very highest

degree it may nevertheless assert for itself a rank in line with the most dignified of the very best Fine Arts. It thus is found to be charged with more than one other, with a double responsibility,—it is bound to conciliate, to harmonise both the harmonies.

How is such an alliance to be effected? The sense of Beauty in all its grades and modifications is dependent on emotional suggestions ministered to imagination, but independent of direct bearing on special usefulness or inconvenience; the feelings of Beauty, Sublimity, of Grace, Elegance, Prettiness, are excited by ideas of pains and pleasures that have every element of vividness, interest, and quantity, except personal and present hope or apprehension. Appeals to imagination gain audience and entertainment through the sympathies, no doubt, but do not pretend to come home to Sympathy as susceptible of Anguish, of the agitating hopes that move amidst the issue of our current life. The dream of Faerie vanishes at the commonplace cockcrow summons of work-a-day interests,—the sting of reality voices a cry of exultation or of pain that in breaking silence dissolves the charm, and contemplation retires before intrusive energy. There is a point, no doubt, at which imaginative extension from roguish fiction,—romance or drama,—may become painful—perhaps as disagreeable, as uncomfortable as many a personal apprehension of ill; but here Fine Art is at an end, confounded by trespass over fated limit. The novelist who makes me throw down his book half read, or turn over to the catastrophe prematurely, must stand down beside the musician who drives me with closed ears from the concert-room. Such Art may sit down contented with the label Sensational, but this only marks its essential commonness and coarseness.

The exclusion of suggestions of personal annoyance and positive inconvenience is therefore a primary condition of the pleasures of imagination derivable, as from other fine arts, so especially from Architecture, and it is clear that the

most important utilitarian harmonies must be in the first instance manifestly, or, at least, to all appearance, satisfied,—must in no case be allowed a voice of audible murmur, though even without just cause. The useful conditions must be seemingly, at any rate, if only seemingly, fulfilled; for if seemingly, though only seemingly, defective, enjoyment from the still more sensitive source infallibly sinks down at once. Stability, due Accessibility, Illumination,—on these and such-like points the mind must be at ease, not merely in proof and practice, but by signs that have the appearance of being infallible in any case. Harmony in use, therefore, as it may consist with almost any absence of salient, palpable signs, does not by any means produce harmony of beauty, of necessity. On the other hand, what pleasure is derivable directly from manifest exhibition and display of fitness in use is indeed alien from, and even may be adverse to, the sense of beauty proper. If this sense is ever apparently awakened in virtue of such considerations, it is in reality because the mind at the moment is diverted from regard to the proper characteristics of ostentatiously set forth conveniences and comfortableness, and loses thought of them in general admiration of the skill of the contriver, or in the general sense of how, in a "beautiful plan," for instance, harmonious requirements are susceptible of falling together with completest consistency in a harmonious design.

Emancipated thus from simple servitude to usefulness, imagination claims further to introduce for the sake of beauty free details that are not subservient to use in any sense whatever,—that might be altered in a thousand ways without usefulness being impaired, though beauty would die at once on alteration in any one of them,—that might be altered again almost as variously, and beauty be still conserved, and only varied, while usefulness would be neither better nor worse in a single change. Whether and to what extent a minor use may not be sometimes sacrificed for the sake of a superior beauty, is a question upon which architects will often have to take deep counsel within their own spirits; and if the sacrifice is successful, as under conditions it may be gloriously, may be contented to abide the challenge of violated principle. But such decisions involve the very casuistry of art, and though every act of life in either case depends on resolution of a case of conscience, the last refinements of casuistry are as perilous in art as in morals.

As a guiding rule the Harmonies of Beauty must ever hover closely around those of Use,—must hold by an attachment to them as the elder born even when most frankly and wildly discursive. It is thus that the appropriate rhetorical accent of the words tells authoritatively on the distribution of notes by the musical composer, while the musician would justly deride the ascription of all the merit and value of his melody to any source independent of his own genius,—as justly as he would imprudently and fatally disregard the import and spirit of the words of which it is his main business to enhance the expression.

As Beauty has need to harmonise with Use, the sentiments it suggests must be those that are in harmony with the particular use in question, whether as regards a structure at large, a section of it, or a particular member; it is for Art to recognise what are these appropriate sentiments, to distinguish, to refine them, to invent modes and forms that will give them distinct and proportionate expression. Beauty is cared for, not by contributing to use, but by expressing the characteristics of usefulness. The simplest illustration is the best; the service of the column depends on its strength,—requires that it should be solid, rigid, vertical. When the mass is channelled from top to bottom in Doric or Ionic flutes, there is argument that strength

has been impaired by removal of material, or that the projections that remain are useless excrescences; a Gothic vaulting shaft, again, is in most cases as palpably either less or more than is required for any constructive service. But both flute and vaulting shaft, contrasted as they are, supply visible emphasis to the suggested function of the members they are attached to; they are notifications and assurance of the bestowal of thought, precisely and appropriately, in the direction and at the points where thought is most of importance. An agreeable sense, rather than an assurance of the strength and commodiousness of a structure, is conveyed by features which give pronounced expression to its leading contrasts, and intimate the truth of their connexions,—the simplicity of their transitions,—the certainty of their coherence. Gracefulness thus supervenes upon vigour, and delicacy upon endurance, and the primary character of the composition at last owes its liveliest declaration to details that are in no way contributory,—certainly not essential,—to its commoner availability in use.

When original parts and serviceable members have been supplied or invented, the natural secrets and secrets of expression are open to study, to scrutiny, to the experiment of untried tentative trial. It is the function of æsthetic art to detect the motive on which character depends,—to estimate its quality and force, and to compass the expression of it by invented features of significant expression and treatment, with natural and precisely modulated emphasis. The instruments and elements for awakening varied phases of sentiment are different in every art; but the principle in accordance with which as they pass from the severe to the elegant, from the ornate to the playful, they assert appropriateness, and realise a peculiar unity, is ever the same; it is the persistently pursued differentiation,—moderate it may be, or extreme,—of combinations that have origin primarily in the harmonies of use. Whether for the leading lines of a large design, or for the details of an ornament, the principle, however latent, is at last the same.

Appropriate sentiment is sometimes much more simple, much more salient than in other cases,—sometimes by very vigour of nature is insurgent and victorious over any mismanagement that does its best or worst to smother or suppress it. This, however, usually will be but in the coarser cases, and characteristic expression that gives an opening for really fine art demands finest powers, instincts, culture, for its appreciation. If write tragedy you will, is the warning of Horace, in his particularly,—one would fancy, rather painfully,—frank intimations,—*ad Pisones*,—it behoves you to study Plato, to bend night and day over the Socratic literature. It were no bad advice to an aspiring student of architecture to enjoin him to familiarise himself, in the first instance, with Shakespeare. All characteristic expression in every art is at last amenable to a moral test,—it bases upon moral fitness. The feelings that are the germ of all artistic perfection, that distinguish the decent and the ungraceful, the refined and commonplace, the grades and hues by which dignities differ from dignities as star from star in glory, are essentially sensitive appreciations of modes of right and wrong.

It is thus that a building of any importance can scarcely but be an expression of the character of the builders,—in this term comprising both client and architect. Dignity and vulgarity, culture and clumsiness, littleness of mind and expansive humanity will struggle into light from the very depths of the unsuspecting designers' hearts, and stand published to all mankind in their works. Liberality manifests and ostentation proclaims itself; if plenitude of wealth and vacuity of ideas start together, they will be housed in company at last, and invite all the world to take note of them; and largeness of

heart that a little disregard limitation of resources will not leave even incompleteness undisturbed by a glory.

But the highest æsthetic harmony does not occur by accident; purity and force of expression exist in virtue of the subordination or suppression of elements that are by their nature incongruous,—by union in due order and sequence of all that are fitted to heighten the effect required; selection, exclusion, arrangement, come into play, and are not performed without labour and strain on the artist's mind, however they might seem, for any record he takes or any account he could give of them if he tried, to proceed spontaneously.

As little does æsthetic harmony, whatever its seeming spontaneity, occur independently of principle,—of that theory of which we have already announced ourselves in search. In moving on to the consideration of this in closer detail, there is but space to-day to indicate one more distinction, which, however, divides the whole field that lies before us for exploration.

The perfect harmoniousness of a combination in respect of Use or Beauty, or both, and whether in Nature or Art, is a consequence from a double source, and is made up of two kinds of harmony in accord. Such a combination is harmonious,—

1. As regards and in virtue of the kind of members, or parts assembled, and the scheme of their arrangement.

2. As regards and in virtue of the absolute and relative magnitudes of the members one with another,—the matter of gradation and preponderance.

Thus the natural structure of an animal is recognised as harmonious, when and inasmuch as its members are of the kind, and complete the set required for its existence and preservation under certain definite conditions: this is the harmony of the gills, fins, scaly coat, and so forth of the fish; and equally in the case of the bird, among parts so different as lungs, wings, and feathers: this it will be convenient to designate Qualitative Harmony. It is this which is violated when a requisite member is wanting, or a wrong is intruded; as if, for instance, we should suppose claws to belong to a ruminant animal, or hoofs to a carnivore; or, to resume our former example, if fish and bird should interchange their organs of locomotion or respiration. But mere harmony of parts in respect of kind is insufficient without the complementary harmony in respect of quantity.—Quantitative Harmony, or, let us say, Proportion. Disproportion between parts will frustrate the efficiency of the most exquisitely contrived organisation, and the ill and irregular growth of the dwarf is in these respects an imperfection as serious as the mutilated condition of the cripple. When the fitting parts in respect of kind, and with reference to a given end, have been assumed, the crowning effect has still to wait upon their fitting adjustment to each other and to the whole, in respect of dimensions, weight, strength, solidity, and so forth.

Æsthetic harmony in the arts is subject to the same conditions;—it is bound, in the first instance, to Qualitative appropriateness in adoption and general distribution of columns, piers or shafts, arches and impostes, &c., or the various ornamental developments attached to useful members,—elements of which the invention in general forms and combination supplies types for further elaboration and refinement by expressive art. The precise definition of expression, however, the evolution of most forcible as well as of purest effect, will depend secondarily upon Quantitative adjustments,—upon just subordination by proportion of features, which, however appropriate and susceptible of harmonious expression in a general way, may easily become insane or ridiculous by exaggeration of one to the detriment of all the rest.

Artistic architectural harmoniousness, therefore, such as we are used to ascribe to the Parthenon,—such as we are conscious of in the finest basilicas and cathedrals,—is recognisable as having a double source: first, in the Qualitative condition of harmony, in the appropriate nature of divisions and members relatively to the purposes of sacred buildings, including the expression of a certain typical dignity, the grand purpose of all; secondly, in the Quantitative condition of harmony, the fitting proportion of these divisions and members to each other at large and in detail, with reference to the same great purposes. The first definition may be otherwise referred to as the principle of Harmonious Design, and the second as the principle of Harmonious Proportion.

A HOLIDAY FOR STUDENTS.

LYNN—BOSTON.

Wednesday, August 2nd.*—From Lynn under the old south gate, across the river, and westward to the Marshland,—to Tilney All Saints. The old bed of the Ouse crossed a couple of miles from the Marshland Freebridge; in one part the site of a comfortable-looking house, buildings, and gardens. An aimless, wandering, lazy sort of stream it must have been before Mr. Rennie "reformed nature," and formed the Eau Brink. A Curvilinear west tower, with triplet of lancets on the second stage at the west, and complets at the sides,—a lingering love of an earlier arrangement. The nave ground-stories (1160 to 1170), with Transitional volutes, and all the force of character usually found in and around that odd little inverted curl; a good deal of the "go" lost, however, in retreating, rather clumsily, some time or other; so that the visitor must not now expect too much. West Walton comes full in view at a turn, after seven or eight miles of the dullest, homeliest, "fit-as-a-T-square" road,—made not uncheerful just now by the plenty waving in every field. Here no expectation is likely to be too high! The detached Lanet tower, designed to form a gateway to the churchyard, a very perfect work in proportion and detail, stands about thirty yards south-east of the church. This position certainly makes the best of the tower in itself, but does little justice to the thoroughly-detached church, which cannot group with it without losing some effect of size. They are too near and too closely associated to be two buildings, and too separated to be properly one,—a remark in a less degree true of every position except the crossing, the centre of the west end, or the end of an aisle, where the tower can join well on to the nave, or the highest part of the church. Three doorways, works of the purest English art; the west door, with five nook-shafts; a nave arcade on clustered piers; an arched clearstory, and a very rich and beautiful window in the south aisle,—the general forms and character of the details—surely in many approaching, if not absolutely reaching, perfection—are well known by the illustrations (vol. i., Early Eng., plates 9 to 22) of Mr. J. K. Collins's "Details of Gothic Architecture" (published 1852): some wall-painting and minor details being also given in "Gothic Ornaments," by the same author,—vol. i., Early Eng., plates 56 to 63 (published 1849). Everything must be very much as it was then, except that some of the stonework has since lost its whiteness.

Along the road on the top of the Old Roman Bank for a mile or two; quite a surprising revelation hereabouts,—a very early work for securing the Marshland district from inundation: the dry land now stretches three good miles northward, and active measures are from time to time taken to snatch fresh areas out of the clutch of the sea. To Walpole St. Peter, the largest and finest Rectilinear church in the whole Marshland deanery: members of the Architectural Association will remember the elaborate paper on the buildings of this district by the Rev. E. C. Nelson, of this parish, read to them in January, 1870. The church, with plenty of floor and cubical space; of course, much over-lighted now by these great untuned windows. The floor at the east end of the chancel,—raised (perhaps too much) by a double flight of steps above the general floor level,—has a public passage under the eastern bay covered with a groined stone roof; doubtless a right-of-way clung to then, as it would probably be now, with true English tenacity. A general similarity of the clearstory of the nave here to that of St. Mary Magdalen, Wiggenshall,—with flat buttresses between the windows dying under the projecting parapet,—is another instance of the "works" (probably) done by the same artist,—a few of which were named by Mr. Street in Sess. Pap. R.I.B.A., 1869-70, pp. 30 et seq. The large Jacobean screen at the west is so high and so solid as in effect to cut the church in two; yet, although conscious of the fervid summer-time, and none of us parishioners, all consent that, as the screen is really a very fine one, and perhaps promotes comfort at times, it might be permitted to remain. This, and the Jacobean pulpit and immense font-cover, are specimens of a store of work of this date, to be found hereabouts, with a not unpleasing, nor ungraceful, and quite peculiar odd quaintness,—one is driven to that most useful, if just now rather vague epithet.

* See pp. 619, 639, ante.

The other Walpole (St. Andrew), near at hand, an instance of failure of one of the much-pierced clearstories, with very small piers (two windows in each bay), such favourites in the Rectilinear period: the walls are now crumpled, and have iron ties, &c. Here are a clever little stone pulpit bracket, good turrets at the east of the nave, and some remains of a hermitage at the west end of the church. Walpole "is supposed to record . . . the pool formed within the sea-dyke (wall) in this neighbourhood" (Murray's "Norfolk," 1870, p. 303).

Terrington St. Clement,—well known by the view in Johnson's "Reliques,"—has a ponderous tower at the north-west corner; giving a fine breadth to the west front, always a source of grandeur; the impression of size necessary thereto depending so much on the "return dimension."

Five or six miles take us back to Lynn, where St. Margaret's Church, with twin western towers, drives home the same ideas as to breadth of western front: a church grand enough to the imagination, but really only the wasted, diminished, and defaced image of its former self. With a height of south-west spire of over 250 ft. it must have been a good "sea-mark," as—being touchy about the merits of their port—they love to call their prominent buildings; and, with its original dimensions, it did not compare badly in area with the smaller cathedrals. Now, having lost the spire, it is—in a sort—externally, flouted by the lean leaden spire of St. Nicholas, and almost by the small but decidedly individual central lantern of the ruined Grey Friars' Church; and internally no one can leave its fine Early Lancet chancel, of a dignified severe type, ornamented with later carvings, with Curvilinear and Jacobean screens, noticeable lectern, and famous "Flemish" Adam de Walskne and Robert Braunches brasses,—with any satisfaction,—for the flat plaster ceiling and very debased arcades that we owe to the restorers of the eighteenth century. (A poor boat, after all, though they really seem to have done what they could!) One feels sure it will get a new nave some day soon, and lose, at the same time or previously, the very vulgar brick market-house; too dull to know what a stupid thing it is doing in blocking out the west front from the thoroughfare. Then to St. Nicholas,—a great Rectilinear church, seated for 1,400; it is twelve bays long, and has among many other things a notable west window, with a cross form in its tracery, a very elaborate south porch in two stories, and a rare kind of Medieval tomb in the churchyard.* A post-prandial stroll takes us through the Public Walks, with good trees and turf, and a little water,—really a credit and a beauty,—to the Chapel of our Lady on the Mount; a pretty and clever little cross chapel, at the top, about 6 yards by 5 yards total dimensions, vaulted with the cross vaults, working into a little dome of four inverted conoids in the centre. At St. Margaret's, again, we hear the Snetzler organ, associated with the good Dr. Burney—organist, 1761-1760; and one would hope much more at home here than among that oddly-mannered company, with whom poor Barry placed him in the famous Adelpi picture.

Thursday, August 3rd.—Let every one going to Lynn walk round the picturesque Custom House, if he can: a little Renaissance work, with a feeling of breadth and simplicity, and some lightness of touch in the decorative portions,—dated over the doorway M DC LXXXIII,—thus in reign of the excellent Charles II., for one in duty follows Mr. Evelyn—who, in dedicating to the King a translation of the treatise of the Sieur de Chambray, found it so "hard not to slide into the Panegyric when once one begins to speak of Your Majesty." The place altogether looks like a town with a history;—not wholly robbed of its look of age by destructive prosperity,—a little old-worldliness hides itself in lane-like streets, and in the courtyards, and now rather ramshackle warehouses,—from which, let us imagine, there came a dozen generations ago a fragrance like that which fills the air to-day. A visitor could not crave or have a better fate,—than the company in these old nooks of a local antiquary, brimful of the traditions of the place, knowing intimately the panelled rooms and vaulted cellars, and their contents. After such tuition, which Lynn can afford of the best

* A recent, short, and most readable account of these two churches, giving some of the results of personal research among dusty documents and foundations, may be seen, illustrated by photographs, in "Tan and Marshland Churches," Walsworth: Leach's Son, 1869 (and series); written by that accomplished archæologist, Mr. E. M. Beloe, of Lynn.

and fullest,—the visitor will, doubtless, hereafter find the memory,—of old rugged timber-framed, shingle-roofed buildings, with their broad toothed shadows, vivid before him; called up by the sense of anell, the master wizard in evoking associations. He will then not fail to remember the so indigenous human product, whose Monkian discourse had erewhile driven him, in search of the outcrops of other times, down odd pathways and Little Chequers.

But a man does not rest and dream when he "excurs" under Mr. Sharpe's leadership! He goes on to Wimbach, and then to Elm Church, on the banks of the Wimbach Canal. A massive lancet tower, built against a much lower church than the present, if we are to believe the weather vane on the east side; or else the works suggested, or the design changed in the mere course of building,—and the nave and upper part of the tower erected together. These rest and changes in course of erection probably more than people are willing to imagine. The roof of the nave—a fair specimen of a modest sort of double hammer-beam; the chancel, much more minutely pointed, of course plays havoc with the grouping. A pretty new wainscot organ-case, with panels of pierced work and conventional foliage—the face left square, and the forms finished by cutting out the intervals. Critics object that something similar in idea has long been used for piano fronts: this is of course fatal. Back again to Wimbach, and over into Walsoken. The ground-stories of nave and chancel once a fine example of the Transitional Period,—full of the sturdy youthfulness and energy and delight that the English architects contrived to throw into their work, as they shook off the traditional trammels the Norman influence had imposed. The confessor capital, Mr. Sharpe loves to call the capital that these architects loved to design, sometimes called a little less happily the scollop capital, is here in full force. The columns of the nave alternately octagons and circles on plan,—a common custom; on the south side, however, the octagons have the angles to the east and west, but on the north their sides. The whole treatment of the arcade has the closest resemblance in general form and even in minute details to the infirmity of Ely, south-east of the cathedral. Some little retouching (and reshaping) of the stonework of the caps,—done, it would appear, in direct disregard of the direction of the architect employed in the otherwise excellent restoration,—leads to remarks of this general tenor.—"The old marks on masonry are of great value, and should in no case be even in danger of obliteration. The distinctive gash of the axe of the early Norman, the vertical markings of the broad flat chisel—of the Transitional period, the texture given to some freestones by the claw-pool or by the drag,—not unlike that given to its work by the bright, light touches of an artist's pencil,—are not only parts of architectural history, but parts of the art itself; inasmuch as the finish is almost always adapted specially to the design,—with judgment like an instinct in itself a study." As to removing whitewash from stonework,—in no case a tool to be used,—only a brush of hardwire, to be followed by bristle-brushes. If oil-paint has to be removed, it may be softened with some powerful solution, and the surface cleaned with brushes. "It is better, and pleasanter in every way, for some little patches of obstinate whitewash to remain,—than to see anywhere raw freshly-tooled surfaces on old stone work. And if this is of importance in the case of plain surfaces or moulded work, it is of supreme importance in the case of carved surfaces. The removal in an irregular way of one-eighth or one-quarter of an inch from the face of a marble statue would distort the expression,—would probably make a beautiful face a laughing-stock; and after such a process, the spirited outlines, the well-modelled surfaces, the delicate roundings and hollows of some of these pier-capitals,—a while ago, works of authentic value, true transcripts of their author's thought, and the records of the skill and dextrous hand,—can give only a very mixed and doubtful pleasure." The fact that this had very rarely to be repeated in full,—with such an example in point,—in a district where a good average of restoration has been done, should give to the true moulding- and distinctive-carving enthusiast no little satisfaction.

The west tower, of considerable beauty, with arcades round the angle-turrets, a sancto bell-cote, and several gable-crosses, a heart-reliquary in the north aisle, some rich wood paroloses, and nearly

a score of old bench-ends, might and would keep us, did not the "horrid shrillness" of the whistle of recall drive us to vehicles, and to Wimbach. In the church there, a double nave, north and south aisles (four aisles), and, withal, height to match; and a long fine chancel and chapel thereto: six bays in the arcade north of the nave, the easternmost arch skewed off at a well-marked angle to the north side of the chancel-arch,—a sad piece of barbarism, however ingenious,—and a quite differing arrangement in each of the other sets of pier-arches. Here also we have the sectional form of the shafts, and of their caps and arches, all Early, whereas the heights are of the most dignified Rectilinear type,—an arrangement that might puzzle the uninitiated. We see at once, however, that this is another of those "raised churches," of which we found a specimen at Spalding last year. Mr. Scott, the vicar, may, by all good right, be listened to, as he furnishes new facts and answers to difficulties from ample stores; Mr. Francis Galtoun's "family theory," the while, necessarily calling to mind the quantities of excellent conservation and other work done by an architect in his plentiful hunting-grounds hereabouts and everywhere.

Leverington Church next visited:—An excellent tower, with turrets at the angles, instead of pinnacles or broach. What variety, with general resemblances, in these various towers and spires! The south porch has an upper chamber (14 ft. 6 in. long), with arched stone ribs (2 ft. centres), covered over with stone flags, prettily treated also with stone eaves and ridge, crooketed copings, and finials. As soon as the construction is seen, this little porch seems to possess a special unity of character,—a result sure to follow in such cases as Mr. Fergusson has pointed out so often and so well. Illustrations carefully to scale, and with details of parts, may be found in the *Builder*, vol. vi., p. 91,—before our volumes required a library shelf all to themselves. The church of late, rather thin, detail, with wall-pieced roof; the corbels to it of coarser type both in idea and execution than in the refined work of what we used to call the Decorated period; old glass in the east window, borrowed from Ely Cathedral; a wooden eagle lectern; and a tablet in the north aisle to "Captain Anthony Lumpkin [a family name appearing in various inscriptions], who died the 11th of October, 1780, aged 51 years;"—traditionally in the village the *honoured* original of Goldsmith's rollicking Tony. The first performance of the play, 15th of March, 1773,—so that the dates do not fit badly: the author stated to have written part of it in a house in the village—a piece of realizing on the part of dear Goldy that Mr. Forster's most careful biography does not record. The name may well have been suggested, as all Dickens's names are said to have been, by an actual one; the author would, no doubt, have gladly welcomed such a godsend: at least one thinks so, in calling to mind the agonies of parturition that at last produced the now so simple and happy title,—"*She stoops to conquer*." Back again to Wimbach:—the inhabitants apparently hesitating just now between the *beach* and *bech*—in pairs of each on tradesmen's boards at the station; and then by rail to Boston. A sectional work of supererogation is done there, in the shape of a pilgrimage to Skirbeck,—

"Though Boston is a proud town,
Skirbeck compasseth it around;"

as any one asking his way will be at once informed. The church, dedicated to St. Nicholas, stands so that the angle may be touched from the footpath on the Wilham bank, a little way below Boston. The nave of six bays, Transitional on the south, and Lancet on the north, probably very slowly built, and of considerable character and beauty, with complete clearstory of Lancet date. The chancel wholly destroyed, the nave piers out of upright, a lot of windows without tracery, plenty of white and other washes on the stonework, a gallery in the western bay across the tower arch, nearly grained pews precisely 4 ft. high in the nave, and the same—blue cloth lined in the chancel, and most other things to match,—the whole church, therefore, a specimen of unretoredness that ought to be delightful to all affected with a morbid dread of that process.

Friday, August 4th.—From Boston about 8—our usual time, by the bye, for all to get the start, after the asynchronous breakfast. Surfleet, ten miles south on the Great Northern loop-line, is soon reached; and our four horses and

the useful patch of colour mounted on the leader, are off for Pinchbeck, another of the "Raised Churches;"—with later caps under the Transitional arches. The church,—restored by Mr. Butterfield, supplied with fittings of the kind coming usually from his hand,—has some polychromy, about which different opinions may be held. The aspect of the whole church is quite Rectilinear externally,—the aisles Early Rectilinear, the clearstory later, the tower later still, while inside the lines of the plan follow the church of the Transitional period. Indeed, usually the Rectilinear architects seem to have cared most for the outsides of their churches. The tower here settled very obviously in the process of construction, so a vertical upper story was added,—a method pursued in the west front of Ely; and "every schoolboy knows" that in the leaning tower of Pisa, the "helped" upper portion and the smaller top story point to a similar history. At Surfleet Church, a couple of miles off, the whole tower was very badly over westward when the venturesome builders put on a stone spire,—vertically, of course, as if nothing had happened! The whole has a very tottering look, and is said to have moved farther within memory. The nave short—Corvilinear in four bays,—the arcade dragged over very awkwardly by the tower towards the west; a good early lancet south door; an octagonal plan, now of a very warm yellow, washed over evenly with strongly-coloured beer, by a church duster with special ideas,—perhaps of taste, and certainly of colour. The fonts in this immediate district, a very good average, if not in any special way remarkable. Gosberton has the advantage of a park close by; the crooketed spire, with ogee flying buttresses, crooketed angle pinnacles, and three rows of spire lights, peers prettily over the tree tops,—the only cross church with a tower and stone spire of this kind in this year's set of churches. Perhaps the builders were warned by failures; perhaps they really preferred the central western position. Of course, in many cases, a tower later than the church could not readily be put on the crossing. Certainly, "there is nothing like a cross church with central spire for picturesque effect." When the vicar has succeeded in persuading the so right-minded squire to form an opening in the wall, filled in with light iron gates, and the long vista has thus the grey church hat the distance,—may we be there to see. They boast that William of Wykeham was rector here speaking of the great Englishman with a pleasant pride; pronouncing Wyke (not Wick) ham, after the pattern set at his New college at Oxford,—calling attention, by the way, to the Wykeham (a grange to Spalding Priory), locally so called, existing not far off,—under four miles through the air. This may bear a little on the case, seeing that the modern Hampshire (Wickham) folk may perhaps shirk the speech of their ancestors; but maybe we had better be satisfied with the Why as we get it, and not press for further reasons. Quairing Church tower, with walls and buttresses battered out of beauty, no doubt done in view of the awful foundations; an interesting oak roof to nave, and an iron-bound chest,—one of the many old bits of detached furniture to be seen here and there. Donington Church, illustrated in Brando's "Parish Churches," vol. ii., very admirably restored in a conservative way, and fitted with good new seats, reredos, &c.,—a model of a dignified parish church for a country town. The nave and aisles spacious and lofty, tower south of the south aisle forming a tall, stone-vaulted portal; three light segmental pointed very beautiful windows in the aisle; cusped buttress tops; a very rare and very exquisite Lancet stone stall-end in chancel. Bicker Church,—unrestored at present, bar a little clearing away of paint and whitewash,—"*one of the prettiest little Lancet east ends to be seen anywhere*," shafts and good moldings. Norman and Transitional work inside and out, and a threatening of ruin; the central tower, though without a spire, the author of the mischief as usual; some arches adjoining it are now crumbled and strutted with timber. At Swineshead we are only six miles from Heckington; this six-mile interval, or thereabouts, continued southward between the villages to the east and west of the fen for more than twenty miles, to the Welland and the Deepings,—nice slips added to the old parishes by the reclamations! The church, 30 ft. clear between the nave piers,—such a width for a parish church as would properly evoke the Dominie's "Pro-di-gious." An engaged tower at the centre of the west opens into the church: always a very grand feature internally; old

seating and screens, incised slabs, good carved label terminations, and a wonderfully beautiful series of stone panels now lining the south porch, said to have been removed from Swineshead Abbey, the grounds of which we pass (the building has disappeared) on our road for Boston. Looking backwards, we keep well in sight the spire of Swineshead, with idiosyncratic panelled screen some distance up the spire, and bold angle pinnacles, altogether very satisfactory; and ahead we have "the stump"—little short of 300 ft. high,—a broad and powerful pile, the open upper lantern and bell-chamber lights throwing form into its grey outline as we get nearer,—making one regret that the "chimes chamber" required glass louvres in the windows up to the transoms; these very grand windows thus not getting quite fair play. A pleasant lodging-place for the bells though, whence they can sound well over the flats and river reaches, ungratefully enough making "the blind wall rock" all the while with nervous shudders at their clangour! In the evening we find here also the church lighted up and the great organ sounding. When one remembers these and so many other good deeds done for us, big Henry VIII. gets back some of the wickedness we credited him with of olden times (for which haters of whitewash have, of course, never forgiven him), if only for saying, in his polite way, that Lincolnshire "was the most brute and beastly shire in all his realm."

Saturday, August 5th.—About seven miles south to Sutton Station, and to the church there: another fen-country enigma: looks as if at one time it had sunk into the ground bodily. The piers adjoining the central tower at the original level, with their bases quite hidden; the nave rebuilt and raised, perhaps after remaining roofless a century or two, the external columns and caps bearing marks of weathering. Algaekirk, covered with grey age and toned with lichen,—in its beautiful situation with the turf of the park running up to the walls, and old trees hanging round,—as sweet an image of peaceful beauty as the best of dreams could supply; within—an unsparring lavishly-finished work that nowadays brings holiday pilgrims from far and near. In an architectural-history point of view, of interest as a specimen of late Transitional work, 1180 to 1185. Every window filled with modern stained glass,—a complete scheme, well wrought out, of Biblical history,—in the nave aisles and transepts, said to be "the completest set of modern windows in any English parish church." The chancel windows of a beautiful jewel character,—little patches of intense colour amid patterns in simpler tones. The modern reredos decorated by Mr. Grace in every inch, in colour and gilding, subdued to chasteness by light splashing of tender colour on the stronger grounds. It is worth while occasionally to have all strength thus put out on a little retired village church. The liberal-minded

custodian who has supplied the will, and the purse, and sustained interest in the work, must have his personal satisfactions in its present condition. Kirton Church has a western tower, rather ingeniously rebuilt A.D. 1804, originally the central tower; and plenty of good detail of various sorts;—also a well-developed specimen of the three-staged canopied structure, formerly adorning the central passage of many a church. The last sad relic of this dwindling race will probably be removed to a museum before many years have gone by! Frampton Church, well known by the capital drawings in "Bowman & Crowther;" a grand lancet spire of a very rare sort, almost all of one date, 1190-1200; a Geometrical ground story, the rest Curvilinear; the chancel roofed. And so back to Boston, and a look round the old buildings there, which may be counted on the fingers,—the town having long prospered, and destroyed, some not so very long ago, most of the remains carefully recorded and illustrated in Mr. P. Thompson's "Hist. and Antiq. of Boston" (Boston: John Noble, Jun., 1856).—one of the painstaking compilations of local history, ready to the head and hand of the future Hercules who shall supply a complete history of the County; sure to add by itself a goodly array to shelves stored with wrist-dislocating volumes got together by the earnest souls of Clutterbuck, Hasted, Surtees, and their worthy company.

Then to the church. After,—the well-deserved thanks and acclamations for those remembering that,—

"Not for our selves alone we are created,
But for our friends and for our country's good;"

And then,—dispersion till the meeting in Northamptonshire next year.

THE NEW BATHS, UNIVERSITY COLLEGE HOSPITAL.

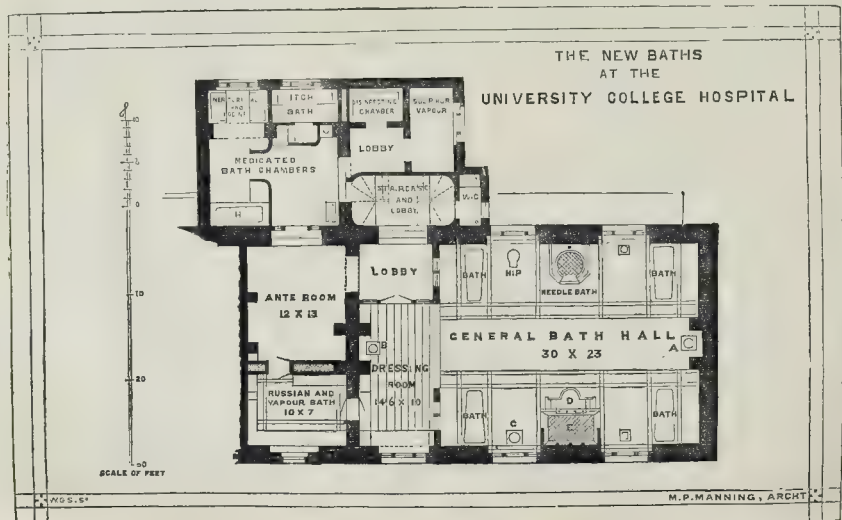
WE mentioned some time ago that very complete baths were being constructed in University College Hospital with a view to the cure of various diseases. These are now completed, and the annexed plan serves to show the extent and scope of the undertaking. The necessary funds were raised by Dr. Tilbury Fox, who has also given unwearied attention to the arrangement and details of the baths. Mr. Michael P. Manning was the architect employed, and Messrs. Jeakes & Co. executed the work, which has cost about 1,500*l*.

The baths are in two parts: the one in which contagious skin complaints are to be treated, disinfection of clothes practised, and fumigations with various metallic vapours made, and the other in which ordinary baths, liquid chemical applications, douche, shower, hot air, and hot vapour baths will be given. On entering from above, the staircase branches off to the left into the

department for contagious skin complaints, and to the right into the general bath-hall. The latter is approached from the lobby indicated in the plan, and at one end has attached to it a dressing platform, separated by a partition, and serving for the patients who are using the baths in the hall itself and the Russian or vapour bath. The general bath-hall is 30 ft. by 23 ft. There is a special outlet into the sewer—some 15 ft. from the external wall of the building—from this part of the baths, and the drainage from the whole of the baths passes separately and directly to this outlet. The drainage of the rest of the hospital runs in a different direction altogether. At E is the arrangement for douches. This is a place 8 ft. by about 8 ft., built in the form of a square trough, of 1 ft. 6 in. in depth; and it is arranged in this way that the water may be employed in a volume without any overflow, and is a platform upon which the operator stands; and he has at hand the various handles which work the several shower, wave, solid column, and other douches. The needle bath, on the opposite side of the room, is arranged upon a similar plan. These baths will be used in cases of nervous affections, rheumatism, neuralgia, chronic urticaria, certain cases of psoriasis, eczema, and pemphigus probably. The four baths are porcelain, and in them may be used alkaline and acid, as well as ordinary water baths. The small bath at C is a uterine douche, arranged upon a novel principle.

The Russian bath is rather larger than is indicated in the plan; it is 10 ft. by 12 ft., and it is heated by radiation. The means for ventilating this room have been carefully attended to, because in treating diseased patients it has been deemed most desirable to supply them with plenty of fresh and good air. There is an open grating each side of the window, leading to two channels that incline downwards and then inwards, so as to meet at the middle line, about 1 ft. below the window frame; thence a single passage runs, first to the bottom of the floor beneath the window, then along the side of the room to the left and the right, and round the next side, on the left hand, as indicated in the plan. There are three inlets a few inches from the floor line, in each of the two sides of the room, &c., that in which the window is placed and that to the left of this, along which the air-channel for the egress of fresh air runs; and the amount admitted is regulated by a valve, worked by a handle just below the window. The fresh air admitted into the room is gently warmed by passing under the flue in a certain part of its course, and the room is heated by radiation from the fire-tiles of the flue from the floor and sides. This room is also arranged for a vapour bath. The general bath-hall, we may mention, is heated by two steam coils, one at either end, and the floor is tiled, the walls being cemented.

In the section of the baths devoted to the treatment of contagious skin complaints, we



d a good dressing-room, to which are added two recesses, in one of which, viz., that the extreme left, as indicated in the plan, are mercurial vapour baths, the other being the a bath. The itch bath is fitted up with great care. It is a walled-off recess, and so built as receive a large amount of water without overflowing. This is effected by a couple of sieves and into the bath, as in the case of the other baths in the general hall. Then there is a large marble slab at the back, upon which the patients can sit and apply the paraffine, which can be placed on a little shelf close beside me. Within reach are basins with supplies of cold and warm water, and above them is on either a rose, whence a stream of water, when running, can be made to fall so as to thoroughly so their bodies from head to foot. Dr. Fox proposes to cure these cases completely at a time of half an hour. The disinfecting chamber, which can be heated red-hot if desired, is a flue of its own, running to the top of the building, and in this chamber the clothes of the patients and other patients will be hung up to be disinfected, whilst the patients are taking appropriate rest. There is no woodwork save the doors, I do not point about this section of the baths; the walls are cemented, so as to be easily and actually cleaned by thorough washing. The floor is tiled, and the mercurial boxes are supplied with steam.

We must congratulate all the parties concerned the completeness of the arrangements made to combat with an obdurate class of diseases.

TO, AT, AND FROM BERLIN.*

METZ.

THE morning we left Strasbourg for Metz, we again to be up at four o'clock, and, moreover, had to start off without "bite or sup." I had asked over-night to have a cup of tea brought to us upstairs, but were told we did not,—why, we were not informed,—and that could get breakfast much more comfortably at the station. When we were quite ready, we went to wait half an hour in the entrance, at last time in a state of dust, disturbance, and discomfort, before the railway omnibus came and to pick up us and our impediments. Why should have routed us out so unnecessarily early, we were at a loss to conceive, but concluded we were paying the penalty of other people's sins; for there are travellers who never are in time for anything, and so, I suppose, others and contrivances get into the habit of being every person half an hour's grace.

Arrived at the station, of course we found that various delays, such as waiting for our turn, lighting all the luggage, and so forth, used up the time; so breakfast had to be postponed. There was much explanation to be given at the ticket-taker's pigeon-hole. The money of the entry is French, but the railways are under German control, so the tariff is calculated in German money. A German was inside the ticket-bureau, and a French-speaking German stood outside to translate and explain; the price the tickets was asked in *thalers* and paid for *francs*. This arrangement was sufficiently puzzling to those who understood German; but those who did not, and who, possibly, were not very familiar with French money either, it was nothing short of mental torture: their only resource was, helplessly to hold out a handful of money and let the Prussians "requisition" what they pleased. A civil question in German, how much is it in French money, please, brought back to us a civil and patient explanation; and when I added, "That's all very difficult for English people," the bearded man sympathized, and told us it all over again, slowly at kindly saying, "And there are so many English people travelling now," he then lifted a cap, bowed through his pigeon-hole, and wished us "guten morgen." But for the bit of vility on my part, we also might have gone on our way saying, "What bears those Prussians?"

As we passed out of the town we again saw the fearful effect of the bombardment on the work quarter and on the outside of the fortifications. Some soldiers were at work on a massive gateway, shovelling down the pounded rubbish of crumbling stone and cement; the old pile of masonry looked like some old Roman ruin. A little way out we passed earthworks, and at every station came upon marks of battle:

houses thrown down, walls loopholed, buildings scarred and patched.

At Hagenau we had to turn out, have our luggage weighed, and then get into another train. It was before the Diet at Hagenau that our Richard Cesar-de-Lion was brought, in chains, by his jailer, the Emperor Henry VI., who bought him, for 30,000 silver marks, of his treacherous enemy Leopold of Austria. Richard's prison was the Castle of Trifels, now a ruin; but the subterranean dungeon in which he is said to have been confined is still pointed out. It was probably from outside this castle that the faithful minstrel, Blondel, discovered his royal master. In the Hagenau train we had for companion an Englishman who had spent the previous day going about the neighbourhood and visiting the battle-field of Woerth. He said, "There are not many traces now remaining of the desperate fighting, excepting the numerous graves; but the church is burnt, and several houses are destroyed." In the fields around, the Hagenauer Wald, we saw some graves dotted about, marked by crosses of wood with wreaths hung on them.

At Niederbronn the railway enters the Pass of the Vosges. Here the scenery becomes very fine, mountain after mountain crossing, surmounting, and overlapping one another. They are mostly richly wooded; but in places the red rock stands out, time-streaked and bare. Excepting in colour, they bear great similarity, both in stratification and vegetation, to the rocks near West Hootly, Sussex. Most charming valleys stretch off to right and left; and presently, on the left, a singular wall of bare striated rock rises up.

Bische.—The fine fortress looks so firm and strong, standing high above the railway on the right. The grass up the slope to the outer walls is all ploughed up by shot and shell, and the walls themselves are much battered, and the houses within are roofless, windowless, and ruinous; but the town and the church seemed to have escaped almost untouched. While waiting at the station, we stepped out on to the platform to look about, the fortress being well seen from below; but though we were nearly at the end of June, the day was so cold and damp we were glad enough to return to the protection of our carriage. The country continues very rocky, and covered with woods. It must have been fearful ground to march over, in an enemy's country, too, and with such hills, or rather mountains to climb. This locality, later in the war, was the haunt of the *Francs-tireurs*. There is plenty of cover for them; and how they ever allowed themselves to be driven out of such a stronghold is indeed a marvel. It struck us that it proved the French unworthy to retain the Vosges, since they were incapable of defending them.

Lemberg: where we had a long time to wait at an uninteresting station. When we again started off, I could hear a party of Frenchmen in the next carriage arguing about the war; one contending that France did well, considering the hopelessness of the struggle from the beginning, and continuing,—"Cependant, monsieur, il faut avouer qu'il y avait quelque chose de glorieux..." "Glorieux, glorieux, monsieur," retorted another; "il n'y a eu rien de glorieux pour la France dans la guerre, dès le commencement jusqu'à la fin!" I was glad to hear a Frenchman take so just a view of the position; particularly as,—from the melancholy tone of the voice,—I judged him to be a grieving patriot, not a country-immolating red republican. The first step towards eradicating our faults is to be able to see them; and to retrieve our errors we must first feel them to be errors.

From its entry into the Vosges district the railroad rises some 700 ft.; but after passing Lemberg it again descends, and when Biesbrunn Station is left behind, it comes out through the rocks on to a large elevated plain. On the right a lovely view is obtained down on to the lower plain, which is seen dotted with villages, church spires, and trees, interspersed with tracts of cultivated land.

Saargemünd was reached about 10.30, and here a fresh delay occurred; the luggage was all moved out and piled up on the platform, and we were turned adrift, with the pleasing intelligence that we must wait two hours for the train which was to carry us on to Metz. However, it gave us an opportunity of going in quest of some breakfast, which was much needed after 6½ hours' fasting,—ever since we rose in the morning, that is, with the exception of some stale biscuits we happened to have with us. At a

modest little place, called the "Restauration-de-la-Gare," we inquired if we could have *quelque chose à manger*, and were told by a good-tempered little French hostess (in a very undress toilette, which the earliness of the hour perhaps excused) that we could *parfaitement* have anything we desired; we were thereupon shown into a small room, with a fire in the grate—acceptable, too, though it was midsummer so-called,—before which sat a burly-looking German soldier, wearing a brown-holland jacket, who was reading some book with the help of a German and French dictionary.

On the table was spread a not over-clean cloth, on which stood a tall white and flowered vase containing some very sweet and fresh pink and white wild-looking roses. The vase, as I afterwards discovered, was marked underneath "Faience de Sarreguemines." The burly soldier soon rose from his seat by the fire, and prepared to leave the room. I begged of him not to *déranger* himself on our account; but I saw he did not understand a word of my little speech, so I had to translate it into German, when he answered me, "as mild as milk," made a polite bow, and—exit. A charming little maid, with black eyes and dark hair, brought us our food; she was habited in royal Stuart tartan, which was bunched up somehow, and made a most picturesque costume. I told her that she *portait les couleurs Britanniques*, explaining that Scotch was part of la Grande Bretagne, and her dress was Scotch; whereupon she laughed, and showed her pretty teeth, said yes, it was *Ecosais*, turned herself half round to display the "panier," and seemed quite delighted to have her tasteful costume admired.

Returning to the station, we had still to wait; an immense train of soldiery, horses, and artillery was being started off for Berlin. The conveyances were mostly luggage and cattle vans, and were of large size; in each van forty men were placed, or eight horses with three or four men to attend to them; they were to travel day and night. There was one proper railway-carriage for the officers; the cannon were placed on open trucks, like those employed on our railways for the conveyance of private carriages. There were fifty-two of these large vans and trucks, besides the officers' carriage, fifty-three in all; and there was only one engine for the whole load. The weight must have been enormous; yet the powerful engine started it off quite easily. It was especially interesting to see the orderly manner in which this large body of men, 1,100 or 1,200, was moved, with baggage, artillery, and all appliances, both for themselves and their horses. Instead of forcing the horses up an inclined plane, as with us, a portion of the platform was raised with earth on to a level with the floor of the trucks; so they walked into them quite unconsciously as they would into a stable. Some of them kicked a good deal when first tied up; but as they stood side by side, four in a row, with their heels to each end of the truck, and their noses meeting in the middle, they could not do much harm; and as they could look about them, they soon ceased to be frightened, when they saw the attendants to whom they were accustomed sitting quietly on the straw at their feet. The last operation was for some of the men of the commissariat department to go round with huge piles of flat circular loaves of bread and distribute among the vans. As there were no lamps, bundles of new lanterns were brought by blue-bloused men and deposited on the platform; this was done so surely that I wondered if they were "requisitioned."

At last we also steamed away from Saargemünd; or Sarreguemines, in French parlance. Soon after, on the right, the memorable "Spichern heights" came into view, but are too distant to afford any distinct idea of the grandly-contested points of onslaught; still, the very vicinage seems to infect one with heroism, to make the heart throb and the eyes glisten with emotion.

At Benning-Merlberge we had again to turn out of the train, and wait for another to carry us on to Metz. When the promised one arrived, it was all but full of French prisoners on their way home. At St. Avold one end of a shed was down, and large patches of woodwork on the opposite side were torn away. At Falckenberg (Faulquemont) some poor women were on the platform, seeing their husbands off; one of them was crying bitterly at parting from hers, who was a mere youth, and looked rather stolid and loutish. Was this glory? and were they going for soldiers? A large pile of buildings close to the station are the barracks. Soon after,

* See p. 640, ante.

Herry, Remilly, and Courcelles were passed, and then came Metz!

We arrived there at four o'clock, having been ten hours on *route*. The Hôtel de l'Europe is called the best, but we did not find it particularly good; still the myriads of German soldiers everywhere are a sufficient excuse for all shortcomings. The hotel seemed to swarm with them, and the pretty courtyard in front was continually filled with saddle and draught horses, provision and luggage carts, and all the bustle and litter of "changing quarters," &c. After partaking of some hurried food, we sallied forth on a visit of inspection to the cathedral. On the Place Napoléon, in front of it, stands the bronze statue erected to the honour of Abraham Fabert, which bears on its base his name, "A. Fabert," and beneath, the pompons inscription, "Si, pour empêcher qu'une place que le roi m'a confiée, ne tombât au pouvoir de l'ennemi, il fallait mettre à la brèche ma personne, ma famille, et tout mon bien, je ne balancerai pas un moment à le faire." High-sounding words these, but not practically useful; a few sand-bags would answer the purpose much better; but this is just the sort of theatrical claptrap in which our Frenchman delights. Let us hear what those two German soldiers say who are standing before the statue, and reading the bombastic inscription; they are part of the "ennemi," and now hold the town, in spite of the shade of Fabert. One of them, a tall powerfully-built fellow, pauses a second, then turns away with a smile, and says, "Ah! il était royaliste celui-là!" possibly he thinks Imperialists may say with truth, "Nous avons changé tout cela."

Fabert was born at Metz, 1599; he was the son of a printer who was five times *chevin* of the town. The statue is by the sculptor Etxer; it was erected October 30th, 1842, and is a fine thing. Fabert is represented in a full suit of armour, but without the helmet; he wears a scarf across the breast, and a large cloak rests on his head, falling in graceful drapery at the back and on each side of the figure; thus giving dignity and solidity. In 1755 some old buildings belonging to the *Chanoines de la Cathédrale* were razed, in order to improve the city, but sorely against the will of the nuns; beneath them were discovered Roman baths of great size and massiveness. In front of this edifice an ornamental balustrade extended, but of this only the trophies of Roman armour and weapons were preserved; the statue of Fabert occupies the site of the balustrade, and the trophies—coarse, ugly things—stand one on each side of it. The Hôtel-de-Ville is erected on the site of the baths.

The cathedral is described by the Metz guide-book in high-flown language, as if it were the most beautiful building of the sort extant; but I must confess to intense disappointment. An oratory was founded on the site in the earliest days of Christianity, and this alone remained standing after the sack of the city by Attila, 451. In 1014 the foundations of the present building were laid by Bishop Thierry, but nothing above ground is of earlier date than the fourteenth century. Different portions were constructed in 1332, 1486, and the beginning of the sixteenth century; the coloured glass in the rose-window (by Hermann, of Munster) was painted at the end of the fourteenth century; and those of the choir, on the right, from 1521 to 1523, by Valentin Bousch, an Alsatian. The cathedral was consecrated on its completion, May 24th, 1546.

The view of the lofty pointed east end, the tall narrow windows filled in with rich-coloured glass, mostly blue and red, is a charming picture; the nave-piers are lofty, and are formed of grouped columns of stone, thickly whitewashed and coloured, and have coarsely gaudy representations of religious subjects vividly painted on them: "stations" for praying. The choir takes in the *cruc*, extending to the south column of each transept, and is inclosed in a heavy classic balustrade placed there in 1810: an utter abomination. The whole interior of the Cathedral is thickly covered with the same coating as the columns; this has been scraped away from a monumental slab on the north wall of the north transept, which commemorates the architect, Pierre Ferrat. The inscription runs thus:—

"Desous cest alteit gist maistre Pierre Ferrat le masson maistre delowraige de leglise de Saïans et maistre du loiraige de la citait de Mes et de leglise de notre dame du carme et de la grant leglise de Tovit et de Verdun qui morat le xxv^e jour de moy de juleit lan de grace notre signour M^e et c^o."

In the original the letters are all capitals: they are about an inch and a half high, and are

cut deeply into the stone. The following is a specimen of the lettering:—

SIENOVRE: M: AT: dddd:

On the east side of the transepts the grotto-arches have rounded heads for the centre ones, the side arches being slightly pointed. The carved capitals are covered with small delicate work, which is continued a little way down between the columns. Under the lofty clear-story windows of the nave is a deep drapery, boldly cut in stone, one festoon to each bay of the windows, there being four bays between each main column of the nave. Below this there is a broad line of fine bold foliation, from which patches have been chopped away, as if shields had been carved there, and subsequently destroyed. The appearance of the interior of the cathedral reminded me somewhat of Westminster. The east end is very beautiful. The numerous later windows also, though somewhat crude and coarse in colouring, have a certain richness of effect that is grateful to the eye.

At the west end of the north aisle stands a large bath of ancient porphyry, 10 (French) ft. long, 4 ft. wide, and 3 ft. high. It is cut out of a single block, and was found at Metz, among the ruins of the Roman baths. It has long been used for baptisms. Of the bells of the cathedral the largest is called the *Mutts* (qr, *émute*, a disturbance, uproar). This bell has been recast frequently, the last time being in 1605. Its weight is 13,000 kilograms. The great bell at Strasburg, cast in 1427, only weighs 4,116 kilograms. Two interesting crosses of ivory are preserved in the sacristy, one dating from the eleventh century, the other from the fifteenth century. The latter is of Flemish work. Also a cope, said to have belonged to Charlemagne, and some ancient chalcies. Behind the choir, encoiled by a massive balustrade, another anachronism,—is seen an antique seat of Cipolline marble, cut in the shaft of a Roman column; it is known as the *Siège de Saint Clément*. The cathedral is, exteriorly, much defaced by the wretched little tenements that cluster closely around it, many of them being actually affixed to the walls. It is supported by flying buttresses, which help to decorate it; but the forms throughout are not beautiful. The roof is very plain, and the two towers, though ornamental in themselves, scarcely serve to retrieve the general stumpy effect, for only one of them is surmounted by a spire, which is, moreover, much too small and insignificant for its position.

The Esplanade is the great promenade of Metz; this is an extensive piece of ground, laid out with numerous walks, shaded by avenues of lime and horse-chestnut trees. The former were in full blossom, and the perfume was delicious. Its first alleys were planted in 1790: they were swarming with German soldiers when we saw them. In 1791 the demolition of the citadel was commenced, under the fear that Louis XVI. might take refuge within its walls. This demolition was not effected till 1802, and was followed by the filling up of the large ditches which separated it from the town; all of the space so gained was added to the Esplanade, which was completed in 1816. Under the trees fixed seats are placed at intervals; while beyond are large parterres filled with flowers, and most carefully tended. In the centre of one of the flower-beds is a large fountain; and a pretty covered orchestra for musicians is erected close at hand. Near to the citadel is to be seen the Oratory of the Templars, now serving as a magazine of artillery implements. It is built in the *Transitional* style, and is octagonal in form. The choir of the chapel constitutes an apse, and displays much delicacy of taste, though rather severe in its details. It dates from the beginning of the thirteenth century.

Metz has ten gates: between two of them, those of Sanloy and St. Barbe, lies the *Naumachia*, the space arranged by the Romans for their naval displays.

A large building adjoining the esplanade is, I conclude from the description, the *palais-de-justice*. I asked some people who were sitting under the trees, but they would not tell, professing an ignorance in which, from their manner, I did not believe; so I settled it in my own mind that the German commandant of the town lived there. The site of the *palais-de-justice* was formerly occupied by the *Hôtel du Gouvernement*; and, prior to that, by the mansion built in the sixteenth century by the Duke of Suffolk, when living a refugee in Metz. One façade of it is turned towards the *Jardin-de-Boufflers*,—a part

of the Esplanade that looks down on to the Moselle, beyond which are seen the *arches-de-Jouy*, ruins of an aqueduct attributed to Drusus, the father of Germanicus: he who opened the canal of the Rhine to the Isar. Former inhabitants of Metz foolishly built their powder-mills in dangerous proximity to the town; they exploded in 1724, 1755, and 1825, the first calamity causing great damage.

The Botanical Gardens of Metz are constructed within the precincts of the *Monastère de Capucins*, formally ceded to the town 1813. They were first laid out in 1802. The church of the convent, built 1724, serves as the oratory. The gardens are under the direction of M. Gabriel Simon. Gratuitous botanical lectures are given there annually. Metz has fifteen bridges,—across the Seille and nine over the Moselle. Of these latter, the *Pont des Morts* requires a few words of explanation, from the peculiarity of its name. It was of stone, and was built by the Hospital of St. Nicholas, towards the end of the thirteenth century. An ordinance of the town, dated June 24, 1282, conferred on the hospital, towards defraying the expense, the proceeds of the fishing carried on from the former wooden bridges on this point of the Moselle; and also the privilege of assigning the best suit of clothes of every person who died in the town. This custom is believed to have originated the name, and not, as some have supposed, the fact that executions took place near it, for none occurred there until many years after it had gained its name,—not, indeed, until 1598. A few years back this bridge, being found much too narrow for modern requirements, was rebuilt by M. Plaisiart, chief engineer of *ponts et chaussées*, in 1845 to 1847.

Metz was, up to 1480, a notable place for performance of the old mystery-plays,—the well-known theatrical representations of religious subjects, and of which the deocennial "Passion play" at Ober Ammergan, in Bavaria, is a late survivor. As far back as 1412 they were spoken of as common occurrences in Metz, while in Paris the first took place in 1398, in the Church of the Holy Trinity.

The fortifications of Metz have attained an additional renown, since in the late war the hardy adventurous Germans declined to test their strength, and quietly sat themselves down before the devoted town, waiting patiently,—or possibly impatiently,—until their strongest ally, gaunt Gamine, should deliver it into their hands.

While gazing at these same fortifications, one cannot but believe that the place really was impregnable, and for the first time I was obliged to admit to myself that Gambetta,—much as I disliked him for all the mischief he has done to France,—was right in this one instance, and that such a stronghold as Metz never ought to have surrendered. But then, there was that same "Gaunt Ally;" and I suppose Bazaine knew what was best to do; especially with the soldiers and people over whom he had to rule. The fort *Belle Croix* and its belongings has 10,000 metres of galleries and mines; and the fort *de la double Couronne* has a triple enceinte formed by deep ditches filled with water, their steep sides being covered with masonry, and the approaches protected by drawbridges. Vanban gained some of his high renown from the fortifications he constructed at Metz; and after him another celebrated military engineer, Cormontaigne, about a hundred years ago, re-constructed and re-strengthened the place very considerably. But of what avail has been all this provision, this outlay of time, labour, and money? Only 222 years had elapsed since Metz was formally ceded to France by the Treaty of Munster, 1648,—when, on October 27th, 1870, we saw it again return to its former owners.

Leaving Metz by railway, the entire circuit of the town has to be made, as at Strasburg; this gives good opportunity for observing the numerous earthworks and outposts on all the heights distant as well as near. Farther on we saw many houses levelled to the ground, by the French we concluded in order to prevent their from serving as shelter to the Germans; the gardens belonging to them were, nevertheless, in course of cultivation, and in several instances long rows of bell and other hand glasses were in use. Still farther, we came upon walls of gardens, railway stations, and private houses that had been loopholed for musketry, but now had the fissures patched up, and an occasional crozier in the fields, told where some poor creature had fallen and lay buried.

At Thionville the station was decked with

gs and now-withered garlands. Here soldiers came to meet their friends,—also soldiers,—in Metz, bringing wives, babies, and bundles. The platform was crowded with military; there sat have been 300 at the very least. We were told that Thionville had the half of its houses rent, and we could see from the railway that many were demolished, and blackened walls rose on all sides. It is strongly fortified; its large quadrangles of grass-covered space being closed by ditches, with steep stone-walled les. Anon came more ruins and more loops, and then we passed along a wide valley lying between two ranges of bold hills; the lights are richly wooded. We here saw a man with a gun, a sportsman doubtless, but he was wrongly suggestive of a franc-tireur; he wore a soldier's cap, blue gaberline, and military trousers; he held his gun upright behind his back. At Bettelbourg is the Douane, but it did not do us much trouble; this was all:—“Haben sie etwas zu erklären?” “Nein, mein Herr; lassen wir ankommen?” “O nein; sie haben nichts zu erklären?”

Luxembourg Station was reached about 5 o'clock. The Hôtel-de-Cologne, which is called the best, is very primitive, but it is clean and the people are civil. The fortifications here are in process of peaceful demolition, this course having been decided upon by various powers as the only one that would prevent this wondrously strong place remaining, as of old, a continual bone of contention. The railway passes by and through astonishing masses of strength, that one is positively stunned; to think how they ever could have been created, and how they are to be pulled, is equally amazing. I remember hearing some time ago that a long while after the impact of demolition had been made, one of the contracting parties remonstrated with the town authorities for not having kept faith with regard to the demolition of the fortifications; hereupon the latter replied, “Oh, we don't care whether they remain standing or not; if you want them destroyed you are quite at liberty to destroy them.” We saw four or five separate encircling works, with ditches (now dry, and some planted with trees), steep emplaced walls, and the like; and we thought a day might be less agreeably spent than driving about Luxembourg seeing the fortifications, and inspecting the old church of Notre Dame, which, we were told, is very interesting. A burly young Englishman, however, who had been compelled to do this by the awkward arrangement of the trains, grumbled loudly at this sheer waste of time, as he called it.

The country around Luxembourg is very tame, and the crops were wretched; nothing seemed to flourish this year, save the wild flowers. Here they were very numerous, and the previous day, after leaving Metz, the banks were excessively by with scarlet, blue, and yellow. From a few miles beyond Strasbourg, all about Metz, and here at Luxembourg, the people seem to be as fond of cultivating flowers as they were unmindful of them all along the route to Berlin.

After two or three small stations were passed, the Douane Belge was reached at ten o'clock; but, so far as we were concerned, only one box was unlocked, and that was scarcely looked into; still, all the luggage had to be taken out of the train, and afterwards carried back again; all of which is an awful waste of time, and gives a deal of useless trouble both to officials and travellers. At Morbihan we found a fine country, and, on the left, a pretty piece of water with white fishing-temple or boathouse; while a clear stream runs for some distance beside the railway. Then come bare downs, rocky and treeless; and soon the rail runs along a narrow alley between the rocks, then out upon a wide plain of apparently waste land covered with what looks like burnt gorse or heather. A dull sky stretched above, the pleasant bit of bright sunshine that warmed and cheered us as we left Luxembourg having soon departed. A cutting through slaty-looking rocks with perpendicular strata, terminated in a wood, with more waste and beyond; and then, *Poit St. Hubert* was reached. The rocks again close round, only sufficient having been cleared away to construct the rail; the wall of rock comes close to the carriage windows on one side, while, on the opposite one there is just sufficient space left for a few small houses. Here long the valley opens out, a pretty little mountain stream runs beside the rail, till both are again lost among the rocks; and thus we go on for some miles through wood, rocks, and plain, alternately, crossing and re-crossing the now widened rushing rocky

river. A large building like a church is seen on the top of the height for a moment; then a square edifice with turrets at the angle; then up a steep road goes—strange to say—a large flock of sheep! “Strange,” because it is the first we have seen for many a long day! The small number of cattle of any kind we have met with throughout our journey has been matter of much surprise; what can have become of them all? Are they never turned out in the fields, or were they all “requisitioned” and eaten up during the war? All this part of the Ardennes is extremely fine. Next comes *Grupont*, lying in a narrow valley that crosses the rocky hills; and then *Jemelle* (Rochefort) which has some grottoes and a ruined castle. Lafayette was made prisoner here by the Austrians, 1792.

At Assesse four French or Belgian ladies and three children came into our carriage, filling up all the seats, so that my companion (who had stepped out to the platform for a few seconds) had to sit *refugier* in some other compartment. At Nannin, still another lady was invited in by the aforesaid party, though they knew the seat was engaged by us. Of course one could not remonstrate: so as we did not wish to be separated to the end of the journey, I had no alternative but to move out all our cloaks, books, opera-glasses, and *et ceteras*, and get into another carriage. So much for foreign politeness! *Namur* is the strongest fortress in Belgium; nevertheless it has frequently changed hands. It was taken by Louis XIV., in 1692.

Just before we reached Brussels, out came the sun again, lighting up the pretty and varied country, but which looked very “mild” after the fine scenery through which we had so recently passed. At Brussels we had to reclaim our luggage, and take it to the terminus of the Caisla railway. The cabman, being, we supposed, “retained” to do so, drove us to the Nord Station, the opposition line; here the porters and commissionaires most annoyingly persisted in endeavouring to persuade us to go by that route, at last even fetching tickets and pushing them into our hands. Finding we were determined not to face the longer sea passage, they then tried to lift down our luggage, saying that at any rate that had better go *via Ostend*. However, we resisted, and finally drove to the *Midi* Station, where we found we were quite right, and everything was smooth and orderly. Here we had a comfortable wash, and a capital dinner, and then took a drive round the town, as we had some hours to wait ere the train started. Surely the aforesaid “badgering” of travellers is very disgraceful, and ought to be made widely known, in order that it may be stopped.

The town of Brussels seems to be in a most flourishing condition. There are hundreds of handsome new houses, evidently intended for separate homes, on the English system, with plate-glass windows, double dining-rooms opening through on the ground floor, the walls covered with pictures, mirrors, and engravings, and looking out on to a bit of greenery at the back. The principal streets are wide roads, with trees planted in four rows, like the Berlin *Unter-den-Linden*; there are also many streets of hand-some shops, which are filled with beautiful goods of all sorts; and the whole place looks clean and well-to-do. We drove past the back of the gardens attached to the Royal Palace, and round to the front, where stands the “Tree of Liberty,” which is of goodly size, and looks in a most flourishing condition. There is a fine *vista* across the park to the “Chamber.” The avenues throughout are so skilfully arranged in all directions to gain effect, that though the ground covered is but small, it looks a tolerably spacious, very pretty, and very nice place. We passed the *Jardin-des-Plantes* and its extensive glass houses; and saw the outside of the fine *Hôtel de Ville*, with its lofty openwork tower. Opposite stands the handsome monument of the Counts Egmont and Hornes, who were beheaded on this spot by order of the infamous Duke of Alva, 1568 (see ante, p. 540). Very quaint gabled houses surround this *Grande Place*. Many of them have their fronts entirely of glass, the windows being so numerous, and the piers between so narrow, as to give the effect of one large window.

The equestrian bronze statue of Godefroi de Bouillon, the Crusader, is very spirited. He it was who led the storming-party, July 15, 1099, which entered Jerusalem to deliver the holy places out of the hands of the Moslems. In the *Place des Martyrs* stands the monument com-

memorating all those who died in the Struggle for Liberty, September, 1830; another monument, elsewhere, is erected in honour of a celebrated burgomaster, named De Brucke, in which his bust is placed at the base, not at the top: “*Parcequ'il n'était pas Belge*,” said our informant, which we thought a very niggardly way of paying a debt of gratitude, and one that savoured more of a desire, on the part of the “braves Belges,” to ornament their city than to do honour to their burgomaster. The *Porte de Hal*, a handsome Medieval-looking building, would seem to have been reconstructed on the old model. It was formerly one of the city-gates; it is now called *La Musée*, and contains ancient armour, weapons, &c.

We left Brussels at 8.30. In our carriage the only passenger besides ourselves was a large clean-shaven Englishman, about forty-five years of age, dressed in black, looking and speaking exactly like a Jesuit, and, consequently, very suave in manner, chatty and agreeable. He told us he had been moving about for many years, sometimes stationary for five or six years at a time, gathering information as to the habits and resources, virtues and vices of humanity in general and of the poorer classes in particular. He gave the palm as to good qualities to the French, in preference to the English, workman, but feared the “International League” is destined to work great woe to all the civilised nations of the earth. He spoke of a conversation he had had recently on the subject with some one high in office at Madrid, in which that same “some one” had said that “the greater part of the funds which supported French Communism had been contributed by British workmen,” and begged him, if he had any influence in his own country, to do all in his power to oppose the International League,” saying, “it was calculated, if left unchecked, entirely to *bouleverser* society.” He, moreover, said that in St. Petersburg and Rome are the two great centres from which the flood of desolation will spread abroad, and that more will be heard ere long of doings such as those of the Paris Communists. This same gentleman told us of a conversation he had with the ex-Emperor Napoleon in 1864, when he said “a Frenchman is the most difficult of all subjects to govern; he is like a child, and requires both firmness and politeness; he must be governed with the hat in one hand and a whip in the other.”

At *Bessieux* all the passengers had to descend from the train to have their passports examined; they were re-examined at Calais, and were demanded again, and looked at carefully, as we were walking down the pier-steps to go on board the Dover and Calais steamboat.

It is an old saying, “An Englishman feels himself at home, no matter in what quarter of the globe he may happen to be, directly he comes within sight of the sea.” Therefore, I may now fairly consider my journey as ended; and methinks I cannot better conclude my narrative than by quoting from the *Times* for February 4 of this year the final paragraph of the Berlin correspondent's account of “Public Opinion in Germany” six months ago,—“These manifestations,” he says, “are more to do honour to the re-establishment of peace than to the defeat of the enemy. That the citizens of this industrious country do not, even in the present tide of triumph, love victory for victory's sake, but only because it is the forerunner of the blessings of peace, may be seen from the following quaint inscription placed high up on the Berlin town-hall in anticipation of the coming illuminations:—

‘Peace brings wealth;
Wealth brings pride;
Pride brings war;
War brings poverty;
Poverty brings humility;
Humility brings peace.’

R. F. H.

OPENING OF A CONVALESCENT HOME FOR HUDDERSFIELD INFIRMARY.

A NOBLE gift has been presented to the Huddersfield district, by Mr. Charles Brook, of Meltham Mills, in the form of a Convalescent Home, erected at Brooklands, as the locality is to be called, at a total cost of no less than 40,000*l*, including 25,000*l* for the endowment, and 12,000*l*, as the cost of the edifice. The firm of Jonas Brook & Brothers had already done much for Meltham, where this new edifice has now been erected. They had provided a people's park, and erected a church and schools there; and now this important addition has been made

in the opening of the Convalescent Home. The building stands on Meal Hill, overlooking the fine valley which Mr. Brook has converted into a Workpeople's Pleasure-ground, and appropriated to them for their sole use. The land devoted to the "Home" consists of 11 acres, the southward portion of which is to be turned into a kitchen-garden and cow-pastures, and the sloping portion in front will be devoted to ornamental purposes. The building itself is of Ryd Edgo stone, relieved by white rock from Kay's pit, and is erected in the Early Gothic style. The mason-work has been done by Mr. N. Barnshaw, Meltham; and the blue Welsh slating is the work of Mr. J. P. Hill, of Wakefield. The architect is Mr. E. Birchall, of Leeds. He has relied for effect on the grouping of the various parts of the building, rather than upon elaborate ornamentation or expensive details,—bearing in mind that it was a "Home" for working people that he had to provide, and not a palace for the high and titled. The architect's ideas have been carried out by Messrs. Kirk & Sons, of Huddersfield, who have had charge of Mr. Birchall's plans.

The front of the main building, which faces the north-east, is 190 ft. long. A projecting centre, rising to the tower, is devoted to the administrative department—the matron's rooms being to the left and the master's to the right. On each side of the centre extend the sections allotted to the inmates, women to the left, men to the right—the accommodation for whom allows of sixty residents—thirty of each sex. By erecting more beds, and somewhat cramping the space now allotted to each, more in number might be accommodated. On the ground floor there is, on each hand from the entrance-hall, a bedroom for the infirm, 42 ft. long by 19 ft. broad. A great feature in the whole building is the preventive measure taken against overcrowding. The rooms are large and airy, and allow of more cubic feet of air per inmate than is prescribed by authority; while Dr. Forbes Winslow's advice with regard to light has not been forgotten. Between each couple of beds is a chest of drawers, a key for one of which is given to each inmate; and every one is provided with a chair at his or her bedside. On the ground floor there are also day-rooms,—each being 35 ft. long by 27 ft. broad—where the inmates may sit and chat, amuse themselves with chess, draughts, or reading, or sit in the bay-windows, commanding views of the landscape. The male patients, also, who prefer it, can smoke in a room provided for that purpose; and every means of suitable recreation are provided for the women. Separate staircases for each sex conduct to the two night wards on each hand, which are situated immediately above the infirm bedrooms and the day-rooms. There are also two smaller wards for cases requiring peculiar treatment, and which may also be used by children. The lavatories and bath-rooms are furnished with both hot and cold water, and are conveniently situated. The central part of the main building on the ground floor consists of the matron's and nurses' bedrooms and storerooms, whence, proceeding along a corridor, is reached a large dining-hall, 50 ft. by 24 ft., with lofty ridge-shaped roof, open. The hall is lighted with lancet windows at each end, and a rose-window above. The "hole in the wall" through which the food is to be sent from the kitchen to the dining-hall is calculated to save labour. Close at hand is a reservoir capable of holding an ordinary supply of water for forty days; and there is also a brook (supplying the mills, running hard by), from which a main is to be laid to the "Home."

As the church at Meltham Mills is close at hand, it has not been thought necessary to devote any portion of the new building to the special purposes of worship.

The conformation of the grounds is in keeping with the arrangements of the building. Close to the men's side of the building there is to be a bowling-green, and a croquet-lawn will be made for the use of the women on their side.

The gasfittings, both chimneys and brackets, are from special designs by Mr. Birchall, and consist of a blue stem, with tinted reflex leaves.

The contractors for this work were Messrs. G. Walsh & Son, Halifax, who have also done the plumbing and glazing. Almost all the furniture in the building is stained pine. The contractors for the furniture, and also for the joiners' and carpenters' work, were Messrs. W. Myers & Son, of Meltham Mills. The plastering has been done by Mr. James Wilkinson, of Huddersfield; the ironwork by Messrs. A. Heaps & Co., of Huddersfield; the hot-air heating

apparatus by Messrs. Stuart & Smith, Wakefield; and the painting by Messrs. J. Preston & Son, Huddersfield.

The foundation-stone of the "Home" was laid on the 23rd of October, 1865, by the Marquis of Ripon, with full Masonic honours, and in the presence of 12,000 spectators; and the opening has been one of great rejoicing also.

INIGO JONES'S WATER-GATE.

Sir,—Your correspondent, "W. C." sees "with regret" this interesting relic "half-buried," and he recommends its being "raised" so as to form "another and convenient entrance" to the Embankment enclosure. My feeling, on the contrary, would be to let the "relic" stand where it is, and to surround it with a well and railing, so that it might remain as a memorial to future generations of the old level and line of the river bank, as well as of its architect. Examples of such treatment of ancient monuments are to be found everywhere in Italy, and they tell their own tale in a very striking manner. Witness, e.g., the arch of Septimius Severus, the column of Phocas, and the forum of Trajan in Rome.

W. H. L.

THE SANITARY STATE OF LEEDS.

THE report of the recent inquiry into the sanitary condition of Leeds, by Mr. J. Nesten Radcliffe, one of the medical officers of the Privy Council, has been issued. Leeds has long had an excessive mortality, from diarrhoeal diseases. The report contains much information, under various heads; but the principal facts and inferences which it sets forth are thus briefly recapitulated:—1. Notwithstanding the execution of permanent sanitary works, at a cost of probably a million of money, and the establishment for several years of a regularly-organised health department, the mortality of the town and borough of Leeds, particularly from certain kinds of preventable diseases,—namely, diarrhoea and fever,—is still excessive. 2. The deaths from diarrhoea and from fever, and the total mortality from all causes, which during the ten years 1851-60 had been respectively at the annual rate per 10,000 of the population of 22, 10, and 277, were during the five years 1866-70 at the annual rate of 24, 14, and 299. 3. The causes which have chiefly given rise to this excessive mortality are:—(1) In respect to diarrhoea and enteric fever—(a) An indefensible method of excrement-disposal,—namely, the common privy-with-middenstead, constructed and perpetuated in its most offensive and dangerous form, although its mischievous effects upon the health of the population had been repeatedly indicated during the past forty years; (b) A faulty regulation of the sewers, the necessary means to prevent flow of sewer-air into houses, and into closed and blind courts and blind yards, having been neglected, and no provision made for systematic flushing, under conditions in which such flushing was peculiarly needed; (c) A water-supply in quantity either insufficient or insufficiently adapted to meet the proper requirements of the sewers, and of which the impure quality was probably not without influence. 2. In respect to fever generally—(a) The prevalent custom of building houses back to back, and particularly the aggravation of the unwholesome states arising from this custom (or independently of it, when through-ventilation of houses is not provided), by their erection in closed and blind courts and blind yards. Also the use of cellar-dwellings.

The recommendations of Mr. Radcliffe are such as must be of value to all towns. He puts foremost the question of the means of removing animal excreta, chiefly from privies. In Leeds it is inferred that water-closets cannot be largely adopted, and therefore comes the question of the frequent, even daily, removal by authority of the contents of ashpits, the reducing of them very much in size, and the regular decolorising of the excrement by covering it with ashes. He urges a completion of the sewerage of the town, with flushing and ventilation; an augmentation and purification of the water-supply; the prohibition of back-to-back houses; and the opening of blind courts and alleys.

The case of Leeds tends to show that ample powers and enormous outlay are not everything that is necessary for removing the preventable causes of disease. A million of money has in this case been spent, and "the sewerage work done by the corporation has been so considerable, that an appreciable return for

this costly labour in the improved health and lessened mortality of the town and suburbs might have been reasonably looked for; but no such improvement is shown," just because the work has not been completed. In fact, the annual death-rate for the last ten years has been rather greater than in the previous ten, from diarrhoea, fever, and from all causes. The corporation has had abundant powers, of no recent origin, and they have been freely used for a generation. What they have done in the way of sewerage and water supply, however, are essential in themselves, and will hereafter be of more use when other essentials have been attended to, and the work of sanitary reform completed.

THE RISE AND PROGRESS OF THE DRAINAGE OF LONDON.

In the middle of the twelfth century the population of London was from 35,000 to 40,000, or about ninety times less than it is at present. The houses were built of wood, with high-pitched roofs, covered with straw or reeds, facing narrow ill-paved streets, cross-lanes, and alleys. At this time, however, there were within the City walls, besides numerous churches and churchyards, many open spaces studded with trees, and large detached residences and conventual buildings surrounded with gardens. The suburbs flanking the City, especially about Holborn, and towards Westminster, consisted of opulent villas and mansions, embosomed in spacious gardens, with shrubberies, vineyards, and orchards. The country, stretching eastward, westward, and northward for miles, consisted of rich arable and pasture lands, divided by hedgerows, interspersed with forest trees; fertile meadows, watered by clear sparkling brooks; large pools, the haunt of wild fowl, and containing store of good fish; coppices, commons, and extensive woods; and pleasant villages surrounding triangular greens. To the present generation, who know the metropolis only as a huge labyrinth of roads, streets, lanes, courts, and alleys, it is difficult to realise its ancient rural aspect. Not more than 150 years ago Bow, Stepney, Hackney, Dalston, Hoxton, Islington, St. Pancras, St. Giles's, St. Marylebone, Chelsea, and other outlying places were scattered country villages, the intervening spaces consisting of green fields, woodland patches, corn-fields, and parks, intersected by rural roads and shady lanes, the expanse being, in fact, like the country is now north of Harnsey, Highbate, and Hampstead.

In 1190, 2 Richard I., Henry Fitz-Eylwin was appointed the first Mayor of London, which office he held twenty-four years. Owing to the combustible nature of the materials hitherto used in house-building, the City had often been devastated by fire; but, with the view to prevent this in future, Fitz-Eylwin established, in the first year of his mayoralty, a code of ordinances for building, which may be considered as the first Metropolitan Buildings Act.

The party-walls were ordered to be built of stone, 16 ft. high by 3 ft. thick; and if recesses were formed in either side, they were to be no more than 1 ft. deep: so that if they happened to be back to back, the wall between them would be 1 ft. thick. The roofs, which rested on the party walls, and were high-pitched, with gables back and front, were to be covered with tiles or slates, instead of thatch. This method of building, it was thought, would prevent fire in one house from spreading to the houses on either side. The rain-water from the roofs, which was received into gutters laid along the party-wall, with parapet-walls between them, was to be discharged by down-pipes on to the streets, or into barrels, for putting out fires,—baskets, ladders, and ropes with grappling-irons, being kept for this purpose at appointed places. Directions were also given as to the projections of girders, door-joints, and windows over the highways; as well as to the making and using of the street-gutters, which, at this time received the liquid refuse from the houses as well as the rainfall from the roofs and streets. The only other reference to drainage was a provision that the cesspits under the "necessaries" were to be excavated at least 3 ft. away from the walls or fences dividing the houses from each other.

The houses generally were two stories high. The lower, or ground-floor story, being level with the street, was used for business and living. The upper story, together with the space in the roof, was the solarium. At the back, a flight of stairs led to the upper floor, and an inclined step-ladder thence to the garret. As nothing was

and in the building code about fireplaces and chimneys, it is inferred that the rooms at this time had none, but that the fuel, which consisted of charcoal, made in the neighbouring forests, was burnt on stone hearths, or in stoves, the products of combustion escaping through the windows and doors. The kitchens, which were at the rear of the houses, had fireplaces for cooking, ovens for baking, and chimneys for carrying off the smoke. Soon after, however, it came into use, when chimneys were made the party-walls to take away the smoke. At a period, also, only the windows of churches and a few windows in the castles and mansions of the nobility were glazed. The windows of houses occupied by the people were filled in with lattice-work, or else with oiled linen-cloth, the shutters for closing at night and during inclement weather. The ground floor of most of the houses was neither boarded nor paved, but consisted of clay, beaten hard and smooth. This was strewn with rushes, which were occasionally renewed; but the surface beneath, as it is seldom swept or cleaned, became coated with dirt and fat, fragments of fish, and everything that was nasty, the vapour therefrom being most pernicious.

Until the fourteenth century few underground drains had been laid in the City. The gutters running down the middle of the streets and leading to the watercourses and river carried off the rain from the roofs and streets, and the waste or slop water from the houses. The latter was brought out from the houses and poured to the gutters. Fishmongers, however, who were located chiefly in Fish-street-hill and Old Wharf-street (whence the names), were compelled to carry their dirty water down to the river. The streets and lanes at this period were paved with silted pebbles laid on the soft ground. As this paving soon became loose and wavy by traffic, the wheels, were not allowed to pass over it. Moreover, the house-slopes saturated the ground beneath, and stood in the hollows on the surface, towards defraying the cost of laying and repairing the paving, tolls were levied on all carts entering the City with firewood and charcoal. Probably this was the origin of the coal duty. Each house had a "necessary" at the back, with cesspit beneath from 4 ft. to 8 ft. diameter, and from 6 ft. to 12 ft. deep, steamed with porous rubble masonry. Through this and the gravelly bottom the liquid freely permeated into the surrounding earth, and polluted the springs and wells. As the cesspits became full, the soil was choked out after midnight, and carted to the general depot for it north of the City, between Roper's Lane and Bishopsgate. Latrines, for the accommodation of the public, were placed over the Wallbrook, the Fleet, and the Thames. Men called rakers were employed by the wards to rake and cleanse the ditches and water-courses, and to sweep the streets. The liquids they swept down the gutters into the ditches and water-courses, and the mud and other refuse they removed to the stalls in the wards, whence it was carried away by the night-car to the same shoals as the night-soil.* By this system of draining and having it is evident that the houses and streets must have been always more or less filthy, and have smelt abominably.

The natural soil beneath the City consists of beds of alluvial gravel and sand overlying the London blue clay. Formerly these beds were all of water, and from wells sunk into them the citizens drew water for household purposes. A great many houses had each a separate well, while here and there several houses had only one well between them. There were also public wells in the streets, and notably one alongside each churchyard. But about the first quarter of the thirteenth century, owing to the proximity of the cesspools and churchyards to the wells, the water in the latter had become so polluted by the percolations from the former, that the citizens were compelled to seek elsewhere for sweet water for the poor to drink and the rich to dress their meat.† This was found in nine springs bubbling out of the gravelly soil near the village of Tyburn. In 1236, 21st Henry III., these springs were granted to the citizens, who shortly after collected them into a reservoir near the south-west corner of Stratford-place, Oxford-street. From this reservoir the water was con-

veyed, by a 6-in. leaden pipe, 5,478 yards in length, to the Great Conduit in Westcheap. The pipe was laid to St. James's-hill, Piccadilly, and thence to the King's Mews, opposite St. Martin's Church, Charing-cross, the course thus far being through open fields. Thence it was carried along the Strand, Fleet-street, over Fleet Bridge, and up Ludgate-hill to Chancery-lane. A small branch was taken from the main to supply the King's Mews, and another to supply a conduit in Fleet-street. By the munificence of some of the City merchants, springs at Islington, Highbury, Hackney, Dalston, and elsewhere were afterwards brought by leaden pipes to conduits at different parts of the City. For 346 years, that is, from 1236 to 1582, these springs supplied the City with water, which was delivered at the houses by water-carriers; but in 1582, owing to the quantity of water yielded by all the springs proving insufficient for the increased population, Thames water was pumped up by water-wheels turned by the tides at London Bridge, and subsequently at Broken Wharf, Upper Thames-street, through wooden and leaden pipes into the houses along the south part of the City. Thirty-one years after, in 1613, several large springs, at Anwell and Chadwell, between Ware and Hertford, twenty miles from London, were brought by an open winding channel, called the New River, thirty-nine miles in length, into a reservoir on the high ground south-west of Islington, whence the water was conveyed by main-pipes of elm and service-pipes of lead into the houses along the north part of the City. From these springs and others, as well as by water brought into the New River channel from the Lea, the Spital Brook, and the Northall district, the whole of the City, together with large districts west and north of it, are now supplied with water.

The result of supplying the houses with water directly by pipes was that more waste water was produced, and consequently the recipient watercourses became more polluted than heretofore. Indeed, they had become so foul in 1606, that Parliament in that year passed an Act placing "all watercourses falling into the Thames within two miles of London" under the jurisdiction of seven Commissions of Sewers, and a general cleansing of them took place. Unfortunately, however, town drainage was not then understood. It was never considered necessary, in order to preserve the natural streams as well as the atmosphere and subsoil of towns from pollution, that water supply and house drainage should be co-existent and connected, and that the latter should be unconnected with the arrangements for surface drainage. When a system of main water-pipes is laid down throughout a town, with branches carried into the houses for supplying the kitchens, sculleries, washhouses, and water-closets with water, a return system of main drain-pipes should also be put down, with branches leading into them from the houses, for removing the foul water poured down the sinks, and the chamber-slopes and fecal matter from the closets, both mains and branches being unconnected with any surface drainage whatever. From the water-pipes terminating over sinks and to closets, flushing-pipes with stop-cocks (to be under the charge of the local boards or the water companies) should be connected with the drain-pipes under all the inlets, which should be syphon-trapped; and from the branch and main drains ventilating-pipes should be carried high above the house-tops. This system would be sanitary drainage; for, as the drain-pipes would be in long lengths, with sealed joints and of impermeable materials, the same as the water-pipes, there would be no percolation of sewage through them into the subsoil under the houses and streets; and, as the branch and main drains would be provided with flushing and ventilating pipes, and the inlets with syphon-traps, they would be well flushed by turning the stop-cocks, so that there would be no accumulation of deposit in them; and they would be constantly ventilated and trapped, so that there would be no escape of noxious gases from them into the air of the houses and streets. Had Parliament understood such a combined system of water supply and drainage as this when it passed the Acts above referred to, as also the Act authorising the New River to be made to a reservoir in Islington, with pipes thence to the houses in the City for supplying them with water, it may be inferred that it would at the same time have required the City corporation to construct a main drain from London independently of the Thames, and enforced the laying of drains into it from the houses

for carrying off the foul water separately from the drains discharging the surface and subsoil water into the watercourses. Had this been done,—and nothing would have been more simple, practical, and efficient,—no polluted streams and rivers, and no choking and stinking drains and sewers, would now be in existence.

Hitherto, however, land and house owners had themselves used, and had suffered their tenants to use, the street gutters and brooks for carrying off the drainage. They were so accustomed to this, that they could think of no other plan for removing the increased quantity of waste water than that of using the brooks as outfalls, and of laying drains from them and the river, along the lowest streets and lanes, with gullies communicating with the surface. At first the slops from kitchens and washing-places, and the rain from yards and courts, ran in open or covered channels through the houses into the streets, and thence down the gullies; but owing to the continued flooding and loosening of the street paving, the drains (or sewers,* as they were afterwards called), were gradually brought up to the front or back of the houses, whence underground drains were laid into them, but unconnected with the cesspools, which were required to be retained and emptied after midnight as heretofore. While this restriction was enforced, the waste water discharged into the drains leading from the cesspools into the sewers. This was accomplished by carrying drains from the kitchens, sculleries, and washing-places into the cesspools, and by the Courts of Sewers permitting overflow drains, with fine gratings placed across them, to be laid from the cesspools into the drains connected with the sewers.

In this manner the system of town-drainage now in operation was partially established. It was completed by the introduction of water-closets. These consisted, at first, of earthenware pans, fitted into vertical pipes, dipping some inches below the overflow drains from the cesspools. Some pans were kept clear by water laid on to them from cisterns, placed on higher levels, but most of them by pouring the house-slops down them. In 1776 the first patent was taken for a water-closet. Two years after Bramah invented and patented the valve closet. This soon superseded all other contrivances of the kind, and is that mostly employed, with improvements, at the present day. It was put up chiefly in mansions and public buildings, the expense of the force-pump and cistern for supplying it with water preventing its adoption in smaller houses. In time, however, by substituting iron mains for wood, and by applying the steam-engine for pumping water through them into cisterns on the highest stories of the houses, which rendered the hand-pump and other appliances connected with the closet apparatus unnecessary, the cost of the closet was greatly reduced, and large numbers were used.

The seven Sewers Commissions, between whom the metropolis was originally divided, had jurisdiction over surface drainage only. Charged with cleansing, repairing, and maintaining the natural watercourses draining certain districts into the Thames, they exercised power over the surface drainage of such districts by permitting sewers to be put down from the watercourses, and drains to be laid from houses into such sewers, for carrying off the pluvial and waste water therefrom; but fecal matter they utterly interdicted under penalty from passing into the drains and sewers, and therefore necessarily compelled old cesspools to be retained, new ones to be made, and all of them to be emptied in the manner before stated. Practically, however, by the introduction,—

1. Of the water supply;
2. Of drains from the cesspools into the sewers; and
3. Of water-closets discharging into the cesspools,

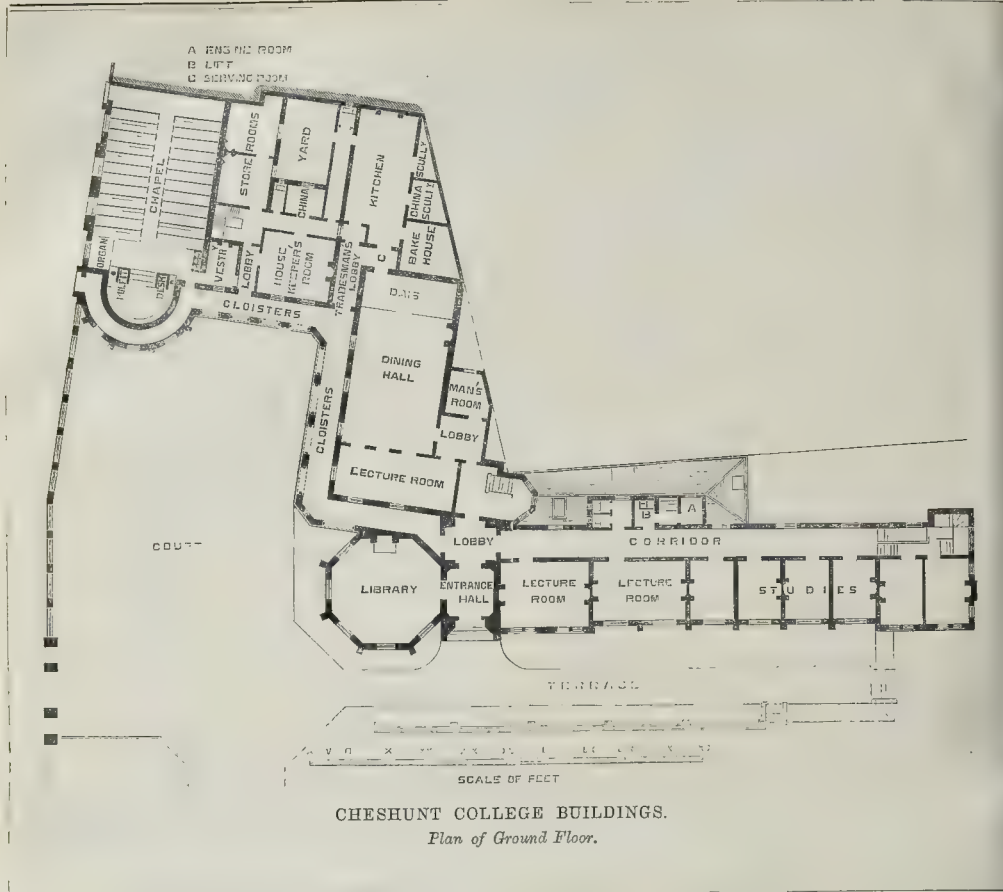
this interdict was rendered inoperative, because, when the accumulations in the cesspools reached the level of the overflow drains, the fecal refuse (which readily dissolves in water) passed off with the water through the gratings into the drains, and by these into the sewers. But now, as the sewers themselves had been built,—

1. Large enough for men to pass through them;

* These sewers were put down from time to time, by and at the expense of the land or house owners, at what depths and gradients, of what sizes and forms, and with what materials they pleased.

* In 1389, 12th Richard II., the streets were used as common lavatories. The annoyance in consequence was so great that proclamation was made "that no person do lay any dung or any other ordure in any street, ditch, or river upon penalty of 20s."

† Slow.



CHESHUNT COLLEGE BUILDINGS.

Plan of Ground Floor.

2. With wide flat bottoms, like ditches for receiving and discharging surface and waste water only; and
3. Without sufficient and regulated falls for accelerating the sewage flow,—

they became choked with faecal deposit, which was removed from time to time as had been done from the cesspools; and thus was the trade of the nightman transferred from the cesspools to the sewers.

About the year 1840, inquiries began to be made into the sanitary condition of large populations. It resulted from these inquiries that undue sickness and malignant diseases were caused or intensified by bad drainage, bad water supply, and bad ventilation. As regards the drainage, where there was any, it was found to be by open channels, or porous brick drains and sewers, discharging either into open ditches, natural streams, or rivers. It was also found that every house had one cesspool at least, and some two or more; that a few of these cesspools, having water-closets in connexion with them, had overflow drains discharging into the ditches or the sewers, and that the remainder, having no such drains, were emptied periodically. Thus were the populations found to be living amidst the filth they produced; and, owing to the refuse being allowed to enter the porous brick drains and sewers which received the rainfall, and to the retention of the accumulations in the cesspools, the subsoil became saturated by the permeation of the filth, the atmosphere contaminated by the emanations therefrom, and the streams and rivers polluted by the sewage discharged into them. It was supposed, and persisted in by those who conducted the inquiries, that the only remedy for these evils consisted in,—

1. Flushing the sewers; 2. Making them egg-shaped; 3. Curving the junctions; and 4. Improving the fall.

These constructive improvements were more or less excellent, as tending to utilise the sewage currents as a motive power, and so to prevent deposit. But they could not delay, but rather hastened the generation and escape of foul gases; for it is a fact that agitation of sewage from shaking it, or accelerating the flow, causes it more readily to part with its noxious constituents. This is verified by the old saying that "the more a certain noxious matter is stirred the worse it smells;" that is, the more the noxiousness is liberated into the air. By reason of this it will be found upon full examination that the air in sewers with rapid sewage currents is more foul than the air in sewers where the sewage is almost stagnant, or has sluggish currents; and hence the necessity that there should be no connexion between sewage drains and surface drains, in order that the intensified gases constantly engendering in the former may not escape into and through the openings to the latter, the whole of which are never, and cannot be, effectually sealed by flaps or traps, and must continue to emit poison into the air all over the town, at the very part or level where the inhabitants live and breathe, so long as the connexion is suffered to exist.

In 1848, according to the dictum of the General Board of Health, "that it is far less injurious to health for the filth of a town to be in the next river than to remain within the town," the cesspools *en masse* were abolished and emptied into the sewers, and the sewers *en masse* were flushed into the tidal channel running through the very heart of the metropolis, which channel became in consequence little better than an extended cesspool itself. Herein the oscillation of the tides continually rolled the mass of abomination up and down, agitating and churning it so as to liberate its noxiousness into the overlying air, whence the winds wafted it all

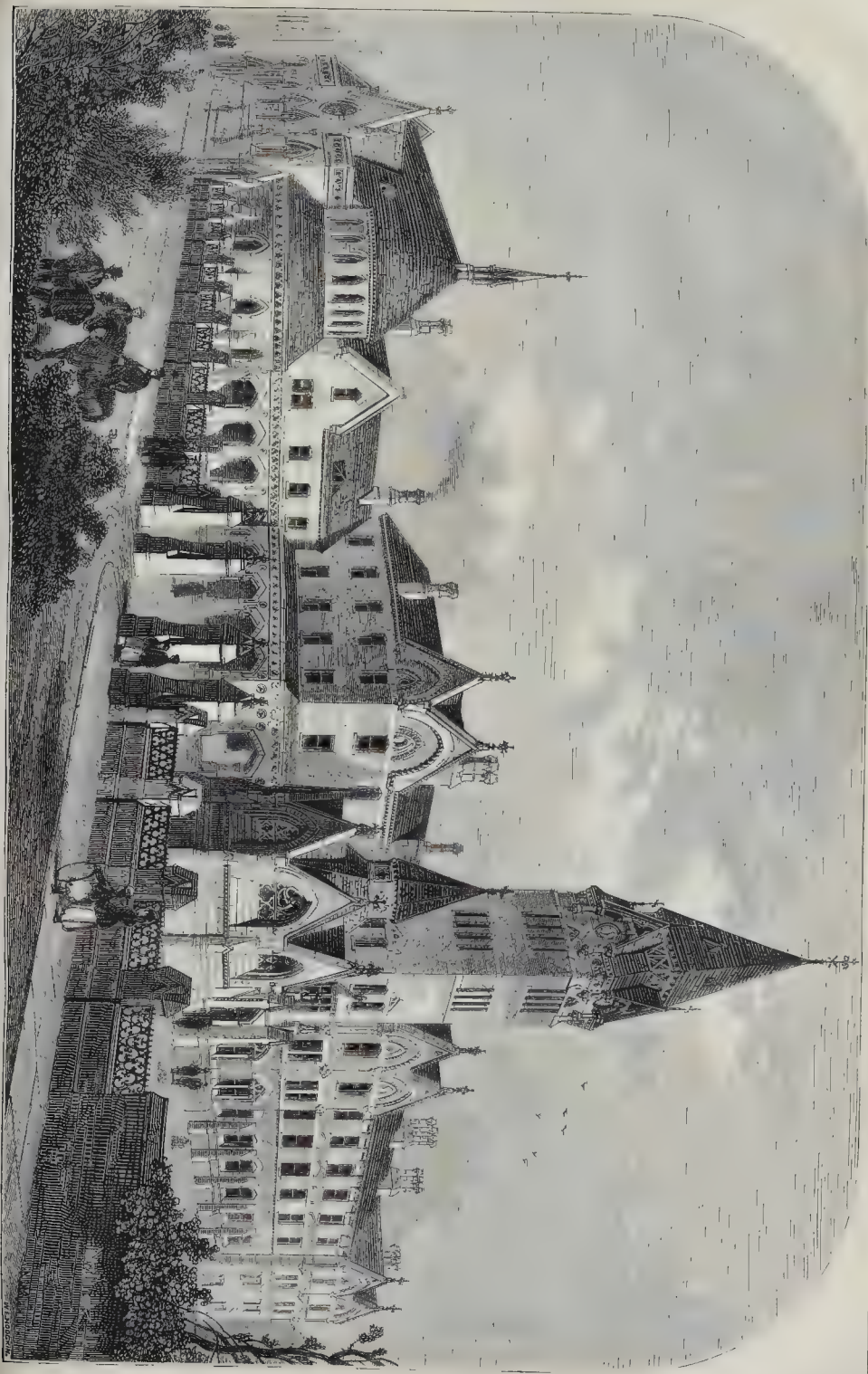
through the metropolis. Subsequently, by the combined efforts of the greatest military and civil engineering talents of the time, a plan of main drainage was pieced together and determined upon,—for separating the sewage drainage from the surface drainage, and permanently intercepting the former from the river?—alas! no, but perpetuating the pernicious combination, and merely intercepting the sewage in front of London, and pouring it into the tidal channel again some miles lower down, where the saliferous water precipitates the sewage matter on to the bottom and sides, and the agitation of the mass by the tidal oscillation disengages the foul gases into the atmosphere. This may be beneficial to the vegetation, but certainly not to the occupants of the adjacent towns and villages, nor to those continually engaged in going up and down the river channel.

Thus was begun, developed, and completed the vicious practice of using the house-drains, the street sewers, the natural streams, and the river for receiving and discharging the waste water and faecal matter from the houses, and the muddy rain-washings and horse-droppings from the roads and streets, whereby the atmosphere of the houses and streets is poisoned by the emanations constantly escaping from the two millions of openings to the drains and sewers, and the natural streams and river are perpetually polluted by the sewage constantly pouring into them.

From the foregoing sketch of the rise and progress of the drainage of London, it is evident that such drainage is the result of chance and ignorance, and not of arrangements having for their object the utmost salubrity,—

1. Of the subsoil;
2. Of the atmosphere; and
3. Of the streams and river.

JOHN PHILLIPS.



THE COUNTESS OF HUNTINGDON'S COLLEGE, CHESTNUT.—MESSRS. JAMES & BROWN, ARCHITECTS.

THE COUNTESS OF HUNTINGDON'S COLLEGE, CHESHUT.

We mentioned recently the opening of new buildings connected with this college, and now we give a view and plan of them. We must repeat some of the particulars already given. There is a lofty tower at an angle of the building, 100 ft. high, at the base of which is the entrance to the college, ornamented with carved work in stone. As far as completed, the buildings provide accommodation for thirty students, and include two class-rooms. When finished, accordance with the designs of the architect, they will provide new domestic offices, a new library, three class-rooms, and accommodation for forty-three students, twenty-nine of whom will be supplied with two rooms each. The buildings will be extended, if necessary, to accommodate in all fifty students. The entire cost is estimated at 10,000*l*. Messrs. Lander & Jells are the architects; Messrs. Dove, others, the builders; and Mr. Rook is the clerk of the works.

The finished portion of the work consists of a rectangular block, 121 ft. long, 26 ft. deep, and three stories high, having slightly projected eaves at each end. On the ground floor are lecture-rooms and six students' rooms, all entered from a corridor stretching behind. There are ten students' rooms on each of the first and second floors. The size of the students' rooms varies 16 ft. by 11 ft. The material of the building is brick, with Bath stone strings, sills, and other enrichments.

THE LATE MR. AUGUSTUS APPLGATH.

A REMARKABLE man has passed away from us, the account of his labours in improving the art of printing may prove interesting to our readers. Augustus Applegath, the son of John Applegath, Captain of the Hon. India Company's ship *Europa*, was born in the parish of St. Dunstan, Stepney, on the 17th of June, 1788; he departed this life at the ripe age of 82 years, and his labours extend over half a century, during which time he took out eighteen patents in his own name, for improvements in the press and silk printing, commencing his career as a printer in Nelson-square, Blackfriars. The Stanhope press was the instrument of general use for printing at that time; but experiments were being made by König, under the patronage of Mr. Thomas Bensley, to carry into effect the suggestions of Nicholson, who, in 1801, in a patent, indicated an entirely new method of increasing the production, by employing a cylinder for the type to pass under, instead of the impressions being produced by two flat faces. He also described his method of using type round a cylinder, but did not succeed, and it was left to the subject of this notice to solve the problem. Mr. Edward Cowper, Mr. Applegath's brother-in-law and partner, in 1816, took out a patent for printing with curved stereotype plates, and machines constructed on a principle were in successful operation for years. His next patent, in 1818, was for distributing the ink upon a flat distributing-table, means of rollers covered with leather, felt, or composition (resin and glue), the distributing rollers having an end-motion. In this patent he also claimed the important improvement of conveying the sheet of paper from one printing under to the other by means of "conveying-rollers," to which it is held by two sets of endless strings or tapes. This form of machine, with subsequent improvements, employing larger pressure cylinders, and only two instead of four conveying-drums, was, and is now, in general use in the trade, and is known as Applegath and Cowper's Royals. These are feeding machines—that is, printing both sides of the sheet before it leaves the machine; and the rate of production is from 800 to 1,000 per hour.

In 1818 Messrs. Applegath & Cowper constructed machines for the Bank of England, to print in several colours, in perfect register, signs for the prevention of forgery, and some of 1*l*. notes were printed by them in the bank, but were never issued, in consequence of resumption of cash payment. Mr. Applegath, having separated from his partner, Mr. Cowper, erected a printing-office in Duke-street, Bedford-street (the nucleus of the extensive works at present in the occupation of Messrs. Gowers), and he turned his attention to expediting the produce of machines for newspaper printing. He met with a liberal patron in Mr.

Thwaites, the proprietor of the *Morning Herald*, and in 1822 made two machines for him, printing at the rate of 1,200 impressions per hour; and subsequently two more, printing 2,000 and 2,400 per hour. The circulation of the *Herald* rose from 2,800 to 6,500 copies in 1825. In 1826, Mr. Applegath was called in by the late Mr. Walter to improve the machines erected by König in the *Times* office, which was effected in the same way as Mr. Applegath and Mr. Cowper had altered König's machine in the possession of Mr. Thomas Bensley. Mr. Walter then contracted for the erection of a machine to print at double the rate of König's,—3,600 instead of 1,800 per hour. This machine printed at first 4,200, and subsequently 5,000 per hour; but for this Mr. Applegath received a very inadequate remuneration, and none whatever for any of the identical same type of machine made since, of which more than twenty were in use in London alone, and known to the trade as the "four-feeders." This machine enabled the *Times* to increase its circulation, which in 1846 reached 28,000 daily: it was difficult to print the number required in time; and, in August of that year, Mr. Applegath offered to construct a vertical machine to print the *Times* at the rate of from 6,000 to 9,000 per hour; in December the contract was signed, and the patent taken out, and in October, 1848, the machine commenced its daily operation, printing at the rate of 8,000 per hour (subsequently increased to 12,000), and a contract for a second machine was immediately entered into, and a third one (with nine cylinders) was made, printing 15,000 per hour.

Two vertical machines, with four impression cylinders, were made for the late Mr. Ingram, for the *Illustrated London News*, and one of them was erected in the Great Exhibition building in Hyde Park, in 1851. This machine was described in "The Crystal Palace and its Contents" as "one of the greatest lions in the Great Exhibition, and which, perhaps, attracted daily more curious admirers than the Koh-i-Noor itself."

The means whereby the produce of these machines so far outstripped the "four-feeders" was the imposing of the type in circular beds fixed on a large central cylinder, with eight impression-cylinders round it, and a corresponding number of feeding and taking-off apparatus connected with them. The cylinders, instead of being placed in a horizontal position, were placed vertically, to insure greater safety to the type, and an incidental advantage of rendering the parts more easy to get at. This position, of course, necessitated a change in the sheet from a horizontal position, as laid on the feed-boards, to a vertical one in the act of printing, involving an entirely new method of treatment; but it was successfully surmounted, and for twenty years these machines were in daily use in the *Times* office.

One advantage attached to the vertical system of printing was that, without rendering the parts of the machine inaccessible, the number of impressing-cylinders could be greatly increased. In the specification of the patent of 1846 a method is shown of surrounding the large type-cylinder with thirteen, instead of eight or nine, impressing-cylinders and feeders, and by this means 21,500 sheets per hour could be printed, a rate of production, we believe, never yet attained by any other form of machine; also is shown in the specification a plan of printing from rolls of paper, with thirteen cylinders, but on one side only; and whether by any contrivance the other side could be afterwards printed in "register" is still a problem.

The improvements in the art of stereotype casting, by the employment of papier-mâché moulds, from which several plates can be cast, indicated that production should be increased by the multiplication of machines, rather than their complication by adding more cylinders and feeders, and the papier-mâché moulds being flexible, circular as well as flat plates could be cast from them, and of a small as well as of a large curve. This induced Mr. Applegath to turn his attention more particularly to "roll printing," which he had never lost sight of; and in 1859 he took out a patent for that object. This is the last patent for letter-press printing that he took out.

During the time Mr. Applegath was at Crayford he took out four patents for improvements in silk and calico printing, and carried these inventions into successful operation.

Mr. Applegath, like many other inventors, although the pioneer of the fortunes of others, did not reap the reward that might have been

expected from his inventive mind. In 1863, writing to the *Stationer*, Mr. Applegath used the following words:—"Before closing this letter, I should be very ungrateful if I omitted to state that though I have not been permitted to do all I wished, yet, through the great liberality of Mr. Walter, a *periodic honorarium* is awarded for my humble attempts to improve the *impressing mechanism* at the *Times*."

Finally, then, the labours of Mr. Applegath may be thus briefly summed up:—In conjunction with his brother-in-law, Mr. Cowper, he produced the machine by which the great bulk of books have been, and are, printed; and to the newspaper reader, who could formerly have obtained a paper printed at the rate of 800 per hour, he offered one printed at the rate of 15,000 per hour, and, had it been necessary, could have greatly increased that rate of production.

EXPLORATIONS IN LONDON BY THE MAORI.

ONE of the gloomiest reflections which some Englishmen are now indulging in is that England has seen her best days, and that the New Zealander will really some day make his appearance after all. Looking forward, then, a few hundreds of years, let us for a moment imagine that the destiny of Britain is fulfilled, and that this distinguished foreigner has at last come. If he be anything of an antiquary,—which, of course, he will be, otherwise it will be of little use his visiting our shores,—he will find a wide field for speculation, and many enigmas to solve in the architectural remains of London. His first pilgrimage will probably be to Westminster Abbey; and though he will be somewhat startled at discovering in the silent aisles and transepts of this Gothic fane a strange collection of ghostly busts and classic monuments, he will here see a grand and true type of ecclesiastical architecture.

His next visit will be to the other Metropolitan cathedral, and that he will find to be Palladian; and he will naturally ask himself "Why Palladian?" As this is the first enigma to be solved, he makes a careful sketch of the ruins of St. Paul's from one of the broken parapets of London Bridge; the style of drawing bearing a striking resemblance to the Pacific art of tattooing in outline, which has now reached its culminating point of excellence.

Leaving the bridge, with measured steps, and in a solemnly reflective mood, he proceeds on his further exploration. It is of no use his hailing a cab, not one being left on any of the former stands. Passing through Cannon-street, he comes upon the London Stone, which he finds rather a tough morsel, not knowing to what age to ascribe it: and if he elsewhere encounters a directing-post, with the perfectly bewildering information on it,—*"So many miles from where Huckle's Hall formerly stood"* it will not be surprising if he exhibits for his private relief and satisfaction a little of his aboriginal ferocity. At last he reaches the British Museum, formerly a great treasure house of ancient art, but long ago ransacked by an invading army, the enlightened inhabitants of the Feejee Islands having, according to precedent (Pekin Palace, to wit), and the law of nations, appropriated all the contents. Much of the building, however, remains: it is Greek; and, again puzzled, he asks, "Why Greek?"

Retracing his steps, the intelligent visitor saunters through Leicester-square, a waste, howling, wilderness (always more or less so), and advances close to the brick, iron, and plaster ruins of a large hall, once devoted to promiscuous entertainment and much resorted to by the advanced youths of the nineteenth century. There is no occasion now for any edict, in the interests of morality, from my Lord Chamberlain, for all the dancing is over, and the ladies of the ballet, with their borrowed blushes and wings—to say nothing of their other borrowed charms—have long ago taken their flight to the more congenial southern latitudes, to the favoured islands of the southern Pacific. But what of the building? Why, it is Moorish, like its Spanish prototype, and the distracted Maori asks, "Why Moorish? Did not a once famous English writer call Moorish art a cruel art, because of its numberless cells scooped out by human hands, with exquisite torture? And were the English a cruel people? What means this?"

The remains of the motley street architecture of the City sorely puzzle also the inquiring

foreigner; and after turning over numerous international fragments,—lotus and acanthus, honeysuckle and palm, violet and tobacco-leaf, unhappily blonded,—in another fit of distraction, he exclaims, "Why molley?"

But our structures are not the only things which will perplex the Maori's mind in this forsaken metropolis. History will have told him that this huge town possessed a population exceeding 3,000,000; and he will want to know where all the people lived, so few private houses will he be able to discover; and he will need to be reminded that the houses of the middle classes,—Cockney rows, villas, and crescents,—were built on extremely short leases, and were constructed in such a fragile manner that long ago one-half of them had tumbled down, one after the other, like a pack of cards (a very slight shock of earthquake would produce that effect), and that the other half, owing to bad joinery, and a superabundance of bad window-sashes and glass, had been blown away by excessive ventilation. J. H.

BRICKFIELDS UNDER THE FACTORY ACT.

Sir,—I see by a paragraph in your paper of August 12th, credit is taken by Mr. George Smead, of Kent, and others, in the Kentish brickfields, for the introduction of the Factory Act. I beg to say, that so far as the brickfields at Dawley, Middlesex, known as the Cowley district, is concerned, we have introduced machinery by which the earth is delivered on to the miller's table, which has done away with the necessity of a pug-boy to place it from the mill on to the table, who was generally about fourteen years of age, and paid from 12s. to 14s. per week, rain or fine, who performed the offices represented by Lord Shaftesbury as being performed by young girls of tender age.

I know nothing of what is done in Staffordshire; but, as the successor of one of the oldest brickmaking firms in Middlesex, viz., John Rutty & Co., I have to say that those practices have no existence here; therefore I do not see why Mr. Smead and the other Kent brickmakers should have more credit than others who have adopted the same plan.

THOS. MAYNARD.

BUILDING BEYOND THE LINE OF FRONT. THE METROPOLIS LOCAL MANAGEMENT ACT.

Mr. JOHN WHITEHEAD, contractor, of Vauxhall Bridge-road, was summoned at Westminster Police Court, by Mr. James Rogers, vestry clerk, on behalf of the Board of Works of the Westminster district, under the Metropolis Local Management Act, 1862, for erecting a building beyond the line of frontage in Vauxhall Bridge-road.

Mr. Bealey, Mr. Arniz, and Mr. Jas. Rogers attended in support of the summons; Mr. H. Roberts, of Clement's Inn, appeared for the defendant.

The building in question was what is commonly known as a contractor's box, or pay-box, constructed of wood, with felt roof, and on four wheels. The line of buildings in the Vauxhall-road, at the spot in question, was produced, the said box being 4 ft. or 6 ft. in front of the houses, and flush with the line of area-railings, and not encroaching on the parish footpath.

Mr. F. King, builder, having been called in support of the summons, Mr. Roberts explained that the erection was merely of a temporary character, capable of being removed from place to place, at defendant's pleasure, for the purpose of his contracts,—and was, in fact, part of his stock in trade as a mason and contractor.

Mr. Nicholls, builder, having supported this, Mr. Arnold said he would visit the premises, and give his judgment.

The parties having accordingly attended on Tuesday, Mr. Arnold, in giving judgment, said, if this case arose under the Metropolis Building Act, governed by Stevens v. Gourley, 20 Q.J.N., 8.C., p. 1 (though this structure is rather smaller and more easily removable than the one in that case, but capable of being used permanently, and seems intended so to be), I confess I should be better able to form a correct opinion than at present; but this case is taken under the 75th section of the Metropolis Local Management Act, 1862, the scope and provisions of which are very different from those of the Building Act. The principal object of the last-mentioned Act seems to be, that all buildings shall be in the main constructed of incombustible material; and it was held in Stevens v. Gourley that a small structure, built entirely of wood, intended to be used as a shop, was, though not fixed to the freehold, a building within the meaning of that Act. The object of sec. 75 of the Metropolis Local Management Act, 1862, as stated by counsel for the Board of Works, is to prevent obstruction of air, and to prevent disfigurement by insuring uniformity of frontage. In this case there is no appreciable obstruction of air, but there certainly is with the uniformity of frontage, which, however, considering the locality, cannot be said to be much disfigurement. Not, however, on these considerations must the decision turn, but upon the construction of the Act.

Having referred at some length to the construction of

the Act, and read the latter part of the clause with regard to demolition.

The learned magistrate went on to say, all therefore he could do would be to order the demolition, not the removal of the structure. It seemed, however, that a removal would not be in compliance with the order, and if merely removed, he was not at all prepared to say the Board might not enter and demolish. The application of this argument is, that the Legislature in this section contemplated all such structures as could not be removed otherwise than by being demolished, and not such as were capable of being removed in their entirety. In confirmation of this view he found that by the 143rd section of the Metropolis Local Management Act, 1855, which was repealed by the section now under consideration, the district Board had the power, without the order of a magistrate, to cause any building erected beyond the general line to be "demolished" or "set back." Now, this construction "clearly might be removed by being set back, and he was bound to suppose that the Legislature, by omitting that term in the later Act, expressly meant to limit the operation to such structures as could be removed only by demolition. On these grounds, therefore, the summons must be dismissed. As it is clearly a matter of law, as in Stevens v. Gourley, decided on demurrer, the complaint may have a case for the Court of Queen's Bench if he wishes."

In reply to Mr. Arnold, Mr. Rogers, the vestry clerk, said he did not know whether the district surveyor had applied for his fees. He would consult the Board before applying for his case.

TIMBER BUILDING.

Sir,—Seeing your remarks in the latter part of the article on "Ancient Timber Houses, Germany," in a recent number of the Builder, I know not whether any correspondent has as yet drawn your attention to a beautiful ancient specimen of a Gothic chapel attached to a cell, belonging to Takeley Priory. This cell and chapel stood at Stansted Mountfriot, at the junction of the London-road with the Takeley-road, and about two miles from the priory.

At the dissolution it shared the general fate, but the chapel in its integrity was preserved; it stood in a triangular plot of ground, and a public-house, "The Cock," was built on the site, the chapel being made into a blacksmith's shop. It being decided by the inhabitants to erect a fountain, this spot was fixed upon, and the site purchased, when the uncommon beauty of the moulded timbers caused them to pause in pulling it down until it was seen by the lord of the manor, Mr. W. F. Maitland, who was absent at the time, and who purchased it and placed it in his grounds.

In the neighbourhood five years ago, at Barrington Hall, a fine old massive tithe barn, built of timber, and three aisles wide, was pulled down to save repairing it. T. B. WATTS.

P.S. The courtyard of old Moreton Hall is, without exception, the richest specimen of late fifteenth-century timber work I have seen in England.

DEATH DRIVING AT TANDEM.

The *Sherborne Journal*, in its last issue, says that "There are two postboys in the town of Yeovil, one named Death, and the other Corpse, and both of them were employed the other day in driving two parties to Bridport."

This is a somewhat singular, though not a happy, coincidence. There is no place in all Somerset where we would feel less wonder at the occurrence than in Yeovil. If rumour speak the truth, scarlet fever is moving through the town. But, outside the region of rumour, it is a stubborn fact that there are many cases of small-pox at present in this ill-drained and ill-served place. Death will always have many Corpses in his trail while he drives at tandem unheeded through the epidemic-stricken waysides and dwellings of slattern Yeovil.

STATUE OF SIR JAMES OUTRAM.

The memorial of Sir James Outram was unveiled on Thursday, the 17th inst., as announced, and Lord Halifax, in the absence of the Duke of Argyll, sketched very clearly the career of Outram, and showed very good reasons to those who needed it, why a memorial of him had been erected. Humble as was his opinion of his own merits, he never shrunk from doing that which he believed to be his duty. An enemy alike of everything that was base and mean, and of everything that he considered overhearing or tyrannical, he never shrunk from giving expression to those feelings and opinions. Feared, but still more beloved by the natives, he advocated their rights and claims in every matter which he believed not to be inconsistent with the honour and true interests of the Indian empire. In war fearless in action, but clear in judgment;

* This, we believe, the Board has abandoned.

in diplomacy conciliatory and skilful; as an administrator firm, independent, and just; he united all the merits of the civilian and soldier-like elements which are so often combined in the Indian service.

The pedestal is about 19 ft. high; the figure itself, which is of bronze, is 12 ft. in height. The statue occupies the angle formed by the junction of Whitehall-place with the Embankment, in the strip of reclaimed land recently laid out as an ornamental garden. The figure looks across the Thames, turning slightly in the direction of the railway bridge.

Mr. Noble was the sculptor, and there is no reason to complain of the manner in which he has executed his task. In front the figure is well balanced and sufficiently like a mortal, with a sash across the figure, rendering the view less uninteresting than is the case in some other back views. Groups of Indian arms and trophies at the four angles of the pedestal serve to render the general outline of the whole agreeable.

It is only fair to say that the successful issue is mainly due to the exertions of Sir John Kaye.

BATHING.

FROM the interest your journal has always taken in sanitary matters, I am induced to write you on this subject, on behalf of those who cannot well make themselves heard.

Persons in the condition of working men and lads cannot go to the seaside, and mostly have not baths at home. Public baths are a necessity, and, in the suburbs, where now most workmen reside, the "Public Baths and Wash-houses Act" is a dead letter; nor, if in operation, would it meet the want of free bathing-places.

In the north of London, where I reside, there is among the youngsters, in whom I have long taken an interest, a healthy desire to bathe, and a love (along with other athletic sports) of swimming. There are, however, really no right means of gratifying so proper a wish without a fee (which is a severe and, in most cases, an impossible tax on working lads), and even then only in a close and "tepid" bath, replenished once a week.

The Regent's Canal is the only "river," and there are many parts of it where free bathing places might, with much benefit and propriety be provided; but all bathing in the canal is rigidly prohibited. Many ponds have in past times been used, but few remain, and most of these are watched and all opportunity of bathing jealously removed.

Now, I do think that this is a healthy want which ought to be satisfied, and that the operations of the authorities in this matter are unwise. The police, and the Metropolitan Board of Works, would seem to be the chief authorities concerned; the latter to provide for such requirements, and the former to see that they be not abused. I will illustrate by two cases from my own neighbourhood the operation of each.

But first let me remark, in case it should be said that such a boon for poor persons must be and always is abused, that in the (as far as I know) exists, which has remained from past times, and where the police department discharges, but does not exceed, its proper functions in the maintenance of order and propriety—I mean the Serpentine,—no abuse, believe, exists, whilst the benefit to near residents is immense.

At Hornsey-wood House there were formerly a spring and ponds, where even the better class of youngsters, as well as the poorer, would, on the summer mornings and evenings, invigorate and purify themselves by bathing and swimming, and the rural scenery around, interested in public footpaths across fields which were not grudgingly shut against pedestrians, were healthy and valuable "lung" to this part of the metropolis.

Unfortunately, however, the Metropolitan Board obtained power to construct "Finsbury Park," which they did on a very grudging scale, not in the close parts of Finsbury, but a long way off in the open country. On this and other features, however, of that performance, I will, possibly, if you will permit me, trouble you with a few remarks on another occasion. Hornsey-wood House and its surroundings were absorbed in this purchase, and the ponds have been turned into a small piece of "ornamental water." Now there would seem no reason why the use made of the old piece of water (the one

thing-place in the neighbourhood that I know should not have been retained in the new one, while a little skill and pains in laying out and planting might have enlarged the privilege, as to permit bathing during the day; but the wants of the poorer inhabitants in this and her respects (except as regards gin-shops) appear to have found no advocate, while the petus given to building and the overcrowding of the neighbourhood caused by the formation of this park (less enjoyable than the old fields) have increased the need tenfold. "Bathing and being are strictly prohibited, by order of the Metropolitan Board," who would exercise a wiser policy by, on the other hand, providing public bathing-places in all the parks and open spaces under their control. Query, will the present right of bathing in the Hampstead ponds be also taken away by the Board (which has lately professed so much jealousy of public rights) when it acquires the control of Hampstead Heath?

But now as to the police administration. On a piece of land very near the last-mentioned instance, laid out for building, but not fit on, and sufficiently retired, exists a pond, very poor one certainly, and no good substitute for the Horsey Wood water, made by an alteration and filling up of part of the New River, it is not now connected with it. Early in the hot season this pond was naturally resorted to, and at a time all was well; but there is a very rough log near, and some lads from thence found it. I do not blame them. They are mere animals, and their habits are the result of the minimal negligence of their betters, whilst a little friendly supervision might have maintained propriety; but some of them began to misconduct themselves, and the police have now, I believe, orders to prevent bathing altogether. So it is ways. The blackguardism of a few roughs was unchecked, until the attention of the police was called to the nuisance, and then violent oppressive measures are adopted against things which, rightly used, are lawful and good, and the public are led to believe that all poor persons are the low and vicious.

Now, why cannot the police in this and other cases (they are all similar) simply preserve (as the Serpentine) propriety and order, and allow that which we, who can afford to pay for it, find necessary and enjoy, but which is so much more necessary to the health of those who generally live by the sweat of their brows? We are all familiar with the police notices,—saturnally suggestive, offensive to the pure, and disserviceful to our morality, which appear at the police-stations and disgrace our public walks, and which probably the low class for whom they are meant cannot read. But surely a discreet supervision of a legitimate and healthy exercise would be much more creditable to our police, and much more conducive to morality and health.

Is not this matter, Mr. Editor, worth the attention of your journal, which would take it in a spirit equally uncomplacent with excessive licence on the one hand, or excessive prudery on the other. F. P. J.

ST. CLEMENT DANES.

Sir,—In common with many others, I should have heard the announcement of the intended demolition and rebuilding, Gothified, of St. Clement Danes, with great anxiety, but for the strong opposition which the proposal has excited in the parish; and I hope that the public interest may also be satisfied that whilst its demolition would be a great calamity on its own account, its rebuilding Gothified would be equally unfavourable to the appearance of the Law Courts. As Mr. Street's opinion has not been quoted, I consider that I am justified in thinking—and I do think—that the suggestion is not found any great favour with him. The body of the church of St. Clement Danes, though plain,—and it must be remembered that formerly the site was not nearly so open as now is,—has much dignity both of plan and elevation.

I am not speaking of some modern chimneys which have been built up against it, and which the parish doubtless could easily be induced to tear. The interior is admirable, and one of the best examples of the school of Wren. Sir Christopher Wren's pupils were chiefly engaged in the work, but he himself actively, although gratuitously, superintended and took great personal interest in promoting it. The steeple by Gibbs is, as

appears to me, the most elegant of his designs. Its effect may be well seen from that part of the Strand where St. Mary's Church, the steeple of St. Clement's, and the handsome lantern of St. Dunstan's are in combination. The growth of the steeple of St. Clement's out of the Mediaeval tower, easily discerned beneath the casing, is an example in adaptation we could ill spare. The church has also memories which deserve to be kept alive; amongst others, it was the usual resort of Dr. Johnson, whose permanent seat was in it.

But unless the building were hopelessly ugly, which it is not, a contrast in style would, I submit, be more favourable to the Law Courts than the Gothic church proposed to take its place. A contrast often is,—nay, when there is adequate reason for it, generally is,—more favourable than a regular sequence. Would the Gothic colleges and churches at Oxford lose or gain by the change or removal of the classical buildings? If St. Mary's is not injured by its neighbour, the Radcliffe Library, could the new Law Courts, with their vast extent, suffer from the neighbourhood of St. Clement Danes? I think that it would be generally conceded that a building so independent of the Law Courts would serve them better, whilst contrasting in style, even if it had not such antiquarian and architectural claims of its own. F. C. PENROSE.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE Congress at Weymouth has been opened under the presidency of Sir W. Coles Medleycott, bart., with much success. The Mayor and corporation presented an address, to which Mr. E. Roberts replied on the part of the Association. The President then read an address, pointing attention to the principal objects of interest in the county; and Mr. Godwin, Mr. W. H. Black, and the Member for the county, having made brief addresses, the members commenced their examinations, and afterwards dined together at the Royal Hotel, the President in the chair, when a number of suggestive speeches were made. On Tuesday a large party in carriages visited Maiden Castle, one of the most remarkable earthworks in the kingdom, the Rev. William Barnes, the Dorsetshire poet, taking the lead in guidance. Mr. Gordon Hills officiated at the monastery of Abbotbury. In our next we will give fuller particulars.

A GRIEVANCE.

SIR,—I regret very much that you should have led the public to believe that the non-admission of my pictures into the International Exhibition arose from some neglect of my own.* As such I beg most distinctly and emphatically to state that I conformed to every rule the committee laid down as a guide to exhibitors.

When my two pictures were delivered at the International Exhibition, my messenger brought back some papers to sign and fill in with my full name and address, my age, and the place of my birth, which was immediately complied with and returned. This naturally led me to look upon my pictures as having been favourably received; the disappointment, therefore, of their rejection was the more intensely felt, which makes me cry aloud for justice.

E. FAÇON WATSON.

WHY NOT?

WHY should not an exchange be built on a large scale and in a central position for the transaction of all business connected with the transfer of land? a central hall for advertisements, appointments, and general business; salerooms; offices to be let to conveyancers, surveyors, and others; and strong rooms for depositing deeds in?

Why should not deal used in joiners' work be immersed in a solution of oak bark, as leather is, and by that means be rendered durable, obnoxious to vermin, and of the same colour or of better colour than can be obtained by painting, staining, or graining? If cedar-bark tan were applied to white deal, it would render it almost identical with cedar, at less expense.

Why does almost every public clock that is erected in London or elsewhere chime Cam-

* We did not wish to make the public believe any such thing; we simply sought to elicit the real cause of the rejection of Mr. Watson's pictures.

bridge quarters? Why not some variety? Oxford, for example; these are much more adaptable in a peal of only eight bells, as here shown:—First quarter, 4, 3. Second, 4, 3; 5, 6. Third, 4, 3; 5, 6; 4, 3. Fourth, 4, 3; 5, 6; 4, 3; 2, 1. Then the hour on the tenor.

Why cannot sea-water be brought to London in pipes laid along the Brighton Railway? It would certainly pay. The water could be supplied to houses. It could be sold in quantities at the works. Salt-baths could be established in connexion with the works, and a salt-water lake similar to the lakes in our public parks would be a great attraction. W. SCARBELL.

DOWN WITH THE DUST.

SIR,—Clouds of drifting dust still meet us greeningly. Is the new salt-water process too expensive for general adoption? I find a small quantity of glue or size dissolved in a large quantity of water hinders road-dust sufficiently from the wind, but not to impede the work of sweeping or scraping our roads.

I hope this or some other inexpensive mode may be adopted to prevent old Boreas throwing dust in our eyes. E. T.

THE SEWERAGE WORKS OF FRANKFORT-ON-THAINE.

THE following are the amounts of tenders received for contracts connected with the South Zeil District of the above works. Messrs. W. Lindley & J. Gordon, engineers:—

I. For the construction of 21,636 lineal feet of brick and pipe sewer, all materials being provided by the Board of Works:—

Löbholdt, Brothers	£13,894 3 8
Andreas	12,940 19 0
Frane & Co.	12,928 7 7
Holzmann (accepted)	12,888 12 7

The above works were estimated by the resident engineer to cost £12,8094. 18s.

II. For the supply of 959,000 square and radiated bricks:—

	Per 1,000 delivered at River-side Depot.	Per 1,000 delivered at Part of Works.
	S. d.	S. d.

Fissolo, Kinscherf, & Co.	38 4 ... 41 8 ...	41 8 ... 45 0
G. M. Gund	38 4 ... 41 8 ...	41 8 ... 45 0
G. Gund	38 4 ... 41 8 ...	41 8 ... 45 0
Seasoles, for 250,000 square bricks only	—	40 10
Waiz, for 90,000 square and 10,000 radiated bricks (accepted)	36 8 ... 36 8 ...	40 0 ... 43 4
Holzmann (accepted)	36 8 ... 40 0 ...	40 0 ... 43 4

III. For the supply of sandstone sewer invert and junction blocks:—

Schenck & Arnold	£2,819 2 7
Schenck & Musswater	2,619 2 7
Holzmann (accepted)	2,633 7 6

SHANKLIN, ISLE OF WIGHT.

THE south aisle of the church of St. Saviour, on the Cliff, was formally opened on Friday, the 11th inst., by the Bishop of Winchester. The church, which formally consisted of nave, chancel, vestry, and organ-chamber, was erected in 1867, to accommodate for the most part the visitors who yearly flock to this very favourite watering-place, the number of sittings then provided being about 370: the committee, finding at the close of last summer that this was quite insufficient, determined to add the south aisle and porch. A contract was entered into at the end of March last with Mr. F. Cooper, builder, of Shanklin, by which extra seats for about 140 adults have been obtained, at a cost of about 600l. The walling is of green sandstone from the local quarries, hammer dressed, the buttresses, windows, and quoins being of the same material from the lower bed, carefully worked and tooled. Mr. Thos. Hellyer, the architect of the first portion of the building, provided the plans.

The requirements of the district having exceeded the accommodation already provided, a committee was formed during last year for the purpose of erecting new schools and master's residence, on a very convenient site, given for that purpose, by Mr. F. White Popham, the lord of the manor of Shanklin; and a subscription list, headed by the Dowager Lady Hatherton, with a contribution of 500l., having been raised to a considerable sum, it was decided to apply to Mr. A. W. Blomfield, of London, for plans and estimates for a building to contain 800 children, these being arranged for boys, girls, and infants, with separate school-rooms, lavatories, and outpremises for each, the master's residence being a detached building adjacent to the schools. The works were commenced in June last, the

contractor being Mr. F. Cooper; and on the 11th of August a stone, with suitable inscription, was placed with due formality, by the Dowager Lady Hatherton, in the presence of the Bishop of Winchester, and a considerable assembly of both inhabitants and visitors. The amount of the contract is 1,650*l.*, which, however, does not include the necessary fences and approaches, nor the incidental expenses.

THE TRADES MOVEMENT.

Leeds.—The master builders have met to consider the demands of the bricklayers, who ask 7*d.* per hour, and nine hours per day, instead of 6*d.* per hour, and ten hours per day. The masters appointed a committee to meet a deputation from the workmen in order to settle the dispute. The moulcers, smiths, strikers, and joiners, numbering 800, employed at Messrs. Greenwood & Batley's factory, have obtained an increase of wages. The fitters, turners, machine men, &c., numbering 700, are still on strike, their demand being for an advance of 1*s.* per week all round, and a reduction of one hour and a half's labour per week. The men have unanimously resolved to stand out until all their demands are conceded. The whole of the workpeople, about 1,700, employed at Messrs. Fairbairn, Kennedy, & Co.'s iron foundry were locked out by the firm, in consequence of a strike for an advance of 1*s.* per week among the young men and boys. A deputation of men who waited upon the firm were informed that the works would not be re-opened till the boys had come back or were replaced. At night, the men held a meeting, and resolved to seek an advance of 10 per cent. in the rate of wages. It has been since said that the boys have been settled with. The boys employed in glass works at Thornhill Lees have struck, placing all the men engaged in great difficulties.

Oldham.—The journeymen plasterers and their labourers have struck work, in consequence of the masters refusing to concede a demand for an advance of 2*s.* per week in wages. The labourers demand an advance of 1*s.* per week. The masters offer, as a compromise, the payment of 7*d.* per hour to the journeymen, and 5*d.* to the labourers. The men refuse this, and insist on working for weekly wages and the advance asked for.

Newcastle-upon-Tyne.—About 100 slaters have struck work for an advance. The wages generally paid are about 28*s.* per week, the hours of labour, in the summer, being ten and a half per day. In the winter, however, their hours are shorter. The men demand 30*s.* per week, and nine hours per day. It having been notified to the Newcastle engineering operatives that agents of the masters had been sent to Belgium to engage from 2,000 to 3,000 men to come over to take the places of the men now on strike, and that Sir William Armstrong had obtained the consent of the Danish Government to bring over a number of the workmen from the Government arsenal of Denmark, the General Council of the International Working Men's Association, at the request of a deputation from the strike committee at Newcastle, have despatched two of their members, Mr. M. Cohn and Mr. J. G. Eocarius, to Belgium, to counteract the agents of the masters by making the workmen there acquainted with the state of affairs at Newcastle. Mr. Cohn is a native of Denmark, and Mr. Eocarius a German, but both have been many years resident in London, and active members of their respective trade societies. M. Renna, the secretary for Belgium, on the council, has also written to the sections of the International in the towns of Brussels, Antwerp, Liège, Verviers, and Charleroi, where the principal iron and engineering works are situated, requesting them to acquaint the workmen in these places with the real state of affairs in England. The delegates will also visit Germany and Denmark, and place themselves in connexion with the sections of the society in reference to the question. Meantime, between 200 and 300 men have arrived in Newcastle from London and Woolwich, and they have been distributed among the various manufactories in Newcastle and Gateshead. About 150 men have been distributed among the following manufactories in Gateshead.—Messrs. Abbott & Co's, Messrs. Hawke, Crawshaw, & Co's, Messrs. Black, Hawthorn, & Co's, and Messrs. Clarke, Watson, & Gurney's. The workmen in Gateshead are lodged in a large warehouse near Messrs. Clarke, Watson, & Gurney's factory. During Tuesday about forty of the new workmen

were engaged at Messrs. Hawthorne & Co's, Newcastle; and the same night about twenty-five men arrived from the south by train, and were at once taken in cabs to Messrs. Thompson & Boyd's works, Barrack-road. The difficulty with the masters now is to find accommodation, not men. Some collisions have taken place between the men on strike and the new-comers, and serious disturbances are expected. Further convictions for intimidation have been obtained, and several men are under arrest for creating disturbances. The masters have appealed to the authorities for additional police to protect the men now at work, and a large number of special constables have been sworn in. The League have made an appeal to Messrs. Stephenson's men for more assistance. They complain that the men do not assist them in the main point, the attainment of the nine hours. The League officials on Tuesday in last week made the weekly division of funds among the men out on strike. There were 2,341 men on strike remaining in the town, against 2,460 the previous week; and it has been agreed to make a similar allowance to that made last week—5*s.* 6*d.* per man, and 1*s.* per child.

The Amalgamated Society of Carpenters and Joiners.—From a manifesto issued by the executive council of this society, recently sitting in London, it appears that a definite split has taken place in the whole body, numbering over 10,000 members, the rival executives, acting respectively in London and Manchester, each claiming obedience from the members. The London council in their manifesto say that "between the branches now there is not the slightest cohesion," and add, that the result of the plan set up by the Manchester council before the magistrate at Marlborough-street lately, to the effect that the society was not entitled to the protection of the Friendly Societies Act, has been "to rend our institution asunder." They conclude by saying, "whether the number of branches who agree to be governed by the rules increase or diminish, we shall still do our duty, and continue the Amalgamated Society of Carpenters and Joiners."

COMPETITIONS.

Leicester Municipal Buildings.—In the town council, last week, Alderman Baggess moved, "That Mr. Street's report, and the three selected plans, be referred to the Municipal Buildings Committee for their consideration, and report to the council." He said he did not propose to make any observations as to Mr. Street's report at the present time; it would be more fitting when the committee reported to the council. Alderman J. Baines said, he should propose as an amendment, that the committee consist of the whole council. There was a great difference of opinion as to the suitability of the site for these municipal buildings, and that had not been allayed by the report from the gentleman appointed by the council to examine and report on the plans. [Mr. Street condemned the Friar-lane site.] Therefore he thought the whole council should have a voice whether they would build on that site or not. After a good deal of discussion the amendment was withdrawn, and the motion agreed to.

CHURCH-BUILDING NEWS.

Middle Littleton, near Evesham.—The church here has been re-opened. The actual cost of the restoration was 1,800*l.*, of which some 1,500*l.* have been raised. The architect was Mr. Freedy. The church was so decayed throughout as to require little less than a total rebuilding; and the parish had also to provide a new national schoolroom and a teacher's house, at a cost of about 700*l.* The main object of the restorers was to preserve the old character of the church, which contained specimens of all the styles, from Norman downwards, besides relics, such as entrance to roof-loft, sanctus-bell cot, piscina, old tiles, screen, Norman font, hagioscope, inaccessible chamber over porch, churchyard cross, &c.

The masonry of the walls has been made good or rebuilt, and the windows restored or new ones inserted; the chancel has been rebuilt from the foundation; the chancel arch has been raised and widened, also the arch to the north transept, and new roofs erected over the nave, chancel, and transept chapels. A new vestry has been erected. The pavement and sittings are new, except some old seats in the nave and a few of the old tiles which could be put together in

pattern. Most of the other fittings, doors, rails, altar-table, reading-desk, &c., have had to be renewed. By the removal of the pews a considerable space has been made available which had been previously wasted. The sanctus-bell cot was said to have been in a too shattered condition to admit of being refixed; and the two rude Norman squints are also gone. The anchorite's chamber over the porch has been opened to the latter by removal of its decayed floor, but in all other respects its character and features have been preserved. Mr. Griffiths, of Eldersfield, was the builder. The restoration of the tower and the re-arrangement and improvement of the churchyard still remain to be done.

Llanerbydd Wells.—Abergweissin New Church, which has been recently restored, has been opened for divine worship. The foundation is evidently of ancient origin, some yew-trees in the yard being, beyond all doubt, more than 500 years of age. The edifice is situated in a rude part of the country, on the borders of the counties of Brecon and Cardigan, and the roads leading to it are almost impassable. The inhabitants of the parish are chiefly Dissenters, and show great antagonism towards the Established Church. The building, in style of architecture, is after the Early English of the thirteenth century, and consists of nave, chancel, and transepts, with tower at intersections, and porch at west of south side of nave. The dimensions are as follow:—Nave, 50 ft. by 19 ft.; chancel, 18 ft. by 9 ft.; transepts, 17 ft. by 9 ft.; and tower, 26 ft. square. The walls are built of native stones, faced internally with red Suffolk brick, the lower 4 ft. being glazed, and the interval stones from the Bath quarries. The external dressings are of Greenshill and Cefn quarries. The roofs are covered with Whitland Abbey slates, surmounted by a red Staffordshire ridge or crest. The nave is lighted on the north by three single and one double lancet window, and on the south side by two single and one double lancet. The west end has a circular rose-window, 12 ft. in diameter, the east end of the chancel being divided into five unequal lancet-windows, and the sides lighted by single lights. All the chancel windows have serpentine and Anglesea marble shafts. The south transept is arranged to receive an organ, and the north transept is divided off by a carved oak screen, glazed with grisaille glass, to form a vestry. The tower at the intersections of the cross forms a lantern, 33 ft. high from the floor of the nave, and is pierced on all sides with small quarter-foils, filled with grisaille glass. Above this the tower rises to a total height of 52 ft. from the floor of the chancel, and is surmounted by a low square spire, having an iron cross and weather-vane. In the nave there are movable open benches to accommodate about 120 persons. The space under the tower is fitted with carved oak. The floors are of tiles, from the Llugwardine works. A peal of six bells, by Warner, are hung in the tower, with a chiming apparatus arranged in the vestry. Access to the belfry is obtained by a spiral stone staircase at the north-east angle of the tower. The warming apparatus is by Ringington, of Skipton. All the glazing is in Hartley's rolled glass, in two tints. The works have been carried out from the designs, and under the superintendence of Mr. E. J. Withers, architect, London, by Messrs. Dore, Brothers, builders, Islington, Mr. Griffiths acting as foreman of works. The statue of St. Michael and all the carvings in the vestry-screen were executed by Messrs. Bell & Almond, of London. The glass in the lantern of the tower was by O'Connor, of London. The total cost is over 4,000*l.*, which is almost entirely defrayed by Mrs. and Miss Thomas, Llwynmadog.

Welshpool.—The restoration and re-opening of St. Mary's Church, Welshpool, after its restoration at a cost of 4,000*l.*, has taken place. The restoration has been effected by Messrs. Fisher & Dyson, the contractors, of Huddersfield, from plans drawn by Mr. G. E. Street. They have placed four new windows in the south aisle, three of stained glass. The ceiling has been removed, the rafters oiled and remodelled, and thrown open, in pitch pine. The floor has been lowered. New bases have been put to the pier of the arcade arches. The floors are new-tile throughout, and there is a new organ-chamber constructed on the north side of the chancel, with an arch to the chancel, and another into the north aisle. The ground floor is new-seated in the north and south aisles, and the chancel. The seats or benches being of walnut. The heating apparatus is Limby's, of Halifax, and the seats will accommodate 1,200 persons. The

dos is of alabaster and marble, with a large in the centre. It was executed by Messrs. of London, and is the gift of Lady Powis. The wings are of Caen stone and tiles. The pews on the south side are filled with stained cathedral tinted glass, by Messrs. Dore & Co., of Shrewsbury. A new arcade has been added at the west end, with two new arches, the whole nave having been lowered to the level of the early church.

Alcester.—The parish church of Alcester has been re-opened, after undergoing considerable repair and restoration. The building consists of nave and aisles, a sanctuary at the east end, with vestry attached, a tower at the west end, has been enlarged by the addition of a chancel, 35 ft. by 16 in., and chancel aisles, each 21 ft. by 18 ft., to the north and south, the north aisle serving organ-chamber and vestries, and the south aisle being seated exclusively for children. Both aisles are divided from the chancel by three arches, having clustered shafts, and from the nave by single arches springing from moulded piers. The chancel is also separated from the nave by a lofty moulded arch, with shafts in the angles of the jambs. The whole of the old high flying, together with the old galleries running along three sides of the church, have been taken away, and the ground floor seated with open benches of deal, stained and varnished, the chancel with desks and choir benches of Irish oak. The aisle windows, ten in number, have been filled in with tracery and reglazed with tinted glass, and the walls and ceilings cleaned and recoloured. It is hoped that at no distant date this portion of the building will be rebuilt. The Hertford monument, which occupies the east end of the south aisle, has been erected eastward into a recess specially built to receive it, and the altar tomb close to it, which occupied the space of some of the best seats in the church to the west end of the nave and north aisle. Mr. Boulton, of Cheltenham, has executed carving throughout, including figures of the Evangelists in the niches of a new stone floor. The passage spaces of the entire building are paved with Godwin's tiles, in patterns, and in the chancel being enriched with encaustic tiles. The stone is entirely from Cornish Down, but the new walls are built chiefly of local stone, faced with Bromsgrove and Bath stone dressings. The new roofs are open, timbered, stained, and varnished, plastered between rafters, and covered with Broseley tiles. The roof has been carried out by Messrs. Collins & Co., of Tewkesbury, at a cost of 2,600l., under the direction of Mr. Preedy, of London, architect. Towards the cost of the restoration, 2,000l. had been subscribed prior to the raising, leaving a deficiency of 600l.

Chesham.—The new church of St. John the Evangelist, Hightown, Chesham, Manchester, stands in a part of the old parish of St. Luke, has been consecrated. This church is the gift of Mr. J. Lloyd, of Monk's Orchard, Kent. Mr. Lloyd has provided for every expense in connection with the establishment of the church, including the erection of a parsonage-house, and ornament, site, &c. The cost will exceed 1,000l. The church is built of stone, lined with brick, and in the Early English style. It consists of a nave, north and south aisles, chancel, semicircular apse, with a tower at the south side, of considerable altitude, and a low porch, covered with tiles, and pinnacles rising from each angle. The aisles are lighted with lancet windows. There is an arcade around the chancel, and above that a series of lancet windows. The roof is of open timber-work divided in semicircular form. The pulpit is of iron shape, perforated with Gothic tracery, the stalls contained in the chancel are ornamented in the front in a similar way. Accommodation is provided for 540, and 170 of the pews are free.

Kurgoland, near Sheffield.—The new church of Kurgoland has been consecrated. The design is by Mr. Street.

Alabam.—The parish church of All Saints, in this village, has been re-opened by the Archbishop of York. The ancient edifice had fallen into a state of great dilapidation—so much so that its roofs and walls were fast crumbling to ground. The rector, the Rev. O. M. Shipson, ordered the chancel at his own expense. The brick floor was taken up and substituted by paving with Minton tiles; the dingy, wagoned ceiling has also given way to an open roof of ribbed woodwork; and instead of high open stalls are now provided for the

choristers. The nave and aisles have been roofed with open woodwork of stained deal, while many of the architectural features which had been hidden for years by plaster and whitewash have been brought to light. A porch of brick on the south side of the church has been removed. The architect was Mr. Ewan Christian, of London; and the contractor Mr. C. Atkinson, of Gloucester. The cost of the restoration amounts to 1,100l., of which about 300l. are still required.

Fladbury (Worcestershire).—The parish church here has been re-opened after restoration. Mr. F. Preedy was the architect, and Messrs. Collins & Callis, of Tewkesbury, were the builders employed. New seats of varnished deal have been substituted for the old high pews, and throughout the church the sittings have been made free and open. Godwin's encaustic tiles have been laid down for the pavements, in patterns of many colours. The great gallery at the west end of the nave has been taken down and the tower opened to the church. A new chancel arch has been erected, and a new organ-chamber at the east end of the south aisle. The walls generally have been cleaned and pointed inside and out, and the windows repaired and reglazed. A hot-water apparatus has also been supplied. Fladbury Church was noted for its brasses, which are scarce in Worcestershire. The Throckmorton monument, on which some of them remain, has been removed from the centre of the nave, where it was an obstruction to the passage to the base of the tower. A considerable number of encaustic tiles, apparently of the fifteenth and sixteenth centuries, many of them sixteen to the pattern, and some charged with shields of arms and devices, were found underneath the old pavement; they have been preserved, and placed in situations where they cannot be readily destroyed. Some of them have been arranged over the surface of the north door (closed) in the nave, and made to commemorate the present restoration by the following inscription in Medieval letters:—"Glory to God on high; restored MDCCCLXXI."

Yonford.—The church, having been restored nearly two years ago, has received a new addition, consisting of a reredos. The work was executed by Mr. T. Stopher, St. Matthew's, Ipswich, in Caen stone, and extends from the north to the south wall. The lower part is divided into six panels on a plinth, with sunk quatrefoils bearing shields. The four centre ones are illuminated with the Evangelistic emblems, and the two end ones with cross keys, the emblem of St. Peter, to whom the church is dedicated. The upper part consists of nine panels, the centre one of an illuminated text, "As often as ye eat this bread and drink of this cup ye do show the Lord's death till He come." On each side two panels are filled in with grapes and wheat and lilies alternately (painted on slate), the upper portions having tracery of heads, and spandrels carved in various natural foliage, and surmounted with carved embattled corners. Right and left are two large panels bearing the Decalogue and surmounted with carved crocketing work and pinnacles.

DISSENTING CHURCH BUILDING NEWS.

Chesherton.—The foundation, or memorial, stones, six in number, of a new chapel, belonging to the Primitive Methodist Connexion, at Chesherton, have been laid. The new building will be situated on the London-road. The contract, exclusive of the land, is 1,400l. The chapel, which will be in the Italian style, will accommodate from 600 to 600 persons. The external dimensions are 55 ft. 3 in. by 38 ft. 9 in., and the height from floor to ceiling 26 ft. 6 in. at the sides and 30 ft. 6 in. in the centre. The ground floor of the chapel will be used for Sunday-school purposes until the school premises are erected. The cost of the building and fittings, with lighting and varnishing, will be about 1,415l.; and of the site, 260l. Mr. G. B. Ford, of Burslem, is the architect; and Mr. James Wood, of Willaston, the builder.

Kidsgrove.—The foundation stone of a new Wesleyan chapel has been laid at Whitehill. The building, which is to be erected from the design of Mr. George B. Ford, of Burslem, architect, by Mr. James Wood, of Willaston, will be a plain structure, faced with red bricks, relieved by bands and vousoirs of blue bricks. Its dimensions, externally, will be 32 ft. 8 in. by 29 ft. 8 in., and it will provide accommodation for about 120 persons. The front of the chapel

is divided into three bays, each bay being spanned by a semicircular arch. The central bay projecting slightly, will be carried up, and finished in a pedimental form, in the upper part of which will be a stone tablet. The porch, which projects from the front of the chapel, will be finished with a curved parapet. A portion of the chapel will be left for the use of the Sunday school for the present, and the remainder will be fitted with pews with inclined backs. The woodwork, internally, will be slightly stained and varnished. The cost of the building, and fittings, including out-offices, and a portion of the boundary walling, with land, will be 350l.

Lightcliffe.—The new Congregational Chapel is proceeding. It is Gothic in style. The roof of the nave has been fixed, and the two transept windows, of four lights each, with circular tracery in the headings, are complete. The west window of five lights will soon be finished, and the tower has reached its third stage. When finished, tower and spire will reach a height of 126 ft. The minister's house, in a style of architecture to harmonise with the chapel, stands near to it, and its erection is being proceeded with. The church consists of a nave, of four bays, with side aisles, north and south transepts, and a short apse up to a wheel window, near the head of the gable. All the gables will be finished with floriated crosses. The clearstory is in single lights. All the shafts to the arches are in polished marble, with carved capitals.

Donsley.—A new Wesleyan Chapel and day-schools, erected at a total cost of about 7,800l., have been opened. These buildings are erected on a plot of land formerly known as Crowther's Gardens, and belonging to the corporation, but which locality is now known as Oxford-place. The new buildings have been erected from the designs of Mr. Wm. Watson, of Wakefield, architect, by Mr. Harold Arnold, of this town, builder. The chapel is in the Italian style of architecture, and is approached from a walled and palisaded frontage and carriage-entrance by a flight of eight steps. It is capable of seating 1,000 persons, and 300 will be free. The seats—those in the body of the chapel, as well as those in the galleries—are of red deal, varnished, and will be approached almost noiselessly, in consequence of the aisles being covered with kamptulion. The chapel will be warmed, when necessary, by means of Blake of Coventry's hot-air apparatus.

Clydach.—The foundation-stone of a new chapel—making the 142nd in the county of Glamorgan in connexion with the Calvinistic Methodist body—has been laid by Mr. Thomas Cory, of Swansea. The new chapel is situated at the Vardre, near Clydach, in the Swansea Vale, where new collieries are being worked by Messrs. Cory, Yeo, & Co., and others. A suitable site was obtained on the Ynispennllwch estate.

Denton.—The foundation stone of a new Wesleyan chapel and schools, to be erected on Hyde-road, Denton, at a cost of 3,500l., has been laid. The new building will occupy a commanding situation on the main road, the mixed and infant schools being situated immediately in the rear. The design, which has been prepared by Mr. George B. Ford, of Burslem, in Staffordshire, is in the Gothic style of architecture. The arrangement of the plan is that of a simple parallelogram for the chapel. The material used in the erection will be pressed red brick, relieved by bands of blue Staffordshire brick and Yorkshire stone dressings. Accommodation will be afforded for about 400 persons with 255 children in the gallery. At the east end of the chapel will be placed the orchestra, the minister's vestry, and a large class-room. The span of the roof will be 38 ft. The schools will consist of four class-rooms, arrangements being provided for future enlargement. The mixed and infant school-rooms will be so constructed that on any public occasion they may be made to form one large room. The mixed schools will accommodate 400, and the infant school 100 children.

FROM IRELAND.

CORK AND WATERFORD.

SMALL-POX and fever are breaking out in these two southern Irish cities. Precautions are being taken by the Town Council of Cork, which is more or less a prey to epidemic visitations. Round that quarter where Old Shandon's steeple raises its head, celebrated by Father Prout, the streets, lanes, and dwellings are in a

deplorably bad condition. We assert this from personal experience and a recent visit. We only wonder that, with such places in the condition that we observed them, fever is not more rife.

The sanitary state of Waterford, too, is very bad. Many of the lanes and alleys under the shadows of both cathedrals are in a filthy state, and the water supply in places is most imperfect. We do not wonder at hearing that small-pox is developing in the city. The streets are never properly cleansed, although the Town Council of Waterford talk glibly of improvements and testimonials. We will probably soon inform the authorities of this ancient city how they best can carry out some useful improvements not included in their programme. Surely the city of the Suir can do some useful sanitary work, if it sets about it. Giving Waterford credit for its recent and projected harbour improvements, we would direct its attention to the crying wants of the town. Cork also requires to wake up to the emergencies of the hour, for there is danger in the winds, and death will reap a premature harvest in many an Irish town and city if the guardians of the people are not up and doing, that fever and cholera may be stamped out with effect. Cleanliness night and day must be the order, and a constant flow of pure water kept on everywhere. This, unfortunately, is not the order that is most attended to in the towns and cities of the sister island.

Books Received.

Scrambles amongst the Alps in the Years 1860-69. By EDWARD WHYMPER. London: John Murray. 1871.

LIVE, as quoted by the author of this book, on his title-page, says justly, "Toil and pleasure, in their natures opposite, are yet linked together in a kind of necessary connexion," and this gives one of the reasons why mountain climbing is found so delightful as it is by a large section of English people; we had written English men, but remembered in time that English women have done all that men have done in this way, and in fact are amongst the best climbers in the world. Mr. Whympier has produced a very charming and useful book, in fact, the most valuable book we know of on the subject, and when it is noted that he has himself done the climbing, writing, and sketching too, the merit of the achievement is seen to be very considerable. Some of the illustrations, drawn on wood either by himself or by others from his sketches, and engraved by himself, or one of his own name, are beautiful specimens of their kind: we may mention particularly the frontispiece, showing the remarkable fog-bow, which was seen from the *Matterhorn*, after the frightful accident in 1865, when Lord Francis Douglas and three others were unfortunately killed; the striated rock at Grindelwald; the crags of the *Matterhorn* during the storm of August, 1863; the summit of the *Moming Pass*; and the ice bridge on the *Dent Blanche*, as effective as *Dur*, with the advantage of being correct. The recent consecration of an English church at Zermatt has revived remembrance of the terrible disaster alluded to above, and which is, of course, minutely described by our author, a saddened survivor; but we will not further refer to it.

Strange to say, considering how much Mr. Whympier has done, his career as a climber commenced only a few years ago. In 1860 he was requested by a London publisher to make some sketches of the great Alpine peaks, and at that time he had never even seen a mountain: we remember an interview with him, before he started on that occasion, with reference to the probability of his getting some sketches on the way that might suit our pages. A considerable part of the volume before us is occupied by the history of his successive attacks on the *Matterhorn*, and his ultimate conquest of that difficult peak. In endeavouring to make the book useful to those who may wish to go mountain-scrambling, whether in the Alps or elsewhere, considerable prominence has been given to mistakes and failures, with the view of showing others what to avoid. The author maintains that the real dangers of mountaineering are small, the risks run are often needless. Very much pleasure we freely admit is to be had with little danger if proper precautions be observed; but those who attempt the high Alps should have good health, some practice, and a steady head; with

out these qualifications they will find it very unpleasant work, and be found by others great hindrances and marplots.

Mr. Whympier, amongst the general information which he communicates, gives interesting accounts of the *Fell Railway*, and of the great tunnel of the Alps, now to all intents and purposes completed; and a suggestive chapter on *Orbitism* and *Goitre*, the frightful prevalence of which diseases in certain localities has always seemed to us a disgrace to science and legislation.

Touching climbing generally, we will repeat Mr. Whympier's closing words,—"There have been joys too great to be described in words, and there have been griefs upon which I have not dared to dwell; and with these in mind I say, Climb if you will, but remember that courage and strength are sought without prudence, and that a momentary negligence may destroy the happiness of a lifetime. Do nothing in haste; look well to each step; and, from the beginning, think what may be the end."

This is good advice, and will apply to other things than climbing. We cordially recommend the volume as well to those who only read, as to those who love to ramble; each may enjoy, though in a different way, "Scrambles amongst the Alps."

Miscellaneous.

Ventilation of Plant-houses.—The most simple plan, says a correspondent of the *Notes Guardian*, is to carry a fresh-air drain communicating with the external air beneath the hot-water pipes, with openings every few feet to allow the air to pass into the house, the hot-water pipes having troughs upon them to hold water for evaporation. Another plan, which cannot be surpassed for vineeries or forcing-houses of any kind, is to carry drains formed of 6-in. common socket drain-pipes, and 4 ft. apart, from the front to the back of the border, terminating beneath the heating apparatus. This we did thirty years ago with perfect success. First, the return-pipes of the heating apparatus were laid in a cement trough 6 in. deep, which could be filled with water for evaporation or not as the exigencies of cultivation might render it necessary. In front of the pipes, beneath the platform upon which the plants stood, was a curtain of coarse woollen netting, through which the heated air passed into the house, and as the cold-air drain terminated behind the trough in which the pipes were laid, it was impossible that air could pass among the plants until attuned to their requirements. Nothing could be more satisfactory than this. Of course with all arrangements for admitting fresh air, there must be a corresponding out-let. In some cases "the chink of air" in the roof may be sufficient for the purpose, except when the day is sunny, but in any extremity it is only necessary to place a light framework of wood before each ventilator, which, covered with fine woollen netting, will check the ingress of cold air, and regulate the egress of warm.

Opening of a New Hospital at Rugeley. The Rugeley Dispensary and Hospital has been opened. The establishment of the hospital may be traced to the Convalescent Home started some years since by Miss Levett, which led to the formation, about five years ago, of the Providential Dispensary and Medical Club. The new hospital is already completed, and there were sufficient funds to pay for the building, which has cost 1,800l. The hospital is situated about half a mile from the centre of the town, on the Breerton-road, in a quiet and healthy locality. It has more the appearance of a private residence than that of a hospital. The general character of the architecture is domestic Gothic of the English type. It is built of the red bricks of the locality, relieved with blue courses round the building and over the arches of the windows, with a moulded blue projecting cornice half-way up the building. The hospital is calculated to hold eighteen beds. The architect was Mr. W. A. Bonney, and the contractors were Messrs. Brown, all of Rugeley.

The New Opera House at Paris.—The works of the new Opera House, Paris, it seems, have been resumed; a sum of 600,000 fr., voted before the outbreak of the war, having been placed at the disposal of M. Garnier for that purpose. No other credits, however, are opened for any subsequent operations.

Chinese Varnish.—Among the raw-stuffs sent by Dr. von Scherzer from Peking was one called *sohio-lias*, a kind of varnish which is employed for varnishing all kinds of wooden things, and has the property of making these articles water-tight. Dr. von Scherzer has seen wooden chests in Peking which have been over Siberia to St. Petersburg and back, and still remain sound and water-tight. Even baskets of straw used for the transport of oil are, by means of this varnish, made perfectly fit for the purpose. Pasteboard, by its use, becomes, both in appearance and firmness, like wood. Most exposed woodwork is coated with *sohio-lias*, which gives it an ugly red appearance, but it gains in durability. This varnish was examined by the Australian Agricultural Department, and Dr. von Scherzer's communication was fully corroborated. The "Wiener Gewerbezeitschrift" also made trials with it. By mixing together three parts of fresh, beaten, defibrinated blood, four parts of slacked lime, and some alum, a thin, sticky mass is obtained, which is immediately ready for use. Articles which are required to be particularly water-tight are varnished twice, or at most three times, by the Chinese. In Europe this varnish is not yet made, although it is one of the surest and best ways of making wooden articles perfectly water-tight.

The New Theatre Royal and Albert Hall, Reading.—This new building, which has been erected on the site of the Assembly-rooms (recently destroyed by fire), is rapidly approaching completion, and will be opened on the 4th of September. The design and arrangements of the building are by the proprietor, Mr. Eliot Galer, and have been carried out by Messrs. Brown, of Reading. The area of the building is 130 ft. by 40 ft. The stage has been fitted up under the direction of Mr. Burgess, of Her Majesty's Theatre. A cornice runs round the interior; and a ceiling, with centre dome, fitted with a sun-burner of 150 jets, lights the hall. The walls are paneled, and decorated light blue salmon-colour, and white, relieved by gilt mouldings. An open balcony runs half-round the hall at the back of which is a gallery. The area of the hall will seat between 400 and 500, in addition to which there are 60 stalls, covered in crimson velvet; the entire building seating over 1,000 persons. The means of egress are five ways of exit, in case of alarm. When not used as a theatre, the proscenium is made to appear as an alcove, and decorated in harmony with the hall. The foot-lights sink through the stage, and an extensive platform remains for concert purposes.

The Census of Sydney.—This census has just been taken, the result being that the figures stand thus:—The population of Sydney is 75,945; of the suburbs, 68,810; and of the country districts, 366,825. The total is exclusive of aborigines. The increase of the population in ten years is:—In Sydney, 19,105, or 33½ per cent.; and in the suburban districts, 21,967, or over 69½ per cent. The males in all number 272,902, the females 225,478. In Sydney the males number 28,555, the females 30,256. Mortality is most observed during the summer months. During the three months ended March 31, there were registered in the metropolitan division, comprising the city of Sydney and its eight suburbs, 1,555 births; 514 deaths, giving to the population a natural increase of 842. The births averaged about 15 a day; the deaths nearly 7 a day. The rainfall from January to March 31 was 16.02 in., the rainy days were 40, the mean temperature was 68.6 deg. (shade). The annual rate of mortality to 1,000 persons living in the quarter ended March 31, 1869-71, was, for the metropolitan districts, 20.3, 18.7, and 15.9. The mean since 1857 was 24.2. Taking the mean of the last three summers, the annual rate of mortality per 1,000 in Sydney (city) was 25; in the suburbs, 14.1.

Oxy-Hydrogen Gas Lights.—A company is being formed for the purpose of lighting the cities and towns of the United Kingdom with the application of oxygen gas as a considerable portion of New York has been for some time and Paris, Vienna, and Brussels are about to do so. When highly carburetted hydrogen is properly burnt with oxygen, it gives a white light so pure that it may be seen for twenty or thirty miles. The promoters of the company are said to be in possession of a discovery by which oxygen can be obtained at one-third the expense of ordinary coal gas. The capital to be subscribed is £1 million.

The late Accident at South Kensington.—Mr. Tyler has made his report to the Board made on the collision which occurred on the 16th of the 2nd inst., at the South Kensington station. The mistake, he says, could not have been made if the fixed signals and their locking apparatus had been in good working order, either a temporary or with permanent arrangements. The signalman made a mistake—with a description of hand-lamp which is capable of movement, which any man is liable to make under similar circumstances; but the constant important traffic which is carried on at South Kensington ought not to have been exposed to the risk of accident from such a mistake, and particularly at so dangerous a spot. Alterations to the signals should have been made during the night. The crossing from the line, across the up-line to the dock-line, so awkwardly situated in the tunnel, and being subject to so much traffic, it appears to be further desirable that it should, by an altered structure and laying out of the station, be altered. A report by Captain Tyler, dated the 16th inst., has been forwarded from the Board of the inst., and finds that the arrangements which have been made at the junction of West Brompton line with the main line of Metropolitan Railway, with a view to the prevention of accidents, are of a satisfactory character. The nature of the arrangements are laid in detail.

New Subway at Blackfriars Station.—In consequence of the extensive works now in progress of construction at the Blackfriars Station, London, Chatham, and Dover Railway Company has been obliged to enclose Holland-street, or it intends to absorb into the goods station. It is at the same time providing for pedestrian traffic by the construction, under Holland-street, a new subway under Blackfriars-road to the point east of the station, where Holland-street continued in a north-easterly direction. The way is about eighty-three yards in length, and is in width, and upwards of six yards from the street level to the footway level. It will be approached from Blackfriars-road and the east side of the railway by a wide flight of steps. The entire length of the subway has been completed, and the approaches will be finished. The company have provided for vehicles by constructing a new street, cutting Holland-street into Southwark-street.

Metropolis Sewage and Essex Reclamation Company.—The seventh ordinary general meeting of this company has been held. After discussing the difficulties through which the company had passed, the chairman said that, at the last meeting, the company had endeavored to obtain a fresh Act of Parliament to modify the present scheme, so as to enable them to utilize the sewage of Canney Island. The Board of the inst. had opposed the scheme, however, and promoted a Bill in opposition, with a view of terminating the concession, and having deposited 25,000l. forfeited. Both these were thrown out, and the company was left in exactly the same position as that in which it previously was. Some modification of the existing scheme was absolutely necessary; and, as a matter of course, the co-operation of the Metropolitan Board of Works ought to be, if it could be secured. What was wanted was to increase the expenditure and increase the capital, so as to bring the whole scheme within the possibility of having a really successful result. Till they could do nothing. No report was submitted to the meeting.

Gifts for a People's Park.—Ashton-on-Heath is about to acquire a public park. The late Mr. Samuel Oldham several years ago bequeathed 7,000l. as the nucleus of a fund for purchasing such a park, falling which to go to the vicarages of Manchester, Oldham, and Stockport. Now, however, that the term is nearly out of an unnamed gentleman, who lately purchased Highfield-house and its park-like grounds, original cost of which was 15,000l., has presented them to the public for the trifling consideration of 2,000l. The park is nine acres in extent, and is subject to a yearly chief rent of 131l. to the Earl of Stamford and Warrington, which his nephew has agreed to cancel, and also to give, for mere nominal consideration, for extending the park, a sheet of water, ten acres in extent, and the addition of a plot of land, which will increase the whole area acquired for the park close to fifty acres.

Accidents.—At the pits of the Newark and Vale of Belvoir Plaster Company's Works, near Newark, part of the top of a tunnel in which several men were at work recently fell in. A man was killed, and four others were injured, one of them seriously. At Stokesley, a bake-house, lately disused, has fallen. The west wall gave way, and the roof fell in, just as seven children were safely got out of it. The work-shops of Mr. Atfield, builder and undertaker, of St. Pancras, Chichester, have been totally destroyed by fire. The building was 25 ft. in length and 20 ft. in height; and the only property saved was a few of the workmen's tools. At Edinburgh, a mason in the employment of Mr. Roberts, builder, Elgin-street, has been killed while working on the third story of a house now under the hands of Mr. Roberts. The man was engaged in guiding a stone to its place in the wall, when the stone slipped from the crane fastenings to which it was attached, and he fell along with it to the ground. Death was instantaneous.

Alnwick and the Utilisation of Sewage.—A report has been submitted to the Alnwick Board of Health on the subject of the utilisation of its sewage. The committee, after detailing the history of the contract with the Duke of Northumberland for the use of sewage, state that the sewage of Alnwick is in the hands, and under the control, of the duke; that it is not utilised, but runs to waste into the river Aln; that a demand for manure has increased by the cultivation of the moor and other lands adjacent to the town; that it would be an advantage to the town and neighbourhood if the sewage could be utilised by irrigation or manufacture; and that great benefit to the community at large would be derived if the Duke of Northumberland would entertain the subject with this object in view. The report was ordered to be entered on the minutes, and a copy to be sent to the commissioner of the Duke of Northumberland.

New Bridge at Chelsea.—A new bridge over the Thames, to be called the Albert Bridge, has been commenced at Chelsea. It will connect the Chelsea and the Battersea shores of the river at the Cadogan Pier, and open up a direct line of communication between Oakley-street on the one hand, and the Albert-road, Battersea Park, on the other. The timber staging across the river, from point to point, has been completed. The bridge will be 710 ft. in length, and has been designed by Mr. Ordish, the engineer to the company, upon his rigid suspension principle, as carried out by him at Prague and in India. There will be two piers dividing the bridge into three spans, one of 400 ft. and two of 155 ft. each. The constructing engineer is Mr. F. W. Bryant, who occupied a similar position on the Westminster and new Blackfriars bridges. The date fixed for the completion of the bridge is May, 1872.

The Fountain Movement at Wigton.—A fountain, to be called the Moore Fountain, will before long be erected in the Market-place of Wigton. The architect is Mr. Knowles. It is cut out of Slap granite, some of the blocks of which are over 10 tons in weight. It is carved and wrought in both dead and polished work, with friezes and reliefs. The chief features of the fountain, however, will be four castings in aluminium bronze, which are in bas-relief, after designs by Woolnoth. They will represent incidents from the New Testament, applicable to the design and object of the fountain. The total height will be about 30 ft., and it will be 17 ft. at the outside of its base, but will rapidly narrow as it rises.

Art Rewarded.—The following is vouched for as a fact. In connexion with rejoicings which recently took place in a village near Oswestry, a man erected what is called a "nest and chaute arch." So great was the public admiration of the arch and the artist, whose family, it should be added, has "always been celebrated for the construction of bowers on festive occasions," that it was resolved to present him with a testimonial. A subscription was accordingly entered into; and, with the money, a shoulder of mutton, 28 pounds of the best flour, a quarter of a pound of tea, and a pound of loaf sugar were purchased, and presented to the artist, "in token of regard for his taste and ingenuity in the construction of his beautiful bower."

A New Knight.—It is stated that Mr. John Gilbert is to be knighted, in virtue of his office as president of the Society of Painters in Water-Colours.

Memorial Church at Zermatt.—A small English church has just been built and dedicated on a rising ground at the entrance of the village of Zermatt, in the Valais, Switzerland. It is a memorial of the first English travellers that ever ascended the Matterhorn (Thursday, July 18th, 1865), consisting of seven, including guides, of whom four perished on their way down. Three of the bodies were recovered,—namely, those of the Rev. C. Hudson, Mr. Hadow, and Michael Crog (the guide), while the other, of Lord Francis Douglas, has never been found. The building consists of a single nave, apsidal chancel, and an open-pointed roof. According to *Galignani*, a debt of 600l. remains to be paid of the cost of the edifice.

The Tulleries.—It is stated, we know not with what truth, that an American, Mr. Harris Posler, has just made M. Thiers an offer to rebuild the Palace at his own cost. The only conditions put forth by Mr. Posler in return for his royal generosity are these:—1st. One of the wings of the monument to be named after him. 2nd. Apartments looking over the gardens to be reserved to him for lifetime, and also a standing invitation to all the ceremonies and fêtes that will be given by any Governments that may hold the place in succession. Mr. Posler is waiting for a favorable reply. His architect has already exhibited plans and estimates, amounting to about 310,000l.

International Exhibition at Vienna.—Mr. Scott Russell has arrived at Vienna, on the invitation of Baron Schwarz, the director of the Vienna International Exhibition, for the purpose of carrying out an idea of his in connexion with the building. Among the new features of this Exhibition there will be an "Exposition des Amateurs," which will be composed of works of art lent to the Exhibition by the possessors of private collections. There will also be a collection of works of art taken from the museums of Edinburgh, South Kensington, Moscow, Lyons, Berlin, Munich, Stuttgart, Nuremberg, Weimar, &c., and a congress of the representatives of these institutions.

The Local Government Board.—Her Majesty in Council has been pleased, under "the Local Government Board Act, 1871," to appoint the Right Hon. James Stansfeld, President of the Local Government Board. The new Act transfers to the Board hitherto known as the "Poor-law Board" certain functions relating to the public health and local government, previously exercised by the Privy Council and the Home Office respectively. The new title of the Board at Gwydyr House is to be "The Local Government Board." The Act in no way interferes with the powers and privileges now possessed by guardian Boards. Its object is to give the Poor-law authorities power to enforce sanitary reform in the houses of the humblest classes.

Northern Architectural Association.—A party of members of this association, consisting of the president, Mr. F. R. Wilson, Alnwick; Mr. M. Thompson, vice-president, Newcastle; Mr. F. Charlton, hon. secretary; Mr. A. M. Dunn, Mr. S. Oswald, Mr. R. B. M. Lush, Mr. W. H. Dunn, Newcastle; Mr. Pritchett, and Mr. Peachey, Darlington, visited Wallington Hall on Thursday in last week. The new central hall, with its pictures of Northumbrian historical events and celebrities, together with the art-treasures in this princely seat, were shown and explained by Sir Walter C. Trevelyan, bart. The members were entertained at luncheon by the owner of the mansion and Lady Trevelyan.

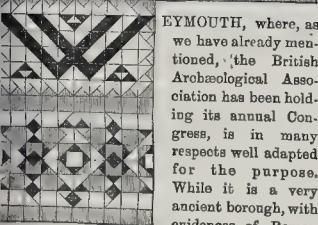
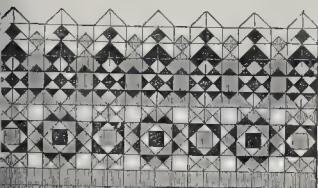
The Supply of Water to the Metropolis.—One of the more important provisions in the new Metropolis Water Act is that for a constant supply. At the expiration of eight months from the passing of the Act every company shall, when required so to do, furnish "a constant supply of pure and wholesome water sufficient for the domestic purposes of the inhabitants." The water is to be laid on at such pressure as will cause it to reach the top story of the highest houses. Another clause provides for the analysis of the water by competent persons.

Columbia Market.—The Committee of the Common Council appointed to consider the subject have agreed to a report recommending that the Corporation should accept the gift of Columbia Market from the Baroness Coutts, upon the understanding that if, after ten years' trial, it is not successful, they shall be at liberty to appropriate the site to some congenial purpose.

0 N.B.—REMOVED from 36, Parliament-street,
0 to 48, ST. MARTIN'S LANE, LONDON, W.C.

The Builder.

VOL. XXIX.—No. 1491.

Weymouth Congress of the British
Archæological Association.

Weymouth, where, as we have already mentioned, the British Archæological Association has been holding its annual Congress, is in many respects well adapted for the purpose. While it is a very ancient borough, with evidences of Roman occupation and Medæval records galore, it offers the delights of a modern watering-place, with a far-stretching esplanade and some good hotels, and has found it a number of places containing objects of interest to be visited and examined. Maiden Castle, Druidical circles and cromlechs at Wimbourne, the ruins of Abbotsbury Monastery, the island of Portland, with its ruined church and castle, and the remarkable Chesil beach; Cerne Abbey, Dorchester, with its Roman amphitheatre and its churches; Bindon Abbey, Wareham, and other places, are amongst these, and were all visited by the Association. Weymouth has not had a very good season. The prevalence, for a time, of an epidemic lessened the number of visitors and damaged the inhabitants; but that has passed, and it will not have been useless if it should lead the corporation to take immediate steps to improve the sanitary condition of the town.

Weymouth is bounded on the east by a beautiful bay, and on the west by the Backwater. The ground slopes from the east to the west, and the drains are carried to the face of the Backwater Quay, where they discharge. Within the last two or three years large drains have been laid down, and numbers of new sewers have been connected with these new mains: the consequence is, the amount of sewage is considerable. The Backwater shore is very often covered with water, as the tide does not rise sufficiently, and for hours during the recent hot days the sewage has been exposed to a burning sun, and has given forth an unbearable odour. When Weymouth and Melcombe Regis were separate boroughs, they were always at open war with each other, and though now united, it is to be feared a somewhat similar feeling prevails; so that whatever party advocates the other opposes; and thus important measures are delayed—the general welfare is interfered with. Advice has been called for as to the drainage, and we earnestly invited action on the part of the corporation, with a view to obtaining immediate improvement in that respect. These are not times to dally in, it is a matter of life and death.

The town is evidently advancing, and new houses and public buildings are being erected in a creditable taste. We may suppose that the authorities would now scarcely permit the erection of such an awkward affair as the memorial set up on the Esplanade to commemorate the 50th birthday of King George III., the great patron of the town: the ugly little figure of the King seems wandering on the top of the huge pedestal. Our business, however, just now is with the British Archæological Association, which has done some very good work. The *Times* has thought fit to come down hard on the Congress, and pooh-pooh the whole affair as being a simple matter of picnic, utterly useless, however pleasant: and it further suggests that the Association has been obtaining hospitality under false pretences. It would be a pity and a damage if this opinion should be received as correct. Never was the sprightly wit of our great contemporary more completely misapplied. There have been congresses quite open to some of the objections taken, but on the present occasion the Association has not accepted hospitality from any person or body, but has applied itself steadily to carry out its programme: several papers of sterling value have been read, useful information concerning the records has been given to the town, a number of buildings have been examined and described, and various popular errors have been corrected. Any unprejudiced person who examined the published Transactions of the Association would see, as concerns former congresses, how large an amount of useful information is by means of these outings brought together and made available. Some of the incidents of the first day in Weymouth will serve to illustrate other results of the Congress. Immediately after Sir William Medley's address, the party went to view a Roman pavement, at Preston, hard by, and the foundations of the rooms around it. Part of the pavement had been opened a few years ago, but was again covered up, and it had remained so till the visit of the Association. The Rev. Prebendary Baker, who gave some particulars of it on the spot, said so much of it had never been uncovered till the present time. The centre, which is very perfect, consists of geometrical forms and ornaments: the tesserae are white (chalk), red (brick), and black, said to be amber, but this seemed to us doubtful. The size of the apartment containing the pavement is 21 ft. The speaker remarked, as to its age, that it was possibly a part of one of the stations made, supposing that the Romans pursued their course of conquest and colonisation from Sordiodunum, or Old Sarum, to Vindolanda, or Wimbourne, and thence to Darnovaria and Dunum, or Maiden Castle. It might, perhaps, have taken them a century or two to settle in this remote part, which would bring them to about the time of Severus, who, as everybody knew, died at York A.D. 212, and they might put the date of the villa at about that period. He thought the pavement was in an open atrium, and that the building was a bath rather than a residence. We found no evidence in support of these opinions, and should be disposed to consider the pavement had been always roofed over, and that the building was a villa.

One of the members urged the desirability of keeping the remains visible, and that a shed should be erected over them. It was understood that this arrangement would be made, thus giving to Weymouth another object of interest and tangible evidence of the skill and taste of the ancient occupants of the neighbourhood.

Again: the party were led to see a small stone bridge of one arch close by, locally described as Roman. Careful examination by Mr. Gordon Hills, Mr. E. Roberts, and others, showed that it could make no pretence to belonging to that period, but was probably Norman work.

Returning for a brief space to the article in the *Times*, the writer of it says the secretary of the Association told the mayor and corporation that the achievements of the Association were due to

men who "had worked for many years among dust and rubbish;" the observation really made included the words "as some people would erroneously call it."

Again: the writer remarks, he will not venture to debate a certain point "with a gentleman who is said to be so extraordinary an Antiquary as to be able to translate Latin as if it were his mother tongue;" the compliment paid to the gentleman in question really being to the effect that he had supereminent facility in reading at sight crabbied Latin documents, and pitching by a sort of instinct on their most important parts,—a very different thing, it will be at once admitted, we have no doubt, by the writer himself, who, doubtless, penned his observations in perfect good faith, misled by the information before him. In another part of the article, after noticing the visit to Maiden Castle, the commentator observes, "But what Maiden Castle was, and why it was called either a Castle or Maiden, no one could say. Some thought the name was plain English, in which case it might mean a variety of things. Some thought it was Celtic, in which case, of course, it might mean anything. One gentleman contributed the observation that the word "Maiden" occurs in other places, and that there are camps elsewhere; and another *savant*—was it Mr. Whalley?—observed that the origin of the name was, no doubt, to be traced to the fact that the neighbouring church was dedicated to the Virgin Mary." Taking the last part of the observations first, the connexion of it with the Virgin Mary, the reply is, no such opinion was expressed. At the close of the discussion as to the etymology, a local visitor reminded the meeting that there was a place called Maiden Newton near, and added, "but that will not help the inquiry, for Maiden Newton probably has its name from the fact that the church there is dedicated to the Virgin Mary." Touching the origin of the name, a good deal came out that was interesting. The Rev. William Barnes (the Dorsetshire poet, and an admitted authority) said he could not, of course, speak positively on the point, but he had thought that Maiden Castle in plain English meant nothing more than a castle without a castle, the term being applied in a similar sense to that in which "maiden assize" was used, as there never was a stone building there. Mr. Barnes further suggested that the name was derived from *maesdin*, which meant grassy stronghold. The place, he observed, was one to which cattle were driven up, which would favour the interpretation in question, and he mentioned, as a striking coincidence, that a clergyman from the West of Ireland, where the service was all in Irish,—he himself being a Celtic Irishman, and Irish being his mother tongue,—gave a similar interpretation of the name, *viz.*, *magdun*, or grassy stronghold. He (Mr. Barnes) thought it rather remarkable that both should pitch upon the same meaning. He did not attempt to fix any date to the castle, except from what was found there; he should say, however, that it was not less than 2,500 years old.

Mr. Roberts suggested that the name might be plain English, and be meant to convey the idea that it was a stronghold which had never been taken. Mr. Black suggested that the etymology of the word was very simple, and that they need not go to Ireland, or out of their own country for it. It was *maes din*. When at Hereford they met with a similar difficulty. *Maes* meant a grassy plain, and if this was not one, he did not know what was. It became a fortress when it was defended by such a repetition of earthworks as in this instance. He was inclined to think, from what he had seen at present, that it might have been a British stronghold for cattle, because it was sufficient to afford eligible pasture for cattle placed there during war. In the same manner they might

men who "had worked for many years among dust and rubbish;" the observation really made included the words "as some people would erroneously call it."

Again: the writer remarks, he will not venture to debate a certain point "with a gentleman who is said to be so extraordinary an Antiquary as to be able to translate Latin as if it were his mother tongue;" the compliment paid to the gentleman in question really being to the effect that he had supereminent facility in reading at sight crabbied Latin documents, and pitching by a sort of instinct on their most important parts,—a very different thing, it will be at once admitted, we have no doubt, by the writer himself, who, doubtless, penned his observations in perfect good faith, misled by the information before him. In another part of the article, after noticing the visit to Maiden Castle, the commentator observes, "But what Maiden Castle was, and why it was called either a Castle or Maiden, no one could say. Some thought the name was plain English, in which case it might mean a variety of things. Some thought it was Celtic, in which case, of course, it might mean anything. One gentleman contributed the observation that the word "Maiden" occurs in other places, and that there are camps elsewhere; and another *savant*—was it Mr. Whalley?—observed that the origin of the name was, no doubt, to be traced to the fact that the neighbouring church was dedicated to the Virgin Mary." Taking the last part of the observations first, the connexion of it with the Virgin Mary, the reply is, no such opinion was expressed. At the close of the discussion as to the etymology, a local visitor reminded the meeting that there was a place called Maiden Newton near, and added, "but that will not help the inquiry, for Maiden Newton probably has its name from the fact that the church there is dedicated to the Virgin Mary." Touching the origin of the name, a good deal came out that was interesting. The Rev. William Barnes (the Dorsetshire poet, and an admitted authority) said he could not, of course, speak positively on the point, but he had thought that Maiden Castle in plain English meant nothing more than a castle without a castle, the term being applied in a similar sense to that in which "maiden assize" was used, as there never was a stone building there. Mr. Barnes further suggested that the name was derived from *maesdin*, which meant grassy stronghold. The place, he observed, was one to which cattle were driven up, which would favour the interpretation in question, and he mentioned, as a striking coincidence, that a clergyman from the West of Ireland, where the service was all in Irish,—he himself being a Celtic Irishman, and Irish being his mother tongue,—gave a similar interpretation of the name, *viz.*, *magdun*, or grassy stronghold. He (Mr. Barnes) thought it rather remarkable that both should pitch upon the same meaning. He did not attempt to fix any date to the castle, except from what was found there; he should say, however, that it was not less than 2,500 years old.

Mr. Roberts suggested that the name might be plain English, and be meant to convey the idea that it was a stronghold which had never been taken. Mr. Black suggested that the etymology of the word was very simple, and that they need not go to Ireland, or out of their own country for it. It was *maes din*. When at Hereford they met with a similar difficulty. *Maes* meant a grassy plain, and if this was not one, he did not know what was. It became a fortress when it was defended by such a repetition of earthworks as in this instance. He was inclined to think, from what he had seen at present, that it might have been a British stronghold for cattle, because it was sufficient to afford eligible pasture for cattle placed there during war. In the same manner they might

account for many similar enclosures on Salisbury Plain, and some of which it was obvious were intended to hold large flocks of cattle. In one instance there was a ditch within the wall, which clearly must have been put there, not for defence, but to afford drink for vast numbers of cattle enclosed. Therefore he thought this might have been a place for holding cattle; at all events it was a *din*, that was to say, "a fortress among the hills." The same word might sometimes be met with in the names of places not in so elevated a position as in the original name of London. Of course the word castle was an addition that might have been made in any subsequent age. *Din* meant an enclosure of some kind. We must take the liberty of contending that so far from there being anything to sneer at here, this was very elucidatory and instructive talk.

Maiden Castle is a glorious earthwork: the area enclosed is called 45 acres, with three concentric ramparts on one side and two on the other. At one point the distance from the top of one enclosing vallum to that of another is 124 ft., and the slope is 78 ft. deep. Circular sinkings, thought to be pit dwellings, have been found on the plateau, and excavations were made for the Association with the view of discovering others, but unsuccessfully. Reference was made by Mr. Cunningham to the discovery in a tumulus which had been dug into, of a skeleton and a small pillar of chalk close beside it, with stone on the top. In one of the spots where explorations were made some black pottery was dug up. Amongst interesting "finds" enumerated were two combs, made apparently of flattened sheep bones, the teeth being cut at the edge of the end. It was suggested that these had been used in working pottery. Another rather interesting object discovered was a small horn, betokening that red deer were at one time prevalent there. A handsome ring found there was also produced. It can scarcely be doubted that this earthwork had a British origin, and was afterwards occupied, probably strengthened, by the Romans.

At Abbotsbury, where Mr. Gordon Hills described the remains of the Benedictine Abbey very lucidly, diggings had been undertaken with the permission of Lord Ilchester, but nothing very particular was brought to light beyond a portion of the tile pavement of the interior of the Abbey Church. The most remarkable feature at Abbotsbury is the chapel of St. Catherine, erected on a hill close to the remains of the monastery; it is a fifteenth century structure, vaulted with stone, and solidly and handsomely built. Within, the vault is panelled and enriched. Attention was called to the circumstance that chapels dedicated to St. Catherine were often built on elevated spots. Mr. Barnes thought this chapel was erected as a mark observable from the sea, and that this was the Church's mode in early days of performing those important works for saving life which the State had undertaken by providing lighthouses.

It occurs to us to mention, touching the occurrence on eminences of chapels dedicated to St. Catherine, that it was a legend of the early Church that the body of St. Catherine was carried by angels to the top of Mount Sinai, and here buried; the supposed occurrence is shown in more early pictures and frescoes than one. Whether or not this belief had anything to do with the naming after her of chapels on eminences we will not inquire. The monastic barn at Abbotsbury is a particularly fine one, of stone, and is about 280 ft. long, with cornices, buttresses, and pinnacles.

Amongst the papers read at the evening meeting, after this excursion, was a valuable list of the municipal archives of Dorset, the result of researches by Mr. J. O. Halliwell, F.R.S., at Blandford, Poole, Wareham, Dorchester, Weymouth, and Lyme Regis. Many of the documents were produced, and were described and translated by Mr. Black in his usual happy manner. Several of the documents were found to illustrate local history and social life. Those from Bridport (brought by Mr. Clifton) were especially voluminous and interesting. Many of the Weymouth documents are in private hands, belonging to Mr. Sherren, who bought them at the time when the Municipal Reform Act led to the casting of what in many places was deemed dusty rubbish. It is fortunate that Mr. Sherren intervened to save from the waste-paper basket by purchase a quantity of curious matter of great local interest. The corporation should regain the documents.

On the following morning Mr. Black was again

called on to use his skill in an examination of the documents belonging to the Corporation in the Guildhall. The first brought to light was a document bearing the great seal in green wax, of the time of Edward II. It was dated from New Sarum. It recited, "We have inspected the charter of the very celebrated Lord Edward, late king, who granted to Weymouth all the liberties granted to the citizens of London, that they might defend themselves according to the custom of that city." The only exception was that what the dead should say if they were alive it should not be lawful to swear. There had been a custom that a man might go to the grave of his deceased ancestor and swear what his intention was, a privilege much abused, and which was liable to a great deal of fraud and exposure, and no doubt was afterwards taken away from the city of London on its own petition. This deed was given on the 27th May, in the eighth year of the reign of Edward III., and there was a confirmation with an addition, and a further confirmation by Edward III. Another document referred to a question of jurisdiction between the two boroughs, after which Queen Elizabeth granted the water of the Wy, and the soil underneath, to the Corporation of the two towns and united them in one borough under the name of Weymouth and Melcombe Regis. Another old paper, dated 1252, stated that the port of Weymouth belonged to the Prior of St. Swithun, who granted Weymouth a free borough, and for the inhabitants to enjoy all the privileges of those of Southampton and Portsmouth.

Afterwards the party proceeded to examine Portland. Speaking of the "Bill of Portland," Mr. T. B. Groves said in an old map he possessed, what was now called the Bill of Portland was spelt "beal," and he believed the islanders themselves sometimes pronounced it in that way. The word Billingsgate, in its derivation, referred to the word "beal," and had reference to a light carried at the prow of a ship. His impression was that "beal" was the proper pronunciation. Mr. Black said the island was of the shape of a bird's head,—this part was the beak or bill. They had scores of similar instances; Hundreds being named after similar peculiarities. Mr. Barnes said, to him the word beal meant a bending, and that the bill of a bird was a fellow word, and that originally the beak of a bird was not called a beak unless curved.

On examining Bow-and-Arrow Castle, asserted to have been built in the reign of William Rufus, it was pointed out that it was not older than the end of the thirteenth or beginning of the fourteenth century. Some of the openings are, nevertheless, semicircular-headed. The next day we found the attendant repeating the old story; and so it will doubtless go on to the end of the chapter. The general wildness of the island here, increased by the landlips, is very striking.

Mr. George Clifton, the governor of the convict prison, an enthusiastic antiquary, did much to increase the interest of the visit. In 1852, he said, the field now forming the west quarries was under cultivation, but, as the earth was removed, traces of a Roman encampment and a Celtic place of burial-ground were discovered. On either side of them they would notice two sarcophagi, with conical-shaped lids, found in the north-west corner of the quarries; and between them, almost equidistant, was a large stone, supposed to be the top of an altar. Several cists had also been discovered, built of slate, about 2 ft. 6 in. in length, and 18 in. broad, which in several instances contained the remains of two human beings, buried in most cases with their knees doubled up close to their mouth. In one of the sarcophagi were the skeletons of what were supposed to be the remains of a Roman soldier and his wife, there being a portion of a jewelled head, spurs, and shield. Mr. Clifton exhibited his collection of antiquities found on the island, consisting of pottery, round stones, supposed to have been missiles, the several articles found in the sarcophagi, and various coins, pronounced to be of the times of Adrian, Constantine, Julian the Apostate, Caligula, and Romulus. Besides these there were some Spanish coins found by Mr. Clifton in Australia.

The strange, black approach to Portland, and the irregular, untidy appearance, for the most part, of the houses, scattered here and there as if by accident, are striking. The town reminds those who have travelled, of some of the locations on the Alps. The enormosity of the Chesil Bank, as it is called, formed of rolled stones, and stretching along for miles, with its fringe of white foam, is also very remarkable. "Why is it called the Chesil Beach?" asked some. The word

chesil they were told means a flint, a pebble, a hard stone. The reply threw light further than the Beach, because it was seen at once that a carpenter's chisel was originally a "chesil." In Dorset the poor people say, when speaking of a flint, "theres a vlint atwone." Why do they not call it a flint? Because "flint" never meant stone at all. Flan or flint meant an arrow, and not a stone.

Near the prison, a group of new buildings, consisting of church, school, and master's house, is in progress. These buildings (work of convicts) are of stone; modern Norman in style, and will give some dignity to the district. The governor has turned the desert into a garden adjoining his residence; many colours gladden the eye, and huge fossils from the quarries exercise the mind.

We will not omit to mention that Mr. Crickmay, a Weymouth architect, aided in pointing out the antiquities of Portland.

At the evening meeting, when the party returned, Mr. George Eliot read a valuable paper "On the Antiquities and Peculiar Customs of the Island," and Mr. Drew one "On Art Treasures and their Preservation," both of which we print. Here we must break off for the present, for want of space. If nothing more had been done than we have already mentioned, no one would be justified in saying that the Congress had been without result. The fact is, however, that we are only half through the week, and that much of the result is not seen till afterwards, when hints and suggestions are pursued, opinions inquired into, and theories deduced, to say nothing of the interest excited locally, which tends to further investigations and the careful preservation of remains and records.

ART TREASURES AND THEIR PRESERVATION.

MR. DREW'S paper, already alluded to, ran as follows:—The preservation of art treasures is an obligation we owe to posterity. They are the sacred symbols in which can be traced the social, political, and religious status of our ancestors; and, though the literature of a country may perish and its records decay, still there are certain monuments amongst the art treasures of a nation which appear to defy the rust of time, and outlive even the memory of those whose genius and labour called them into existence. Now, the object of the paper we are about to read, is to call attention to the decadence which, under some form or other, has become apparent in many of the higher departments of our present Schools of Art; for where the art itself is still in the zenith of its power and freshness, the elements and materials employed to give form and colour to the creations of the mind are frequently in themselves of a more fragile and perishable character than were formerly used, and this we date to the peculiar characteristic of the age, namely, that spirit of rivalry and competition amongst our manufacturers which lead them to produce, irrespective of durability, inferior articles at the cheapest possible rate. The decadence, however, to which we more particularly allude, is especially apparent in the absence of durability amongst the paintings produced within the last century; for whilst transcripts from nature are quite as faithful, and the ideal conceptions frequently more elevated in character than many of the early schools, still we regret to say the works of our modern painters are, for the most part, doomed to a very limited existence; premature decay has already set in amongst them, and many of the noblest efforts of modern art are even now passing into a state of dilapidation beyond the restorer's art to repair. We know we have men who assert that art itself—taking the word in its most comprehensive sense, has degenerated, and that the art-workers of the Early Ages possessed a more elevated conception of the beautiful than the designers of the present day, but we see no reason why we should endorse this opinion. We have no standard whereby to measure perfection, consequently our judgment can only be comparative. One country may decline in art, but the great wave of intelligence and genius will be found surging on other shores, and unlooked-for examples of excellence have been and will again be the result. To a certain extent, however, we have come to recognise an idea of perfection, and to believe that each particular department in the art world culminates at its own specific time. Sculpture is said by

some to have reached its meridian of glory and perfection several centuries before Christ, when Phidias, the chief of the early Attic school, produced his Olympian Jupiter, and Praxiteles, the head of the latter school, his group of Niobe; but may there not be in this idea an excess of veneration for early art? Modern times have given to the world marvels of beauty; the works of Baily, Pradier, and Canova will go down to posterity as glorious specimens of art-creation wrought by men whom England, France, and Italy love to claim as their children; and although the ideal in some opinions may not reach so high a standard as ancient Greek, still these works have become art treasures, beyond price to their possessors, and are as imperishable and as valuable for the purposes of education and archaeology as those relics of the Athenian schools, the remains of which are so much prized at the present day. Without, however, presuming to be an art critic, and without being so enthusiastic as some in favour of ancient art, we cannot pass through the courts of the British Museum without being struck with the massive grandeur and classic beauty of some of the ideal creations of those men who have left us such a comprehensive syllabus, as it were, of primeval civilisation. Some of the sculptures in the Egyptian sanctuary, although upwards of 4,000 years old, stand before us as perfect in preservation as if the last touch of the finishing chisel had just been given; and yet, notwithstanding their preservation and beauty, many of the works of our modern sculptors will bear a critical comparison with those of the same class, whilst, like them, they have become the imperishable records of our age, in which will be read the history of our art schools, and from which posterity will be enabled to judge of the elevation or decadence of our art productions. Now, as a rule, the works handed down to us by the painters of the sixteenth and seventeenth centuries, and more especially those of the Venetian, Roman, and Parma schools, are well preserved. We can go quite as far back for examples of the painter's art as we can for those of the sculptor's, but they are not so familiar to us, from the fact that very few are found in private collections; for paintings were not always the moveable chattels and cabinet gems they are at the present day. In its earliest phases the painter's art was principally called into requisition for mural decoration,—the representation of battles and triumphs, and these were usually painted on the interior walls of public edifices, and on the ceilings of the mansions of the great; but even these early works commanded much attention in their day, and the artists realised enormous prices for their productions. The earliest picture of which we have any authentic record is one painted 720 years before Christ, by Bularchus, and mentioned by Pliny. It represented the battle of the Magnesians, and this was purchased by the king of Lydia for its weight in gold; but as we have neither the size of the picture nor the particulars of the material upon which it was painted we can form no conception of the price realised for this early work of art. Pliny, however, mentions another picture painted by a disciple of Antiochus, representing "Ulysses invoking the shadows of the dead," for which the artist refused sixty talents of gold, or about 11,000*l.* sterling, and afterwards made it a present to his country. All these very early productions, however, were in outline only, and it was not until Apollodorus, the Athenian, established a school of painting, about 400 years before our era, that the distribution of light and shade became a recognised principle of the art. Apollodorus was the first man who contributed to the glory of painting, and before he appeared there was no production of the easel worthy to be called a work of art. Alexander the Great was a manifest patron of the fine arts, and by way of encouragement, he gave a monopoly,—so far as his own person was concerned,—to Lysippus the sculptor, and to Apelles the painter, and refused to permit any other artist to carve his bust, paint his portrait, or even to introduce his figure as a copy in any of their productions, without his special licence or consent; and by these means men were stimulated to compete for true excellence. But, passing over these art treasures, of which so few examples remain, we come to those with which the world is more familiar, those marvellous conceptions of Raffaele, whose works still preserve all their original delicacy and beauty. With very few exceptions, the productions of this prince of painters are in the same

perfect state of preservation as when they left the easel, untouched by time, and undefaced by the work of restoration. Not only are the paintings themselves in such a high state of preservation, but the colours have such a brilliant hue of freshness that we can scarcely reconcile their beauty with the fact that three centuries and a half have passed since his great patron, Leo X., stood by his easel, watching the facility of his pencil and admiring his work; for even now the delicate bloom on the cheek of beauty, the harmonious colouring of the draperies, the semi-tones and half-tints, as it were, of the accessories and distances, possess a delicacy and transparency rarely to be found in the productions of other schools. The intrinsic value, however, of the art treasures bequeathed by this glorious painter to posterity does not consist simply in their high state of preservation and delicate work, but in the emotions produced by the contemplation of their conception and beauty; in fact, the effect produced by the study of a really beautiful picture upon the mind is never effaced, it becomes photographed, as it were, upon the imagination, and we can always bring to our remembrance some prominent incident in connection with its composition or general beauty. Raffaele, like the Grecian sculptors in the purest era of their art, strove for that ideal beauty which is never to be found in individual nature, and which can only be represented by taking the most beautiful parts of the many to form one; and it is this desire to reach ideal perfection that Sir Joshua Reynolds says "ennobles the painter's art and elevates him above those who can only reproduce by the mere exercise of mechanical labour." What we have said of the works of Raffaele, as to their perfect state of preservation, applies equally to those of Correggio, and to the productions of other schools of the same period; the works of the best masters in the Dutch and Flemish schools are also in the highest state of preservation, forming a very striking contrast to those dilapidated wrecks so frequently found amongst the pictures of our modern men. Now the great question is, where are we to look for the cause of this decadence? Certainly not in the decline of the art. If we could entirely disabuse our minds of that "halo" which schoolmen and enthusiastic art critics have thrown around the works of ancient art, and were to go through this year's exhibition of the Royal Academy, we believe we could point to canvases not wanting in the beauty and passion of Raffaele, the sweetness of Correggio, the triumphs of Titian, the cool silvery transcripts of Ruysdael, or the golden sunsets of Gyp, the mellowness of tone, which time alone can bestow, being the only element wanting to render many of them worthy of the admiration bestowed upon their early rivals. But will these modern efforts of the painter's art bear the same test of years as their predecessors have done? We have melancholy forebodings,—amounting almost to a moral certainty—that they will not. Now, the old masters were chemists as well as painters, they were no tyros in the mysteries of the crucible and alembic; they knew from personal investigation, much thought, and direct experience, the nature and durability of the pigments they were using. Under their own supervision were their canvases and panels grounded,—under their own immediate direction were their colours selected and their mediums prepared. No element of care was wanting, no precaution neglected to make their works, not only worthy of their name to posterity, but durable in the highest degree. The artist colourman, with his prepared canvas at so much per yard, coated with whitening and size, and his tube colours, and megilp, so neatly put up, but which will not bear the action of light for a few years, was unknown in these early days; and it was not until the productions of this particular branch of trade were made competitive in price and cheapness and became the order of the day, that decay commenced its ravages, and the durability of paintings could no longer be relied upon. In examining the preparation on some panels of the fifteenth century, we found the surface upon which the picture was painted much harder than the panel itself, whilst in modern panels it was quite the reverse. In the early panels the surface broke with a gelatinous kind of fracture, the edges of which were sufficiently hard to cut the fingers; whilst in the modern panels a fracture of the surface represented a soft marly appearance, and the preparation itself could be crumbled by friction or pressure. It appears, then, that this want of solidity in the

preparation of canvases and panels permits the colour to sink in, it extracts the medium used in working them, and thus the pigments become so non-elastic, that as the panels and canvases contract or expand by the atmospheric changes so prevalent in this variable clime, so the colours are rent in all directions, and the fine network of cracks which we so frequently observe spreading over the surface of a picture would appear to be the first step towards its decay. Then, again, in the metropolis paintings are generally hung in rooms where the air becomes highly vitiated by the presence of large assemblages of human beings and by the pernicious influence of gas, and this is a very prolific source of destruction to these works of art; added to which even the air of London itself has been declared by competent authorities to be very prejudicial to the preservation of paintings, owing to the excess of carbonic acid and other deleterious gases in the atmosphere; and if this hypothesis is correct, then all other crowded cities must be the same. In watching the progress of this decay in a modern picture we noticed that when these cracks once made their appearance, their edges were immediately eaten away by becoming oxidised, and as the erosion went on the fissures gradually widened; and although a thin coat of the finest mastic varnish would for a while stop the process of decay, still we have even seen the varnish itself rent asunder by the contractive and expansive action of the materials beneath. In fact, so justly alarmed have the patrons of art become upon the question of durability of our modern paintings,—for some of them have invested large fortunes in their purchase,—that Sir Francis Grant, the president of the Royal Academy, has suggested that a chair for chemistry should be founded and a professorship established in connection with the Academy, so that the painter's art might receive the assistance of the science of chemistry, in order, if possible, to check the spread of this terrible blight which is destroying some of our noblest works of modern art. This difference in the durability of paintings is painfully manifested, and can be readily studied by comparing the pictures of the Peel collection in the National Gallery—which are generally productions of the seventeenth and eighteenth centuries—with the Turner collection under the same roof, which may be called examples of our own day. In the former they are as perfect as when they were painted, whilst in the latter many are already in ruins. Indeed, the possessors of some of the best works of Reynolds, Turner, Wilson, Hilton, and a score of other modern men, look with increasing dismay on the widening cracks and fading colours of those otherwise matchless productions of art, and they feel they have a right to invoke the aid of the Royal Academy, whose council is supposed to be the conservators of this particular art, to investigate the cause and point out the remedy for this gigantic evil which is robbing posterity of the art treasures it is our duty to hand down to them in as good a state of preservation as possible. But, as we have said before, we do not believe that the art has waned, but we do believe that all this mischief can be traced to the present rage for cheap productions. The age in which we live is essentially an age of electro-plate, and lath and plaster. The ancients built their houses upon rock; the moderns build them upon sand. Quantity and not quality, expediency and not principle, are the prevailing characteristics of the present age. Those matchless carvings which Gibbons left for our admiration and instruction,—the throne at Canterbury, and the choir of St. Paul's and Windsor,—can now be imitated by machinery at a comparatively small cost over the price of the material. The portrait-painter, with his hundred-guinea portraits on canvas and panel, has been superseded to a certain extent by the photographer, with his sixpenny pictures on paper and glass. The elaborate works of Buonvanti Cellini and his followers are supplanted by race-cups and salvers, produced by the thousand at the factories of Sheffield and Birmingham. Lace-work and tapestry, the goldsmith's art and enamels, stained glass and ornamental china, and even architecture itself, have all lost a certain amount of their native dignity in the art world through the inundation of inferior substitutes; but the producers say that mediocrity and cheapness pay the best, and these are the causes which will prevent many of the art treasures of the present century from occupying that place in the estimation of posterity which from our intelligence and wealth they would otherwise be entitled to claim.

We cannot close this short paper without alluding to the fact that Weymouth has some slight associations with the art world. Sir Christopher Wren, whose celebrity as an architect and mathematician is so fully attested by the monuments he has left us, was, in the year 1700, elected one of the Parliamentary representatives of this borough, and Sir James Thornhill, the eminent painter, whose daughter married the inimitable Hogarth, was born at Weymouth in 1676, and, strange to say, Thornhill was the artist selected to paint the dome of St. Paul's, one of the greatest achievements of Wren's genius; and thus were the two men and Weymouth associated together. The altar-piece of St. Mary's Church was the gift of Sir James Thornhill to the town, and we rejoice to say this admirable work, representing the "Last Supper of our Lord," is still in a most excellent state of preservation.

The Rev. W. Barnes said, if he could believe that archaeology did not affect art he should believe that Mr. Drew had brought amongst them a subject which did not belong to them; but he would say that Mr. Drew had hit a great evil in the works of art. There was a very fine canon on art in a Welsh poem, which was most needful to men of art,—an eye to see nature, a heart to love nature, and boldness to follow nature, and unless an artist worked upon these grounds he would never do so upon good ground. If the man of art was to win wealth rather than glory his work would be of a low kind, and therefore no man could become great in art unless his aim was not money but glory. The man of art must decide between making money and making himself a good artist. In art the great thing was truth, and no man could be great in truth without love. He was very glad to hear the observations which Mr. Drew had made, and believed he had hit a great evil in speaking of the commercial value of art. Mr. Barnes said one great evil in art in the present day was the division of labour. At the present time one man drew and another engraved, but the latter did not work with the love of the painter. There was another evil in art of the present day,—the overstraining of treatment, the overstraining of drawing, and the overstraining of colouring. He believed, and perhaps he should be called a heretic for saying so, that the designs of Dore were very much overstrained in light, shade, and general treatment, and he thought there would be a time of purer taste when his works would decline, and purer and truer designs rank much higher than his.

Mr. Godwin said (as reported in the *Southern Times*) that the subject which had been brought forward by Mr. Drew was a most important one, but at the same time he did not think the failures of modern painters arose from the desire to save money. He did not believe that painters ever received so much money for their pictures as they did at the present time; when Mr. Ward could get £1,500. for one of his pictures; Mr. Millais 2,000 guineas for a portrait; and Mr. Birket Foster, for one of his delicate landscapes, any sum he asked for. It must be obvious to all that if painters could secure the endurance of their paintings by the expenditure of a few pounds they would be most anxious to do so. He knew that amongst the collections at South Kensington there were failures observable; but those were the result of ignorance on the part of the colour-makers and artists; and they all looked forward to the result of the step taken by the Royal Academy as to the appointment of a professor of chemistry. He was sorry that he could not agree with Mr. Drew in the exalted view which he took of the present position of art in England. He looked in vain for a Vandyke and a Raffaele; still there were good painters, although not so good as some of former years. The advice that had been widely given to artists merely to copy what they saw had done harm. We did not want to see the imitation of a few leaves or a man's head; we wanted to see the manner in which artists saw them. We wanted to see the intellectual part of the object represented, and that was not to be obtained by mere copying. There was another reason for the destruction of works of art than had been named, and that was the efforts on the part of restorers. Even at the British Museum, either want of care or over zeal had damaged many of the works there, and a caution thrown out on the part of antiquaries and archaeologists might lead people to be careful how they meddled with works of art, and to remember, that they had better do nothing, in

fact, than do wrong. Speaking of collections of paintings in Continental towns, Mr. Godwin observed that it was distressing that in Birmingham, Manchester, and Liverpool there was no public collection of paintings. In France, Italy, and other Continental towns, every place had its collection of pictures, whereas in this wealthy country they might go from town to town and not find a collection open to the people. There ought to be pictures on the walls of our public buildings throughout England, and until corporations saw that it was no waste of money to spend it in such decorations, art would not take its proper place in England. He trusted there was a school of design in Weymouth. No town should be without such a school, for although it might not produce great painters it would an appreciative public.

THE PECULIARITIES OF PORTLAND.

MR. GEORGE ELIOT said,—In reading a paper upon the antiquities of Portland, I must warn my hearers at the beginning not to expect too much. The almost complete isolation of Portland has prevented it taking any great part in the historical events that have so crowded upon other parts of England, and while the great drama of the history of this country has been played out, Portland, like some back eddy, or some quiet pool by the side of a rushing torrent, has had only its own simple domestic history of its own simple and somewhat primitive inhabitants. Here we shall find no lordly mansions dating back to the times of feudal barons—no churches exhibiting the taste, the grandeur, and the piety of our ancestors, hundreds of years ago—no Druidical circles or Roman amphitheatre. But this same isolation gives Portland a peculiar interest in the eyes of the archaeologist, for while he finds perhaps but a few things that come within the range of his peculiar study, he finds those few, if I may so term it, in a remarkable state of preservation; in fact, until within the last thirty years, the advancing step of modern improvement had done little to disturb the quaintness of primitive Portland, or to alter its native customs; but now (shall I say also?) the ferry at the entrance to the island has been bridged, a railroad station is the first object that greets you, the telegraph wire spans the island, its stone is sawn by steam and worked by machinery, plate-glass windows appear in many of the shops, a Government convict prison stands in its midst, and I need hardly say that in the face of these innovations, every year it becomes more difficult to preserve the rapidly disappearing antiquities, social and physical, which have hitherto existed on the island. As an evidence of the complete isolation of Portland until, as I have before mentioned, the last thirty or forty years, I will mention one or two facts. Until within this period marriage with a mainland was almost unheard of in Portland; consequently we find a few surnames predominant in the island. Some years ago, in a directory of Dorset, it was found that of 193 persons having a trade or calling in the island, 21, or nearly one-ninth, bore the name of Pearce, 15 were Combens, 8 were Whites, 10 were Stone, 7 Flews, and 5 Scrivens; and if, as has been suggested, Pearce is a corruption of Pierre, of course the 21 Pearces and 10 Stones were identical names. There is also a curious term used for a mainland; he is called in Portland, a "kimmerling." It is, I believe, a term unknown elsewhere, and my friend Mr. Barnes has made a suggestion which I am sure he will not mind my repeating—it is, that the term comes from "Cymr-ling," or Briton. If such be a true derivation, the term is an interesting relic of the past. Pieces of evident Roman pottery, part of a tessellated pavement, and some personal ornaments, have from time to time been found in different parts of Portland. I am sorry to be able to do little more than mention these, as, although there is good evidence of these things having been found, through want of appreciation they have gradually become lost. I have, however, succeeded in rescuing a few pieces of pottery,—one found in an old well which was discovered a little to the south of the parish church. I am assured that a good deal more was found there, but it has been lost. This well was discovered accidentally in a field by a shepherd, who, when driving a stake one day for his sheepfold, was surprised by its suddenly disappearing. It was opened by Mr. Pearce, a stonemason of Reforme, and was found to be filled up to within 4 ft. of the surface. It was about 2 ft. 6 in. in diameter,

and the walls of the well were composed of neatly-laid stones, about 1 in. thick, such as are now found near the surface amongst the rubble in opening quarries. It was 16 ft. deep, and the bottom of the well was concave, and the bottom and the sides to the height of some 4 ft. or 5 ft. from the bottom were plugged down with clay, so as to hold any water that might be there. At the bottom a great quantity of Roman pottery was found. It is much to be regretted that, through an accident, all these pieces have been, with a very few exceptions, lost. Some of the smaller vases were very perfect, and of others such large segments were found as to show very clearly the size and shape of the original. Further south, still nearer the village of Southwell, great quantities of pottery have been found, as well as some iron implements, and all within some lines of embankment which are perceptible to this day. Those lines, when I saw them and examined them some time since, were clearly parts of a circle; and at the time I was there the foundations of a field-wall were being excavated, and it is no exaggeration to say that the loose earth which was being thrown up was full of shreds of evidently Roman pottery: in a few minutes I filled my pockets. Various other Roman remains have been discovered during the progress of the Verne works; some of them have already been examined and written about. I have with me here a few things which have been kindly put at my disposal for this meeting by Colonel Belfield, of the Royal Engineers. First, I have here a bronze coin of Antoninus Pius, discovered about 2 ft. under the surface on the North Common; near it was also discovered what must have been once a pretty little ornament, a small circular Roman fibula; it has an inner circle marked off in divisions, in which the enamel green and red still remain visible; the hinge or part of the clasp at the back still remains visible; the enamel which fills up the rest of the disc has perished. Another coin I have is one of some rarity; it is a gold coin, slightly dished in shape. Mr. Evans, the numismatist, has examined it, and thinks it Gaulish rather than British, although it certainly approaches very nearly some of the known British coins of the *charistee* type. A third coin is a silver penny of Henry III. It has the king's head, with a crown, surmounted by a cross, and the right hand grasping a sceptre, also surmounted by a cross. On the reverse are the words "Terri-on-Lund." Terri le Chanier was one of the keepers of the mint in 1322. Another piece of antiquity I have here is somewhat ponderous instrument of iron, about 20 in. in length, and 14 lb. in weight,—the weight is in the centre, the extremities tapering off, the one to a point, the other to a chisel-shaped end; this was found on the North Common, near the *fibula* and the coin of Antonine. It has been thought by some antiquaries that this and a similar instrument of iron, of similar weight, shape, and size, were specimens of metal iron in the pig. This may have been the case, but I rather incline to the suggestion offered by Captain Ferguson, that they are primitive "hand-jumpers," the tool used for loosening the stone to prepare it for being split and detached from the original block in the quarry. Not only are the edges bevelled, as Captain Ferguson suggests to save the hand from injury, but you will also observe a cavity on one side, which seems purposely made, to give the hand a better and firmer grasp. Again, the fact of one edge being chiselled and the other pointed, seems to show that it is a manufactured instrument, and further, the weight is so eminently fitted for the efficiency of the instrument as a jumper; and, if our military forefathers could wear and fight in the suits of armour we see hung up in the Tower of London and elsewhere, it is equally possible that the arms of our ancestral quartermen would have wielded with ease a 14 lb. jumper. I have also kindly lent me by Mr. Holland a very perfect urn and basin. They were found in a grave in 1863 in the Witheycroft Quarry, about 4 ft. below the surface. The coffin was a rude one, made of slabs of rough stone, and the urn was full of fragments of bone. We now come to some of the social antiquities—the old customs which have been preserved so well, but which we fear may soon have to yield to modernizing influences. For some hundreds of years Portland has been a Royal manor, and, as lord of the manor, the Sovereign claims a royalty upon all stone quarried from crown lands. This royalty amounts to 1s. per ton, but Charles II. made a remission to the inhabitants of three-fourths of his dues, and 9d. per ton is now paid to three

justices to lay out for the public benefit of the inhabitants. A court-baron is held twice a year the months of May and November, under the presidency of the steward for the time being of a manor. At this court the reeve, i.e., the man appointed for the year to collect the royal dues, under his accounts. This reeve is chosen by rotation from amongst the tenants on the Royal estate, the tenant who pays next lowest quit-rent the outgoing reeve being chosen. We find the ancient title of reeve preserved in but few titles handed down to our day. The sheriff of the county was originally the shire-reeve, and in the twelfth almost extinct office of shire-reeve, whose duty was to collect any valuables the sea might throw up (*ejectum maris*, in old legal phraseology), and take possession of any wrecks that might come ashore in behalf of the lord of the manor—we find traces of this ancient title. The first proceeding of the court baron is to swear in the homage jury, which consists of twenty-two jurymen, two assessors, and the clerk, the assessors or officers being officers appointed to affirm upon their oath what penalty they think in conscience ought to be inflicted on any persons who have committed faults cognisable at the court baron. The court baron proceeds to the usual business of passing renders and admittances, settling encroachments and boundary disputes, and also means of presentments claiming the ancient privileges belonging to the tenants of a royal manor of Portland. For instance, the terms of one of the presentments run as follows:—"We also present that we have three acres to dispose of our lands,—viz., in free church gift, surrender in court, and the last will and testament; that the gift of land in church, before two or more tenants, is not to be revoked, whether for term of life or for ever; that if land be surrendered in court, the heir hath power to redeem it, if he bring the principal money which the party gave for it for his use, before two tenants or more, within one year and one day; and by last will and testament we may give our land to whom we please." Such are the surroundings in which is embalméd one of the most ancient of the customs of Portland,—and, I may say, altogether unique at this date in England, and one which at once carries us back to those days when many a large landed proprietor or feudal baron could neither read a book nor sign his name, and when for the benefit of one (the great majority) who could not read, a man put his sign,—the blue boar, the golden lion, the white hart, &c.,—over his shop, instead of as well as his name. I refer to the manner of keeping the accounts of the royal dues by cutting the reeve-pole. Every year the reeve of the year presents his reeve-pole, on which are cut the various sums paid by the different tenants in the different villages of the island. The reeve-pole, as you see, is square, and on each side are cut notches, each notch denoting a current sum; thus, a full notch, 1s.; a half-notch, 6d.; a full scratch, 1d.; a half-scratch, ½d.; a quarter-scratch, ¼d. The reeve-rent amounts now to £151, and is paid by about 500 tenants, of whom more than half stand as heirs; but of this we are presently. Of course, books and accounts are now kept as well; but they have not as yet replaced this ancient method of keeping accounts. In this reeve-pole I think we may trace the remnant of the ancient tally-rod, which reeve formerly in such universal use. The tally-rod, from the French *tailleur*,—was a stick cut down in two parts, on each of which were marked with corresponding notches what was between creditor and debtor. This was the ancient method of keeping all accounts, and was a long time the manner of giving receipts for public revenue, one part being kept by the creditor, the other by the debtor. Hence came the tally of the exchequer, which was corrupted to the teller. This was also the origin of the tally Court in the Exchequer, which was attended by two deputy chamberlains of the Exchequer, and the tally cutters; and the Tallages of our Anglo-Norman kings, those heavy taxes which were so heavily on our forefathers, had all reference to the tally-rod. Of course, when a tally stick is split down in half, the notches on the two halves correspond in such a way as to show each could, and therefore when a man could produce his half of a tally-rod exactly corresponding to his creditor's half, it was sufficient proof that the debt had been paid. So we find here, as the archaeologist does every here and there in his researches, some ancient relic of the past standing out amidst the improvements and advances of modern education and civilisation,

like some venerable stunted oak amidst a forest of saplings, not perhaps untouched by the hand of time, but preserving its vitality, and holding up a picture of the past when all that flourished with it has long ceased to exist. And, however much we may venerate these monuments of former ages, however charmed the archaeologist may be to discover some ancient mansion with its inconvenient rooms, or its ill-contrived passages, its damp and unhealthy situation; or however much our curiosity may be excited to bring to light a Portland reeve-pole,—I think we cannot be too thankful that our lot has fallen in busier and more stirring times, perhaps—but in days when health and home comforts are understood and enjoyed, and when it is not necessary to scratch on a stick what the youngest boy in our national schools can write with ease and read with fluency. The reeve-pole, however, exists side by side with the ordinary method of keeping accounts. We now come to a custom which modern innovations and modern laws have left untouched. I refer to the custom of conveyance of land. I have before mentioned that at the half-yearly court-baron a presentment is made, claiming the ancient privilege of disposal of land by free church gift. This custom is, I believe, unique, and Portland is, probably, the only place in the United Kingdom where a church gift is recognised as a legal conveyance of land. If the reeve-pole may be compared to the stump of some venerable forest which exists only to point out its ancient greatness, the church gift may be compared to an equally ancient tree, but one which is still vigorous and healthy, producing its leaf and fruit; and although this custom is surrounded by younger, more complicated, and, I may add, more expensive customs and institutions, it is yet vigorous as ever, and, as I mentioned just now, the only recognised legal conveyance of land in Portland. The legal transaction is extremely simple. A deed is drawn up free from the modern legal verbose terms, and commences somewhat in this fashion, "Memorandum that upon such and such a day, I, A. B., of Portland, in the county of Dorset, came in the parish church of Portland and did then and there, according to the ancient custom, time out of mind, freely give unto my loving son-in-law a certain piece of land,"—then follows a description of the property, its boundaries, position, &c. Of course this "free gift" usually follows, or is followed by, the consideration money, but it is not necessary to mention the sum paid on the deed. The purchaser and vendor then meet in the parish church of St. George's, and in the presence of two householders, who sign the church gift as witnesses, the vendor signs the deed, a small fee is paid to the clerk, and the legal transaction is complete. I have heard, but I have not been able to verify the statement, that this custom is decidedly Danish in its origin. Mr. Barnes has, I think, evidence of its being Saxon. If any of our friends can throw any light upon the origin of this custom, it will show the advantage of these things being discussed at meetings like the present. But to pass on—Portland is not only peculiar in its method of conveying property, but is also peculiar in its method of distributing property, for there is no such law known in the island as the law of primogeniture; in fact, we find to this day, in active operation, the old Saxon law of gavel-kind, a term thought by some to be derived from the three Saxon words *gife eal kyn*—"give all kind," i.e., to each child his part, and by others from the British words gavel, a hold or tenure, and conneed, a family. The law of gavel-kind ensured an equal distribution of property amongst the different members of a family, and as such is observed to this day in Portland. The consequence of the operation of this law is, that the land is cut up into innumerable strips of holdings—lawns, as they are commonly called in the island, and even these small strips of land frequently belong to several members of the same family; hence it is that upon the reeve-pole we find several of the sums inscribed upon it payable by the heirs of so and so, more than half the sums, as I mentioned just now, are thus payable, 1d., ½d., ¼d., due from the heirs of some deceased tenant. If any advocate for the abolition of the law of primogeniture wants an argument to strengthen his cause, I can safely recommend him to pay a visit to Portland, for we find there—and I do not think it by any means an unfair deduction to make from the facts of the case—we find there as a consequence of this wholesome law an amount of independent thrift and honest compe-

teny rarely to be met with so generally amongst a population so numerous. Some years ago an elder son tried how far he could shelter himself under the English law of primogeniture, and his father having died intestate, he laid claim to all the freehold property. The case was put into the lawyer's hands, and after dragging its weary length in the law courts for several years, was finally arranged by arbitration, and the small remnant that was saved, after paying the legal expenses of a many years' suit, was equally divided between the two contending brothers. The result has not encouraged other elder brothers to satisfy their greed under the protection of English law; so that we find gavel-kind still to be the law of the island. The laws of Portland are also favourable to the rights of women. A woman may "during her coverture dispose of any property belonging to herself in her right by will or testament to whom she please, as if she were single or unmarried;" and if this be indeed an ancient custom handed down—shall I say from happier days?—then the attempt to deliver women from their thralldom and subjection now-a-days is no liberal advance of modern civilisation, but a return to a state of things which advancing civilisation has obliterated. These are some of the old customs or laws peculiar to Portland. Many of them, I believe, are quite unique, and it is because I fear they will rapidly disappear, now that Portland is brought into such immediate contact with the mainland, that I have made this effort to preserve an account of some of the most curious and most ancient; and if it will lead to the subject being investigated by some abler hand than mine, and thus cause more light to be thrown upon them, I shall feel that my humble endeavours have not been entirely in vain.

PUBLIC MONUMENTS: COMMITTEES OF TASTE AND JUDGES.

THE whole argument as to the mode of selecting artists for the execution of public works is included, as the *major* contains the *minor*, in the general objection that is felt by professional men of established reputation and high standing against open competition.

It will be well, then, to examine the causes and the value of this prejudice, and whether the objection is either to the practice or to the principle.

It may fairly be asserted that the whole career of an artist is a competition; that he is exerting himself to gain distinction, and in a trial of strength with others pursuing the same objects as himself. Therefore, when an artist achieves a high position, it may be assumed it has been gained by establishing his superiority over others. This disposes of the question of entire objection to competition in its larger sense. Artists do compete; they could not hold their own without it; and thus it is not the principle itself of competition that excites their opposition.

It may be asked, then, how is it that when any work is offered to competition almost every artist of reputation feels an indisposition to enter for it? If his position has been fairly earned, why should he fear the rivalry of those below him? Does it not rather suggest that he is not justly placed, and that he distrusts his power to maintain his rank? It might be so argued; but the matter may not be dismissed so summarily. He may naturally dislike the intrusion of rivals in the field he has come to think his own; but this is not the real reason of his holding back; and this leads to the consideration of a very important question.

There would be little objection felt by the best artists to so fair a test as open competition if there was sufficient security that the judgment given on their designs would be the result of knowledge; and that the deciding tribunal would be composed of persons duly qualified to give opinions on the difficult questions involved in the examination of trial models, drawings, and plans; in composition, in details of construction, and other points severally requiring careful consideration in the works submitted for judgment. If this security cannot be reckoned on, can it be a matter of surprise that artists whose fame and livelihood depend upon their maintaining their position, object to running the risk of losing their *prestige* through the incapacity of the judges to whom they may be asked to submit their claims? This is no fanciful or imagi-

* See p. 617, ante.

nary difficulty. It is well known that committees of taste, as they usually are constituted, are not generally very strong in the knowledge of the theory and practice of art, or in the principles of art criticism. Take a few points only, but quite sufficient to try the competency of a judge. First, as to the kind of models usually submitted by sculptors. These, however extensive in scale the completed work is to be, are of comparatively very small dimensions. They may be mere rough sketches, or they may be elaborately finished models. From experienced sculptors the former should be sufficient; but candidates, not always safely to be trusted with the conduct of large works, not unfrequently calculate on the effect very highly-finished sketches will have on amateur judges, and supply designs full of minute prettinesses which are often totally unfit to be executed at large. It requires much experience to calculate the effect of a small model, exhibited in a room, in relation to its fulfillment in a large-sized work *in situ*. Elevation, perspective, the conditions of light and atmosphere, are all to be considered in coming to a decision on the merit of a model possibly not above one-fifth the dimensions of the proposed design. Again, the material of the completed work may be marble or bronze. In the small sketch this cannot be a matter of much seeming importance; whereas, in fact, the peculiar treatment of a group or statue, in the one material or the other, is, or should be, a very carefully studied question. The material itself should affect the composition of the design, as each has its own conditions and requirements. It is not to be expected that ordinary committees should enter into such details; or be able to determine, first, whether the author of a pretty small model is competent to undertake the execution of the full-sized design; or whether, in a work in bronze, the sculptor, who may have had no experience of the material, is qualified to carry out his sketch *ad finem*; or whether he means only to make a model, and to leave the work to be carried further by other hands, by contract or otherwise. The judges may, possibly, select a good design, but there is much to be done beyond this. No amateur committee can be competent to judge as to the best or even honest composition or mixture of the bronze, or of the proper degree of thickness or substance of the metal used, or of the strength, materials, and disposal of the inner supports, or framework, on which the safety of the work depends; or of other practical questions of, it may be said, vital importance. The time may not be far distant when the consequences of the little attention,—owing not to intentional carelessness, but simply to want of knowledge,—given to such details, may be made painfully obvious by the failing condition of works now supposed to be likely to endure for ages. *Abiit omen*; but it is a subject worthy of consideration, and bears on the question before us. Artists, who conscientiously decline to submit to the judgment of chance-elected tribunals, refer to the incompetency of those committees to wrestle with, or even to recognise, practical matters of the kind referred to; and assume, with great show of reason, that, in the long run, they are likely to be influenced by the superficial effect of the first showy model submitted to them, to the neglect of more meritorious and substantial designs.

There surely may be a remedy found for this; some means by which the co-operation of the highest class of sculptors may be secured, and yet to give to others, who may be duly qualified,—for this should be an essential condition of being allowed to compete for public employment,—a fair chance of attention from a court of judges known to be competent to decide on rival claims.

On the mode of effecting this it is not our purpose at present to offer suggestions. Our object is to show that one cause of the depression of sculpture in public works among us is the want of a higher standard of design,—in form and style,—and that to procure and insure this desired improvement it is essential to organise a tribunal of judges differently constituted from those usually intrusted with the responsible duties of determining such important questions as instructions to artists; deciding on the merits of designs and the capabilities of competitors; and, finally, to undertake the supervision of works while under execution. The latter obligation is scarcely recognised at all, yet some late experience has shown how great is its importance.

It might seem at first sight that these remarks point to the formation of committees to be composed only of practical members (artists). This

is not so. There is no intention to suggest or recommend the exclusion of the "lay element" in such committees. On the contrary, the assistance of well-educated gentlemen of cultivated taste, who are known to feel an interest in art (*con intendimento*, as Italians say), must always be of advantage in such councils. As regards expression, character, fitness, general taste, they would be quite as competent as artists to give weighty and valuable opinions; and, being free from professional bias, they would not be affected by one-sided and confined views on merely technical points. But, on the other hand, there are details and matters of a practical kind in which amateurs cannot be expected to be sufficiently informed; and here the advice and suggestions of experienced artists would be necessary. A system that should bring these two forces into combined action would have a most salutary influence on the parties themselves, by the mutual interchange of opinions, sentimental, theoretical, and practical. It would lead to the study and expression of principles in the conduct of art-questions; and, as a means of organising a competent court of appeal or decision in the matter of public works, would, while raising the standard of art, command the confidence of the great body of professional artists. Wherever any approximation to such a measure as is here hinted at has been tried, sufficient good has resulted from it to justify further efforts being made in that direction. It may be stated broadly, that no tribunal composed exclusively of unpractical members can ever be satisfactory to the general body of professional artists; whereas even a very small, if judicious, mixture of the practical and artistic elements would be likely greatly to conciliate the good opinion of candidates for the honourable distinction of public employment.

The selection of the right men in both categories would of course be a matter of no slight responsibility. It has been said that the best artists would object to act on such committees, chiefly from the little influence their opinions would exercise on the amateur majority. But surely artists of reputation in their several callings should not, for so weak and unproved a reason, shrink from giving the advantage of their experience and knowledge when called upon to assist in judging important art questions; while amateurs, desirous to identify themselves with the progress and condition of art, would see the necessity of qualifying themselves to take an efficient part, irrespective of class, in questions to whose discussion they might be invited. Of any other and lower motives for objecting to the proposal to constitute a superior court with the avowed purpose to improve the style and status of art, it will not be expedient to take much notice. The artists in this country are "Legion." Many, no doubt, practice their calling, as mere tradesmen, for a livelihood; and to these the elevation of art and any difficulties thrown in the way of its success as a mere mechanical exercise would, probably, be unacceptable. But there are many who follow art lovingly, for its own sake; and as a means to elevate the taste of the people, and to confer distinction on a nation. To such artists every step in the direction of improvement and honour of art would be welcome, and would receive their earnest support.

Our appeal here has, with reason, been made chiefly to raise the condition of one branch of art. Historical, or high-class-subject painting has, it is true, but small standing among us, or, indeed, elsewhere, compared with its exercise in former days, when churches, halls, staircases, courts of assembly, were decorated with pictured scenes of national and religious history. But this art has its resource in the legitimate practice of other forms of illustration than the highest, and by which they can afford pleasure, on one side, and insure fame and profit on the other. Sculpture has no similar opening. The conditions of its existence as a fine art are opposed to its application to subjects of a low or even familiar class in which Beauty of Form is not a paramount study or element. It is to draw attention to this fact, this condition of the art, and to show the desirableness of establishing—especially in public portrait sculpture—some general rule or (modified) standard, that may save it from the degradation to which it is threatened by a mistaken exercise of unrefined and *ultra* realistic imitation, that these notes of warning have been written.

A VOICE FROM THE DUMB-WELLS.

THE recent fatal catastrophes through the breaking in of old and rotten covers to old and forgotten dumb-wells (cesspools), enforce attention to an element of danger to health, worthy of deep consideration. The question may be asked—"Are there, in and around London, many of these old dumb-wells covered over and forgotten, but which may some day break in, and endanger, or even destroy human life?" The answer can only be given in the affirmative, in an indirect and roundabout sort of a way. As London grew in size, and before sewers were used for the removal of house drainage direct, cesspits and cesspools were used generally; "cesspools" being, strictly speaking, open receptacles; "cesspits and dumb-wells" being pits or wells covered over: these pits and wells having been formed beneath the basements of houses, in back yards, and in gardens attached to suburban houses. Those who formed them did so to get rid, by infiltration, by absorption, by evaporation, or by all combined, of the slop refuse from kitchen-sinks and water-closets. An absorbent subsoil, which allowed of rapid percolation, was considered advantageous, even though the wells for fresh water and for foul water both penetrated the same substrata. In the reports by the inspectors, made under the Public Health Act, 1848, many facts are recorded where the fluid level in wells and cesspits rose and fell simultaneously, showing a direct communication. The inmates became sick in various ways. Gastro fever, typhoid fever, typhus, and cholera, were present in the country. Family after family left such houses after having lost some of their members, the medical men and the inhabitants remaining in profound ignorance as to the causes of unhealthiness.

In towns obtaining water for domestic uses from subsoil wells on the premises, a public supply may subsequently have been set up; and some persons have taken this supply, and have pulled up the pump, and the town being without sewers, the well has been turned into a cesspit for the accommodation of that house, but to the injury of the subsoil, and of all those who continue to draw water for domestic uses from such subsoil. There are many private wells in London up to this day. The members of the great clubs in Pall-mall, for instance, who drink water, have it drawn from private wells beneath the basements of the buildings, the managing committees being proud of their domestic arrangements in this respect. They do not mind the bad pun, namely, "to let well alone," and to be contented with the public water supply, although chemical analyses have shown that the bright, sparkling, and cool waters drawn from London wells, are more impure than Thames water drawn from the pool below London-bridge. Men forget that water may be bright, sparkling, and yet impure. Sea-water is bright and sparkling; salts of sewage are equally transparent. The brightness of water is, therefore, no test of its purity. As a rule, wells sunk into town-subsoils furnish contaminated waters. Shallow wells always do so.

But as to London and its unknown dumb-wells, "are there any?" or "are there many?" The reply must again be a roundabout one. Until within the last thirty years dumb-wells were the rule, and they existed by tens of thousands. With few exceptions, every house had one; some houses had many. In the year 1848, the first Public Health Commissioners, who were located in Gwydyr House, Whitehall; there were at this time nine cesspools, "dumb-wells," in the basement, and all full; as, about the Christmas of 1848, the basement became flooded above the floor-level, so revealing the mischief. Here was the first General Board of Health legislation for the health of the country, and directing the removal of nuisances seated over nine dumb-wells choked full with putrid refuse. At this date there were also fifty-four dumb-wells in the sub-strata below the basement of Windsor Castle. The public will learn with satisfaction that these dreadful contrivances for poisoning the subsoil have been filled in, and so abolished, not only at Gwydyr House and at Windsor Castle, but in tens of thousands of other houses in the metropolis. It is, however, certain that thousands still remain, as every now and then the presence of an old dumb-well is detected,—after a violent thunder-storm, for instance, or from some other surface-flooding. Foul sewers and foul drains in London are the rule now, in spite of the six million sterling expended on "inter-

ing and outlet sewers." The whole of Margaria, Elton-square, St. James's Park, and Westminster, down to the river, is a mass of stagnant sewage in ruinous flat-bottomed sewers, running with rats, these rats being a sure test of the existence of sewers of deposit. It is the undant street-surface ventilation of the metropolitan sewers and drains alone which saves London from an ever-present plague of typhus. A main sewer leading from Marlborough House, through St. James's Park, requires to be cleaned every year, and some 30 tons of sediment removed by hand. This sewer swarms with rats. Rats have, however, been taken to prevent mischief by ventilation and stop-gates; but rats are the sewer, part of the metropolitan system of main sewers, and the putrid sediment and the rats form parts of the same system. As rule, the presence of rats in sewers and drains is a condemnation of the system. Such sewers contain deposit, food, and shelter, or rats could not exist. At Alnwick, before the town and castle were newly sewered and drained with all earthenware pipe-sewers and drains, rats founded in the old large rubble sewers and drains; and they were rats of discrimination and taste, as they migrated regularly from the town to the castle when the family was at home. I had company, and back to the town when the family left the castle. The main sewers for Alnwick town are 18 in. in diameter; for Alnwick castle, 12 in. diameter. Neither sediment nor rats can remain in sewers of this class, having smooth vitreous surfaces, and through which water is constantly flowing. Many noblemen's houses in the country swarm with rats; that is, there are rats about the stable-drains and in the house-sewers. No other proof is needed that such houses are in a defective state, and may be dangerous to health; but it will be very troublesome and very costly to root all the basement, to remove the tainted soil, to re-sewer, re-drain, and to concrete the basement floors, ventilate, and make all pure and sweet. Yes, such work will certainly cost money (if you even obtain the services of a competent sanitary engineer), and money is more readily spared for fashion and for folly than for domestic comfort and means of health. The annual costs of a couple of racehorses would take the family mansion into a sound sanitary state. But the annual vote is for the racehorses, the foul sewers are left to become still sicker, and the family rats are left in peace. Last sanitary improvements have been made during the last thirty years, but very much remains to be done. There are buried dumb-bells to be rooted out when discovered, sewers to be reconstructed, and country mansions generally to be properly sewered and drained. If the company in the drawing-room could see the foul subterranean arrangements under which they are dancing, and could comprehend their danger, they would break up and give in as much horror as they would rush from gunpowder magazine near to a slumbering volcano. Men have yet this prime lesson to learn, namely, that means of health in their dwellings are worth far more than rich furniture and costly picture galleries, and that these means of health cannot be secured until all cess-pits, cesspools, and dumb-wells, have been polished, and there is a dry subsoil, absolutely free from the possibility of sewage taint.

NEW RAILWAY AND OTHER PRIVATE BILLS.

In accordance with the standing orders of parliament, notices were deposited towards the close of 1870 in anticipation of the session which has terminated, that petitions would be presented for 275 private Bills. After parliament commenced its sittings leave was given to introduce fourteen other private Bills, the greater number of which related to estates; no others were Bills in the interests of Bethlem Hospital, Fleetwood Docks, London, Chatham, and Dover Railway, Ross and Monmouth Railway, Wigan Rectory Glebe, and a Divorce Bill, which are documents since the Divorce Court, which has changed the character of these unhappy proceedings, came into operation.

Of the 289 Bills for which notice was given, or that were subsequently introduced, 99 have received the Royal assent, 28 have reached the committee of one House or the other, and have been rejected in one form or another, chiefly on the finding that the preamble was not proved to the satisfaction of the com-

mittee. There has been the anomaly, however, that in a number of instances the committee of one House has declared the preamble of a Bill proved, and has been at the trouble to go through and settle the clauses, whereas the committee of the other House has thrown out the Bill on preamble. The Edinburgh and District Water Bill, which has caused one of the most protracted and costly contests of the Session in committees of both Houses, was rejected by the Lords after the Bill had gone through all the stages and had been passed in the Commons. Their lordships dealt in the same way with the Hounslow and Metropolitan Railway Bill, the Hoxley and Metropolitan Railway Bill, the North Metropolitan Railway Bill, and the South Essex Estuary and Reclamation Bill. On the other hand, the Lords passed the Isle of Wight and Cowes and Newport Junction Railway Bill, and the Wandsworth Gas Bill, which the committee of the Commons threw out. The defeated Bills include the London Street Tramways (Extension, &c.) Bill, which passed the Commons committee but had the third reading put off by the House for three months. In another instance the House ruled that standing orders should not be dispensed with. In another case the formula in the Commons was to put off the second reading of a private Bill for six months. It is not unusual for the Lords' Committees to reject Bills under the apparently wild finding, that "it is not expedient that the Bill should be proceeded with." An unusual mode of dealing with private Bills has been resorted to in the case of three tramway Bills, "suspended under order of the House." In next session the proceedings upon these Bills may be resumed from the stage at which they had reached. The Bills are the London Street Tramways (Kensington, Westminster, and City lines), the Metropolitan Street Tramways (Westminster Bridge and Battersea Park, &c., Extensions), and the Paddington, St. John's-wood, and Holborn-street Tramways Bills.

Of the 199 Bills that have received the Royal assent, 82 relate to railways, 19 to gas supply, 19 to water supply, 30 to gas and water supply combined, local improvements, and local Boards; 6 to tramways, and the residue to objects that scarcely admit of classification, including estate, bridge, canal, harbour, dock, pier, inclosure, and other Bills, for a variety of objects.

Among the private Acts of the Session affecting London, are,—The Albert Bridge, Billingsgate, and Leadenhall Markets; London Central Railway, formerly Euston, St. Pancras, and Charing-cross; Holborn Viaduct Station, Metropolitan Board of Works (Inclosure of Hampstead Heath), and the North Metropolitan Tramways Bills. The other Acts passed relating to tramways, apply to Columbia Market, Dublin, Edinburgh, Greenock, and the Vale of Clyde. Sixty-two of the Bills petitioned for were withdrawn before committal.

THE METROPOLIS NEW WATER ACT.

After the expiration of six months from the passing of this Act, the local metropolitan authority shall, whenever they are of opinion that there should, in any district, be a constant supply, make application to the water company requiring compliance with the terms of the Act. There is a right of appeal to the Board of Trade upon the application being made to a company requiring them to furnish a constant supply. The Board of Trade may order a constant supply to be given if after inquiry the metropolitan authority refuse to act, or unreasonably delay acting, or if, by reason of the insufficiency of the existing supply of water in such district, or the unwholesomeness of such water in consequence of its being improperly stored, the health of the inhabitants is or is likely to be prejudicially affected. Before a company is compelled to carry out the Act, certain specified regulations are to be observed. At least one-fifth of the premises in the district must be provided with the prescribed fittings, and nothing in the Act shall affect any contract made between the owner and the occupier respecting the payment of the expenses involved in altering the fittings.

In case of default, the owner or the occupier may be required by the metropolitan authority to supply the necessary fittings, or to cause the fittings in such premises to be repaired, so as to prevent any waste of water, and if any person fail to comply with the terms of such notice the metropolitan authority may provide for such premises the requisite fittings, or repair the fittings within the same, as the case may be.

The expenses incurred by the metropolitan authority in providing such fittings or in making such repairs, shall be paid to them by the person liable to pay the rate for the water supplied, or by the owner of the premises. All such expenses may be recovered, with costs, from the owner, and to the extent of any rent due by the occupier of the premises, from such occupier, by proceedings in a court of summary jurisdiction, or by action in any court having jurisdiction locally in the matter, as if the same were an ordinary simple contract debt. Any sum and costs so recovered from an occupier may be deducted by him from the rent payable by him to the owner, and shall be allowed by the owner and every other person interested in the rent, as if the same had been actually paid as rent; but if in any case an occupier fails to disclose the amount of rent due by him, or the name or address of the owner, he shall be liable to pay the full amount of such expense and costs.

A company shall not be subject to any liability for not giving a constant supply if the want of such supply arises from frost, unusual drought, or other unavoidable cause or accident. Any company which violates, refuses, or neglects to comply with any of the preceding provisions of the Act shall be liable to a penalty not exceeding 200*l.*, and to a further penalty not exceeding 200*l.* for every month during which such violation or refusal or neglect to comply with the provisions continues after they shall have received notice in writing from the Board of Trade to discontinue such violation, refusal, or neglect.

THE DRAINAGE OF MARGATE.

SEVERAL months ago, as noticed in our pages at the time, the Town Council of Margate appointed a committee, consisting of seven of their own number, to visit various towns, both littoral and inland, where drainage arrangements on a complete scale had been carried out, and by the light of the experience thus gained, to make a practical report upon the best method of dealing with the collection and disposal of the sewage matter of this rising and important town; and the result is now before us. The committee comprised the mayor, Mr. F. Chambers, M.D. (of the University of Giessen, 1842), a tailor, a grocer, two lodging-house keepers, a soda-water manufacturer, and a house painter. It is necessary to look at the composition of the committee in order to a proper understanding of their reports.

The Drainage Inspection Committee have put the ratepayers to about 100*l.* expense in the travelling and other expenses incidental to the collection of the necessary information and the preparation of their important and comprehensive reports. We are obliged to use the plural, for the party could not agree upon a single report, and so they send in two, and they may be summarised thus:—

1. We deprecate irrigation and all systems of dealing with or utilising our sewage matter, and recommend that the town be drained into the sea.

2. We deprecate all systems of sending the sewage matters of the town into the sea, and unhesitatingly recommend that a system of irrigation be carried out in the neighbourhood.

To the first report five names are appended, and to the latter three. One of the members has signed both reports, and this accounts for eight signatures by a committee of only seven people.

It is noticeable that the borough surveyor, who accompanied the Inspection Committee in their travels, sends in a separate report, signed "P. B. Coghlan, C.E., borough surveyor," in which he says,—*"I unhesitatingly recommend irrigation as the best means of dealing with sewage refuse, and as especially adapted for the town of Margate."*

It is also noticeable that so little respect attends this important committee and their antagonistic reports, that when the documents were first brought before the Town Council at their meeting on the 15th ult., several members rose and left their seats as soon as the town clerk commenced to read them, and they were accordingly read over in a meeting mostly, if not wholly, composed of the signatories themselves. Leamington, Croydon, Canterbury, Dover, Barking, Hastings, Brighton, Worthing, and many other towns have been visited by the committee of the Margate Council, and with no better result than to leave the question about in the same position that it has been for the last

five years. Only so long ago as October, 1870, Mr. Bazalgette was called into communication with the Council upon the general feature of a scheme for carrying out at once and efficiently a comprehensive system of town drainage; but Alderman Pickering expressed in the Council Chamber an opinion "that Mr. Bazalgette was too grand a man for a small town like Margate," and others thought that a select committee of their own body would be better and safer advisers. Never since the Charter of Incorporation was granted to Margate has a question of nearly so much importance been brought before the ratepayers, and the labours of the Sewage Inquiry Committee, even when most favourably viewed, seem to have advanced the question very little indeed.

The matter cannot very well be shelved; for, if we mistake not, there stands a resolution upon the minute book of the Council, "that the time has arrived for the Council to direct their earnest attention to the drainage of the borough," and the question now is, "What will Margate do next?"

THE ARTANE INDUSTRIAL SCHOOL FOR DUBLIN BOYS.

THE foundation-stone of the centre building of the Artane Industrial School has been laid by Cardinal Cullen. The R.C. Christian Brothers have undertaken the task of providing for the Dublin Arabs. An old farmhouse was modelled into a dormitory, and speedily the work commenced. Mr. Charles Geoghegan provided the design, and the plans for an institution capable of accommodating 600 boys were adopted. The western wing of the building is now partially built. Meantime, under the direction of a few carpenters and masons, the boys were employed in constructing a number of wooden sheds, which were coated with tarred brown paper and roofed with felt, and in these they have taken up a temporary residence. Since July, 1870, no less than 288 boys have been committed to the care of the Christian Brothers, and these, together with receiving an excellent education, are being taught a variety of trades.

The building, which is of limestone, will ultimately cost several thousand pounds. Up to the present 2,800l. have been expended on the building, and of this 1,800l. have been subscribed by the public. The building may be classed under the head of Domestic, and consists of a bold projecting centre, 91 ft. in length, having four stories in height, and 51 ft. in width, in which the various offices and apartments of the community are provided. It will have on either side extensive wings three stories in height with projecting ends, containing the scholastic and trades departments, with dormitories, &c. A spacious corridor 367 ft. in length by 13 ft. wide, with staircases at each end, extends the entire length of the institution. Numerous and spacious openings filled in with glazed partitions are provided in this corridor to admit light and air through the schools and trades rooms. The walls are built of blue limestone of the district, Portland cement being introduced to supply the place of all portions of the work usually built with bricks. Ventilation has been amply provided for, the walls in every apartment being pierced by flues for the entrance and exit of fresh and foul air. The building will be heated by hot-water circulating-pipes and by open fireplaces.

The works will be executed under the direction of Mr. Geoghegan.

THE POOR-LAW BOARD AND THE NEW LOCAL GOVERNMENT BOARD.

HENCFORTH, as already noted, a new governing power, termed the Local Government Board, of which Mr. Stansfeld is president, will take the place of the Poor-law Board, but without any disturbance of the relations which existed between that Board and the local Boards of Guardians. With regard to other parochial matters, however, the powers of the new Board will embrace a much wider range, and will especially comprehend those statutes having reference to the sanitary arrangements of parishes, such as those relating to sewers, contagious diseases, vaccination, nuisances, labour in workshops and factories, baths and wash-houses, common lodging-houses, adulteration of food, sale of poisons, alkali works, and smoke nuisances. The supervision of these matters will be transferred from the Local Government

Act Office and the medical department of the Privy Council to the new Board, and thus the government of matters relating to each other, and hitherto performed by three separate departments, will be united in one body. From the report of the commission appointed to inquire into the operation of our sanitary laws it appears that "the organisation of local government is very complete, though the working of it seems to be, from various causes, imperfect." Does Mr. Stansfeld know anything of Sanitary Science?

DESIGN FOR PROPOSED NEW LAW COURTS AND CORPORATE BUILDINGS, BIRMINGHAM.

THE following reference to the design of which we give the plan, is from Mr. Waterhouse's report, of the 8th of April, to the Estate and Buildings Committee:—

"With regard to the site, it is equally clear that some of the competitors have taken it for granted that the first paragraph on the second page of the instructions authorised a certain latitude for extension beyond the boundary lines shown on the lithographed plan. I think it right to mention this, although I do not myself draw such a conclusion from the paragraph in question.

Premising this much, I have to say that the design which appears to me to merit the first place is that which, bearing no motto, has been numbered 9; if the fact that the author has taken considerable license with regard to the site by connecting his building with the town-hall, in the belief that the clause I have already referred to permitted of his doing so, be not conclusive against him. The author's idea is to regard the town-hall as the type of his own design. He has connected the buildings together very cleverly, and has succeeded, I think, in making of them one harmonious group.

The new buildings are raised upon a rusticated basement, two stories in height. Above this basement the design is columnar like the town-hall, but, unlike that building, the cornice is surmounted by a balustraded parapet, which would hide some of the irregularities in the roof. The municipal buildings are united to the town-hall by a covered corridor (over an archway), leading from the mayor's reception-room to the platform of the present large hall. Under the archway would be a footway, while the roadway uniting Edmund-street and Paradise-street would be through Ratcliff-place.

The beautiful statue of Watt would, of course, in such case, have to be removed.

At the back of the town-hall the vacant ground is formed into a 'municipal court yard,' which would doubtless be convenient for open-air meetings and for carriages in waiting.

The author proposes to lower the crown of Edmund-street about 3 ft., but though he urges this as an improvement it is not an essential part of his design. The new buildings would have a semicircular end toward Eden-place, which, besides being grand and effective, both within and without, would gain much more light than the plans of most of the competitors, not only for the rooms in the building at that end, but for the new bank opposite. In consideration of the latter he would ask, as an equivalent, the right to bring the prison-van down the street.

The general scheme of the surroundings I cannot but regard as admirable, as a whole, and well worthy of attention and study. Within it is difficult to do justice to the ingenuity with which the design has been worked out, resulting in a plan no less remarkable for its simplicity and convenience than for its symmetry and architectural effect.

The public hall (130 ft. by 35 ft.) is in the centre of the buildings, and, with its vestibules and porticos, runs through from north to south, having the council-chamber on the west, and the courts on the east. The portico towards Ann-street, with a campanile rising behind it 190 ft. in height, would be very effective, especially so when seen in combination with the town-hall. The portico towards Edmund-street is also well planned.

The covered passage connecting the reception-rooms with the town-hall is not quite so successful, ending crudely at the town-hall extremity.

The public hall, already alluded to, would be lighted like that of St. George's Hall, Liverpool; the windows being on the west side, looking into internal courts.

The two drawing offices, to the east of this block, on the upper ground floor, would perhaps hardly be lighted sufficiently, but possibly they might change places with some of the town-clerk's offices on the second floor.

The suite of apartments, consisting of the reception-hall, ante-room, library, and committee-room, and terminating in the mayor's parlour, are admirably arranged.

The town-clerk's offices are conveniently near the mayor's, and his public office has special communication with the other rooms of the department on the upper floor.

There is a proper serving-room attached to the reception-hall. The council-chamber opens out of the latter, and, though facing Ann-street, is so far recessed as to be in great measure cut off from external noise. The burgesses have fairly direct access to the gallery of this chamber.

The ante-room adjoining the chamber would possibly be more convenient if fitted up as a retiring-room, though the author has an elaborate and conveniently-arranged system of retiring-rooms on one side of the public hall. Entering either from Ann-street or Edmund-street, the public would have direct access to the vestibules and the public hall, and thence into their galleries in the courts and council-chamber, interfering in no way with the business parts of the building, which are approached on the court side by three corridors, one of them running between the courts, for the barristers, and leading to their robing-room, and by a few steps up to their library—a noble circular apartment, 37 ft. in diameter, on the Eden-place side, to the right and left side of which are consultation-rooms, and below which are the witnesses' rooms, on either side of the courts.

The principal floor is so arranged that the public hall

and the reception suite may be used together on special occasions, while yet the reception-rooms are kept away from the public hall.

The Judges' lodgings look into Eden-place and Edmund-street, and are conveniently connected with the Judges' retiring-rooms behind the bench.

The author estimates at 120,000l., exclusive of the tower above the general roof, and in this I do not think he is wide of the mark.

I consider this to be, on the whole, the most masterly design of the series. Its general arrangements are eminently suited to the requirements of the case, and it has the merit of not being a copy, as far as I know, of any existing building of a similar character."

The committee upon this came to the following conclusions:—

"1. The design without a motto, and marked No. 9 by your committee, having disregarded the instructions to architects issued by your committee, in breaking the street line, and projecting the buildings into Congreve-street, cannot enter into the competition for premiums without breach of faith with the other competitors, and is, therefore, excluded from the competition.

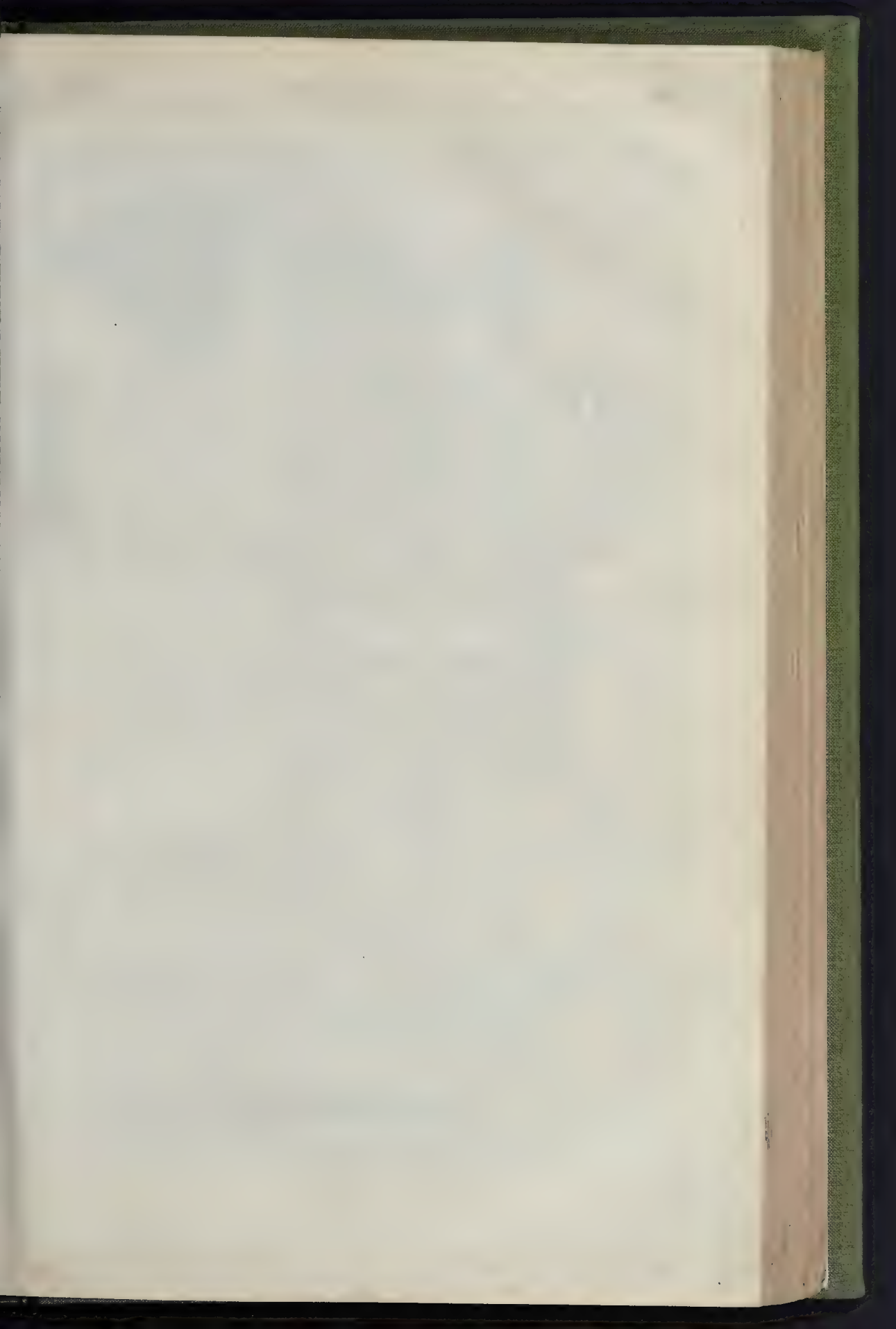
"5. Agreeing in opinion with Mr. Waterhouse, that the design referred to as No. 9, without a motto, is the most masterly design of the series, and by far the best of the set, your committee recommend that they be authorised to treat with the author thereof for the acquisition of the drawings, so that the council may not lose the benefit of that design when it proceeds to consider the important question of erecting the contemplated buildings."

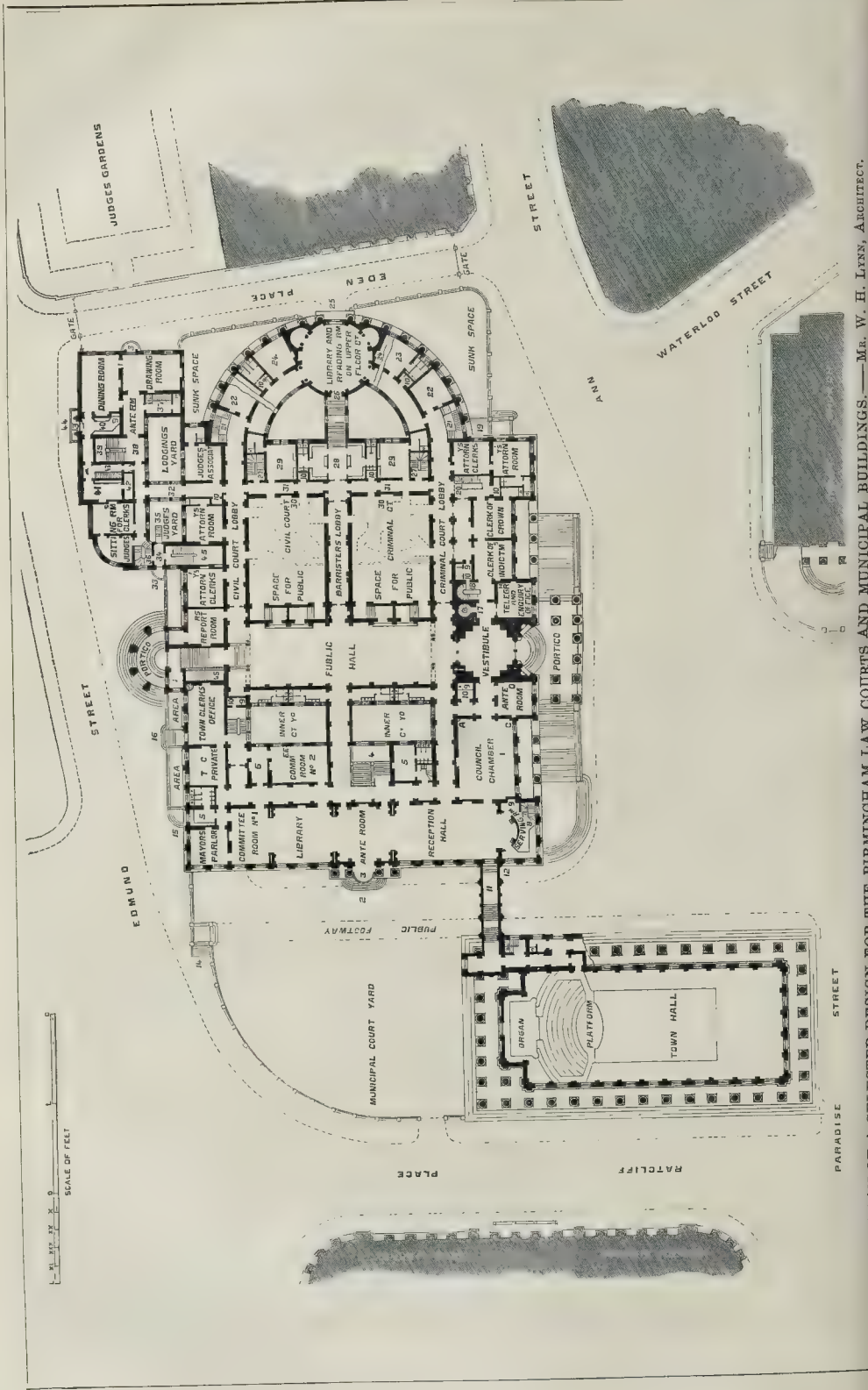
The site for the new buildings as indicated on the plan issued to competitors, is, in shape, an irregular oblong, lying to the north-east of the Town-hall, and separated from it by the oblique line of Congreve-street. On the west side of the Town-hall, and parallel to it, is Ratcliff-place, of equal width with Congreve-street, as proposed to be widened. Opposite to the Free Library, and at the back of the Town-hall, is a vacant space, divided from Edmund-street and Congreve-street by iron posts and rail. As this space is useless in its present state, and as the oblique line of Congreve-street, if adopted as a frontage line, would throw the whole of the new buildings out of square with the Town-hall—which in any case must be the most prominent object—the author of this design suggests the transfer of the general thoroughfare from the line of Congreve-street to Ratcliff-place; and the formation of the vacant space at the back of the Town-hall, with the portion of Congreve-street adjoining it, into a municipal courtyard or place. This admits of the new buildings being arranged at right angles to the Town-hall, and also of their being connected with it, without diminishing the means of communication between Edmund-street and Paradise-street.

This bringing of the south-west angle of the new buildings nearer to the Town-hall than was contemplated by the committee, and thus encroaching on the proposed line of Congreve-street at that point, constitutes the disregard of the instructions on account of which this design is stated to have been disqualified.

REFERENCES.

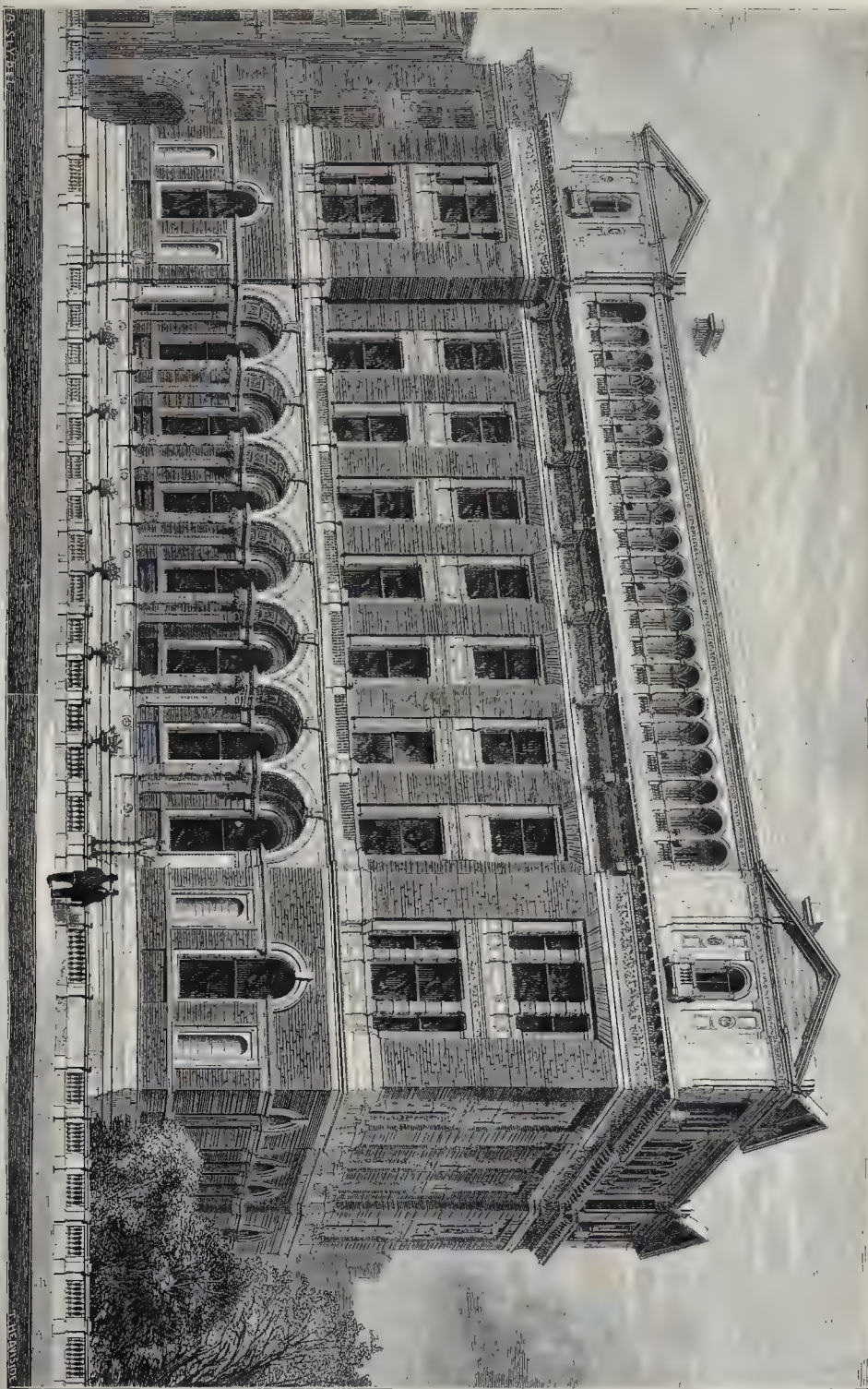
1. Council Chamber, including Burgesses' Gallery over A. R. C. D.
2. Corporation Entrance.
3. Balcony.
4. Corporation Staircase.
5. Retiring-room.
6. Waiting-room.
7. Stairs to Music Gallery.
8. Serving-stairs.
9. Lift.
10. Coals.
11. Connecting-passage over Gateway.
12. Entrance to Rate and Treasurer's Office under Gate-way.
13. Gateway Entrance to Weights and Measures, &c.
14. Steps down to Court-yard.
15. Entrance to Surveyor's Office below.
16. Entrance to Town Clerk's Office below.
17. Burgesses' Stairs.
18. Grand Jury Stairs.
19. Entrance for Witnesses, &c., below.
20. Witnesses' Stairs to Grand Jury.
21. Witnesses' Stairs.
22. Witnesses immediately wanted.
23. Sheriff's Room.
24. Consulting Room.
25. Prisoners' Entrance below.
26. Steps to Library.
27. Petty Jury's Stairs.
28. Barristers' Robing Room.
29. Judges' Room.
30. Bench.
31. Judges' Corridor.
32. Judges' Corridor and Gallery to Lodgings.
33. Entrance for Judges' Clerks, &c., and Porter.
34. Back Hall.
35. Steps to Yard.
36. Clerks' Stairs.
37. Stairs to Bedroom.
38. Lobby.
39. Entrance Staircase.
40. Serving Room.
41. Butler's Pantry.
42. Plates and Safes.
43. Back Stairs.
44. Judges' Entrance below.
45. Refreshment Room Stairs.

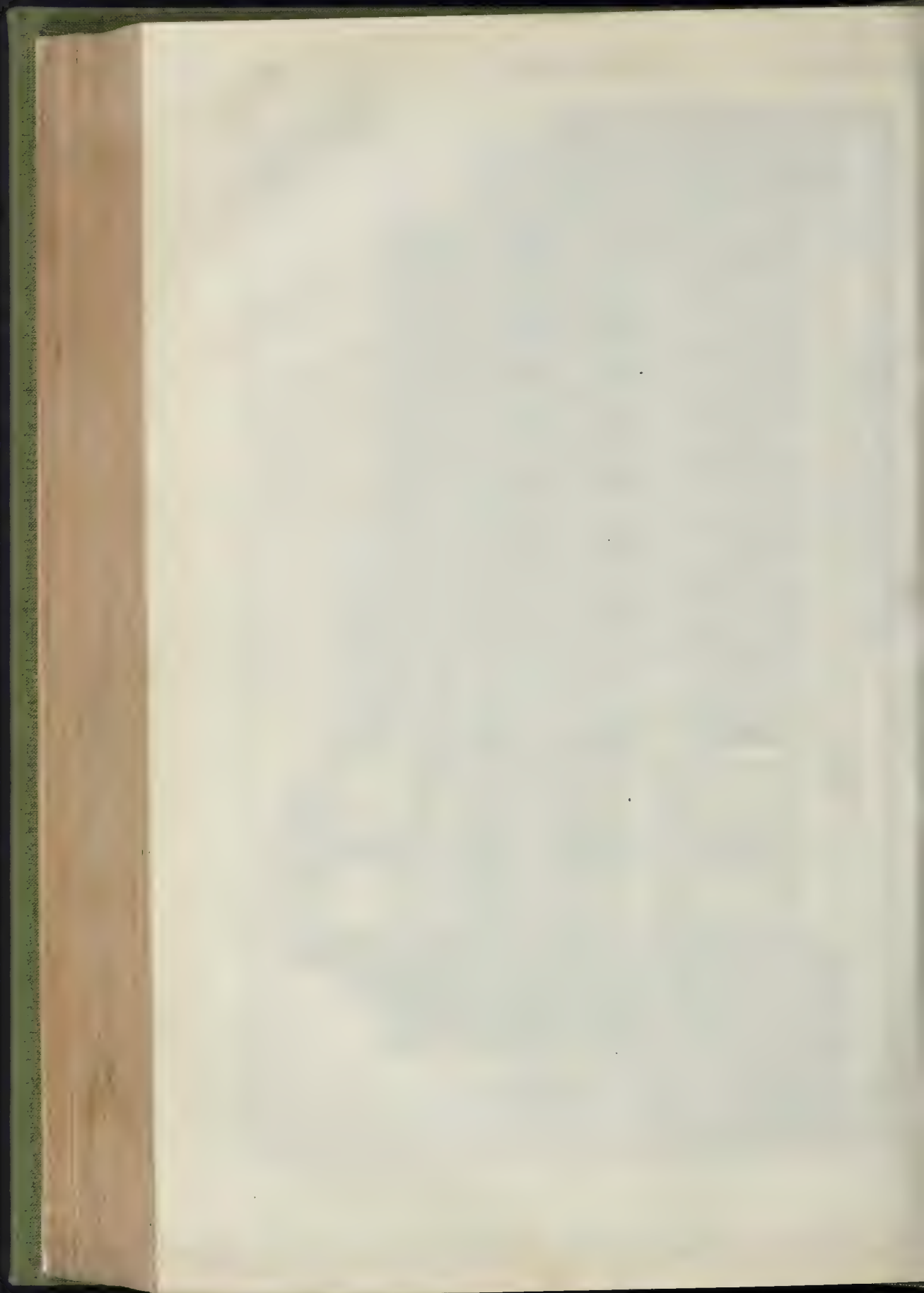




PLAN OF A SELECTED DESIGN FOR THE BIRMINGHAM LAW COURTS AND MUNICIPAL BUILDINGS.—MR. W. H. LYNN, ARCHITECT.

THE NEW SCIENCE SCHOOLS, SOUTH KENSINGTON — Major-General SCOTT, C.B., DIRECTOR OF THE WORKS.





NEW SCIENCE SCHOOLS FOR THE DEPARTMENT OF SCIENCE AND ART, SOUTH KENSINGTON.

The removal of scaffolding has recently exposed fully to view on the east side of Exhibition-road, opposite the site of the 1862 Exhibition, a large and lofty structure of red brick and cream-coloured terra-cotta, with ornamental bases on the first and topmost floors, containing the wings which project, as our view shows, before the central and main portion of the building. Hundreds of the visitors flocking to the International Exhibition have asked the purpose of the building, and, when they have learned of the right person, have learnt that it is to be appropriated to the science classes of the Department of Science and Art, and will form a nucleus, when the whole plan has been carried out, of the South Kensington Museum. The general outline of the schools was made, we believe, by the late Capt. Fowke; but the building has been erected from the designs of Major-General Scott, R.E. Messrs. G. Smith & Co. were the contractors, and the cost of the arcades is estimated to be 44,000*l*. The interior has yet to be determined. The height of the building from the ground is 96 ft., and the frontage, including the way at side, 186 ft.

The upper arcade, it will be noticed, projects from the face of the wall, and is carried on cantilevers: the underside of it is of terra-cotta, an inappropriate application of the material, as the pieces which it is composed seem to have but partial support, though of course they are fully secured, and produce a feeling of danger. The site of the larger arcade below are successfully filled with Messrs. Minton & Co.'s majolica: the flow colour of part of the tile work, in some respects, is not altogether agreeable. The very handsome columns here are of the same design those used in another part of the Museum buildings, and described by us at the time. The groups on the columns illustrate the Seven Ages of Man, and were modelled by the late Godfrey Foulkes. Much of the other terra-cotta work was modelled at South Kensington, and is, for the most part, satisfactory. We cannot use this word in speaking of some medallions which ornament the stylobate of the arcade. Some of them are abortions, and should be removed at once: being close to the eye they lead the visitor to the impression that other parts of the work not so visible may be of the same kind. The brickwork is a fine specimen of its kind, but was produced at great cost; it is, in itself, all gauged work: the bricks, from Farnley, were rubbed smooth on a revolving metal plate, and set closely with fine stuff. The terra-cotta was produced by several manufacturers,—Palham, Mr. Blanchard, and Mr. Wilson, of Islington.

We must not pass by the occasion of mentioning the method of external ornamentation, which trial is now being made in the blank panels at the back of this lofty structure. With the increase of elevation, and the great ornamentation of the prime cost of building, it comes more and more important to select durable materials. For the purposes of cornices, string courses, and window dressings, we have little doubt that terra-cotta will, when its manufacture is improved, to some extent replace stone in London building. We took occasion to call especial attention to the very excellent and promising specimens of structural terra-cotta that are displayed in the eastern cloister of the International Exhibition. But there are no qualities, of almost equal importance, as far as the eye is concerned, to be regarded, in a material used for ornamental building in London. One of these is chemical durability: the other is what we may call "washability," the readiness of the material to cast off any crusted dirt and smoke under the influence of a sharp shower of rain. In this latter quality Portland stone is eminent, while, unfortunately, the chemical action of the sulphurous London smoke on its texture is not always resisted by it. Now, many descriptions of terra-cotta that are perfectly durable, as well as rich and pleasing in tint, will form perfect smoke-traps. The rough granular surface will hold the successive layers of smoke and fog with a tenacity that no lifting shower will overcome. As to the artificial cleansing of lofty structures, such as that which we speak, the cost would be too often prohibitory. Thus we may be erecting buildings in their architectural forms, and durable in their materials, but which yet, by virtue of their very qualities, will deepen year after year into

a gloomy shade that will become intolerably oppressive to the eye.

We shall look with interest to see how the selenitic mortar on which General Scott is now experimenting at South Kensington, will comport itself in this matter of cleanliness. As far as durability is concerned, we believe that the prospect is favourable. The method of ornamentation to which we refer, and which is well known in Italy, consists in the spreading of successive coats of cement on the recessed portions of the building. At South Kensington, large panels in the external wall are thus treated. They are rendered with a coat of the selenitic mortar of ordinary fineness. On this, when dry, is spread a second and thinner coat, of a finer description of the same mortar, blackened with manganese. A third, and yet thinner coat of fine mortar, which this time is tinted with a light grey, is spread on the black ground. Designs are traced on this upper coat, as soon as it is dry enough to bear them, and the parts of the design which are to be left as ground-work are then scraped out, thus leaving a white pattern relieved on a black ground. The process, it may be remembered, is known as Sgraffito.

As to the potential cleanliness of the new method of decoration, and its unfading brilliancy, we shall be glad to have the means of forming an opinion. For this, however, time is requisite. There are some blank windows at South Kensington, from the external decoration of which much was expected, that have so suffered from smoke and chemical change that they look like the backs of stained glass windows, covered with a protective iron grating.

SINKING AT BRENTWOOD MAIN DRAINAGE WORKS.

The Brentwood main drainage works have scarcely been completed under the auspices of the Home Office, are a part of the roadway on Brentwood-hill, leading from opposite the Shore-ditch Industrial Schools towards the High-street, has fallen in for a distance of about 60 yards, and its appearance led to the idea that an earthquake must have occasioned it; a deep yawning chasm, of varying width, rendered traffic impossible; and the line of large drain-pipes, which had there been laid six weeks or more, was completely broken up, showing that the disturbance of the earth must have been of a serious character.

Under the direction of the contractors engaged upon the works, a staff of workmen are proceeding to relay the pipes.

The bill is of sand, and the excavations are said to have been affected by rain finding its way into the sandy bed, and then forcing itself to the surface; but, looking at the immense quantity of soil which has sunk, others think it more feasible to suppose that some springs underground have formed a space into which the roadway has fallen.

SOUTHPORT PUBLIC HALL COMPETITION.

SIR,—The Corporation of Southport recently advertised for designs for a public hall and market, offering a 50*l*. premium for the best set, which "is to become the property of the Corporation," according to the usual formula. On looking into the details of their "instructions," however, with a view to competing, it becomes apparent that a new step in the competition system is to be inaugurated. The theory of architectural competitions commonly is that they are a means of finding out the best man; and all that is necessary for this is that drawings should be sent which will show clearly what is to be the plan and design of the building, and the main principle of construction. The Southport Corporation, however, are wise in their generation; and they not only demand that the plans shall be drawn to a scale of 6 ft. to 1 in. (a regular "working scale," you perceive), and that they must be such as "a contractor's *bond fide* tender" can be calculated on. The real meaning of this is, of course, that the Corporation want to have for their 50*l*. a set of drawings from which the building could be immediately carried out without the farther intervention of the architect.

The building is to cost 7,000*l*.; so that, according to the usual scale of charges, the remuneration for preparing working drawings (exclusive of superintendence) would be about 175*l*.; in place of which the Corporation kindly offer us

50*l*. for the same amount of work (or, rather, the chance of 50*l*.). I, for one, decline to be fleeced of my time and labour in this way; and as I already know one other intending competitor who has withdrawn his intention on the same ground, I hope others will follow suit, and that the result of this unfair attempt on the pockets of the profession will be that the Corporation will get nothing worth even the beggarly amount they offer for full working drawings and specifications for a large building.

A PROVINCIAL ARCHITECT.

THE COMING SOCIAL SCIENCE CONGRESS.

THE special questions for discussion at the Leeds Congress of the Social Science Association, to commence on the 4th of October, under the presidency of Sir John Pakington, Bart., M.P., have been finally arranged by the general and local committees of the several departments. In the Health Department they are:—1. What are the best and most economical methods of removing and utilising the sewage of large towns? 2. What are the best means of securing the sanitary improvement of human habitations? 3. What are the best means of promoting the health of operatives in factories and workshops? Economy and trade:—1. What amendments are needed in the existing laws for the licensing of houses for the sale of intoxicating liquors? 2. What principles ought to regulate the assessment and administration of local taxation? 3. Is it desirable that the State or municipality should assist in providing improved dwellings for the lower classes; and, if so, to what extent, and in what way? These questions will be taken one on each day, and two days will be set apart for the reading and discussion of voluntary papers on other subjects within the range of the departments not specified above.

PROPOSED SANITARY EXHIBITION.

THE Social Science Association have determined, at the request of many persons interested in sanitary reform, to hold an exhibition of sanitary appliances at the forthcoming annual congress, which is to be held at Leeds, from the 4th to the 11th of October next. Among the articles which it is intended to receive, are filters, water-fittings, taps, standpipes and pumps, closet apparatus, models and plans of improved workmen's dwellings, public baths and washhouses, gymnasiums, cottage and temporary hospitals, illustrations of various disinfecting processes, hospital ambulances; illustrations of drainage, farm and sewage irrigation works, specimens of preserved meats and other dietetic articles, improved cooking apparatus, warming and ventilating apparatus, &c. The exhibition is intended to bring under the notice of health officers, and the many men interested and experienced in sanitary questions in various parts of the kingdom who usually attend the Congress, the latest appliances of science having for their object the improvement of the public health, and will probably form a useful as well as an attractive feature of the meeting. As many of our readers will probably be found among the exhibitors, we may add that every information may be obtained on application to Dr. Robinson, Honorary Secretary of the Health Department, Social Science Office, Leeds.

THE HALLINGTON RESERVOIR.

THE directors of the Newcastle and Gateshead Water Company and the members of the Water Committee of the Newcastle Corporation, have paid an official visit of inspection to the reservoir at present in course of construction at Hallington. The works are of an extensive character, and when completed will enable the Newcastle and Gateshead Company to supply the district within the operation of their system with an almost unlimited supply of pure, wholesome water. The new reservoir is situated about 23 miles from Newcastle, in a district lying between 500 ft. and 600 ft. above the level of the sea. The Hallington works have their source or commencement at a point locally known as "Nine Wells." During the last ten years the Newcastle and Gateshead Water Company have brought water from these nine springs to Newcastle, but never stored water at

Hallington. The plan of the new works is simple. The water issuing from the nine springs will in the first place be collected in the natural hot-house in the field in which they are situated, and thence carried along a sunken aqueduct a mile or two in length to the storing reservoir, which is 160 acres in extent, and will hold 600,000,000 gallons of water. The Whittle Dene reservoir, eight in number, it may here be stated, are 140 acres in extent, and hold about 500,000,000 gallons of water. When full the reservoir will, in consequence of its large extent, have a lake-like appearance. Its construction was commenced in 1869, and if all goes well it will be completed, ready for winter storage, about Christmas of this year. At present there are about 150 men employed on the works, principally masons and dry wallers. During the construction of the embankments and other earthwork some 400 navvies were employed. Mr. J. B. McGairie is the contractor in charge of the works. The Tommy-shop system has been discontinued by the contractors, and permission given to provision dealers to supply the navvies, but only on condition that the articles vended should be reasonably cheap and good. No public-houses have been allowed, and hence orderly quiet has been uninterrupted.

THE NEW BOURGHOUS JUSTICES' COURT AT SHREWSBURY.

The court is 40 ft. 6 in. long, by 23 ft. 6 in. wide, and the roof 20 ft. from the flooring. The old ceiling has been removed, and the roof is open to the original rafters, which are of oak, and have been stained and varnished. The same improvement has also been made in the other old timber of the building. The roof appears to have been originally open, so that the room has been restored, in this respect, to the original design of its builders. At the top of the room are four ornamental iron ventilators, with corresponding openings in the roof above; and there are, also, ventilators in each of the four windows. The old diamond-shaped panes of the latter have been removed, and the windows glazed with large squares by Messrs. Done & Davies. The court proper is 20 ft. long. The portion of the room for the accommodation of the general public is 16 ft. 9 in. by 16 ft. It is a raised and sloping gallery, and is without seats. There are two approaches to the Court, one by the old doorway and staircase, which leads to the gallery, and a new one upon the other side of the building. The staircase is Elizabethan, so as to be in character with the building. It is of pitch pine, and varnished. Beneath the staircase is a vault for a heating apparatus. At the back of the Court is a retiring room, 12 ft. by 19 ft. 6 in. At one time some doubts were entertained as to the security of the old flooring; but to allay these, our authority, the local Chronicle, states that the beams which support the floor are 19 in. square, and are so sound that portions which had to be removed for the new staircase, were used for the mayor's chair and carved work. The court is now nearly completed. Mr. Richard Price, of Shrewsbury, builder, carried out the contract under the supervision of the borough surveyor, who provided the plans.

SINKING IN OF COVERED WELLS AND CESSPOOLS AT WOOLWICH.

A YOUNG WOMAN was drowned, the other day, in an old well at 45, King-street, Woolwich. Evidence was given at the inquest to show that deceased went into her garden, and that the ground opened beneath her feet, causing her to disappear into an opening about 30 ft. deep, and half filled with mud and water, in which she was suffocated. It appeared that twenty years ago the pit was a draw-well, and supplied the house with water; but the cutting of the railway adjacent, and the construction of the town sewers, had drained it dry. Seven years since the property came into the hands of Mr. Look, who, finding the well dangerous as well as useless, employed a local builder to cover it over. This he did by removing 5 ft. of the brickwork at the top, and constructing a dome $\frac{1}{2}$ in. in thickness. It was thought that a stratum of sand had been washed away from under the brickwork casing of the well that remained, and that it had sunk like a cylinder to the bottom. Mr. Lewis, a sewer contractor, said he had satisfied himself by sounding that the dome was now intact. The

brickwork had probably given ways sometime ago, leaving a mere crust of earth to entrap the first person who should step upon it. The coroner, in summing up the evidence, said he was unable to fix criminal responsibility anywhere, and the jury could only return an open verdict. The jury then returned a verdict of "Suffocated in a cesspool," and they made a subscription on behalf of Catling, a man who descended into the well and got up the body at the risk of his life.

The ground has since fallen in over another old well in Woolwich, which has increased the alarm and excitement. The tenant of 50, Artillery-place, was standing on the paved footpath in the middle of his back garden, when one of the flag-stones sank under him and disappeared; but by clinging to a post, which fortunately stood close by, he was enabled to save himself from going down into a pitfall, 8 ft. wide, and filled with water to within 20 ft. of the top, the water being afterwards found to be 9 ft. deep. It was evidently the remains of an old well, part of the brickwork being still standing. Mr. Phillips, who had occupied the house seventeen years, had not the slightest idea of the existence of the well. The same afternoon an application was made to Mr. Maude, at the Woolwich Police-court, by the tenant of 59, Beresford-street, in that town, who said that she had found a hole in her garden, which by probing with a clothes-prop she found to be so deep that she could not touch the bottom, and extending nearly all under the garden. After the fatal accident which had occurred she was afraid to go into the garden, and asked the magistrate what she was to do. Mr. Maude advised her to apply to the parish authorities, who, if there was any nuisance, would at once interfere. From a large number of communications which have been addressed to the parish authorities all over the district, it is to be inferred that London is honeycombed with secret wells and cesspools, and it is the opinion of competent persons that the completion of the main drainage scheme has left a large number of these hidden pitfalls insecurely protected, or that, having been forgotten, the foundations and brickwork have become rotten and are giving way.

LAND TO LET IN THE CITY.

A PLAN of the site of the late Debtors' Prison, with a copy of the conditions of sale of that new plot of City building area, has just reached us from the City Corporation. The old prison, it may be remembered, stood between Whitecross-street on the right and Redcross-street on the left, with Fore-street in front, and about midway between Finsbury-circus and the present Meat and Poultry Market, close by where the Metropolitan Railway now passes. The excellence of the site admits of hardly any question; and of this the City Lands Committee, the intending vendors, or rather lessors, appear to be fully aware, stating as one of the conditions of sale, that they "do not bind themselves to accept the highest or any tender that may be delivered in." We may be sure, however, that the committee will accept, and the public be prepared to allow them, terms not only reasonable but advantageous; and we may expect, therefore, very shortly to witness the transformation of one more ancient and venerable quarter of the City into a place of modern aspect and commercial enterprise.

The ground is proposed to be leased on a building lease, or building leases, for the term of fifty years from the 29th day of September, 1871, at a peppercorn rent for the first year, and at the rents to be agreed upon for each of the succeeding years of the term; and the committee is to meet at Guildhall on Wednesday, the 11th of October next, to consider the tenders for building leases which up to that date shall have been sent in.

So soon as the terms of the contract have been agreed upon, and the contract signed, the work is to proceed apace. Thus, the successful contractor is required by one of the conditions of sale to commence the erection of the new buildings within three calendar months from the date of the contract, and to cover in, finish, and complete the same within nine months next thereafter; so that the space of twelve months or less from the month of October next will see the transformation of this spot accomplished.

The buildings which the contractor will be required within that space of time to erect are stated to be "good and substantial brick and stone messuages, to be erected on the whole front next each of the said streets," meaning the Whitecross and Redcross

streets before mentioned, extending along the one street 240 ft. and along the other street nearly 160 ft.; and the plans and elevations of the proposed erections are to be submitted to and approved by the committee or their architect, on behalf of the mayor and community and citizens of the City. In case anything in the plans and projected elevations to be submitted shall be condemned, the contractor is to be bound to adopt such alterations in either of these respects as the committee or their architect shall direct; and in case also the two fronts of the proposed erections, or either of them, or any other part of the said buildings, shall not, when completed, be agreeable to the plans and elevations in question, or to the particulars specified in the specification, which is annexed to the printed conditions of sale, the contractor is to be compelled, at his own costs and charges, to alter the parts that are faulty, as the City architect shall direct; otherwise the City architect is to be at liberty to make the necessary alterations himself, and for that purpose to employ workmen, and do all other necessary things, at the sole expense of the contractor.

The particularly onerous nature of these conditions is apparent, even from the particulars which have been already stated; but there are still other conditions not less onerous, or even more onerous, than these. Thus, the contractor shall be required to take down the external boundary-walls fronting the two streets, and to take all risk of damage of every description that may accrue to the adjoining premises; and he shall also be required to erect and keep in repair a good and substantial hoard before the whole front of the said ground next the public street or highway, and from time to time to remove such part or parts thereof as the City architect shall at any time direct. Moreover, all open and closed areas, cellar-daps, and cellars, are to be constructed and placed according to the rules and regulations of the City Commissioners of Sewers, and the rigorous nature of these stipulations, and of others which we leave unmentioned, carry, indeed, their own justification with them, and carry also with them a justification, because an explanation, of the onerous nature of the rents of City premises, and of the onerous nature and the multiplicity of the covenants of the tenure. The work of the concrete-makers, of the bricklayers, of the masons, slaters, plumbers, and painters is also required to be of the most perfect, and therefore also of the most expensive, sort; and, as all these stipulations and matters indicate the wealth and greatness of the City, and the great force being applied to the improvement of the City, even the autonomy, of the City Corporation within its own domains,—the contractor shall accept the terms, and execute the counterpart thereof without requiring the lessor's title.

. We put on record these conditions as set forth by our correspondent, but we do not find them much more onerous than might be expected.

PAVING.

SIR,—Will you allow me, in answer to "D. W." in reference to his inquiry in your last issue as to paving a large court-yard, to suggest concrete faced with Portland cement; this, if done properly, will be very durable, and much less expensive than stone. H. M. S.

I would recommend "D. W." to try concrete, set on concrete, to pave the court-yard with: it is cheap, and makes a clean, quiet, and solid pavement. BUILDER'S CLERK.

SIR,—"D. W.," who wants a cheap and good paving for a large court-yard, and who objects to tar paving, now generally adopted, cannot do better than use Portland cement concrete. If he uses a mix of 1 part of cement with 3 parts of sand and cement, and the proportion of 1 cement to 2 sand and 6 coarse gravel, and then, having properly levelled his ground, he may wet his mixture and lay down, and will roll it on the surface, the same as with the concrete. The thickness required will depend on whether cart-wheels have to go over it or not. If they have not, 6 in. will be ample, but if they have, then 10 in. to 12 in. would be required. E. G.

ARBITRATION ON LIBEL.

ON Thursday, the 10th ult., Mr. W. C. Habseshon, of London, architect, sat in the board-room of the Rotherham workhouse, to hear evidence bearing on a case of libel, in which Mr. Blackmoor, of Rotherham, architect, was the plaintiff, and Mr. Chas. Morris, builder, also of Rotherham, was the defendant. The case arose out of a Rotherham building affair connected with the erection of a new building of guardians, who some time ago were wishful to erect new wards for cases of fever or infectious diseases, and for this purpose Mr. Blackmoor was appointed architect.

Mr. Morris charged Mr. Blackmoor, in a letter to the guardians, published in our columns, with allowing the builder who had obtained the contract to depart from the specification.

The following is a copy of the arbitration award:—

"Now I, the said William Gibbs Habseshon, having taken upon myself the burden of the said reference, having duly weighed and considered the averments, allegations, proofs, and evidence of both the said parties touching the said matters so as aforesaid referred, do hereby make and publish my award of and concerning the same as follows, that is to say:—I award and determine as the first issue joined between the parties in the said action that the defendant is guilty of the grievance therein laid to his charge. And as to the second issue joined between the said parties in the said action, I do award that the defendant is not guilty of the said grievance, nor is, true in substance and in fact. And I find award that at the commencement of the said action

dition of the lodgings in which they have been housed is something intolerable. Masters must remember that they also have duties as well as rights.

Berlin.—It is announced from Berlin that the masons' strike there has terminated, owing to resolutions adopted by the men. A German paper states that at the commencement of the strike 6,000 masons left work, and that about 2,000 of them, mostly unmarried, quitted Berlin. According to the same paper the strike had cost the men about 200,000 thalers in wages, and the money they have received in support of their movement has not amounted to a sixth of that sum. About 800 resumed work on the old conditions. Only 7 of the 287 builders and master masons of Berlin accepted the proposals of the workmen's committee, and the chief of these have since withdrawn their concessions, and are resolved only to employ masons on the old conditions. The statement that the London "Internationals" voted 15,000 thalers in support of the strike is not considered trustworthy.

WATER SUPPLY AND SANITARY STATE OF WELLS.

It may be remembered that last December Mr. A. Taylor held an inquiry into the sanitary condition of this town, a memorial having been numerously signed charging the local Board with a neglect of duty in not providing a sufficient water supply, &c. After entering into many particulars, Mr. Taylor concludes his report thus:—

"If Holes Ash Spring is ever to supply Wells with water, an Act of Parliament giving powers of compulsory purchase is almost certain to be needed, thus largely adding to the cost of what would otherwise have been a very cheap scheme. On the other hand, in February last, Mr. Bell reported strongly in favour of resorting to the original source of supply,—the conduit water,—only using modern appliances to lift the water high enough to insure proper pressure and distribution. If, on further consideration and examination, the quantity and quality of the water from the spring in the garden of the bishop's palace prove to be as Mr. Bell reports them, and if a careful estimate of the cost does not much exceed that put roughly by him at 3,000*l.*, then I consider that the town council are bound to give the matter further and early consideration. The promoters of the Joint Stock Company having, through no fault of their own, failed in their endeavours, the question of the water supply is now once more in the hands of the town council, as the responsible public authority for the city. As regards their general sanitary administration, I consider that the Town Council ought at once to set about the completion of their sewerage system, so as to prevent any offensive matter from going into the mill stream in its course through the city. They also ought to enforce better scavenging regulations for the removal of night-soil and solid house refuse. Having regard to all the circumstances, I do not consider that I ought in the present instance to recommend the issue of any compulsory order under the 49th section of the Sanitary Act, 1866."

The majority of the Somerset towns are notoriously in a bad sanitary state. For months upon months we have reiterated this fact, but not until our monition assumed a graver shape, and pestilence stalked abroad, has tardy action been taken. We trust, even at the eleventh hour, some energetic measures will be adopted, not in scotching, but in killing the plague germs at their root. Vendors of poisoned food can be squelched by the due administration of the law. Why should not those who are answerable for our poisoned water supply be held equally accountable?

Until some such powers are invested in the hands of a public prosecutor, the poisoning system of water supply in our towns will go on piecemeal.

FROM SCOTLAND.

Edinburgh.—It is now decided, it seems, that the Prince Consort memorial is to be placed in Charlotte-square. The consent of all the proprietors of the square has been obtained, and the Queen is understood to have signified her cordial approval of the proposed arrangement. According to the plan which has been adopted, the memorial will be placed in the centre of the square garden,—the area raised off for its re-

ception being rendered accessible to the public by means of a broad pathway approaching from the east. In the position now selected for it, the monument will be seen to advantage from the whole length of George-street, as well as from other streets debouching upon Charlotte-square. To carry out the necessary alterations in the square, and to substitute granite for freestone in the construction of the pedestal, something like 3,000*l.* will be required. A portion of this sum has been raised. Several of the subsidiary figures and bas-reliefs have been completed. Mr. Steel, says the *Scotsman*, still lingers over the principal figure, touching and retouching; but, so far as he is concerned, there will be no delay, for the time required for the erection of the pedestal will suffice for putting his work into the bronze.

Aberdeen.—The restoration of St. Machar Cathedral, Aberdeen, has been slowly progressing during the past two years. The galleries which disfigured its internal proportions, and the thick coatings of plaster which covered the massive granite columns of the aisles, have been removed; the fine old oak ceiling, blazoned with the armorial bearings of the bishops and principal Scottish nobles of the fifteenth century, has been repaired with care, and the colours of the quarterings are again fresh. The whole of the nave and side aisles have been re-seated. Externally the decaying parts of the roof and stone-work have been put into repair, and in this, as well as in many matters connected with the internal restorations, Mr. Gilbert Scott has been engaged. His suggestions have been ably carried out by Mr. James Matthews, architect, under the superintendence of a committee of subscribers. Part of the proposed scheme of restoration consisted in filling the windows with painted glass; but the resources at the disposal of the committee were well nigh exhausted when three applications for permission to fill windows were made by gentlemen belonging to the city. Shortly after this, an application was made to the surviving members of the Gordon Statue Committee to devote the surplus fund at their disposal (about 400*l.*) to filling the great west window with painted glass as a further memorial of the late duke. This proposal was readily agreed to by these gentlemen, who commissioned Messrs. Clayton & Bell, of London, to execute the work, which has since been carried out by them. Naturally, the much-voiced question, "What is good glass and where can it best be had?" had to be solved, and at one time Munich seemed to have carried the day. There were, however, among the committee some who held that Munich glass was essentially wrong and false, ignoring in its most vital points the principles of glass-painting as practised at the period of its highest development (the thirteenth and fourteenth centuries). The matter having been brought under the notice of Mr. Ruskin, a letter from him was received by a gentleman in Aberdeen, in which he says:—

"The German glass is very delicately executed, and as it consists of pretty sentimental pictures rendered striking by transparent lights, it always pleases the public, partly as a magic lantern does children, and partly because there is really much merit in the drawing and finish of the work, and sometimes considerable dramatic interest in the German revival of Catholic traditions. But the school is essentially a barbarism."

Mr. Ruskin referred his correspondent to the appendix to the second volume of his "Stones of Venice" for the principles of right in glass-painting, as he views it; but he stated that no English or Scottish firms that he knew of were capable of designing glass in this manner. The commission to fill the three windows in question was given to Mr. Daniel Cottier, of London, a Scotchman by birth, and formerly a student in the schools of the Royal Scottish Academy. The largest of the three windows is the gift of Mr. J. E. White. In the one light is the figure of St. Paul, and in the other a figure of John the Baptist. The window next in order and in close proximity, was presented by Mr. George Reid, A.R.S.A. The figures represent St. Luke and St. John. The third window is the gift of Messrs. Alexander & James Walker, Aberdeen. The figures represented are St. James and Mary.

Dumfries.—To St. Andrew's Roman Catholic Church a large addition is to be made. The nave is to be lengthened 50 ft., with transepts on each side of the new portion, so as to give the church a cruciform appearance. The east end of the nave will form an apse, with a dome. In each transept there will be a chapel. The arches of the transepts will rest on pillars of Dalbeattie granite polished, and on each side of

the apse will be square columns of red freestone with panels of polished granite. These columns will be ornamented with carving of scroll work. The cost of ground, which will afford additional playground to the school in connexion with the church, was 1,000*l.*, and the expense of the building will be about 3,000*l.*, the whole being defrayed by the Hon. M. C. Maxwell, of Torregles.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Oldcoats.—The new church of St. Helen, Oldcoats, built and endowed by Mr. Edward Challoner, has been opened for divine service (the R.C.) Bishop of Nottingham. The church is designed in the style which prevailed in England in the middle of the fourteenth century, and comprises a nave, with south porch, chancel and chancel aisle, and transept. The chancel aisle is divided so as to form a chapel and an organ-chamber, separated from the chancel by screens. The windows have flowing tracery, and the arches are of stone, moulded. Roche Abbey stone is the material of the wall and for the roof and other timbers, the screen organ-case, traceried doors, benches, &c., and is exclusively employed. The flooring is encaustic and plain tiles, a memorial of the ancient Roman pavement discovered on the site during the progress of the works being formed by a reproduction of a portion of the pattern of the tiling of the nave. The altar and font are of Roche Abbey stone. The roof is covered with tiles, with an ornamental pierced cresting. On the north side of the church is a sacristy communicating with the presbytery, both of which are designed in harmony with the church. The architect is Mr. S. J. Nicholl, of London, and the builder, Mr. J. Athron, of Doncaster. The organ was built by Messrs. Forster & Andrews, of Hull.

Darlington.—The School-Chapel, erected Nestfield-street, Albert-hill, Darlington, memory of the late Bishop Hogarth, the foundation stone of which was laid on the 15th October last, has been opened. The walls are built of red pressed bricks, interspersed with bands of black bricks. The windows are relieved by black arch bricks, Lazonby stone for key-stones, springers, and moulded red brick cornices. The front of Nestfield-street is symmetrically arranged. In the centre is a triple lancet window, over which rises a lofty central gable, with projecting roof, acting as a canopy to protect the stone niche, in which is placed a statue of St. William the Bishop, executed by Messrs. Farmer Brindley, sculptors, London. On each side this central window there are five coupled lancet windows. In the centre of the school roof is a large ball-turret of open timber-work, covered with a slated spire, surmounted by a gold cross. The east front, facing to what will hereafter be Hogarth-street, has triple lights, the upper part filled with stone tracery. This front has a projecting gable, supported by timber brackets on stone corbels, finished with woodmouldings. The west front, to Barton-street, has a similar finish to the east front. From Barton-street the building is entered by a gateway, bounded by pillars and wrought-iron railings, leading into the girls' yard, and then through the principal porch into the large school room, 122 ft. long by 24 ft. wide. The school is lighted by coupled lancet windows, and the three large triple lights before mentioned. The walls are lined with white bricks, 4 ft. high and plaster above. The roof is open-timber. All the interior woodwork is stained and varnished. The schools are warmed by hot water pipes, and Messrs. of Loughborough patent boilers. The ventilation is effected on open windows, Sherringham's patent air-valve and ventilating turret in roof. The boys have separate entrance-porch and playground. The schools have accommodation for 870 children, and are fitted up with Bank's patent school desks. The gasfittings are supplied by Mr. D. Dory, of Manchester. Separated from the educational department of the building by a partial timber partition is the sanctuary. The altar is of Caen stone, and is divided into five arched bays by pilasters of Serpentine marble, and these are overhung by vine-leaves and clusters of grapes. The design is intended to present to the eye the symbol of the Holy Eucharist, or the Lord's Supper. The whole has been executed by Messrs. Priestman, of Darlington. Above the altar is a window of stained glass, and on each

a statuette. The cost, including boundary line and heating apparatus, will be about 100*l.*, exclusive of land and furniture. The role of the works have been designed and carried out under the superintendence of Mr. Edward Robinson, of Darlington, architect. The contractors are:—For brick, stone, and plaster work, Messrs. M. Watson & Son; for carpenter and joiner's work, Messrs. Laverick & Foster; plumber, glazier, and gasfitter's work, Mr. Johnson; for slater's work, Messrs. Wharres; and for painter's work, Messrs. Harrow, of Darlington.

STAINED GLASS.

Wiley New Church.—The east window of this church, consisting of three lights, has just been filled with stained glass, in memory of the late Sir Robert Mitford. The design and work were supervised by Mr. J. W. Knowles, of York. At the base of the window is the following inscription:—"Erected by friends to the memory of Sir Robert Mitford, County Northumberland, 1st Baronet, Bart., in this county, Lord of the Manor of Filey, and a benefactor to this church. Died June 18th, 1870."

Wyvenhoe Church.—The window in memory of the late Mr. J. Gurdon Rebow, M.P., has been placed at the east end of the south aisle of the church, and contains three lights, with tracery designs, of Flamboyant style. The subjects are placed under canopies, and represent, on the left-hand side, "St. Peter at the Beautiful Gate," the right-hand side, "The Martyrdom of Stephen," and in the centre, "St. Paul preaching." The panels below the subjects, and also the tracery openings, are in grisaille glass, to harmonise in effect with the canopies.

Miscenden Church.—A stained-glass memorial window has been erected in the chancel of this church to the memory of the late rector. The subject is the Ascension of our Lord. At the upper part of the window is the company of angels watching the ascending figure of our Lord; on either side is an angel adoring; the whole being surmounted by the sacred monogram. The artists were Messrs. Ward & Hughes, London.

Acton Church.—A painted window, dedicated to the memory of the late Earl Howe, lord of the manor, has just been inserted in the east end of the church. The window, which has been put at a cost of about 130*l.*, has been erected by tenants and intimate friends of the deceased nobleman, and is a representation of the Last Supper, accompanied by the words of our Lord's terrible command, "Forasmuch as ye eat this bread, and drink this cup, ye do show the Lord's death till he come." The window was designed and executed by Messrs. Heaton, Butler, & Payne, of Covent-garden, and the stonework has been done by Messrs. Keogh, of Sudbury.

St. Luke's, Reading.—This building has had its east window filled with stained glass by Messrs. O'Connor, of London. The entire design embodies a *Te Deum*. The window consists in its stonework of four main lights, and tracery terminating in a sexfoil ope. At the base of the window in the two central ope is a picture of the Birth of our Lord; in the background is shown the angelic announcement to the shepherds. On a level with this picture on each side are represented the Psalmist and the prophets. In the upper part of the two central ope are groups of saints, representing the story of the Church, looking up in adoration of the Saviour in glory, whose seated enthroned figure fills the sex-foil great ope of the tracery. The outer opening of the upper part of the four main lights, and all the other openings of the tracery, consist of the angelic host in attitudes of praise, and some bearing censers. The division between the subject of the Nativity of our Lord and His glorification is treated with a pictorial representation of the manger as a ruined place, according to some ancient authorities. All mere ornamentation is strictly avoided in the treatment. Our Lord is surrounded with the rainbow.

St. Mary's, Aylesbury.—This church has been enriched with another stained-glass window, placed in the south chapel by Mr. and Mrs. James Cooley, to the memory of their only son, the late Mr. Arthur Jas. Cooley. The window is the work of Messrs. O'Connor, of London, the same artists who were employed to execute the Tindal window at the west end of the church. The new window represents the miracle of the healing of the centurion's servant, as recorded in St. Matthew and

St. Luke. There are six subjects, two in each of the three lights of which the window consists, representing (1) the centurion dedicating the synagogue; (2), the centurion in command; (3), the centurion watching over his sick servant; these three form the upper pictures of the three lights. Below are (4), the messengers coming to Christ; (5), Our Lord healing the servant by His word; (6), the servant healed, and the centurion in adoration.

Miscellaneous.

Progress of Co-operation.—The manager of the Agricultural and Horticultural Co-operative Association furnishes statistics from which it appears that 710 co-operative societies have made returns to Government. In 1867, 577 did so; and in 1866, 441. As the number of societies making returns was only two-thirds of the total number registered, 1,000 societies must have been registered up to this time. The share capital of the 710 societies included in the new return amounts to close on two millions, the exact figures being 1,978,255*l.* To this must be added a sum of 190,895*l.* of loan capital deposited with the societies on interest, and used by them for carrying on their business transactions. The return shows the average size of shares in all the co-operative stores to be about 1*l.* 6*s.* 6*d.*, and the average investment by each member about 9*l.* The marvellous profitability of co-operative trading is now generally admitted. The return illustrates the phenomenon anew. The net profits returned by the 710 societies for 1870 amount to 604,042*l.*, or nearly 28 per cent. per annum on all the capital employed. The Civil Service societies, which will probably figure more and more largely upon the returns every year, do not, as a rule, exhibit their gains for their members as "profits." They reduce the prices of their goods instead of giving a bonus or drawback on purchases.

Higham Ferrers.—The sanitary condition of this town (says a correspondent) is very bad. Typhoid fever is, and has been for some time, very prevalent. The spread of this disease is attributed to the ill-constructed underground drainage works, which were completed last winter. The sewage matter, which before had been carried off by open drains, is now concentrated in pipes which are not properly flushed with water; the result, as might naturally be expected, is that the air is poisoned by the rising of deleterious and offensive gases. It is impossible to walk the streets without one's olfactory organs giving unmistakable evidence of this. The water obtained from the town pump, and from whence many of the houses have their supply for domestic purposes, is quite unfit for wholesome use. If kept for a single night it is quite offensive, and a film spreads over the surface. In some houses as many as seven or eight people have been ill of the fever, and it is high time the authorities of the town took some steps in the matter, as it is commonly reported that the drains are very incorrectly and imperfectly laid.

Liverpool Art Exhibition.—This year Liverpool will probably have an exhibition of paintings in oil and water colours in many respects superior to anything previously shown in the town. The town council has given a guarantee that the collection shall comprise only works of a high order, and in that respect that it shall be far superior to any of its predecessors. This exhibition is to include works of modern artists. Four spacious rooms in the Free Library and Museum have been devoted to the exhibition, and the hanging committee are now actively engaged in arranging the places for the pictures. The exhibition, which will open on the 4th of September, will comprise about 200 productions of the leading artists of the day, many of them brought from the Old and New Water Colour Society, the Dudley Gallery, and the Suffolk-street Gallery, and will continue open to the end of October. There will also be some statuary.

International Exhibition.—Mr. Buckmaster delivered a lecture on the pottery collection of the Exhibition, in the Albert Hall, on Saturday. There was a much better attendance than usual, and those present appeared much interested with the explanations of the various processes employed in the manufacture of pottery and porcelain. Mr. Buckmaster referred to the majolica and imitation Palissy ware.

Kidderminster New Waterworks.—These works are now approaching completion, so far as laying the pipes and the construction of the reservoir are concerned. The well-sinkers are drilling through the rock, which in some parts is so hard that they can only work down 1 ft. a day, sometimes less. Altogether, they expect to have to work down to 400 ft. before they get a sufficient supply. The reservoir is built at the top of a hill, on a level with the top of St. George's Church. It is 200 ft. square, and is faced with brickwork, 9 in. thick, behind which are 3 ft. of stonework, padded with 2 ft. of puddle. The bottom resembles a sea-beach, being covered with shingle, underneath which are 2 ft. of puddle, 1½ ft. of concrete, and 2 ft. of gravel. The main pipes are 12 in. in diameter, and the main and service pipes are being rapidly laid all over the town. The reservoir is ready.

The London General Omnibus Company. The report of the directors states that the gross receipts of the company during the half-year ending 30th June, 1871, were 267,343*l.* 4*s.* 8*d.*; in the corresponding period of 1870, they amounted to 268,215*l.* 15*s.* 5*d.*, being a decrease of 872*l.* 10*s.* 9*d.* In the half-year ending June 30, 1871, the number of passengers carried by the company's omnibuses was 21,256,221; 1870, 21,417,533. The number of omnibuses working on week-days was 575; 1870, 587. The average traffic receipts per omnibus per week, was 17*l.* 2*s.* 8*d.*; 1870, 17*l.* 7*s.* 10*d.* During the half-year seven new omnibuses were issued for service from the company's coach factory. The directors have made arrangements for horsing the tramway cars, and are carrying on those services. The directors propose to declare a dividend at the rate of 5 per cent. per annum, free of income-tax, which will take 15,366*l.* 18*s.* 9*d.*; leaving to be carried forward to next half-year's account, 3,218*l.* 15*s.* 3*d.*

Sanitary Condition of Grimsby.—Dr. Horne, a commissioner from the Privy Council, having made an inspection of Grimsby in respect to its sanitary state, met the members of the local Board of Health at the town-hall, and laid before them the result of his experience, upon which he will found a report to Government. It appears from Dr. Horne's remarks that Grimsby is in a bad condition, with a high mortality. The state of the water-supply is alarming, and there is a want not only of drainage, but of cesspits, &c., as a substitute for drainage. Dr. Horne said his report to the Privy Council would be printed and a copy furnished to the Board, and if they hesitated to act on his recommendations he intimated that the Government authorities would step in and carry them out compulsorily at the town's expense.

Presentation to Sir Titus Salt.—The club and institute at Saltaire have had a meeting in honour of the founder and builder of the village and the donor of its public edifices and park. A very large number of Sir Titus Salt's work-people, together with many of his admirers, met in the lecture-hall, for the purpose of presenting him an address and a full-length portrait of himself in oil, towards which there were 2,296 subscribers. The address was illuminated by Messrs. Armitage & Ibbeson, of Bradford. It was inclosed in a gilt frame, surmounted with the coat of arms of Sir Titus, which bears the motto "Quid non Deo juvante." Accompanying the address was a volume, bound in maroon morocco, containing the names of 2,170 subscribers. The portrait is by Mr. J. P. Knight, of London, the secretary to the Royal Academy.

Proposed Stephenson Memorial Hall in Chesterfield.—A meeting has been held in the municipal-hall, Chesterfield, consisting of deputations from the committees of the local Mechanics' Institute and the Association of Civil and Mining Engineers, to consider if terms could be agreed upon as a basis of amalgamation of the two societies, with the ulterior object of raising a building in which both could be efficiently accommodated. A suggestion, which met with general favour, was made that a Stephenson Memorial Hall should be erected, at a cost of about 5,000*l.*, the shares to be taken up by a limited liability company, in which the two institutions, with other kindred societies, could invest their funds as shareholders.

Fever Hospital for Leicester.—The Corporation of Leicester have decided to erect a fever hospital in that town, according to the requirements of the Privy Council, and have appointed Mr. Thomas Barnard, of Leicester, architect for the new buildings.

Lightning.—In a paper addressed to the Academy of Sciences, and reported by Galignani, M. Wilfrid de Fonville gives an account of the effects produced by lightning a short time ago in the Convent de la Providence, Rue Leclerc. A curious circumstance was this, that a leaden pipe had been melted and had ignited the gas which it contained, although the point of fusion of that metal is not sufficiently high to produce that effect. The stroke was really formidable, and the percussion felt at considerable distances, 250 yards and more,—in one instance, at 1,000 metres. As to the ignition of gas by lightning, another instance occurred at the Salpêtrière, where a leaden pipe issuing from the wall immediately re-enters it in proximity to a cast-iron tube, which must have carried off a large proportion of the lightning. Notwithstanding this the heat developed was such as not only to melt the lead, but to volatilise it and ignite the gas. Experiments with electricity on so gigantic a scale being pretty nearly impossible in a laboratory, M. de Fonville intends gathering all the information he can on similar cases, it being highly probable that many fires, the cause of which could not be ascertained, have owed their origin to electricity.

Iron Churches at New York.—Ironclad churches are becoming a feature in New York architecture. Four of these edifices are now in course of erection, the most insignificant of which is to cost 31,000 dollars, and the most sumptuous, 61,000 dollars. The Brooklyn Tabernacle, capable of seating 3,200 persons, was finished last year, at an outlay of 35,000 dollars, and it has since given rise to an animated professional controversy. It is a circus-like structure, having a framework of timber, inlaid with brick, fluted iron being nailed over the wood-work outside. The cost is about half that of stone, and its advocates contend that the fluted iron is a great advantage on acoustic grounds.

Northern Architectural Students' Society.—By permission of the Earl of Durham, a meeting of this society was held at Lambton Castle on Saturday afternoon. The members composing the party travelled to Chester-le-Street by rail, and after inspecting the ancient church there, walked to the castle, where they were met by Mr. Leighton, the resident architect, who conducted them over the building and grounds. After leaving the castle, the modern church of Burnmoor was visited, and an opportunity afforded for viewing the memorial window to the late Countess, which was to be unveiled on the following day. The party returned home by rail from Fence Houses.

Flushing Pipes and Drains.—With a view to this Messrs. Harrison & Son have devised and manufactured a neat and inexpensive plug, of wood and gutta-percha, by the use of which the basin of a closet may be filled with water; the weight of which, when the plug is withdrawn, cleanses the pipes and traps. If this flushing were done half-a-dozen times in rapid succession in the houses in any neighbourhood once every day at or about a fixed time,—say, when the water is flowing into the cistern,—the cleansing effect on the sewers of the district would be very considerably greater than if the same quantity of water were dribbled away in the ordinary manner. Care must, of course, be taken to have a plug to fit the opening in the pan.

The Government Official Shifting System. Mr. Nasmyth, the engineer, has published an energetic protest against the "vicious and insane" system of short periods of service, involving the frequent removal of superintendent officers, which he declares "has worked incalculable mischief" in our dockyards and arsenals. Under this system the Government are about to remove Colonel Dixon, the superintendent of the Enfield rifle factory, which, Mr. Nasmyth says, is "a perfect model of organisation, order, and efficiency, and the admiration of all who are competent to judge on such a subject."

Progress in Siam.—A Java paper states that the King of Siam has abolished slavery in his kingdom from and after the 1st January, 1872. A good commencement has also been made in laying out of new roads and the erection or building of new bridges of a substantial nature, whereby the development of the varied resources of the kingdom of Siam will be much furthered. The proposed visit of his Majesty and suite to Calcutta will enable them to carry out plans for improvement with creditable vigour and effect.

To Destroy Ants.—The remedy that I have found most effectual, says a correspondent of the *Gardeners' Magazine*, is pounded chalk, which soon banishes them when sprinkled about their haunts. Melon frames may soon be cleared of them by sprinkling the chalk over the surface of the bed, and they can be prevented from going up trees by placing a circle of chalk round the base of the stem. Has the remedy of an alkaline base, such as lime, anything to do with the neutralisation of the formic acid of the ant? If so, would not quick-lime be still better, or the more solvent soda or potash?

Cost of New Workhouse Hospital in Newcastle.—The entire cost of the main building has been 11,343l. 3s. 7d., and the extras amounted to 1,301l. 2s. 8d., making the total of the main cost of the building 12,644l. 6s. 3d. The cost of the basement has been 738l. 12s. 1d., which brings the total up to 13,382l. 18s. 4d. In addition to this, there are the washhouses, not included in the original contract, and which cost 981l. 0s. 6d. The boundary walls and palings cost 537l. 4s. 1d., and a sum of 223l. 2s. was paid to the clerk of the works.

Victoria Theatre, Waterloo-road.—This theatre is undergoing extensive alterations from plans by Mr. J. T. Robinson, of Haverstock-hill. The auditorium will be considerably enlarged by cutting the stage back, and the whole of the present floors and galleries removed and reconstructed. The entrances and staircases will be re-arranged and enlarged, and the stage and appliances replaced. The entrance front is to be re-stuccoed, and the flank walls coloured and pointed. The contract has been undertaken by Mr. T. Snowden, of Harrow-road, for 5,600l.

Proposed New Town-hall for Lydney.—A public meeting has been held at the Market-hall, Lydney, to consider the best site for the intended new Town-hall. Ultimately it was resolved that the site should be in the Moorlands, near to the toll-gate. The chairman expressed a desire to have a new road made through the Moorlands, and offered to give the land necessary for that purpose, a proposal that was greeted with applause, and cordially accepted.

The proposed Public Park for Stalybridge.—At a public meeting, the burgesses of Stalybridge have resolved to carry out the long-projected public park; that the Highfield estate, from its central situation, picturesque surroundings, diversified scenery, and spacious buildings, should form the nucleus of the park; and that the offer of Lord Stamford to remit the chief rent on that estate is deserving of their best thanks. A committee has been appointed to carry out the resolutions.

Stone's Patent Box.—Externally this is an ordinary book-shaped box for letters, accounts, or pamphlets, as the case may be; but it possesses this advantage, that by a very simple arrangement inside, the papers, whether few or many, are held down at the foot, and so can be examined, and any single paper removed without deranging, or in any way interfering with, the others. The box is made of various sizes, at a low price, and we can safely recommend it as well adapted for its purpose.

The Iron and Steel Institute.—The annual country meeting of this trade association has taken place at Dudley. The rooms of the Dudley Mechanics' Institution were the headquarters of the institute, where every accommodation was provided for the discussions connected with the iron and steel trade of the kingdom. Mr. H. Bessemer is the president, the Duke of Devonshire the past-president.

Irish Imitation of the Vendôme Obelisks.—An attempt has been made to blow up the obelisk erected at Kingstown to commemorate the visit of George IV. to Ireland in 1821. A heavy charge of powder was inserted between the base of the structure and its pedestal; but though the explosion shook the surrounding buildings, the monument remains unimpaired.

Four Men Buried Alive in Watling-street.—Four men were engaged digging earth in Watling-street, from a ground floor, in order to make an opening for the foundations of intended new buildings. Whilst excavating, the earth, gravel, &c., fell upon them, and they were buried, but were got out alive, though black in the face.

Exploration of the Tiber.—A Roman or Italian archaeological association has set on foot the project of exploring the bed of the Tiber.

Ways and Means for the London School Board.—This Board has adopted a report from the Finance Committee, in reference to a sum of 100,000l., to be borrowed by the Board from the Public Works Loan Commissioners. The Education Department have recommended the Commissioners to lend the money on the understanding that it is to be repaid in fifty equal annual instalments.

Sinking of a Steam-Boat Pier at Chelsea.—A narrow escape has occurred to a great number of passengers through the foundering of a floating landing pier at old Battersea Bridge, during the late gale.

Scientific Instruction.—An association for the promotion of scientific instruction among working classes, in connexion with the Government Science and Art Department, has been formed at West Bromwich, and on Monday evening the movement was formally inaugurated.

The Army and Navy Club-house.—Pall-mall is just undergoing a thorough cleaning and painting, and some of the rooms are being re-decorated. All is being done under the supervision of Mr. Alfred Smith, architect.

Decoration.—Miss Garrett, a younger sister of Mrs. Anderson and Mrs. Fawcett, has determined to devote herself to house decoration profession.

New Baths at Harrogate.—At Harrogate a set of baths, erected at a cost of 20,000, have been opened.

TENDERS

For proposed alterations at the Arras Arms, B. street, for Mr. Goddard, Messrs. Bird & Wall, architects:—	
Bell.....	£497 0 0
Fish.....	415 0 0
Eds & Sons.....	385 0 0
Brown.....	377 0 0
Williams & Son.....	367 0 0
Morison.....	363 0 0
McLeland.....	315 0 0

For alterations at the Codrington Hotel, Elgin-road, Notting-hill, for Mr. Panetti, Mr. Pennington, architect:—	
Middlewalter.....	£259 0 0
Horne & Foulds.....	215 0 0
Saunders.....	195 0 0
Mann.....	187 0 0

For alterations and decorations to a warehouse, L. lane, City, Mr. Herbert Ford, architect:—	
Henshaw & Co. (accepted).....	£236 0 0

For decorations and alterations to fittings to a warehouse, Mr. Herbert Ford, architect:—	
Lawrence & Sons (accepted).....	£214 0 0

For the erection of school, &c., in connexion with Congregational Chapel, Boston-road, Brentford, John W. Smith, architect:—	
Gibson, Brothers.....	£235 0 0
Wiles.....	411 0 0
Brundson.....	347 0 0
Bostel (accepted).....	318 0 0

For new factory, for the Patent Plumbago Company, Battersea. Quantities supplied by Mr. W. Bockshell:—	
Sharrington & Co.	£3,111 0 0
Breeze & Hamsay.....	2,886 0 0
Jackson & Shaw.....	2,824 0 0
Bracher & Son.....	2,690 0 0
Manley & Rogers (accepted).....	2,587 0 0

For new schools, teachers' residences, &c., at Misseon and Lees, Bucks. Quantities supplied, Mr. A. Vernon, architect:—	
Clarke & Hobbs.....	£1,680 0 0
Reavell.....	1,600 0 0
Hunt.....	1,600 0 0
Woolmans.....	1,551 0 0
Corby.....	1,548 0 0
Honour & Castle.....	1,457 0 0
Holland.....	1,450 0 0
Dover, Dowel, & Co.....	1,476 0 0
Stall.....	1,453 0 0
Spicer.....	1,430 0 0
Clarke & Holland.....	1,375 0 0
Smith & Fincher.....	1,305 0 0
Almond.....	1,202 0 0
Johnson.....	1,289 0 0
Taylor.....	1,285 0 0
Taylor.....	1,350 0 0

For corn store, Abbey, Reading, for Mr. R. Oakley, Messrs. W. & J. T. Brown, architects:—	
Wheeler, Brothers.....	£438 0 0
Barclat.....	439 0 0
Mathews (accepted).....	427 0 0

For residence at Birdhill, for Mr. Henry Hoare, architect, supplied by Mr. W. Davie:—	
Harborne.....	£1,061 7 4
Partridge.....	1,050 0 0
Jeffery & Fritchard.....	1,040 0 0
Twigg & Rowe.....	1,039 0 0
Bloore.....	1,028 10 0
Parton (accepted).....	1,024 10 0

Builder."

The Builder.

VOL. XXIX.—No. 1492.



French Solutions of Social Difficulties.

ITHIN the last few weeks there has appeared in Paris a work by a somewhat remarkable person, M. Godin, the wealthy manufacturer, and the founder of the Familistère at Guise, who is now a member of the National Assembly. It is entitled "Solutions Sociales,"* and is an attempt to classify social difficulties and to suggest means by which they may be removed. It contains also a statement of social requirements, and unfolds plans by which more comfort and happiness can be at-

tained by more people than the usual mode of life permits. We say usual mode of life advisedly, because, if we follow M. Godin aright, in the acute, abrupt, positive, personal, and dissonant meditations of his book, we must allow that the community of families now established at the Familistère are getting as much comfort and happiness in return for their properly organised labour as they could expect to have. It is now about six years since we gave an account of this establishment.† We may repeat that it is a group of buildings containing model homes for the workmen and women employed by M. Godin in his factories and foundries; which are not only fitted with many sanitary appliances, but provided with stores on a principle akin to co-operation, besides numerous arrangements calculated to enable them to partake of luxuries, or the equivalents of riches, such as baths, restaurants, amusements, music, schools for their children, nurseries for their infants, well-kept gardens, &c. Hitherto the Familistère has been described only by visitors. Now we have the advantage of hearing the founder's own explanation of it, and learning the working of the thoughts of his heart that induced him to build it. The history, description, and account of the management of this experiment form the most valuable part of the work. It is the main social solution. But there are others, equally thoughtful, to be made out in the autobiographical details and social and political treatises of which the rest of it is composed.

M. Godin's, "Social Solutions" were completed before the investment of Paris by the Germans; but this event, with the subsequent

civil war, delayed the publication of his work till the present time. It was undertaken, he declares, as a preservative from the tempests he saw brooding on the social horizon, and he little thought the storm would have burst upon his country before the book appeared. If he set himself to write it again, therefore, he would have to make some slight alterations to adapt it to the present aspect of political affairs; but the great bulk of the work, his cogitations, convictions, and solutions, would be the same. With this preface he presents it to his compatriots for the general welfare. We will now, without comment, put our readers in possession of the views of this energetic philanthropic French manufacturer.

His first chapter is divided into two headings, fantastically,—the incubation of social ideas and the social idea in action. But the first division contains little more than the statement that though passion for material interests, earthly vanities and authorities may induce France to abandon her civilising mission, Frenchmen will ever be faithful to a love of progress and liberty, except a polite apology for the literary workmanship of the book, which, owing to his constant contact with workers in the field and foundry, is, he is afraid, less polished than it might have been. In the second he relates that his friends asked him why he did not give publicity to his schemes for the improvement of the comfort of the section of mankind of which he saw so much; and he replied that it appeared to him better to act than to talk; and that for a long time he meditated and acted in silence, till he had accomplished the foundation of the Familistère,—till his Utopia was a flourishing success. But now he desires imitators, and there is no longer occasion for careful silence. He proceeds in chapter the second to give an account of his childhood, because from his earliest remembrance, when he sat upon the form of his village school, and when he worked in the atelier of his father, when, eleven years and a half old, he had already begun to think of the great undertaking of his life,—when he left home and began his career as an *ouvrier*, working from five in the morning till eight at night,—this thought was ever before him:—"If I am able to elevate myself above the condition of an *ouvrier*, I will look for the means to render a workman's life more supportable and enjoyable, and to raise labour from its abasement." The third chapter tells us how he founded a new industry,—the manufacture of cast-iron stoves,—and set up as a master, or *chef d'industrie*. The various divisions in a working day in different parts of France are discussed, for Paris has but eleven working hours while the provinces toil on for twelve and thirteen. The various modes of payment are also mentioned. Payment by the hour is set forth as superior to that by the day, because it is then no longer the desire of the workman to endeavour to shorten his time; but payment by piecework is placed above either. To prevent the usual jollification and idleness that take place in a large factory when all the men receive their money on the same evening, either weekly or fortnightly, M. Godin adopted the plan of dividing his men alphabetically into sections, and of paying them fortnightly, but on four different days of that fortnight, the Tuesdays and Fridays. By this means they are not all in funds at the same time, and there is not the old inducement to stand treat and be treated: the allurements of the cabaret have ceased. And all fines deducted from wages, either for breach of regulations or defective work, he hands over to the *caisse de secours*, the equivalent of our sick funds. These, then, are two of his solutions.

The fourth chapter drifts away from practical experience. It is devoted to the democratical principle. Man has his rights, and one right is that those who create riches should enjoy them. A man has a right to be a free and independent

citizen, ennobled by, first, political, and then, social reform. Whilst M. Godin, however, was turning over in his mind these facts, and the best mode of reconciling the interests of a large industry with the intellectual, moral, and physical well-being of the workpeople, the events of 1848 occurred, and the development of the prospects he began to form was postponed.

He proceeds to discuss, with much sympathy, the Socialism that occupies itself with the amelioration of the condition of individuals, not by reforming the constitution of empires, but by intellectual, moral, and physical renovation; after that, the St. Simonism that demands that political, religious, and administrative direction should be given to philosophers, artists, and *industriels*; then, the impracticable Communism that, he expounds, is the protestation of industry irritated by the unjust distribution of the fruits of production, and only another name for collective despotism; and more minutely still, the associative principle elaborated by Charles Fourier, as an indication of the various trains of thought that were occupying men's minds at this time, each of which was entertained by large circles of Frenchmen, and regarded as the real solution of their social difficulties. Emigration to Texas appears to have been the next hope of these ardent spirits, after they found that the Revolution of 1848 was of no advantage to them; and M. Godin invested 100,000 francs in the project of colonisation brought from America by M. V. Considérant in 1853. His experiences, and loss connected with this scheme, however, made him resolve to listen to no plans for social reform that he could not work out by himself.

Under the heading, *Épaves des Idées Sociales*, workmen's towns, or *les cités ouvrières*, are next discussed, and such French inventions as "fraternal architecture" and "social architecture" introduced to the reader. Workmen's houses, especially those of *la cité du Grand-Hornu*, Mulhouse, Guebville, and Colmar are described, and the shortcomings of these, comparatively model dwellings, pointed out. Then, in another section, these facts are quitted for meditations; workmen continue to create riches, and continue to be deprived of the comforts riches procure: labour continues to produce all that makes life agreeable, but the life of the labourer continues to be surrounded by disgusts, and in contact with misery: labour rears superb edifices, and the labourer's own habitation remains in the condition of that of primitive ages. The "crime of war" continues to be perpetrated. Revolving these mysteries in his mind, M. Godin resolves to seek out the destiny of man, and the law and end of his creation; and he finds that labour is part of the law, but not all; and that life is the law of law. "Man cannot live without activity: activity is labour: labour is production, consumption, and distribution: it is the aliment of life. Man fulfils the law when he does all he can for the good of life." This discovery reverberates through many pages. Investigations into the importance of the conservation, maintenance, and duration of life, lead up to right, duty, and justice: right is liberty, duty is fraternity and charity, justice is truth. To further explain the wants of man, the divisions of his brain are illustrated, and the requirements for the welfare of each faculty stated. The right to live involves subsistence, lodging, raiment, pure air, light, space, cleanliness, salubrity, and *l'hygiène*; and these involve the rights of production, labour, industry, invention, and science; the rights of consumption, economy, possession, conveniences of life, justice, sovereignty, and liberty; the rights of *repartition*, control, participation, functions, and directions; the rights of social protection, security, affiliation, distinction, and usefulness. Everything is good that is in accordance with the law of life: everything is evil that opposes an obstacle to it. We shall see presently

* Solutions Sociales. Par Godin, Fondateur du Familistère de Guise, Chef d'industrie en France et en Belgique, Membre de l'Assemblée Nationale. Paris: A. le Chevalier, Rue Richelieu; Guillaumin et Cie., Rue Richelieu. Brazzais: Office de Publicité, Rue de la Madeleine. 1871.

† See vol. xxiii, pp. 689, 845.

that the Familistère is in accordance with the law of life, and that it places within the reach of its residents most of the rights above enumerated.

But though we have now arrived at the fourteenth chapter, we have not yet come up with the social palace in question. The action of nature and man is explained. Nature has created the elements upon which man has to imprint form, movement, and thought, and has placed them at his service. Riches are, therefore, composed of two parts,—the work of nature and the work of man. To produce riches, and to make a good and just employment of them, is one of the laws of our destiny. Being the result of the industry of man, he has a right to enjoy them. By this route, M. Godin conveys his readers to architecture once more, and, eventually, after many reverberations, speculations, ruminations, and calculations, within hail of the habitation of man that is really in accordance with his progress,—the Familistère, that has been seen so long in the offing. But we are not yet permitted to enter. Caverns, wigwags, snow huts, stone huts, tree huts of all kinds, tents, pre-historic dwellings, cabins, feudal châteaux, village houses in the Middle Ages, and town houses, are shown in wood-engravings, successively; and then we come to illustrations of the model dwellings of the Grand-Hornu, the houses of the Auzie Company, the Mulhouse houses, the model houses shown at Danish and from Antwerp, in the Exposition of 1867, and learn there is not so much improvement in them as there is in the substitution of stalls and stables for the natural shelter that animals were left to in old times. The poor little mean house that architecture has hitherto designed for the workman is a wrong, from M. Godin's point of view. The rich are not obliged to have their linen washed in their private apartments: they have laundries. The workman should have the same. The children of the rich have nurses and *bonnes*, plenty of clean linen, toys, amusements, instruction, and general care. Those of the workman should have the same. His infants, instead of being left to cry in the cradle, or to be lugged about the perilous streets by another child, should have their nursery, with proper appliances; and his children, when able to walk, instead of being left to their own devices, should be cared for, amused, and gradually instructed. These equivalents of riches are added to the dwellings of the Familistère. This social palace he believes will be the model dwelling of the future, not, perhaps, in the exact manner of its details, but as an example of a building erected in accordance with the wants of human nature, and consequently in subjection to the laws of life. When the workman turns his face homewards, it is to a palace, and not to a hovel. There is no tiring distance to walk. He may meet his children coming out of the schools as he goes into his house for his meals, and he can purchase his dinner, skillfully cooked, if his wife has been working too, and partake of it with her and them in their own apartment. He can purchase any of the necessities of consumption without the profit of the intermediate shopkeeper. Should he be single, he can have ready-furnished rooms; should he be sick, he can have accommodation and attendance away from distractions; or if the invalid should prefer to remain in his own dwelling, he may hire an extra room for his nurse or friends.

This is the grandest of M. Godin's social solutions. For the small house he substitutes a portion of a palace, with a free right to conveniences only to be found in the abodes of the wealthy, and to a participation in privileges that only the highest intelligence and administrative powers could bring together. Eventually, M. Godin suggests it will be possible to heat such a palace so effectually in winter as to preclude the necessity of each resident warming his own apartment. But here the philanthropist would probably find that what one person considered only just warm and comfortable, another person might deem too hot, as in our own Houses of Parliament. Just as it is a step in civilization to have secured the ventilation of the palace, another to have laid on water to each story, a third to have removed the necessity of laundry operations being carried on in a dwelling, a fourth to have done away with the perils of darkness by the illumination of the courts, galleries, staircases, and so on with gas all night, so it would be a fifth, however, to have heat distributed throughout the fabric. Fraternity and concord, we find, are at the bottom of this desirability, and it is not till they are

further developed that it will be accomplished. Now that we have the Peabody and similar buildings, we may look, perhaps, with more distrust at M. Godin's organisation than we might otherwise have done. It is only fair to bear in mind that his labours were pioneer works commenced twelve years ago. He endeavoured to secure order and tranquillity in his palace by placing it away from the clang of the workshops and noise of the schools; and security by lighting, and the hourly patrol of a watchman, with the additional precaution of a fire brigade of forty volunteers among the residents. This brigade is in uniform on fête days; and it has accepted the mission of preserving order on such occasions, besides guarding the edifice and rendering any assistance sudden need may require. In fine, the wants of human nature, or the laws of life, have been considered throughout: lodging, raiment, temperature, diet, pure water, pure air, sweet smells from gardens and plants in windows, taste in the elegance of the exterior, and repose in the distance from noise.

M. Godin gives two chapters to objections, oppositions, and obstacles, such as the discontent of the intermediate shopkeepers and declarations that his lofty and handsome palace dwarfed the rest of the houses in Guise. But we pass by these to his statement that capital can build palatial dwellings, and in other ways regenerate the working community, with profit, just as it can regenerate the means of transport by railway with profit. He gives eight illustrations of his proof of this fact,—his palace. The first is an isometrical view. We are shown a tract of agricultural country, with a small river taking a sharp bend in it. A road runs through the centre of the tract, with a few poplars by the wayside; and two other roads turning out of this, one on the right, away into the distant country, and one on the left, following the bend in the river. On one side of this central road stand M. Godin's foundries, with their six tall chimneys discharging clouds of smoke, their rows and rows of workshops, their offices, sheds, and other business requirements; on the other, across the river mentioned, and within the sharp bend of it, stands the palace, finished, with its three pavilions, to form a centre with two advanced wings, leaving an open space in front of the centre. One of these wings, however, is yet to be built. Behind the central pavilion is the *nouricerie*. In the foreground is another group of buildings, containing the theatre, with a school on either side of it. On the right, in the foreground of the right wing, are the bakehouses, the café, and a billiard-room. In the foreground of the left wing are the stores, bakery, stables, and coach-houses. Between the grounds of the palace and the site of the business premises there is a small tract on the river's edge, and on this stand the baths and wash-houses, and the gasworks. All the odd corners of ground are planted, and in the symmetrical arrangements of the various groups of buildings and their approaches there is a general air of order and taste. The other illustrations are plans, sections of the dwellings; an exterior view of the nursery and *pouponnat*, with their verandah; an interior view of the same, showing the babies and the arrangements for their safety and amusements; an exterior view of the schools and theatre; and a view of one of the inner covered courts of the quadrangular groups of dwellings fitted up with decorations on a fête day. As rewards are distributed to the scholars every month in the presence of their parents, these covered courts are found useful for the presentation ceremonies and similar proceedings. It will be noticed that M. Godin believes that the desire to distinguish oneself in the eyes of his fellow-creatures is natural to man, or to the laws of life, and he has thus provided for one phase of it.

The founder laid the foundation stone of the left wing of his Social Palace in 1859. It was finished in 1860, and fully inhabited in 1861. The site cost 50,000 francs, the building 300,000 francs. In 1860 he built some of the dependencies at an expense of another sum of 50,000 francs. In 1862 he accomplished the central group of the dwellings at a cost of 400,000 francs. In 1866 he built the accommodation for the infants and younger children, the nursery and *pouponnat* for 40,000 francs. In 1869 the schools and theatre were added, at a cost of 125,000 francs. The baths and wash-houses were constructed in 1870, and cost 35,000 francs. The present total cost of the palace, with its 500 chambers and dependencies, has been a million francs. To this must be added the expense of the right wing when it is constructed. Eighty thousand addi-

tional francs have been expended on fittings. The rents yield 40,140 francs, from which the cost of assurances, administration, elevation of water, lighting, and repairs, amounting to 9,756 francs, has to be deducted, leaving a profit of 3 per cent. When the profit of the stores is added to this, there is a percentage of 6 per cent. realised.

Every detail is given, every advantage weighed, every objection canvassed and cancelled. No item is too inconsiderable, in its bearing upon the rights of man and the law of life, to be passed over. The way the babies' beds are kept sweet and dry in the nursery is an instance of this attention. Each cradle is composed of an oval iron frame supported by two standards, one of which—at the head—rises above the bed to support the curtains. There is a strong linen sack or bedtick fastened upon the oval frame, and on this is laid a sufficient quantity of bran to form a comfortable bed. Over it is thrown a little sheet. Should it receive any moisture, the bran adheres together, and that portion of it is easily removed, and the rest is left as sweet as before; and there remains nothing but the small sheet to dry or replace. The bran is changed every month.

To pass to the administration. There are two councils: one composed of twelve men, elected by the men, and one of twelve women, elected by the women. The electors are residents of full age, or those who are at work after leaving school. The minimum age of electors, in default of this *brevet*, is sixteen for both sexes. The council of men superintend questions of labour, the provident institutions, *répartition*, and the organisation of *fêtes*. The council of dames preside over the domestic arrangements, report upon the quality of the commodities sold, the cleanliness and salubrity generally, the care given to infancy, the baths and wash-houses, and consider improvements in the management of the *ménage*. There are also several committees who superintend departments of this little commonwealth. About seventy persons are employed in the conduct of the various branches of the Familistère.

"What will become of this work when you are no more?" ask many visitors, as they view the order, agencies, and functions of the palace. "Your son," they politely add, "may be inspired with your sentiments, but then he is a mortal like yourself," and they ask what is there to prevent an incapable, eventually, from inheriting and leaving all to disorder and ruin. This query makes room for a disquisition on sovereign power. M. Godin calls over the titles of some of the French kings,—*Débonnaires*, *Fainéants*, *Simplets*, *Cruels*, &c., and finds that nature knows nothing of hereditary power. But nature has distinguished some men by endowments others do not possess. Nature has given all men sovereign power, and with this sovereign power they should confide the direction of their interests to those who are the most capable, the most intelligent, and the most devoted to them.

There is an epilogue to this singular and vivid book. The late war with Germany, and the subsequent civil war, are passionately deplored; twenty-seven milliards of francs lost to France, M. Godin computes. With these twenty-seven milliards, France might have made 90,000 kilometres of railways; four millions of houses might have been built with the money; or twenty thousand social palaces, in the midst of model farms and workshops, might have made the land the happiest in the world.

M. Godin has the power of generalising and of particularising; of commandment and execution. His thoughts can roam at large over the rights of man, and yet keep within call to regulate the care of infancy, the instruction of youth, the organisation of labour, or the care of the sick. This marvellous elasticity is one of the features of his book. Every one, pondering over the great question of good dwellings for the industrial classes, should carefully examine the details he has given of the most important of the social solutions at which he has arrived.

EXPLORATION OF THE TIBER.

ONE of the first reflections that occurred to many persons familiar with Italy, on hearing of the fall of the temporal power of the Pope as the master of Rome, was, Now, at length, the Tiber will be explored! It is not for the first time that the work has been attempted. The conviction is strong among Italians that treasures of art, of fabulous amount, have been cast into the turbid river on each successive capture or

sack of Rome. Without counting the occasions on which extreme terror was caused in the city by the ravages of the Huns, under Attila, and by the final overthrow of the empire by Odoacer and the Heruli, the capture by Victor Emanuel in 1870,—the 2624th year of the city,—was the ninth instance of a successful siege of the capital of Europe. Of these the first (under Brennus, in the 385th year of the city), and the three preceding the Italian conquest, were all effected by the same nation, the warlike and restless inhabitants of Gaul. Of neither of these sieges, unless it be of that by the Constable Albert de Bourbon, in A.D. 1547, which, indeed, was rather a Spanish than a French feat of arms, can we expect to find any memorial preserved beneath the waters of the Tiber. But on the more fatal occasions of the sack of Rome by Alaric, by Genseric, and by Totila, and possibly on that of the capture by the Greeks under Belisarius, the firm opinion of the Romans is, that despair sought to rob the barbarians of their prey by casting the treasures of the city into the Tiber.

The existence of so long established and firmly held a tradition is ample justification for an attempt being made to solve the question. It will not be necessary to incur a very large outlay in the first instance, as a comparatively partial exploration will be enough to prove whether it is worth while to continue the operations on an extensive scale. We regard the problem as one of immense interest, although not one of which it is at all easy to anticipate the solution. The present era is distinguished by discoveries in human history, no less than in science. The ancient world is being interrogated, and has only commenced to speak in an intelligible language, in reply. In Egypt, in Assyria, and in Palestine, a very large amount of positive information as to the history, art, and warlike and social habits, of nations now swept from the earth, has been freely forthcoming. In Italy, it must, however, be remembered, the work of exploration is not new. The respect of the Italian peasant for the slightest memorial of *Antichità* can hardly be realised by persons so heedless of their own pre-historic monuments as are the majority of Englishmen. The pride of the Roman in his name and ancestry is enhanced by the high price always commanded by any relics worthy of note. Italy has been thrashed over in the search for coins, gems, statuettes, and terra-cotta lamps and vases. But the riches of the soil in these relics seem almost inexhaustible. The Count of Syracuse, the brother of King Ferdinand of Naples, added much to our knowledge of Roman antiquity, by his systematic exploration of tombs at Cumæ, and elsewhere. Apulia is very rich in remains, and has hitherto lain too remote from the influx of tourists to be by any means exhausted of its treasures. Terra-cotta funeral sculpture, of wonderful vigour and beauty, has been within the last year or two acquired by the South Kensington Museum from this part of Italy. The Government exercises a right over all treasure trove of this nature, and the general object of the law is, both to preserve all structural remains, and to prevent the removal from the country of any portable objects. Thus, in spite of the sloth and corruption of the administration, the *Museo Borbonico* at Naples has become enriched with some of the most exquisite remains of art that have anywhere escaped the ravages of time.

Apart from the architectural remains, which public and private taste alike respect throughout Italy, the recoverable relics of ancient art mainly consist of coins, gems, mosaics, terra-cotta lamps, vases, and statuettes, bronzes, and marbles. To these six classes of objects the operations at Pompeii have added the discovery of fresco paintings. In addition to this, specimens of food, tools, armour, requisites for the toilette, and personal ornaments of all kinds, have been found in the Campanian cities, and his Royal Highness the Count of Syracuse was in possession of a Roman lady's workshop, made in the first century of the Christian era. Frescoes and mosaics have been chiefly discovered at Pompeii, as the gradual induration of the volcanic ash which buried this city has not proved destructive to ornamentation on walls or floors. On the other hand, bronzes have been, for the most part, much corroded by long contact with the sulphureous tufa. The most perfect and uninjured bronzes have been found at Herculaneum, where the hot lava, pouring round the metal it encountered in its course, has encased it in a matrix impenetrable to atmospheric influences, and preserved it in all the freshness of its early state.

With regard to the surmised treasures of the Tiber, two questions occur. First, is it true that so much and so many of the art-treasures of Rome have been thrown into the river; and then, if so, in what state of preservation may they be expected to exist. It is clear that a satisfactory solution can be given to these questions by the operations of the engineer alone.

We may, however, form some idea of what we should seek. Paintings, for instance, which are, from their rarity and other causes, the most interesting relics of antiquity, are here utterly out of the question. The same may be said of mosaics, except in the case of such small objects as fibule, or perhaps plaques. Marble and bronze statues are hoped for. In addition to the difficulty that would be experienced, at times when people were principally concerned in saving their own lives, in removing massive and heavy objects of this kind from their stations—and that not for the purpose of actual preservation, but from a questionable kind of art enthusiasm, or even spite—the effect of the water of the Tiber, or the yellow mud which it rolls down, on either marble or bronze, during a period of more than a thousand years, is not to be despised. The waters of the Italian rivers are often charged with salts of volcanic origin, none more so than some that are sparkling to the eye and soft to the touch and taste. A period of fifty years has been enough to eat away a great portion of the ironwork of vessels sunk in the Seine, leaving the remainder in the state of silver-like threads of great purity and beauty, but retaining little of the form of the object of which they composed a part. In the Seine, however, there is no trace of the sulphureous elements frequent in the Italian waters. Thus it will be only on the actual discovery of some uninjured work of ancient date, in marble or in bronze, that we shall be justified in looking with any confidence for more. The very first few days of a serious and well-ordered exploration will possess the utmost interest for all lovers of art.

For terra-cotta, again, it is pretty clear that we shall look almost in vain. Quite imperishable as this material would be, from chemical causes alone, its fragile texture, and the low intrinsic value of the articles of which it supplies the material, are such as to lead us to expect nothing but fragments of earthenware from the bed of the Tiber. Of course more is possible, but it is not, in our opinion, probable.

It remains, therefore, that the treasures which may most reasonably be expected from the careful exploration of the Tiber will be coins and gems. Nor can it be considered as improbable that ornaments of the person or of the habitation, composed of the more precious metals, will repay the toil. On gold, silver, and the hard stones of the agate and corundum families Father Tiber may try his teeth for a long time in vain. Objects of small size would be very likely in the first instance to be thrown or dropped into the river, and in the second place, to have sunk alone into its bed, and buried themselves from further disturbance.

For objects of this nature, of high intrinsic and artistic value, and requiring care like that of the diamond-washer to detect, it is clear that only a well-ordered and systematic search will be suitable. The Italians have great experience in research. The *scavi* at Pompeii have assumed the form of a regular industry, under the direction of the State. Nor have the engineers of Italy been slow to learn all that has been effected in the profession in England and in France; and in the execution of the Mont Cenis Tunnel they have far outstripped their French partners. But they are less experienced in dealing with the water. Their tideless seas, and, with few exceptions, riverless coasts, have afforded them no opportunities for such operations as are familiar to ourselves. Their one great river, long the tyrant and devastator of its fertile basin, has been tamed, so far as is yet effected, by Englishmen; as to whose treatment in the matter there is said to be the better. The experience gained in the canalisation of the Po will be of little avail as to the exploration of the Tiber. The conditions, in the latter case, are unique. It will be essential, in order to obtain any adequate support from this country, for something of our own large professional experience in tidal and submarine works, in river walling, and in sinking the foundations of river bridges, to be brought to bear upon the works attempted in the Tiber. On former occasions, when great interest was excited in this country on the subject, when money was forthcoming for the search, and when only the steady and stolid opposition of the Papal Govern-

ment prevented the solution of this secular problem from being attained, it was taken as a matter of course that the works would be directed by English skill and energy. Italy has made enormous strides since that time in her mechanical excellences; but no man will be justified, in a matter of such European interest, in failing to avail themselves of the experience gained in the raising of the *Royal George*, in the bridging of the Tamar, the Medway, and the Thames, and in the recovery of Roman relics from the mud of the river Fleet.

In fact, it must not be doubted that for the exploration of the bed of the Tiber to be attempted with any satisfactory result, it must be confronted as a serious operation of the civil engineer. No peddling, no amateur work, no trusting to the chapter of accidents, can lead to success. The work must be undertaken under competent authority. Either the Italian Government must itself take it in hand, as in the case of the excavations of Pompeii, or it must give to the company or association undertaking the enterprise a definite and exclusive right, for a fixed period, to deal with an agreed portion of the bed of the Tiber. The proprietorship of objects recovered must be distinctly ceded to the company, any Government reservations or claims being renounced, or reduced to well-defined limits. Preliminaries being thus properly arranged, the next step will be to make such a thorough investigation of a measured area of the bed of the river, as may afford some basis for future calculations. This may be done by means which are perfectly familiar to English engineers, at small and definable cost, and with an exhaustive result. In case of failure, a second, and even a third exploration of spots selected in different parts of the channel would be proper. If the results confirm the sanguine expectations of the explorers, there will be no difficulty in raising the capital necessary for a proper inauguration of the enterprise upon a sound practical basis. If then such searches as we suggest should prove unavailing, as we fear they might, we should recommend the abandonment of the design.

Should the preliminary investigations have the result of proving that Art relics of value are actually embedded in the mud of the Tiber, and that the chemical effect of the water has not proved so corrosive as to reduce bronze and marble to shapeless deformity, we shall have before us a very notable and important enterprise. If a long-lost chapter, or series of chapters, in the history of Rome may be thus regained, neither cost, nor toil, nor patience, must be spared in adding so precious an illustration to human knowledge. Above all, it will then become necessary that impatience and slovenly work should be avoided, and that Tiber, if put to the question, shall be made to yield up the entire truth. It is obvious that this can only be done by an operation of the most complete kind. The sanitary state of Rome will be materially affected by the proper regulation of the Tiber; and questions of sewerage, drainage, and protection against the ravages of flood, will all demand proper forethought and skilled settlement. Any attempt to save expense in the first instance, or to dribble away time and money in successive potterings with sections of the Tiber will involve failure. The objects which we conceive to be most likely to repay the toil of the explorers, are precisely those which nothing but a thorough and leisurely exploration can reveal. Working against time in the bed of a river subject to floods, and with the scene of operations only partially bare, or imperfectly protected, would yield but scanty result in the shape of gems, coins, or small articles of personal ornament. The extraction, unimpaired, of large objects of sculpture or of architectural character, if met with, would be equally out of the question, unless the engineer of the undertaking has his work clear and open before him. A diversion, or series of diversions, of the stream will be a necessary feature of the case. It is unnecessary for us to come uncalled for into council, or to point out, unasked, the proper methods, either of making at once the cheapest and the most thorough preliminary search, or of uniting the various objects of sanitary improvement, and of provision for the discharge of flood-water. It is, indeed, possible that the Romans may choose to deal with their historic river after their own fashion. In such a case we shall have nothing to do but to look on with interest, both at the engineering and at the archaeological results. But in cases of this kind it is the usual custom of our continental friends

to come to this country for money. Lovers of art in England have already been appealed to, to support the great enterprise of the exploration of the Tiber. It is to them that we speak, with all the earnestness which acquaintance with Italian life, and longer acquaintance with subaqueous and fluvial operations, render natural, and, we hope, pardonable. It is quite possible for a considerable sum of money to be spent, not only uselessly but mischievously. For if the attempt be now made in any but the proper manner, the result will be the final abandonment of all the buried stores of Tiber, be they more or less. Let no Englishman, then, further the scheme in any way, unless he be assured as to the conditions under which it is to be carried out.

In a word, if in searching the bed of the Tiber we are told once more, *Italia farà da sé*, we have nothing to do, in this country, but look on with interest. If Italy comes to London for aid, that aid ought to be afforded only on the clear and distinct conditions to which we have referred. A definite Government concession, in which at least one English name is inserted, must be a *sine quâ non*. Then, a plan of operations must be laid down by an English engineer, and faithfully carried out under his direction. In this case we shall be able, first to know what we are about, and then, if we decide to go on, to do so to certain good results. Rome will, in such case, be certain to benefit by the permanent effect of the river works carried out; and it may possibly be the case that the museums of Europe will receive such additions to their stores as shall prove worthy companions to the Elgin and Phigaleian marbles in the British Museum, to the busts and statues of the Vatican, and to the exquisite *canetti* and unrivalled bronzes of the Museo Borbonico at Naples.

WEYMOUTH CONGRESS OF THE BRITISH ARCHÆOLOGICAL ASSOCIATION.

THE notice in our last issue gave a general idea of the proceedings of the Congress up to the end of the third day, August 23rd. We must confine ourselves, in the present sketch, to a few quotations from some of the papers read and brief allusions to the most interesting places seen and described. On the 24th, Dorchester, Cerne Abbey, the incised figure known as the Cerne Giant, and the Manor House of Wolveton were visited under careful guidance.

At St. Mary's Church, Cerne Abbey, Mr. Gordon Hills and Mr. Edward Roberts, F.S.A., commented on the building. In the vestry, Mr. Black examined the register and read some of the entries, including banns published in the open market-place. One of the entries certified that a couple after the banns had been three times published in the open market, and, there being no opposition, with the consent of their parents, were married at Alton Pancras, on the 7th May, 1665. This was signed by a justice of the peace. Turning to the other end of the register, Mr. Black read a part of a statute of 39 Elizabeth, for the suppression of rogues, vagabonds, sturdy beggars, the persons punishable being scholars and wayfaring men, fencers (sword-players), &c., who were to be whipped and sent out of the parish. And to show the manner in which the law had been carried out, the following entry was read:—"1661. A register-book for all such rogues and vagabonds as have been punished according to law at Cerne Abbas, in Dorsetshire. Oct. 11, James Balden and E. Balden, his wife, Thomas Balden, Robert Balden, and John Balden, their three sons, and Joseph Dallinger, rogues, vagabonds, and sturdy beggars, were punished according to law at Cerne Abbas, and sent with testimonial from constable to constable to Bowell, in Cornwall, the place of their ordinary abode, there to work at hard labour as good subjects ought to do."

The title barn was examined with interest. It is the last of the remaining relics of the Abbey. This barn was originally 200 ft. long. A part of the barn has been converted into a residence; and in piercing the wall for windows, the hardness of the material gave so much trouble that it would have been cheaper to build a new house—a tribute to the goodness of our forefathers' building. The roof is tolerably perfect. There is also some original reticulated pavement in the barn; the same kind of pavement may be noticed in some of the towns kept up, perhaps, since the time of the Romans. The name of Cerne is frequently spelt with a K, and sometimes spelt Kernell, but in the deed of surrender of the

monastery it is spelt with an S, therefore the sound of the hard C must have altered in the course of time.

Mr. Levison referred to a document in the British Museum in which there are some verses incidental to Cerne, and it was thought they would throw some light on the name of the place, but they only related to the legend of St. Augustine. The verses are in quaint Latin, and from a MS. of the thirteenth century. Part of them are leonine verses, but the hexameters and pentameters are mixed together in a very curious way. The following is a rough translation:—"Ye who pass by, if ye wish to know the name of this town (part untranslatable), let worthy praise, praise due to God be given. Let this place be called Cernelium, because I behold God. Et is an Hebrew word, and *cerno* Latin, and ye have Cernelium compounded of these. Et is God to every one; the Latins have added *cerno*. So Cernelium plainly signifies I behold God. The whole stands Cernel if you join these two—Cern-el. From their being joined, the word becomes a village by name Cernel. O fortunate Cernel, no longer the village, but the city of Cernel. That thou hast so increased is due to the vision of Christ. Here is the spring of Augustine, in whose honour the water is frequently converted into the flavour of wine. Here, to his (the saint's) prayers, God appeared; here, by the entreaty of the saint, the native rock produced the living stream."

On the return journey, Wolveton House, the seat of Mr. W. H. P. Weston, was visited, and the carving in the great hall, and the other apartments (of the time of James I.) was examined. In the drawing-room an *apograph* paper was read by Mr. George Wright, F.S.A., "On the Involuntary Visit of Philip of Austria and Joanna of Spain, King and Queen of Castile, to Weymouth in 1506, and its Consequences."

Dorchester.

When the party returned to Dorchester, they went to see the curious sculpture in the tympanum over the south door of St. George's Church, Fordington. The Rev. H. Monie explained that it was hidden until about sixty years since. A former clerk had the credit of having made the discovery by removing the plaster, and his (Mr. Monie's) son, about two or three years ago, took off two or three coats of paint, and laid open the cross in the figure. It had been spoken of as St. George and the Dragon; but there could be no question that it was intended to represent the vision of St. George before the battle of Antioch. The figures were exactly the same as those in the Bayeux tapestry. He supposed the date of the sculpture was about 1090. We have no doubt the sculpture belongs to the end of the eleventh or the beginning of the twelfth century. It is in an excellent state of preservation. After leaving the church, Mr. Monie pointed out a spot where in lowering a hill about sixty skeletons were discovered. From the jaw of one of them he took a new coin of the time of Constantine, and from another gave a coin of Postumus, who ruled in Britain fifty or sixty years before Constantine. Comparing these facts, and considering the bodies were buried in wood, they must have been interred about the time of Constantine.

At St. Peter's Church the monuments are interesting. Mr. J. R. Planché ("Somerset") looked to them, but was unable to say much of them. When once figures were removed from their original position, he observed, there was an end usually to everything specific, unless there were some marks upon which a theory could be founded. As regarded the armour, there was not the slightest doubt it was rather late in the time of Edward III. Hutchins called the figures Crusaders simply because their legs were crossed. He (Mr. Planché) had taken some trouble in this matter some time ago, and quite convinced himself that crossing the legs of figures was merely a conventional mode of sculpture. It had nothing to do with the vow to go to the Holy Land, or with having been there. If it meant anything, it meant a right of gibbet or judgment, or of holding courts of their own, possessed by feudal lords. All the ancient sculptures of kings had the legs crossed, some of them in a remarkable way above the knee. With respect to the figures in question he could not tell, unless he studied the records, whether they were taken out of the Priory. There was a tradition that St. Peter's was founded by Geoffrey de Ann, or Vann, and his wife.

"Geoffrey de Vann and his wife Ann.
Built this church without the aid of man."

There was no information by what means this was done, whether by miraculous assistance, or by their own extreme industry and skill. He found there was a family of that name existing in the county in the time of Edward I., and an abbot of Cerne as late as 1468, of the same name. Two of that family might have been represented by these warriors, but there was no possibility of ascertaining it at present. The figures might have been painted and gilt, and perhaps if they were scraped there might be some remains of armorial bearings on the surcoat. He found there was a brass here also, to the memory of the widow of Robert Moore, who had the peculiar name of Johanna de St. Omer. That brass had disappeared, which was a great pity. The figures were perfect specimens of the military costume of the time of Edward III. Hutchins says they were in complete mail, but it was not so; they were in the plate armour of the period, of which they were good specimens.

When visiting the Museum some examples of the so-called Kimmeridge coal money were discussed. The Rev. W. Barnes said they were nothing more than the refuse left after turning rings, &c., in a lathe.

At the evening meeting on the return to Weymouth a paper was read, amongst others, on

Roman Christians in Britain—Evidence at Frampton.

by Mr. J. W. Grover, of whose investigations in this direction we have before now spoken. The writer said—This subject is one ranking, if it be conceivable, even above archaeology, and taking its place amongst the great supporting columns of the structure of English history; it is a subject, I venture to say, whose surpassing interest is alone exceeded by its deep obscurity; like the star of evening, it grows brighter as the darkness increases around it, and like that star it fixes the attention and awakens the reflection of the mind. Frampton has a national interest, for it declares a great fact. Some places are famous for legends,—indeed, owe their very existence to the breath of tradition. Such an one is St. Alban's, the City of the Protomartyr of Britain. We have lately been told by a great man, at a great meeting in St. James's Hall, that all England should feel an interest in St. Alban's, because of its traditional fame; and that that interest should not end in smiles, but in a practical 60,000l. for the Abbey Church. I say England should feel an interest in Frampton, for on the sacred ground there is inscribed the first known emblem of the Christian faith in Britain. Good King George III., aided by the regiment of militia, opened these pavements, and Dr. Lysons made some beautiful drawings of them, which have been photographed by Mr. Ponney, of Dorchester, so that the transcripts of Lysons are accessible to all, although the original work is out of print. I must refer to those well-known plates, for, owing to the difficulties of the site, we are unable at this congress to see the originals. Referring to the plates, it will be noticed on the principal pavement at the chord of the apse, that there is the early Christian emblem, the Chi rho, as it is called, or the two first letters in Greek, of the name of Christ. I may briefly mention for the benefit of those who do not enter into the subject of Christian iconography, that this emblem formed a species of Masonic sign amongst the early faithful; and the sign of the cross was in use from very early times for the object of secret recognition in days of persecution. When Christianity became victorious the emblem of the despised and persecuted sect was worked in purple and gold or the regimental colours of the Roman armies, and in that form was called the Labarum. We Britons have it now in a modified and exemplified form on the Union Jack. The uncovering of this remarkable emblem by the militiamen under George III., gave rise to much discussion as nothing like it had been found in Roman Britain. The great Lysons declared that it must have been the work of later ages. We have, however, improved in archaeological knowledge since Lysons' time. The whole pavement, monogram and all, is Roman work. Without careful examination it would be impossible to say that the whole was executed at the same time,—probably not, the sign being most likely interpolated after the conversion of Constantine. This appears more probable, as the rest of the pavement indicates rampant heathenism. We have, indeed, an anomalous inscription to Neptune, and the head of that divinity, evolving dolphins from his mouth, in close proximity to the Christian sign. Now, as I have shown in my previous

paper, this is not surprising; we find the same confusion of ideas prevailing in the Christian catacombs themselves. Inscriptions have the "agan headings, to the "Gods and Shades." Constantine's faith was never strong enough to induce him to discard his beloved *Sol Invictus*, the Sun-god Apollo, whose memory has descended to us in our Sunday. The Roman Lord of Frampton perhaps became a Christian, like his imperor, and to celebrate the event he intercalated the monogram amidst the forms and figures to which he had been used all his life. But there is a more interesting medallion still to which I would particularly draw your attention,—it is in another room, not far removed from the last. The centre medallion shows a portrait of a mild and intelligent head, surrounded by a nimbus. I have formerly suggested that this is intended to represent the head of the Christ. If so, it is the most interesting mosaic upon record, and quite unique. The general Christian character of the whole will hardly bear question, I think, on examination, more especially when the proximity of the undoubted monogram is remembered. Here we have four distinct Greek crosses. Four Tau crosses of the Egyptian type, with equal arms, ten fish, four heads with cornucopias, denoting plenty, and in the centre the head with the nimbus. One difficulty occurs to which I think it right to draw attention. The Christian nimbus, according to Didron (p. 99), is not found on well-authenticated monuments before the sixth century. It is, however, in use amongst the Pagans in much earlier times. An instance of its existence occurs in Britain at Beguir, surmounting the head of a Venus, and I think we must not be too hasty in denying the Christian character of the central Frampton medallion on that count; the artist who produced the work was evidently accustomed to Pagan ideas, and he would treat the head of the Christ as a deity, in precisely the same way as he would a Pagan divinity, and give it the same attributes and conventionalities. The confusion of ideas has already been noticed, and is only too apparent in the pavement where the monogram occurs. I will finally draw attention to the fish; the extraordinary number of fish delineated in early Christian catacombs is well known; the fish is also seen on sarcophagi, seals, rings, lamps, &c., it was the standard symbol of the faith in early ages. Viewed in connexion with the context, I think there can be little doubt as to the figurative character of the fish on the second Frampton pavement.

There was also read a paper on

Flint Implements and Weapons of Dorset.

Professor Buckman said:—He proposed to speak more particularly of the discovery of flint implements in Dorset. He had been a resident in this county for eight years, and during that time scarcely a day had passed in which he had not picked up two or three flints, which at first puzzled him considerably, because when he first came into the county people had very slightly considered the matter. They had observed a quantity of flints in every direction, but they did not know that these had been manufactured by man's handiwork, but thought that the marks on them had been caused by accident. He, however, believed he should be able to show from the specimens which he had brought with him that a very great number of the flints picked up about the county of Dorset and other counties had been elaborately worked indeed, and that they belonged to a period in their history when flint did as much for the people as iron and steel in the present day. The flints he now produced had been principally picked up on his farm, a farm of 400 or 500 acres, situate between Yeovil and Sherborne. The farm was situate on the slope of a range of hills called the Dorset hills, and below was part of the valley of the Yeov. Now, it would be necessary to mention that his farm was situated on the inferior colite formation, and not covered with any flint drift at all. He would not say that some flints had not found their way there by accident, but it was not a locality in which geologists would recognise a flint-drift at all. At the same time, he might state that there was scarcely a field in which hundreds of flints could not be picked up, and most of them bore evidence either of having been knocked off other flints in the manufacture of flint instruments, or were themselves so highly manufactured as to be capable of being called implements themselves. It was very curious to notice that these were not recognised, or scarcely understood, until a man

known as "Flint Jack" showed how very easily flint implements could be made by ordinary means. The people, seeing how readily the implements could be manufactured, came to the conclusion that they were not all made as matters of imitation, but that some must have been made by design by other people before Flint Jack could imitate them. As regarded the specimens which he had to introduce to their notice, all had been picked up by himself; and they would see that they were just such specimens as would show that they were of great age, and the colour would prove that they could not have been manufactured in modern times. At the close, Mr. Buckman called the attention of the meeting to a very curious set of implements, which were remarkable from having a notch at the side. In all probability the notch was for the purpose of tying the flint to a stick, and the notch was always on one side. He thought these were used as small hammers for delicate work, such as fine arrow-heads. As regarded those implements which one would call implements for mechanical purposes, he had several which it would be difficult to say for what they were intended; but they were all the result of work, and sometimes of very hard work, to bring them into shape. We wish every county would make its own separate collection of such implements found within its boundaries. Mr. T. B. Groves gave an account of the

Agglestone.

which the party afterwards visited. This stone is situated on the heath, about a mile from Studland. It can scarcely be approached by wheel conveyance, though there is a track used by turf-cutters that leads up to the crest of the hill that overlooks it. In its vicinity several mounds are to be found, that are believed to be of artificial formation. Puckstone is the name given to one that resembles Agglestone in character, but the stone on its summit has fallen down. Its name is derived from Puck, the Anglo-Saxon for fend. Various derivations have been suggested for Agglestone. Some say that its first syllable is taken from *hagge*, Anglo-Saxon for "witch"; others, from *egge*, Anglo-Saxon for "sharp"; others, again, affirm that *hagge*, Anglo-Saxon for "holy" is its true derivation. The country people call it the "Devil's Nightcap," and have a tradition that it was hurled by his Satanic majesty from the Isle of Wight, for the purpose of destroying Corfe Castle, but that it dropped in the place where we now find it. The stone is supposed to weigh about 400 tons. Its shape is irregular. The rock of which it is composed is known here as heath-stone, a coarse-grained sand-stone, the cementing matters of which are carbonate of lime and peroxide of iron. Geologically it is referred to the series of strata that immediately overlaid the Bagshot formation, of which the heath consists. Whilst none can positively affirm that the stone was raised to its present position by human agency, it is by no means improbable that it owes its figure to that cause. Certainly the conical hill on which it stands has all the look of being artificially shaped. According to Hutchins, the conical hill is 90 ft. in perpendicular height, the slope of the steepest (the east) side is 300 ft. on the west it is much less steep. It is clothed with heather, gorse, and fern. Agglestone is 18 ft. high; the girth at bottom is 60 ft.; in the middle, 80 ft.; near the top, 90 ft.

We must hurry on, and can say but little of the excursions on Friday in the neighbourhood of Dorchester. St. Mary's, Piddletown, contains a remarkable series of monumental effigies and tombs. The Church of Bere Regis has a roof of carved oak and a series of figures in wood, life-size, concerning which there have been disputations. The Rev. Francis Warre, in the course of a paper descriptive of the church, said of these,— "The old notion that they represent the Apostles may be dismissed. They appear to be ecclesiastical figures; but I submit myself to your opinion on this point. Looking at the central part you will see first the head of St. John the Baptist, to whom the church is dedicated. Next comes a coat of arms, and then the rose of Lancaster. Now, it would be very advantageous to my supposition if it were possible to identify the dress of the figure beneath the coat of arms with that of a cardinal, and the coat of arms with that of the Mortons."

Mr. Planché remarked, respecting the twelve figures ornamenting the roof, that whether they did represent the twelve Apostles or not, one of them was apparently St. Peter, for he had a key in his hand, and he was crowned—a common

way of representing that saint. Regarding a figure-head to which reference had been made, he did not think it represented King John. He had never seen the caricature of a king in Mediaeval times. Referring to the state of the church, he said, they must all join in expressing an opinion that something should be done for the restoration of such structures. He suggested that Government should take such matters in hand where they were neglected by the parish. Certainly such a roof as that—than which he had never seen a more interesting one—ought to be preserved.

We are very much disposed to think, notwithstanding doubts, that the figures are intended to represent the Apostles. Photographs would admit of more careful examination, and the question might be set at rest.

At the Manor-house of Athelhampton, a portion of which seems to have been erected in the early part of the fifteenth century, by one of the first Marys, some tapestry was submitted by the hostess for explanation, nothing being known of it. It seemed of about the time of Charles II., and illustrated incidents in the career of Perseus, King of Macedon. Much pleasure was given by the discovery of "B. B." in one corner of the various pieces, showing the tapestry was by Bernard, of Brussels, and since then the exact passages illustrated have been found in "Plutarch's Lives," and sent to the owner.

At the evening meeting Mr. Planché read a paper "On the Tenant of Corfe at the time of the Domesday Book," when he made an interesting exposition of the confusion created by the non-verification of dates. In concluding, he said,—

"The degrees of affinity are not very strictly defined in Mediaeval documents or records. Children of the half blood are not specially distinguished as such, and the same terms are employed in speaking of illegitimate as of legitimate issue. 'Fratr meo' are the words used by Richard I., in speaking of William Longespée, his father's natural son by 'Fair Rosamond,' as well as when alluding to his certainly very unnatural brother John; and by Henry VIII. he is called 'our beloved uncle.' The Empress Maude has no other designation than 'brother' for Robert de Caen, Earl of Gloucester, the illegitimate son of her father, Henry I., and examples might be multiplied *ad infinitum*. The word *nepos* is indifferently used for grandson and for nephew, and this practice, added to the unqualified statements of credulous and careless monastic writers, not to speak of fabrications like those laid to the charge of Ingulph, have involved the personal histories of our ancient English families in a maze of falsehood and contradiction."

Mr. Edward Levison, M.A., read an elaborate paper on

Wareham and its Religious Houses.

The paper entered minutely into the social history of Wareham from A.D. 800, when Beorhric, king of Wessex, was buried there, noticing the ravages of the Danes and Vikings, the visit of Canute, the re-building of Wareham Castle in 1015, which had been destroyed by the Danes, 876, the burning of the town in 1142 by Stephen, the visits of King John and Edward I., the fact that in 1486 Henry VII. settled on Elizabeth of York the profits on the sale of salmon caught here, the part Wareham took during the Commonwealth, that Horace Walpole was born here in 1717, and referring to a document between A.D. 1426 and 1436, whereby the Bishop of Norwich and others agreed to let the manor of Wareham with others to the Duke of York.

Mr. W. H. Black, F.S.A., read a paper on

Wareham and the Earliest Historic Monuments in Dorset.

The lecturer alluded to some remarks made by him on the subject at the Hereford Congress last year, observing that no illiterate Saxon or Norman could ever have exercised such astronomical and geometric skill as the county of Hereford showed. Then, as to Wareham, he said that not only the central position of Wareham in the extreme breadth of the kingdom, but the word "war-," led him to conclude that the place was a position to determine the truth of some line or curve in the map of Britain. He found that it stood, and was designed to stand, in a position equidistant from two geographical points,—i.e., the North Foreland in Kent, and some point in Cornwall. Accordingly, he drew lines on the map, and perceived that a straight line drawn from the North Foreland, through Wareham, nearly reached the Land's End,—apparently the Logan Stone on the south side of the peninsula of Cornwall. But what was the most observable was that the distance from the North Foreland to Wareham was the same as the distance from Wareham to the Lizard Point, the most southern point of Great Britain. But there was more to come. The line of distance between Wareham and the North Foreland was

obviously the line of measure which enabled us to reach the Lizard Point. It ought, therefore, to enable us to reach some more distant point on the continent. And, continuing the line, Mr. Black showed that Rouen and another place (the name of which was imperfectly heard), were established points on the continent equal to the length of the line from Wareham to the North Foreland.

Mr. Gordon Hills said,—In order to test the observations made by Mr. Black, he had applied to a marine surveyor of Liverpool, who was, in fact, his own brother—a staff-commander in the navy; but, he might venture to say, a man second to none in dealing with such questions. He told him that he wanted to know by astronomical computation the exact distance from some point in Wareham to the North Foreland Lighthouse, and from the same point in Wareham to the Logan Stone in Cornwall, and whether Wareham lay in a straight line between those two points. Mr. Hills then read the reply of his brother to the questions, which in some respects remarkably confirmed Mr. Black.

It is time that Mr. Black's theory and researches in this direction were more fully set forth for discussion and acceptance if confirmed.

Corfe Castle.

full of romantic story, was the chief place visited on Saturday, and there Mr. Blashill read a particularly interesting paper on the remains. In the course of it he said, speaking of the keep,—

"We have here a good illustration of this class of buildings, of which specimens also exist, with certain modifications, at Dover, Rochester, Porchester, and Scarborough, in the Tower of London, and in numerous other castles built under Norman influence. The dimensions of the keep at Corfe are somewhat small,—65 ft. by 57 ft., outside measurement. These are almost exactly the same as the dimensions of the Château d'Arques, near Dieppe, supposed by some antiquaries to have been built before the Conquest. The walls above the splayed plinth are about 7 ft. 3 in. in thickness, exclusive of the broad buttresses of 1 ft. 6 in. projection which exist,—five each on the east and west, and four each on the north and south sides. Yet the masonry is far too thin to allow of the numerous mural chambers, passage-ways, and recesses with which, as at Dover, the Norman keeps were often provided. Between the buttresses on the highest part of the walls blank arcades were constructed,—those on the east and west sides consisting of pairs of shallow recessed arches, with plain imbric mouldings. On the north and south sides, where the spaces between the buttresses are wider, the arches are in sets of three. Possibly some of these on those sides of the keep which are destroyed may have been pierced quite through the wall, as is the case with a part of the arcade round the Tower of London. Except these arcades, nearly all those points which could afford any indication of the precise date of the keep,—all doorways, windows, &c.,—have been destroyed or modified. It is certainly amongst the oldest buildings of its class: for there is a record of some trifling repairs being done to it as early as the eighth year of Henry II. (1161), while the keep at Dover Castle was not commenced until 1180. It was probably built during the first half of the twelfth century, though there is nothing in its architecture which forbids the idea favoured by Mr. Bond, that it may have been built as early as the eleventh century, or even by the Conqueror himself. The masonry of the keep corresponds exactly with what we usually find in the work of the eleventh and twelfth centuries. It consists of large squared stones, which form the facing of both sides of the several walls, the inner part or core of the walls being composed of small stones and of chalk, thrown in at random, with mortar, made of lime and coarse sand."

Another "Boy-Bishop" (a small sculptured figure locally so-called) was met with during the excursion, but was, of course, quickly disposed of as at Salisbury: it doubtless records a "heart-burial."

Some newly-discovered Roman and Saxon remains at Finkley, near Andover, were fully described and illustrated at the closing evening meeting by Dr. Joseph Stevens; and the last paper, a scholarly account of the Bishops of the West Saxons, more particularly those of the diocese of Sherborne, was read by Mr. Henry Godwin, F.S.A., of Newbury.

Thanks were then given to those who had contributed to the success of the meeting, and the Congress was at an end.

The Mayor and Corporation of Weymouth deserve the warm thanks of their fellow townsmen for so acting, that the whole pecuniary advantage of the visit was obtained for the town without the wasteful expenditure of even a cup of tea. Saying nothing of the money actually there spent by the party, the amount of attention which has been directed to Weymouth and its attractions throughout the country will not fail to take visitors there hereafter, and may safely be put down as worth 500*l.* to the town. It is not often that a Mayor and Corporation act in such a manner, and they well deserve to be remembered for it. Under such 'cute and far-seeing managers Weymouth can scarcely fail to prosper and increase.

BERNERS STREET.

ALTHOUGH the history of the streets of London has been written by numerous authors, much still remains to be done in order that we may have a complete picture of the great city. If the history of each street could be written by some one who had lived in it, and known it for years, we should obtain a voluminous but truly valuable history. Our former volumes contain notices of a few of these streets, and we now propose to say something about Berners-street, which, according to De Quincy, has been, for a short street, uncommonly fruitful in men of genius. The street was planned and the ground leased by Mr. Berners to the various tenants in 1763. Three years before it was merely a passage-way to the Middlesex Hospital, and in September, 1769, the committee "ordered that the causeway be repaired from Wardour-street and continued up to the hospital." In 1764 the new buildings were progressing rapidly, but although the street, when finished, formed a handsome approach from Oxford-street to the hospital, the hospital visitors were a little put about during the progress of the works. Mr. Wright in consequence "reported that by the several buildings now carrying on, the usual ways to this hospital are greatly obstructed and rendered almost impassable; therefore he has applied to Mr. Berners for a coachway to the hospital from Oxford-street up Newman-street, which he has granted. Mr. Wright also proposes that the builders in Berners-street may be desired to lay their bricks, &c., in such a manner that they may not obstruct the highway as they do now." Berners-street was at first inhabited by fashionable people, but as years rolled on the *dilettante* travelled more westward, and left the street to artists and professional men. Now shops connected with quiet and old-established businesses are gradually destroying the private houses, very few of which remain. In noticing some of the separate houses in the street, we must commence with No. 1, the front of which is painted in a remarkable manner with portraits of the great composers. It is in the occupation of the eminent music-sellers, Messrs. Novello, Ewer, & Co. Nos. 6, 7, are now occupied by the Berners Hotel. No. 6 was formerly the banking-house of Messrs. March, Fauntleroy, & Co., where lived the notorious Henry Fauntleroy, who is described by the Rev. Dr. Richardson in his "Recollections of the Last Half-Century," as "a heartless sensualist and hypocritical coxcomb." He was the acting partner in the bank, and succeeded his father in 1807, in which year he commenced a system of frauds that eventually brought him to the gallows. In 1814 and 1815 he committed forgery, and disposed of Bank of England stock to the amount of 170,000*l.*, for which he was prosecuted and condemned to death. Great efforts were made by his friends to obtain his release, but without avail. He might have escaped from prison had he not been a coward; but although he knew he must soon have a halter round his neck, he would not run any risk of immediate personal peril. He was surprised in the performance of his last toilet by the Ordinary of Newgate, who found him, within an hour or two of his execution, most carefully airing the shirt in which he was to be hanged, and when he ascended the scaffold he was dressed in a black coat, waistcoat, and trousers, with silk stockings and shoes. The crowd that came to see his execution was so great, that it was calculated at 100,000. He had been accustomed to be early and late at the banking house, and was looked upon as an example of devotion to the duties of his office; but the truth really was that he was afraid to leave in case his crime should be found out. A little

time before the discovery, a friend came upon him suddenly, and tapping him on the shoulder exclaimed, "Hilloa, old fellow, what are you thinking about?" He turned round trembling with a face deadly white, and stammering out some unintelligible sentence said, with a ghastly attempt at a smile, "You almost frightened me out of my senses!" Besides his town residence over the bank, he kept a house at Hampton, and another on the Brighton road, where he lived dissipated and profligate life. He slept at the latter house, which is situated in a pretty garden the night before he was taken prisoner. On the sideboard of his dining-room, in Berners-street he placed two marble busts, one of Napoleon I. and the other of himself, because his flatterers persuaded him that he bore a remarkable resemblance to the Emperor.

The celebrated painter, Opie, who was the son of a poor carpenter in Cornwall, lived at No. 5 from 1792, until his death in 1818. A brother artist, the great Fuseli, lived at No. 13, in 1809, and remained there till 1806, when he was appointed keeper to the Royal Academy. In the following year Sir Robert Smirke, the eminent architect, lived in the same house. Two doors further on (No. 15), lived Henry Bone, the enameller; and No. 31 was inhabited by William Shield, the composer of "Rosina" and other admired operas, and the friend of Joseph Ritson. The following original letter from the musician to Robert Bloomfield, author of the "Farmer Boy" (dated February 9, 1811), is taken from *Notes and Queries*, 3rd series, x. 287:—"That which you obligingly transmitted to Berners-street I should prefer replying to by an interview, either at No. 31 in the said street, or at your own apartments. I cannot conclude without acknowledging that I felt highly gratified when I read that you entertain'd the same opinion of my musical attainments that I do of your poetical powers." Shield died in 1829, and was buried in the cloisters of Westminster Abbey.

No. 53 was built by the celebrated architect Sir William Chambers, for his own occupation, and he removed into it from Poland-street. In the front room on the ground-floor a medallion of Æneas carrying his father Anchises from the ruins of Troy, is let into the wall over the fireplace. This is the original work of John Bacon the sculptor, who was a student at the Royal Academy on its establishment in 1768, and in the following year gained the first Royal medal for this piece of sculpture. Chambers at the time was treasurer of the Royal Academy. During his occupation many celebrated men visited the house, among whom was Dr. Johnson. Washington Irving also relates that one evening Goldsmith was seated at the whist-table with Sir William and Lady Chambers and Barstow, when he suddenly hurried out to assist a beggar woman who was singing some melancholy air in the street. In later years, the painter, Frank Stone, had his studio in the back room on the first floor. This house has been for many years in the occupation of the Royal Medical and Chirurgical Society, and the walls of its rooms are lined with the Society's very valuable and extensive library. As several other Medical Societies also meet here, it may be considered as the chief debating ground of the medical profession.

No. 54 is the house made famous in 1809, by Theodore Hook's notorious Berners-street house. It was inhabited by a widow (Mrs. Tottingham) who was almost driven out of her senses by the simultaneous arrival at her door of carriages and carts that blocked up the roadway, and of walkers, who jostled against each other on the pavement. Hook had written 1,000 letters to tradesmen and persons out of situations, to the Governor of the Bank of England, the Lord Mayor, the chairman of the East India Company, the Archbishop of Canterbury, the Commander-in-Chief, and many others. He fixed the same hour of the day for all of them to arrive, and sat at a window opposite to witness the distraction. Great was the damage done on that day, and loud were the cries that arose for the detection of the deceiver. Hook found it convenient to leave town for a week or two, and when he returned, the storm had blown over. Besides the celebrated men we have already mentioned, we must note that the great surgeon, Henry Earle, lived in this street from 1813 to 1818; and Dr. Robert Gooch, the obstetric physician, from 1815 to 1818. Bartleman the bass singer, who was buried in Westminster Abbey, died at this house in this street, on the 14th of April, 1829, in the fifty-fourth year of his age.

De Quincy relates in his article on "Murder undecided as one of the Fine Arts," that he was sitting tea with Coleridge, at one of the houses, when the company were surprised by a cry of "Fire!" They adjourned to Oxford-street, where a fire, which promised to be a conflagration of great magnitude, was raging at a piano-forte-maker's. Some days after Coleridge was asked how the extinction had terminated.—"Oh! sir," said he, "it rained out so ill that we damned it unanimously."

Before closing this notice, we must add a few words on the Middlesex Hospital, which forms so important an object at the top of the street. This valuable institution was originally opened in 1745 as the Middlesex Infirmary, and occupied small houses situated in the Marylebone fields, which were rented from Mr. Goodge, whose name survives in Goodge-street. On the 15th of May, 1755, the first stone of the new hospital was laid by the Earl of Northumberland, and the wings and other enlargements have since been made. In 1769 "the Board received an application signed by several of the inhabitants of Berners-street, requesting the liberty of planting a row of trees, at their own expense, in the court before the hospital, alleging that it will add to the beauty of the street, and they apprehend will not be detrimental to the hospital. Resolved, that the above request be granted, provided that when the said trees shall want cutting, it be done by the said inhabitants in such form and height as the Board shall approve." In May, 1785, Mr. Lunardi desired permission to ascend his balloon from the garden behind the hospital, and not long after the ground before the hospital was wanted by the Berners-street division of the West Marylebone Volunteers as a place for drill, but both these applications were refused. The hospital has passed through many money difficulties, and has been assisted by the managers of the theatres, the Opera-house, and Ranelagh, and by sermons preached for its benefit; but at the beginning of the present century the funds at the disposal of the management were inadequate to meet the increasing expenses. The number of patients, which was 4,519 in 1831, was reduced as low as 611 in 1808. It has since received greater support, which has allowed the governors to increase its sphere of usefulness. In 1845 a centenary festival was held, at which 4,000l. was collected. In conclusion we will quote from Mr. Erasmus Wilson's history of the hospital a notice of a very singular proposal made by a Mr. Peter Legrand:—"At about this period, namely, in May, 1762, a singular proposal was made to the governors through Mr. Wright, the treasurer, by Mr. Peter Legrand, an old gentleman, 74 years of age. The proposal was to the effect that Mr. Legrand would assign to the hospital 600l. invested in Old South Sea Annuities, on condition that the governors would permit him to reside in the hospital, and provide him with all necessaries during the time of his natural life. These terms were agreed to by the Board. A room was fitted up for the old gentleman, and articles of agreement were drawn up and signed by the treasurer and the new inmate. On the transfer being made, the sum was found to be 15l. greater than had been stated by Mr. Legrand, and comprised the whole of his property in the public funds. Mr. Legrand died on the 23rd of November, 1770."

ON SOME SKETCHES BY MULREADY.

In one of the smaller rooms, among the picture-galleries at the Kensington Museum, stand two folding-screens, labelled, "Original Sketches by Mulready." These contain a small proportion out of the number of sketches and studies left by that indefatigable and persevering worker in his art,—chiefly figure-subjects, either studies in the "Life Academy" or rough sketches, thrown off at odd times to try some problems of attitude or foreshortening; including also first sketches of the composition and details of pictures since become well known amongst us. Those who are acquainted with Mulready's work of this kind (specimens of which are continually turning up, at picture sales and elsewhere,) will know pretty well what will be the nature and value of such a collection. There may be others who are unaware how much is afforded for study and suggestion in these sketches; and a casual visitor to the Kensington Museum might pass by the two screens, amid the wealth of larger and more striking productions around him, without suspecting that they

contained, even for those who are not practical students, a fund of interest and beauty greater than many much more ambitious collections can show.

The first screen, which is the best and most interesting, consists very largely of Academy studies, mostly labelled, "Before 1820;" some much later: few are precisely dated. No. 6,000 is the study made for permission to draw from the life (dated 1800), showing already great mastery over action and perspective in figure-drawing, though comparatively laboured and mechanical in finish. It is interesting to compare this and an early life-study (6,028, a reclining female figure) which are finished and shaded carefully, but somewhat ineffectively, with some of the later ones, in which far greater vigour and effect are obtained, with so much less appearance of labour. Notice especially, in contrast, the half-length female study, 6,122, a sitting figure, really grand in its indication of the soft folds and wrinkles of the side, and the depth of thigh (the latter possibly exaggerated). Nos. 6,123, 6,124, are splendid half-length studies of a remarkably muscular figure, the massive rolls of muscle on the back and shoulders evidently drawn and shaded *con amore*, though with no loss of labour; every touch tells. Nos. 6,128 and 6,125, on the contrary, are very fine specimens of Mulready's more finished manner, when he had an unusually good model before him, and wanted to make a picture rather than a mere study of it. Both are sitting figures,—a full-length of a man and a half-length of a woman,—very delicately and carefully shaded. The latter, from a model of more refined development than usual, is perhaps the prettiest drawing in the collection, though less valuable as a study than some others. Nos. 6,144, 6,145, 6,146, 6,147, consist of some studies in pen and ink, rough, but remarkably vigorous and characteristic of an infant lying on its back. There are two separate studies of the head, one in outline and one white relieved against a black shadow. Later, Mulready seems to have employed pen and ink for some of his life studies. There are two of female figures, dated 1860, evidently from life, and shaded with hatched lines with a pen; one of them a most curious study of a crouched sitting figure, knees up to the chin, and hands round the knees. The indication of the salient points in the framework of the skeleton is admirable in this, which is rather a thin figure. If the shading were finished on the spot, it is a remarkable instance of neatness combined with rapidity of execution. Among the most interesting things on this screen are some of the many slight studies of figures apparently imaginary. A great many of these are very rough. There are two, however, specially worth looking at (6,108 and 6,109); they are merely outlines with a coarse pencil on a rough brown paper; two side views of nude male figures, one stooping as if to pick up something, the other sitting, with face buried in hands. Slight as these appear, there is evidence of a life's study in them. The lower one is full of feeling in attitude and expression. A remarkable study, too, is No. 6,161, a sitting figure, with one knee raised and the head drooped on it, powerfully shaded in monochrome. This is a very poetical and imaginative design; indeed, such drawings as the two last-named cannot but excite surprise that an artist with such feeling for the human figure as the medium for the highest expression of art, and such power in delineating it, should have chosen to confine himself, in the public exercise of his art, almost entirely to *genre* pictures of every-day life, and not have turned his thoughts in a greater degree towards works of a more imaginative and less realistic nature. Nos. 6,101, 6,102, 6,103, 6,104, show chiefly various rough sketches, very clever, of groups of recumbent figures foreshortened ("end-on" so to speak), the most difficult position in which the representation of the figure can be attempted. One sketch on this sheet, however, that of a profile head reclined back on a pillow (6,102), is really one of the most remarkable of the collection; it is nothing more than a thick pen outline, roughly put in, looking as if it were begun at the back of the neck and carried round the whole profile almost without lifting the pen, yet with a character and intensity of expression, and a perfect indication of all the features, which is quite astonishing in so slight a performance.

Among miscellaneous sketches on the same screen are two sheets of studies of heads of different character, stated to have been made after a conversation as to the influence of the zodiacal signs on the character of persons born

under them. There is a great deal of humour in these, and they are very suggestive, too, of the various means of giving individuality of character to a face. Nos. 6,293, 6,294, 6,295, rough monochrome sketches of draped figures, seem intended as studies of attitude and expression under special circumstances; and 6,317 to 6,321 show sketches of drapery, slight, but containing very good hints, and supplied by written notes in a microscopical hand: we manage to decipher, among other things, the observation that "the action of drapery about the loins is most difficult to understand: the lay figure is quite useless in this case." A study for one of the figures in "The Careless Messenger," a young woman with her back turned full to the spectator, is another capital study of dress; the figure is relieved against a dark background; the sketch is dated "Sunday, 4, 2, 21." A little monochrome study, about 4 in. by 3 in., for the entire composition of "The Cannon," is one of the most spirited things in the collection; small as it is, not only the whole expression of all the figures, but the pose and attitude of the limbs under the dress of the figures is completely indicated: so ready do they all seem for a "start," that one expects the next moment to hear the *ping* of the small piece of artillery which forms the centre of interest. Below is a larger sized study of the outstretched arm of the lad about to fire the cannon (nude, though the arm in the composition is covered), and one of the feet of the same figure. These may serve to indicate to the uninitiated the extent of study which may precede and underlie a small work undertaken by a true artist. Numbers of studies of hands, in all kinds of positions, have interest; and we should not pass over 6,428, a remarkably careful and finished study of that difficult feature, the bent knee, in three aspects.

The second screen is of less interest in point of drawing than the first: it consists largely of very rough small first studies for pictures, or figures forming parts of pictures, subsequently more or less well known. A larger one, for a group in the "Return from the Hussings"—a drunken man helped along by two comrades—is full of humour and action. A large portion of this screen is occupied by sketches and copious notes on costume; the notes cover a quantity of paper, and might be most valuable if we could read them, which we cannot. Mulready must surely have written with a magnifying-glass before his eyes. Some of the sketches are very interesting. There is a little one (6,543) representing figures at an Assembly,—two sworded gallants advancing to the front, and some figures behind; one of which, a lady in rich costume, sails away from the spectator with most evident motion: the figures are scarcely more than 2 in. high. Then there are bits of landscape, studies of birds (one or two of the wings and plumage, of doves, life size,) and sketches of plans, roofs, and ornamental details, made when the artist's house was in course of alteration; but in architectural detail, we must admit, the learned and talented artist does not shine. One or two slight bits of landscape study on the first screen, on the other hand, are nearly as masterly in their way as the figure-drawings.

It is in these latter, however, that Mulready's strong point as a sketcher lay; and while some of his figure studies show that he had a degree of imagination and feeling for the more poetic side of his art, which the ordinary spectator would hardly infer from the style of his known works, it is probable that in mere power of drawing and mastery over the details of the human figure, he has rarely been surpassed by artists of any school; we might perhaps say, rarely equalled. For those students who are endeavouring to master the difficulties of figure-drawing, there is plenty in the contents of these screens both for interest and instruction; and we refer to them, the rather because it appears that the Society of Arts, who have offered so much money in prizes for works of artistic merit of merit. Perhaps a little more study of these Mulready drawings would awaken a wholesome spirit of emulation among art students at least. They do seem to be "caviars to the general," judging by the remark of a good lady who glanced at one or two of them while we were making these notes, and observed that "her children had made sketches quite as good as those." Such precocity, however, being uncommon, we fear sheer hard work is the only thing for less gifted students. The execution of the life studies

suggests a word as to practical methods of execution in this kind of drawing. Where high finish of a drawing is the object, a somewhat rough granular paper, and pencilling laid on gradually in broad and carefully graduated tints, will probably answer the end best; and this is a very good way of working from casts, and when a man has plenty of time on his hands. But a study from life always means, unless the model be placed in a very easy and natural position, a study made against time; and any such elaborate and delicate shading is out of the question. In the French art-schools, where it is the custom to draw to a large scale (life-size, or near it,) the stump is, we believe, largely used, and a very soft and graduated effect of shadow may be thus produced; but unless on a very large scale, the stump is not exact enough in definition; and though saving time on large work, it has on small scale drawings a weak and amateurish appearance not very pleasant, even putting aside the want of perfect exactness and precision. The best method for combining rapidity with clearness is that adopted in nearly all the best of the Malready life studies we have been describing, of drawing on toned grey paper, leaving the paper for the middle tints, hatching the deeper shadows in a slight but precise and careful line shading, and the high lights in a similar manner with white chalk: thus the necessity of any extensive masses of shading to give roundness to the figure is dispensed with. The student will contrast the effect of these studies, in the artist's matured manner, with one or two of his earlier more carefully studied ones, and observe how far greater is the effect of the latter in proportion to the labour expended. Pen and sepia sketching, of the rough dashing kind found in this collection, is rather for the hand to which practice has given a familiar ease in delineating the figure, than for the student or learner, who should aim at careful correctness rather than dash and effect. Haydon tells a story of a young man who brought up his sketch to the then instructor in the Life School of the Royal Academy, asking him, with an ingenuous self-laudation, if it was not "very spirited?" "The result," he observes, "of this spirited young gentleman's efforts is what might be expected—we do not know his name."

WILL THE TIBER PAY?

DREDGING the River Tiber will bring to light lost things of various sorts, no doubt. But will the work pay as a mere speculation? This is doubtful. Antique valuables are from time to time discovered in various places, but more by accident than by being deliberately sought for, and the proportion found to the searching labour bestowed is ridiculously small. Consider what has been done in this way in England and Scotland for instance, and then infer what may result from extensive dredgings, diggings, and trenchings in Italy. Pompeii is an exceptional case. It may be said Rome and the Tiber are also exceptional. Granted; but is it quite certain that digging, trenching, and dredging, will produce results such as outside speculators anticipate? England was occupied by the Romans, and has 2,000 years' history to work in; the more distant period, barbarous and unproductive, no doubt; but it must be remembered that this applies to Rome and the Tiber also. Now the river Thames has been dredged "below bridge" and "above bridge," for commercial purposes, to an extent far beyond what may be anticipated for the Tiber. Where are the proceeds? London has been excavated, dug, and trenched for foundations and for sewers over every acre of its surface, but our museums only show a beggarly collection of antiquities. The river Tyne has been dredged below Newcastle-upon-Tyne without bringing to light many antique riches. The river Clyde, below Glasgow, has also been dredged from 3 ft. to 30 ft. in depth, but with remarkably few antiquarian results. Then as to excavating and trenching old town sites for foundations and for sewers; and, in London, for the Underground Railway, almost every old town in England has been so dealt with. A few may be named; that is, towns which have been trenched for sewers and water mains. These are Berwick-upon-Tweed, Alnwick town and Alnwick Castle, Morpeth, North Shields and South Shields, Newcastle-upon-Tyne and Gateshead, Hexham, Carlisle, Penrith, Ulverston, Keswick, Kendal, Lancaster, Wigan, Manchester, and, indeed, all the large towns, and many of

the small ones throughout England, as Chester, Canterbury, Dover, Portsmouth, Plymouth, Bristol, Hull, York, Leeds, &c., but with no great discoveries of antiquities in any of these diggings and trenchings in towns. Then as to land draining, the operations have been over tens of thousands of acres in area, and by hundreds of thousands of miles in open trenchings, but with no very great antiquarian results. Railways have also opened, but have also covered surfaces, almost in equal proportions. It may be said, "England is not Italy," "London is not Rome," "the Thames is not the Tiber." Admitted; and it may also be admitted that dredging, excavations, and trenchings in the Tiber, in Rome, and in Italy, will prove far more productive in bringing antiquities to light than in England and in Scotland; but will it pay as a money speculation? Any person who reads these lines must draw his own inference. I say "No." Rome and the Tiber may produce antiquities in greater abundance and of greater pecuniary value, but not sufficient to pay for the special labour and contingent costs. Those who take up the task had better do it for the love of the work, and not for greed of money hoped to be earned, as chances are against them. It does not pay, in a money sense, to excavate and clear Pompeii and Herculaneum. How, then, is it to pay to dredge the Tiber?

The richest countries have not produced the most valuable antiquities. It is a fact, inconsistent with modern conditions, but no less a fact, namely, that Ireland has produced more gold ornaments than any other country in Europe. The Dublin Museum is rich in antique ornaments of gold; and it is also a fact well known that the Museum, rich as it is, only holds a fraction of the gold ornaments found and removed out of the country, to be, for the most part, remelted, and so lost to the antiquary. Where did the ancient Irish obtain their gold from? Let the Tiber be dredged, not, however, by foreign commercial speculators, but by the municipal body of Rome, or by a national committee of conservators, for the benefit of the Italian nation. It will be a disgrace to the newborn Italian nation to allow speculative joint-stock limited liability companies, American or English, to come in and dredge the Tiber for money-making purposes. R.

THE MACCLESFIELD INFIRMARY.

THIS extensive building stands unoccupied in the midst of its unfinished grounds. By a bequest of the late Mr. Tunnilliff a sum of 30,000L. was set aside as an endowment for an infirmary at Macclesfield, the conditions being that within ten years of the decease of Mrs. Tunnilliff a suitable building should be erected and presented free of debt for the benefit of the endowment. Mrs. Tunnilliff died in 1865, and only four years, therefore, remain within which to take advantage of the testator's liberality. After considerable controversy, the plans of Mr. Jas. Stevens, of Macclesfield, were selected, and it is in accordance with those plans, with some modifications, that the present building has been erected. It is built on the Pavilion plan.

"Mr. Stevens," says the *Macclesfield Courier*, "had visited, in the year 1854, the best hospitals in Belgium and France, including St. John's, at Brussels, and the model at Bruges, with the Lariboisiere at Paris. He had also obtained most valuable hints from a series of clever articles written by Mr. George Odwin, the editor of the *Builder*, to which paper the country is so much indebted for the sound sanitary principles which it inculcates in building matters. The result of the information which the architect had thus so judiciously collected is to be seen in the Macclesfield Infirmary as it now stands. The judgment of those local medical men and others who supported Mr. Stevens in asserting the superiority of his plans over all others submitted, notwithstanding the adverse opinion of Mr. Curry, in favour of Mr. Waterhouse's, is fully borne out by the testimony of Dr. Renand, of Manchester, Mr. Robertson, and others who have devoted special care and attention to the subject, and who are of opinion that the general construction of this hospital is as nearly perfect for the working comfort and health of the patients as it is possible to make it, and that it is admirably constructed that additional wards can at any time be made if necessary."

With the exception of the façade of the principal entrance, and the grand staircase in the interior leading to the second floor, it makes no architectural pretensions, though when the ground before it, facing to the continuation of Cumberland-street, is levelled, and ornamentally laid out as intended, it cannot fail to have a comfortable and cheerful, and, in its entirety,—capped by the towers and ornamental ironwork,—a dignified aspect. The structure occupies about 2,000 square yards of building space. It consists of centre block, sur-

mounted by clock-tower and spire, and rising to a height of upwards of 100 ft. from the basement, with north and south projections and porches, entrances, and with corridors east and west communicating with the side wings or pavilions. The whole is built of stone from the Taganac quarries, with finely-worked ashlar facings from the Windyway quarries. The building is complete, and ready for occupation; but there are detached washhouses, laundries, and mortuary receiving-house yet to be erected at the north-east extremity of the land. The working offices of the institution are in the centre block. The front entrance is protected by a porch-colonnade, in keeping with the entire façade. The latter is carried up in simple Italian style, with columns and angle pillars. The entire accommodation for patients includes main wards for twenty beds each on the principal floor, two convalescent sleeping-rooms on the second floor, wards for ten beds in the children's hospital, besides corridor space capable of accommodating a row of beds, and still leaving a passage of 6 ft. for attendants, &c. These corridors are an important feature of the building. In addition to the sleeping-space, there are patients' convalescent day-wards, operating-theatre, accident-room, entrance-hall, &c., in the principal floor; children's wards, &c., with a corridor-space, on the principal and ground floors, of 250 ft. in length by 15 yds. wide and 16 ft. high on the principal floor and 11 ft. 3 in. high on the ground floor. It is calculated that, altogether, from 100 to 120 juvenile and adult patients may be accommodated.

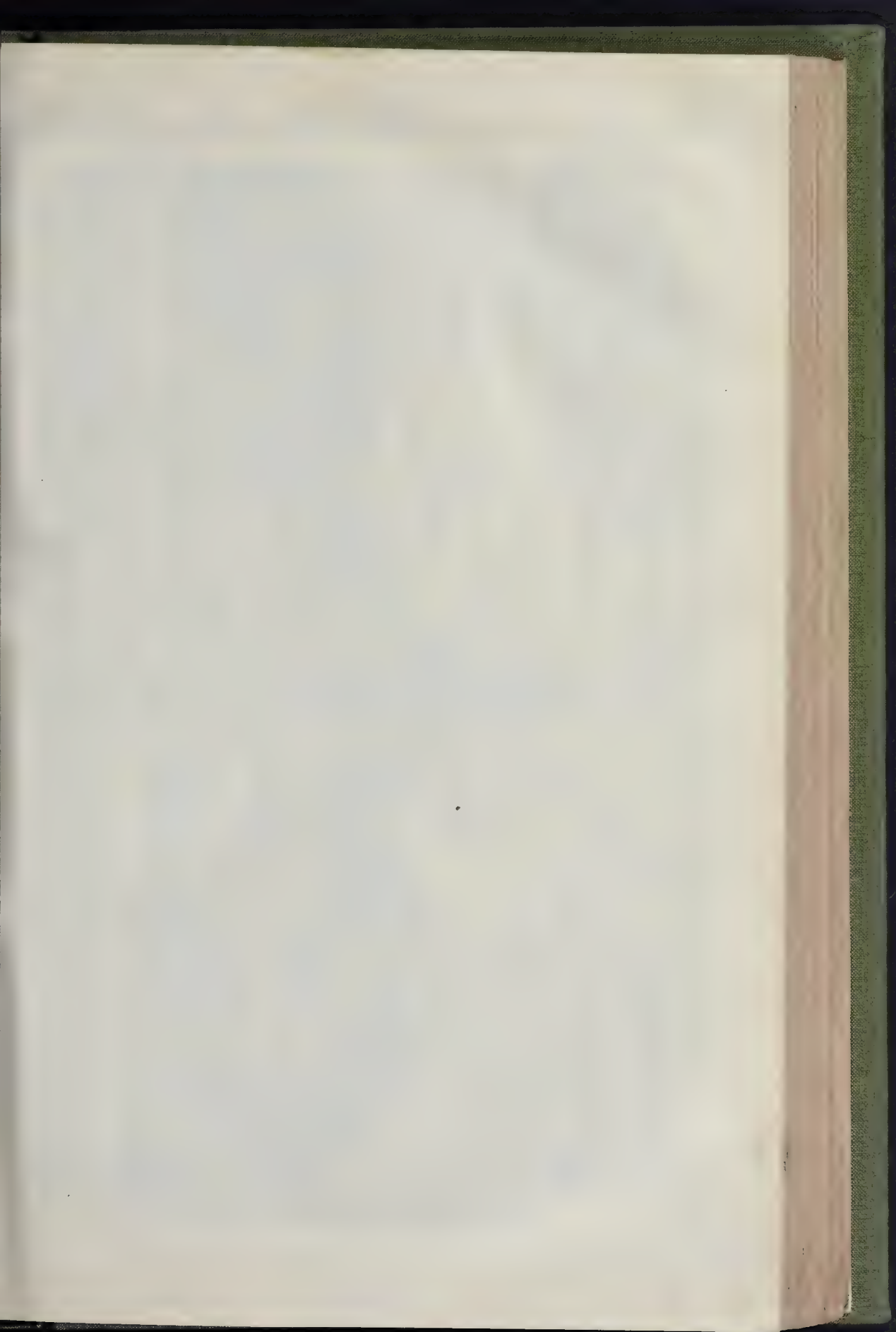
There are hit-and-miss brass grids placed in the floor of the wards between the beds. This is done to supply a flood of fresh air at the floor-line in case of burrs or scalds, which at times, when being dressed, create annoyance. The nurse or surgeon will have charge of them, and they will merely be used when needed.

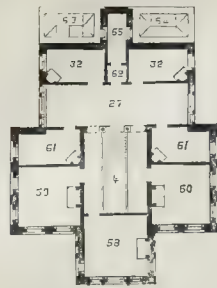
The work in connexion with the building has been executed under the superintendence of the architect by Messrs. R. Neill & Sons, of Manchester, the principal contractors. The sub-contractors are Mr. Charles Frith, of Macclesfield, for the stonework; Mr. Robert Davies, Macclesfield, plumbing and glazing; Messrs. Kitchen & Brown, Manchester, for the inside ironwork; and Mr. West, of Manchester, for plastering and painting. The joiners' work throughout has been done by Messrs. R. Neill & Sons. The floors are of pitch pine, to be polished with bees-wax. The internal hot and cold water apparatus, electric bells, gas-fittings, grates and mantelpieces, fire-plugs, and hose, &c., have been supplied by Mr. William Wilson, of Manchester; all the above being under Messrs. Neill & Co.'s contract. James Fletcher had charge of the works on behalf of Messrs. Neill.

It is urged that it will be a great mistake if this important institution be much longer allowed to remain closed. Nearly 9,000L. are required to set the building in full operation. Meanwhile, there is even already talk of appropriating it either to the purpose of a Recreation Hall and Museum in connexion with the Park, a Public Library, a School of Art, a Club-room, or some other purposes. The 30,000L. offered by Mr. Tunnilliff will, in such a case, of course be lost.

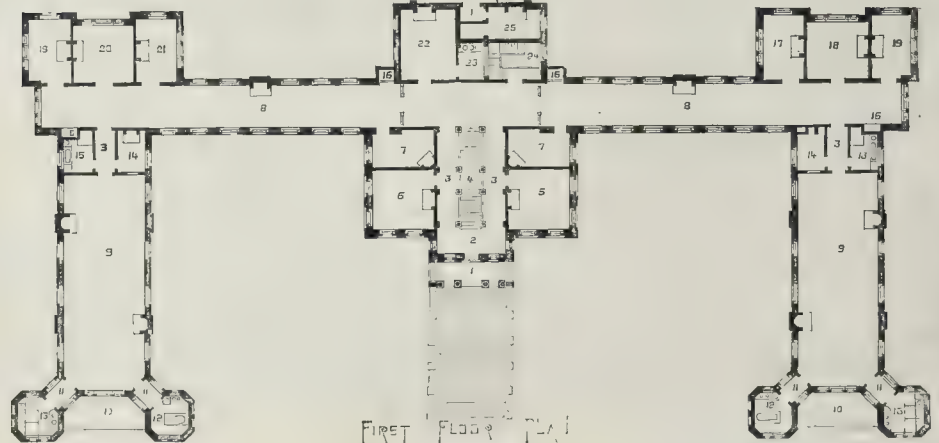
REFERENCES.

- | | |
|--|--------------------------------------|
| 1. Porch. | 33. Boys' Wards. |
| 2. Hall. | 34. Special Room. |
| 3. Passage. | 35. Lavatory. |
| 4. Principal Staircase. | 36. Dispensary. |
| 5. Matron's Parlour. | 37. Dispensary's Private Room. |
| 6. Surgeon's Parlour. | 38. Surgeon's Private Room. |
| 7. Head Nurse's Bedroom. | 39. Surgeon's Room. |
| 8. Corridor, 12 ft. wide. | 40. Coal, &c. |
| 9. Ward for fourteen Beds. | 41. Waiting Hall. |
| 10. Balcony. | 42. Porter's Room. |
| 11. Passage. | 43. Waiting Hall. |
| 12. Bathroom and Lavatory. | 44. Outside Accident Ward. |
| 13. Latrines. | 45. Girls' General Ward. |
| 14. Nurses' Sittin'-room. | 46. Servants' Hall. |
| 15. Nurse's Scullery. | 47. Flour and Bread. |
| 16. Hot. | 48. Beer. |
| 17. Ophthalmic Ward. | 49. Cooked Meat-Larder. |
| 18. Convalescents' Day Ward. | 50. Fresh Meat Larder. |
| 19. Special Ward. | 51. Scullery and Vegetable Kitchen. |
| 20. Convalescents' Day Ward. | 52. W.C. and Bath-room for Servants. |
| 21. Ophthalmic Ward. | 53. Covered Asbitt. |
| 22. Operating Theatre, lighted from above. | 54. Ash Shoot. |
| 23. Surgeon's Ante-room, Instruments, &c. | 55. Dry Asbitt. |
| 24. Stairs to Basement. | 56. Outside Boiler. |
| 25. Nurse's Bedroom. | 57. Chapel. |
| 26. Open Balcony. | 58. Surgeons' Bedroom. |
| 27. Corridor. | 59. Matron's Bedchamber. |
| 28. Fever Wards. | 60. Convalescent Sleeping-room. |
| 29. Retiring. | 61. Ante. |
| 30. Wine Cellar. | 62. Skylight. |
| 31. Servants' Bedroom. | 63. Lead Flat. |
| 32. Spare Room. | 64. W.C. and Lavatory. |

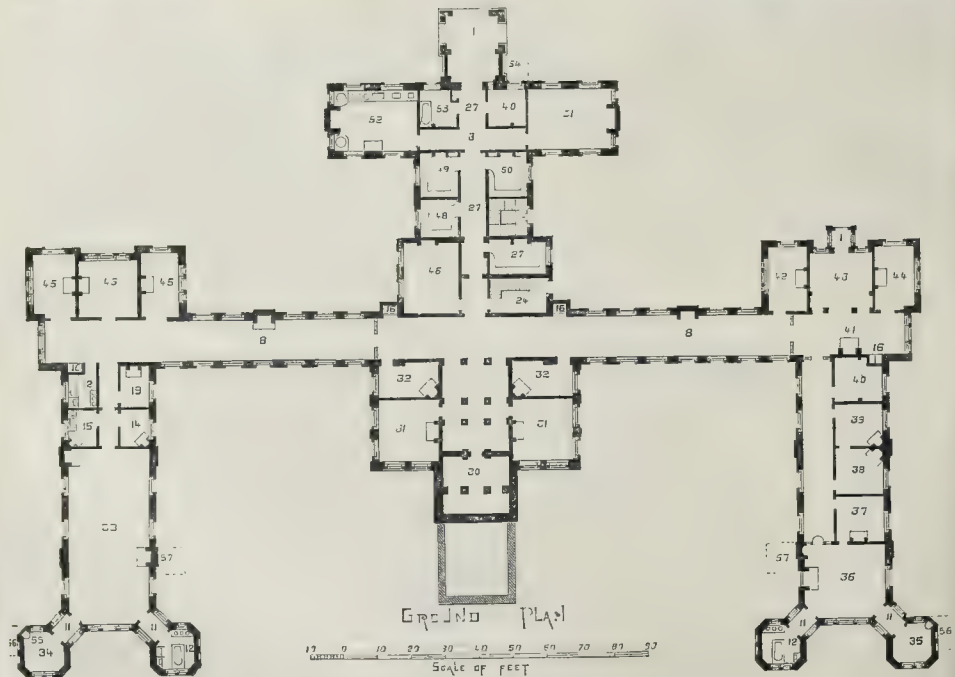




SECOND FLOOR PLAN



FIRST FLOOR PLAN



GROUND PLAN

Scale of feet

MACCLESFIELD INFIRMARY.



MACCLESFIELD INFIRMARY.—MR. JAMES STEVENS, ARCHITECT.

COLOURED DECORATIONS—SALISBURY CATHEDRAL.

At the last meeting of the Bishop Hamilton Memorial committee, a report was received from Mr. G. G. Scott, in the course of which he said,—

As regards the decorative painting, the report states that the choir roof has been painted with large circular medallions, containing Scripture subjects, which decoration had become historical. These were covered with yellow wash in 1789, an act of vandalism which provoked the severest censure at the time, from those capable of forming a sound opinion. It has been found impossible simply to remove the yellow wash (as it was hoped might have been the case), as the process of scraping the wash so nearly destroys the painting that from the floor of the church it would be unintelligible. Mr. Scott, therefore, recommends that the painting of the vaulting and spandrels be restored, as delicately and with as much reserve as possible; and that the arches of the choir be cleaned of their coating of wash, with the remains of colour left upon them to speak for themselves. The report adds that by this course, as this cathedral is the most unique and complete in its architecture of any which we possess, so shall we have it down complete (so far as we deal with it), in its decorative accompaniments.

After some considerable discussion it was agreed that, considering the lack of funds, it was only possible at present to order the decorative painting of the choir. That, in order to this, Messrs. Clayton & Bell's estimate, amounting to 970*l.*, be accepted for the above-named decorative work; and that 80*l.* be paid them for a specimen of a section of the choir walls already painted, which specimen will enable any one who may wish in future to carry out this part of the decoration of the choir. Another reason which weighed with the committee for ordering the painting at once was that Mr. White, the builder, will allow the committee to make use of the scaffolding at present in the choir for its architectural restoration; and thus save the heavy cost of erecting new scaffolding at a future period.

URBINO, AND THE HOUSE OF RAFFAELLE.

I must send you a few lines from this most interesting city, well known to us by name as the birthplace of Raffaele, but little visited in these days by our countrymen. The reason of this neglect is probably its remote situation; for while Siena, Perugia, and Assisi are easily reached by rail, Urbino is five hours' drive from the nearest railway station—Pesaro. It is, however, well worth a visit, were it only to see that magnificent specimen of cinque-cento architecture, the Palace of the Dukes; but there are also many other objects of interest. For instance, in the Church of S. Giovanni are some admirable frescoes of the school of Giotto, painted by the brothers Lorenzo and Giacomo Sallimbeni; then, at the Institute of the Belle Arti are to be seen pictures (which formerly were hidden in dark churches), but now are brought to the light; they are by such masters as Giovanni Santo, Timoteo Viti (a pupil of Raffaele's), and Federico Barocci, all natives of Urbino.

Turning from painting to sculpture, in a chapel under the cathedral is one of Gian Bologna's finest works,—a dead Christ, lying at the feet of his disconsolate Mother. The figure of the Virgin Mary is by another hand, and is much inferior, but the Christ is a most perfect piece of sculpture. Then again, in the Church of S. Giuseppe is a very cleverly modelled group, representing the Adoration of the Shepherds; this is by an almost unknown but very talented sculptor, also a native of Urbino, Federico Brandini, who lived in the sixteenth century: he worked only in plaster, but the group just mentioned has quite the appearance of marble.

In the dual palace itself are some splendid carvings in stone. The palace is built of brick, but all the ornaments which are lavished on the windows, doors, &c., are of carved stone, and of elegant design. The view from the palace is most extensive. The founders had undoubtedly a greater appreciation of nature than the Italians of the present day. In the palace are three loggias, from which they enjoyed the view of the blue Apennines, which lay spread before them, and inhaled the fresh mountain air. In some of the finest rooms of the palace is established at present the Academy of Raffaele. This is an academy founded for the promotion of art, to honour the memory of Raffaele. Its present chief object is to erect in Urbino a memorial worthy of him, and to establish a museum of his house in which he was born. This house is situated in a steep street which turns out of the Market-place. Ascending to the first

floor one enters the family living-room, which is large, of a singular shape, and with a handsome raftered ceiling, elaborately carved. The mantelpiece is of stone, large, and reaching to the ceiling; it is also carved, and so are the doors. On the right is the room in which the painter was born. The great point of attraction in this house is the fresco painted by Raffaele's father, which represents his wife, in the head-dress of that time, reading; on her knee is her little rosy son, who has fallen asleep.

This house and the precious fresco are now for sale; and the Count Gherardi, president of the Academy, is anxious to secure them for the town: the sum demanded is 25,000 francs (1,000*l.*). A subscription has been opened, and the Count wishes to make it known to all who love Raffaele, and have derived hours of enjoyment from his pictures, that even the smallest donations will be acceptable. Each subscriber will receive a pamphlet, with a description and an engraving of the house, and a woodcut from the famous fresco. Let us hope success will attend the Academy in its endeavour to preserve for poor Urbino this relic of her great son; she has indeed been ruthlessly robbed of her many treasures of art. C. M. C.

THE LOCAL GOVERNMENT BOARD.

The new Local Government Act, which has just come into operation, places the Poor-law Board, the Medical Department of the Privy Council, and the Local Government Act Office, under the new president of the Local Government Board at once. The Right Hon. James Stansfeld, M.P., is president, as we have already mentioned, and Mr. John Lambert, C.B., is secretary. Things will probably go on much as at present in the offices, or until Sir Charles Alderley's Public Health and Local Government Bill becomes law. This Bill contains 452 sections and schedules, from A to K. It purports to repeal twenty Acts of Parliament, from the Public Health Act, 1843, to the Sanitary Act Amendment Act, 1870, the new Act codifying these repealed Acts, for England and Wales (exclusive of the metropolis). The several officers and clerks are placed under the authority of the new president, and will have to be amenable to him. Next session of Parliament ought to settle the mode of preventing river pollutions, and the metropolitan water supply; but this latter may probably be deferred until the Metropolitan Local Government has been settled.

There must be alterations and additions to many of the 452 sections, or clauses, of the new Public Health and Local Government Act before it can become law.

COMPETITION, HAMPTON.

At a meeting of Guardians of the Kingston Union, held on Tuesday last, the selection of plans for the new schools, &c., at Hampton, resulted as follows:—First premium, to designs marked "Experientia," which were found to be by Mr. F. Haslam, of Henley, the estimated cost 8,150*l.*; second premium, 15*l.*, "Two heads are better than one;" third premium, 10*l.*, "Masonic sign;" fourth, 5*l.*, "Justitia." The estimates of the last three designs were within a little of 8,000*l.*, though some of the designs were marked as low as 3,500*l.*, and some as high as 16,000*l.* or 17,000*l.*

A CHURCH FOR ROME.

The Rev. Richard Burgess, lately of Upper Chelsea, and well known to all members of the Institute of British Architects, appeals for aid to build a proper church for the British residents and visitors in Rome. About twenty years ago a similar appeal was made, and about 3,000*l.* was promised, but intolerance prevented the fulfilment of the scheme, and the money was never collected. The chance of success would now be much greater, and we shall be glad to find that Mr. Burgess's appeal is liberally responded to.

It is thought by experienced persons who know what it is to build churches abroad, that this object may be the most economically and easily carried out by obtaining, through purchase, in a good situation, some disused edifice which should furnish the site, and in a great measure the materials for a church, a chaplain's residence, and other accommodation for religious and benevolent purposes; the whole cost of the work to be covered by 10,000*l.*

As soon as a sum of money, equal to that which was offered to a similar appeal twenty years ago, can be guaranteed, an experienced and practical friend to the scheme, qualified by his knowledge of the language and the habits of the Italians, will proceed to Rome for the purpose of making the necessary inquiries, with a view to purchase at once a property, and take any further steps that may be necessary or expedient.

GLASS ROOFS AND PAVEMENTS.

A PATENT has been taken out by Mr. J. H. Johnson for the construction of frames or gratings intended to receive glasses for the purpose of forming illuminating roofs, coverings for areas, and walking surfaces for side walks when light is required to be transmitted therethrough. It consists in casting, in such frames or gratings, grooves or channels, or in perforating or partially perforating the same in rows, or in combining perforations or partial perforations with grooves or channels, in order to facilitate the sub-division of the said gratings into separate smaller portions or sections of any given dimensions, according to the requirements of the particular roof or structure to be erected. Also in making the lights or glasses for this and other descriptions of illuminating gratings intended for foot pavements in such a way, as that the glass itself shall in a measure act as the medium for protecting its surface from being scratched by the feet of the passengers.

ECCLESIASTICAL DILAPIDATIONS ACT, 1871.

SIR,—In this week's *Guardian* there is a letter from the Rev. J. G. Joyce, from which, as it affects persons of our profession, I venture to make extracts for your pages, and comment thereon. He tells us that:—"A surveyor having been duly elected for the whole diocese of Winchester, the language of the Act was then discussed by those whose duty it was to settle the table of charges, when it appeared that the Act directs the surveyor, if he views for repairs, 'to specify in detail' what is needed to 'estimate' probable cost, and calculate what time should be allowed for their completion; upon which he is to survey again, and, if satisfied, then furnish the certificate of protection for five years. Upon the minds of those who on that occasion considered the language of the Act, there was no doubt whatever that, as the relief of the clergy was the main issue, the purpose of the Act was that the surveyor under the Act should be the person to direct the repairs, and should draw up after his first survey such a 'specification in detail' as a builder could estimate to and work from. It will be apparent, I think, to any man of business, that this is not merely just and equitable, but a necessary interpretation, because otherwise, in every instance, the peril would be imminent to an incumbent that the surveyor on his second survey might refuse to pass the repairs. . . . It was, however, alleged on the part of the surveyor, very respectfully and properly, but very definitely, that this was a mistaken view of the Act; that the meaning of the words 'specify in detail' merely is, that the surveyor shall signify in his report whether it is the residence or the offices, the roofs, or walls, or floors which need repair, instead of stating in general terms what repairs are needed; and it was even asserted, in reply to the clerical interpretation of the Act, that 'the sort of survey made at first would be of very little use for the purpose of drawing up a specification such as a builder could estimate to.' A tariff was consequently proposed, *over and above the charges under the Act*, for the direction of repairs ratably to their amount, being about 5 per cent. on the outlay."

I have paid great attention to the subject, and shall feel obliged if you will permit me to explain my views. I have now in the press a treatise, which I have called a "Handy Book" on the law, which will shortly be published by Messrs. Rivington; and therein I have expressed opinions which differ considerably from those of the surveyor of the diocese of Winchester, as represented by the letter above referred to. The Act directs the surveyor to "specify in detail." I ask, then, what the work, when done, can be otherwise than a specification; and, if it be in detail, and properly executed, I cannot understand how it can be anything short of a detailed specification. For this, of course, the

surveyor should be fairly paid, and the charges under the Act should be sufficient to remunerate him. It is evident that, as the Act directs the execution of the repairs, a specification to which a builder can work must be prepared, and it may as well be done at once. Such a survey as proposed in the letter referred to, purporting to set forth the views of the Winchester diocesan surveyor, would be of no practical value.

There should be some uniformity in the scale of charges; and it would be well if a conference for comparing before it were finally adopted in any. I have suggested a scale in my little book, and shall be glad to furnish you with a statement, if you are disposed to allow the question to be debated in your pages.

EDWARD G. BAUTON, Architect.

COMPLETION OF THE SCOTT MONUMENT.

SIR,—Do not our Scotch compatriots, by their representative committee appointed for the Centenary Completion of the Scott Memorial in Edinburgh, exhibit an unworthy narrowness of view in their determination that none but Scotch sculptors shall be employed on the work in question?

By the course adopted, they proclaim the possibility that the north of the Tweed it can be imagined that the broad universality of Scott's genius—by which the world claims kinship with Scotchmen—is best represented by a provincial exclusiveness such as this!

It is true that in another, the pecuniary aspect of the case, Scotch patriotism becomes perfectly impartial; for, in the published reports of their proceedings, it is not apparent that the objection so vigorously manifested by the committee against other than Scotch artists is so much as whispered against other than Scotch subscriptions.

UNION JACK.

* * We quite agree with our correspondent: no argument is needed beyond his signature. The decision of the committee is narrow and erroneous, and should at once be amended.

NEW FACTORIES IN NOTTINGHAM.

The activity of trade in Nottingham has rendered it necessary to make large additions to the factories of that town. The most recently completed is a large five-storied building at the junction of London and Queen's roads, which has been erected from the plans of Mr. Robert Berridge, architect, Bishopsgate-street Without, by Messrs. Dennett & Co., Nottingham, and Whitehall-place, London, for Messrs. Charles Cox & Sons, bleachers and lace dressers. The new structure is L shaped; the longer side fronting Queen's-road, and the shorter joining and fitting into an old building whose gable fronts London-road; thus forming three sides of a parallelogram, each wing of which is 300 ft. long, and the connecting side 150 ft. Light, air, and ventilation, all of the best and purest, being essential requisites in the delicate processes of dressing and finishing lace goods, Mr. Berridge has secured the most ample supply of each and all of these, by leaving a court-yard between the north and south wings. The heating apparatus, by Messrs. George Simms & Sons, gives a thorough and equal circulation of heat by pipes to every floor of the building. A speciality in the structure is, that the principal floors are of Dennett's patent fireproof material; and when we call to mind the late lamentable loss of life by fire in a factory at Leicester, the importance of having incombustible floors in buildings where large numbers of persons are employed, cannot be over-estimated. There are 365 windows, filled in with 5,000 superficial feet of glass by Messrs. Wheeler & Humphreys; the frames are of cast iron, from the adjoining foundry of Messrs. Hind & Son, who also supplied the cast-iron pillars which support the wrought-iron girders upholding the floors.

The building has been five months in the course of construction, and it is a satisfactory proof of the amount of work which Nottingham men can turn out of hand, that in the short space of time stated, 4,000 cubic yards of earth have been excavated, 1,000,000 of bricks laid, 4,500 cubic feet of timber cut up, bolted, and placed in position, 800 squares of flooring done, 300 tons of wrought and cast iron put up, and (in three weeks) 250 squares of slating placed on the roof by the Messrs. Lewis. The space of ground covered is almost an acre, and the cost

will be, including extras, 16,000l. Mr. Berridge's instructions were to secure space and air, and to study economy rather than ornament; but, by the introduction of white brick into the arches of the windows, he has, without any increase of cost, produced a pleasing effect. The comfort of the workpeople has not been neglected, for a spacious refectory has been provided for them, 60 ft. by 30 ft., and 10 ft. 6 in. from floor to ceiling, the windows of which afford a noble prospect of the valley of the Trent, shut in on one side by Colwick Wood and, in the far distance, by Belvoir Castle, of which dual fortress there is a distinct view. It is due to the Messrs. Hind to say that, at the dinner given in honour of the completion of the works, at which 150 sat at table, Mr. Dennett, the contractor, remarked that, in many of the numerous contracts in which his firm had been engaged they had experienced a stoppage, for a longer or shorter period, owing to the contractor for the ironwork not being up to time; but in this instance there was not a delay of a moment; and it is also a noteworthy fact, as showing that the windows are approved of, that Messrs. Hind have received an order to supply 1,000 cast-iron window-frames, of the same pattern, for a factory in course of construction at Bradford, intended to be the largest in Yorkshire.

MACFARLANE'S CASTINGS.

THE fifth edition of Messrs. Walter Macfarlane & Co.'s Catalogue of Castings, just now published, is a very remarkable trade book. It takes the shape of a handsome folio volume of 595 pages, exclusive of the price list; and contains some thousands of designs,—terminals, panels, columns, gates, trusses, railing, sanitary appliances (very useful), and so forth. It is the result of years, and must have cost a very large sum of money. Some of the designs are very bad,—stone and clumsy; take, for example, the Gate, No. 85 (p. 420): but a very large proportion of them are appropriate and good. Messrs. Macfarlane feel that cast iron applied to decorative purposes is only in its infancy, and appear determined to realise its power and obtain truthful expression.

The value of the book is greatly increased by the lists of prices which are given.

THE COMPLETION OF ST. PAUL'S CATHEDRAL.

SIR,—My attention has been drawn to a letter in the *Builder* of the 2nd inst. from the Rev. James Lupton on the subject of the works which have been done of late years in St. Paul's Cathedral.

As mistakes appear in Mr. Lupton's statement, it seems important that some notice should be taken of them. I have attended the meetings of the Committee from the commencement of their labours in 1853, and on referring to the minutes find that the late Sir Charles Barry did not object to the placing of the new organ in the south transept. What he protested against was that it should be put upon the columns of the old screen. To meet his views, it was placed on the six tall marble columns, with which arrangement he expressed his satisfaction. These columns, however, were much less costly than Mr. Lupton supposes. They will, of course, be on hand when the south transept organ is removed, but nothing yet is known of their destination.

As Mr. Lupton values, and justly, Sir Charles Barry's authority, it may be well to state that the lowering of the stall-work, which Mr. Lupton deprecates, was proposed by Sir Charles Barry, and "unanimously agreed to."

As to Sir Christopher Wren's approval of the organ in the centre, nothing is more certain, that all he did with it was to make the best of a situation forced upon him; and an architect of high reputation in ecclesiastical matters, in a letter to the *Guardian* of recent date, has entirely endorsed the views of the committee on this point.

Having so far disposed of some of Mr. Lupton's mistakes, I would gladly stop here; but he proceeds to state that "the work in the cathedral is in the hands of some few, who would make believe that they are carrying out Wren's designs."

Sir, the "few" of whom Mr. Lupton ventures to write so unceremoniously, were selected from amongst the leading architects and experts of the day. They are not the men to deceive the public—

which the above charge really means—in order that they may indulge their own peculiar views and crotchets. They are devoting their time and talent to the study of Sir Christopher Wren's unfinished work, with the high and conscientious feeling and conviction that they are doing what he intended himself, but was not permitted to do,—that they are carrying out strictly the programme set forth in their appeal, which states that "Sir Christopher Wren's intentions, which he made of treatment, and so far as they can be authenticated, his very designs, will be scrupulously kept sacred, and followed;" and again, "The leading principle affirmed by all who have been consulted is this,—to make Sir Christopher Wren's intentions for the completion and decoration of the Cathedral the main text, as it were; and to study to carry out as implicitly as possible whatever he may have expressed in drawing, model, or writing; and where these materials for guidance fail, that harmony is to be sought for, to the fullest practicable extent, with what he has proposed or done."

I will only add that the committee would welcome gladly any friendly suggestions from those who take an interest in this great work, and especially from any members of the cathedral body; but as Mr. Lupton has chosen to express his opinion and to make his complaints through the press, it appears to be unavoidable but that I should beg of you to allow me to reply through the same channel.

WM. C. SHONE.
Chapter House, St. Paul's.

THE PATH BY THE RIVER.

There's a path by the river, shaded by trees,
At low tide don't go there if you please;
Banks there may be where wild thyme grows;
But wild thyme can stand it, not having a nose.

SIR,—Last Saturday I walked from Barnes Common along the towing path to Putney. The stench arising from inlets, creeks, and ditches was almost overpowering: sanitary inspection is needed there. A resident informed me the nuisance had damaged the locality considerably.

R. T.

FLATS FOR MIDDLE CLASSES.

SIR,—I read a great deal in the papers about all the grand new buildings in London, and the model lodging-houses for the poor, but I should like to know if any one considers how much the *real poor* would like pleasant and convenient abodes for moderate rents,—I mean people well-born and bred, and with artistic education and tastes, but whose means are not more than those of a skilled workman? These are obliged to live in dear and uncomfortable lodgings, with rooms on various floors, and kitchen underground, if they do not exile themselves to some natchel on the far outskirts of the pale of society. Where are the handsome airy blocks of houses with well-arranged flats,—of rooms from three to ten in suite,—at rents varying from 20l. to 80l. a year, uniting comfort, economy, and artistic beauty?—homes for the *real working classes*,—young professional men and their wives, artists and others,—where a young governess could have two pretty rooms, and feel herself at home after the day's labour? The huge gloomy houses I have seen in flats were not inviting to live in and fabulous rents were demanded for a few dark rooms.

This subject is interesting to many who do not know where to live. The rooms widely separated called unfurnished lodgings, are most uncomfortable.

THEATRICAL.

Covent Garden: *Riviera's Concerts*.—If those who love music do not find here a good return for their money they must be hard to please. There are an excellent band, well conducted, an array of singers and solo players greater than usual at so-called promenade concerts. Messrs. Grieve & Son have provided tasteful decoration and everything looks and sounds bright and cheerful.

Gallery of Illustration.—The new entertainment by Arthur Sketchley, called "Poor Relations," with music by Mr. German Reed, is going remarkably well; the performers have fallen into their parts, and they now see what emphasize and what not. Mrs. German Reed is admirable as ever, and Mr. Arthur Cecil, his make-up and acting as an old man, has advanced his position as an actor.

Gaiety.—Some alteration may be made here in the level of either the stage or the pit. It is abominable—especially in house professing, as the Gaiety does, to pay attention to ballet—that not one-third of the people in the pit should be able to see the floor of the stage; yet so it is.

New Circus.—The building in Argyl-street, Regent-street, known as the Palais Royal, has been transformed into a circus for Mr. Charles Hengler, and is about to be opened.

Bishop Auckland.—A new theatre erected at Newgate End here, for Mr. Alfred Boyd, has been opened. The pit floor is raised to the back, so that those persons sitting in the back can see the stage floor. There are two tiers of galleries, the first being intended for dress circle and boxes, and the upper for the gallery. The building will accommodate close upon 1,000 people. The place will be conducted as a music-hall, until such time as a theatrical license can be obtained.

A National Theatre.—A paragraph has appeared in some of the newspapers, stating that the proposal for a new national theatre is likely to be abandoned. There is not the slightest ground for such an assertion at this time, whatever may hereafter be the case. The committee who met to consider the feasibility of such a foundation, have adjourned until people come back to town again, and no decision whatever has been arrived at.

YORKSHIRE ARCHÆOLOGICAL AND TOPOGRAPHICAL ASSOCIATION.

THE ninth annual excursion of the above association took place from Leeds, its head-quarters for the year. The mayor (Mr. John Barran) received the members in the Victoria Hall, and expressed his gratification in having to welcome them to Leeds. The party, about 200 in number, then started in omnibuses for Adel, the church of which little village is famed as a specimen of the Early Norman period of architecture, and for its deeply recessed porch. Mr. Fairless Barber, honorary secretary of the Association, described a number of crosses dug up from under the church, which, he said, were similar to some discovered at Bakewell and at other places in the United Kingdom. They pointed to a Christian settlement at or near Adel at a very remote period. The Rev. George Lenthwaite, the son of a former rector of the parish, said the church had apparently been erected early in the twelfth century by King Stephen as a memorial of his mother. He explained at length the carvings in the porch, and described the other interesting features of the church. At Kirkstall Abbey, after luncheon, Mr. Edmund Sharpe gave an account of the rise and progress of the Cistercian Order of monks, especially in respect of their contributions to European architectural adornment. The party on their return to Leeds inspected St. John's Church, which is considered almost unique as a specimen of a seventeenth century church.

CEMENT.

Srs.—Will any of your contributors oblige me with information as to the best way of stopping cracks in cement?
J.

"MAY DIFFERENCE OF OPINION NEVER ALTER FRIENDSHIP."

Srs.—Concerning the letter addressed to you signed "Gribble," which surely, sir, would be more appropriately called "Grub-ally," in which the writer attempts to excuse himself from being the lowest in three contrivances of which I am the architect, I ask you whether it is at all likely that I should have misled him in the manner he has described. I am willing to submit to you, Mr. Editor, or any other qualified gentleman, the quantities for your inspection. The fact is, I put Mr. Gribble's tender on one side, knowing that he could not carry out the work at the price sent in. He informed the other builders that he had made a mistake, and in attempting to exonerate himself he has most unworthily condescended to make mis-statements respecting others.
A. JAS. ROYCE.

DRAWINGS AT THE INTERNATIONAL EXHIBITION.

Srs.—Among the architectural drawings at the International Exhibition upon which it was my duty to report officially, is one showing the Choir of Sherborne Abbey as restored by Messrs. Carpenter & Slater, and attributed to them in the Catalogue and, consequently, in my report. Mr. Slater has written to me to ask me to assist him in making it known to those who may have seen my report, that this drawing is from

the pencil of Mr. Barbage; and that it is owing to an accidental oversight that his name is not appended to it as the artist. May I ask you to be kind enough to allow this correction to appear in the *Builder*? The drawing is a very excellent one, and it is only justice to the artist that his name should be made known.

T. ROGER SMITH.

OPENING OF THE PUBLIC BATHS FOR HARROGATE.

THE new public baths and reservoirs just erected by the Improvement Commissioners of Harrogate, as to which we gave some particulars in our last volume, p. 830, are now formally opened. Plans were procured from competing architects in response to advertisement; but, after much deliberation, none of these plans were adopted, and the town surveyor was instructed to prepare plans of his own for the approval of the committee of the Board. These plans the surveyor accordingly prepared, and the building now opened has been erected in accordance with them. The first work was the construction of reservoirs for the conservation of the mineral waters wherewith to supply the baths. The contract for these reservoirs was obtained by Mr. Newcome, of Leeds. They are constructed on the upper part of the land, nearly parallel with the west front of the Victoria Baths, and the mineral waters are conveyed to them from the Bog Fields by gravitation. These reservoirs are five in number, and are so constructed that they can be filled and emptied either conjointly or separately. The excavating for the baths was undertaken by Messrs. Rider & Foster, the masonry by Mr. Joseph Stephenson, the joiners' work by Messrs. Raworth & Co., plumbing and glazing by Mr. J. Marshall, the painting by Mr. Dent, and the ironwork by Messrs. Heaps & Robinson, Leeds. The foundation-stone of the new baths was laid on the 4th of February last.

The baths will cost nearly 20,000*l.* They stand on the ground formerly occupied as allotment gardens, lying between Cheltenham-square and Promenade-terrace, with the east front immediately facing the Spa Concert Rooms.

The central part of the building, on either side of the main entrance, consists of waiting-rooms, one for ladies, and another for gentlemen, with separate entrances to each. The principal entrance leads to the manager's office, built upon the circular plan, so as to command a view of the whole of the interior of the establishment, including the entire length of the corridor, which is 8 ft. wide, and 200 ft. long. Behind the office is the house of the manager. The bath-rooms are placed on each side of the corridor; those in the corridor to the right, or east of the entrance, are for gentlemen. The whole of these bath-rooms are 10 ft. by 11 ft. Attached to these rooms on one side of the corridor is a dressing-room to each, and on the opposite side two dressing-rooms to each bath-room. Each dressing-room contains a water-closet, with tip-up lavatory; and in each wing provision is made for four shower and four vapour baths. At either end of the long corridor is a swimming-bath; that on the east, or ladies' side, being 47 ft. by 18 ft., with six water-closets and six dressing-rooms. At the opposite end the gentlemen's swimming-bath is 78 ft. long by 18 ft. wide, with three water-closets and nine dressing-rooms. The swimming-baths are so arranged that each end will be 3 ft. 6 in. deep, and the centre 5 ft. deep. The walls, up to 5 ft. 6 in., and bottom of the bath, are tiled with white tiles. The roof is an open one, with moulded wall-plates, boarded and stained, and from the floor line to the ceiling the swimming-baths are 28 ft., and the baths and dressing-rooms 16 ft. in height. The floors of the bath-rooms, dressing-rooms, and corridors are boarded and covered with linoleum. To Promenade-terrace there is an end frontage 20 ft. high, and at the opposite (Cheltenham-square end) a similar frontage, but in consequence of the fall of the ground this is 33 ft. in height. The east, or ladies' swimming-bath, is lighted by a four-light window, with circular heads and columns, after the Italian style; while the gentlemen's bath (fronting Promenade-terrace) is lighted with two three-light windows, after the same style. The corridors have windows of stained glass on either side. The baths themselves are eighteen in number, nine for ladies and nine for gentlemen. The main entrance has two stories, with a one-story wing on either side, and a feature is

made of the swimming-baths at either end. The buildings are covered with a Mansard roof, with ornamental cresting at the break as well as the ridge. Along the centre front extends a verandah of ornamental ironwork. On the first floor, in the centre of the building, are two large rooms, one 31 ft. by 26 ft., and the other 31 ft. by 14 ft. These may be used as waiting-rooms, committee-rooms, or even as board-rooms. On the same floor there are five water-closets.

CHURCH-BUILDING NEWS.

Exeter.—St. Sidwell's Church, Exeter, has been re-opened, after considerable improvements. The church, rebuilt in 1812, with the materials of an older edifice of Perpendicular Gothic, was esteemed, at the time of its erection, a very complete place of worship. The additions that have now been considered requisite and made, consist of a chancel, 28 ft. by 20 ft., and an organ chamber on the north side. The new organ is by Forster & Andrews, of Hull, and cost 500*l.* The church has been wholly re-seated, in pitch pine, the pews having been considered awkward of access and incommodious. Those in the galleries have been also re-arranged, and the west gallery fitted up for the children of the parochial schools. The church has been warmed by two Gurney stoves, arranged by Mr. Rice, and it has been lighted anew with brass standards. The gaswork has been executed by Mr. Rouse, and the brasswork is from Thomason & Co., Birmingham. A new pulpit, of Caen stone, of open tracery, is placed at the entrance to the chancel. The sacristy is laid with Minton's tiles; also the avenues. The contract for the works was undertaken by Messrs. Hunt & Seaborn, of Exeter, who have made the alterations under the direction of Mr. Edward Ashworth, architect, Mr. Jerman having been clerk of works. The outlay is about 2,400*l.*, which has been raised by subscriptions.

Hook (Hampshire).—The Church of St. Mary, Hook, has been consecrated. It is built upon Hook Common, three miles from any other church, and stands in a centre, equi-distant about three miles from Tithefield, Sarisbury-green, and Hamble. It is built in the Early English style of architecture; and the external walls are of Swanage stone with Bath stone dressings. Internally the church consists of an apsidal chancel, nave, north and south aisles, vestry, and organ-chamber. Entrance is obtained by north and south porches, a western door having been dispensed with owing to the prevalence of west and south-west gales in winter. The seats, which are all free, and will accommodate over 300 persons, are of modern pattern, and of varnished deal. The pulpit is circular, and stands on a plain base of Caen stone, around which runs a brass band containing the inscription "We preach Christ crucified." The pulpit proper is of oak, with four panels, each containing a Mediolan vase representing the four Evangelists, and above these there is a carved oak rim of flower and ivy leaves. The whole was the work of Messrs. Lavers & Barrand, of London. The chancel is approached by two landings of, apparently, Yorkshire stone; and there is another landing of the same material as an approach to the altar. The apse contains three coloured windows by Clayton & Bell, the centre of which contains a representation of the "Descent from the Cross," the "Transfiguration," and the "Ascension" being on either side. In this part of the church a tessellated pavement of unique pattern has been laid down; the rest of the flooring is of plain red and black square tiles. The entire roof is of open woodwork, that of the chancel being more elaborately wrought than the other part. The organ faces down the north aisle, and forms a screen for the vestry. The instrument is one of Bevington's chamber organs. The front pipes are dispersed. The cost of the church, 4,000*l.*, has been entirely defrayed by Mr. Arthur Hornby, of Hook, who further has given the site as well as the burial ground of two acres around; has built a parsonage house, with seven acres of glebe land attached; and has endowed the living with 300*l.* a year. The architect was Mr. Raphael Brandon, of London, and the contractors were Messrs. Dove, Brothers, of Islington, with Mr. J. Osborne as clerk of works.

Selly Hill (Northfield).—St. Stephen's Church, Selly Hill, has been consecrated. The estimated cost of erection was 3,700*l.* The building seats 300 persons. It is nearly 112 ft. in length on the outside, and 30 ft. wide; and the roof, open

to the ridge, rises to the height of nearly 45 ft. The edifice consists of nave, chancel, vestry, organ, and tower and spire. There are no aisles. The roof is an open-timbered one, carried on trusses, without intermediate supports. A lofty arch, supported by two carved and ornamental pillars, separates the nave from the chancel, the east end of which will be polygonal. In the chancel are five large windows, shafted and traceryed. This arrangement will render the light rather too strong for ecclesiastical taste, until some liberal donor fills the window-frames with stained glass. The nave is lighted by a large west window and nine other windows. The tower and spire together are about 100 ft. in height. The spire is constructed of timber, covered with slate and lead, arranged in ornamental bands. At the junction of the tower and spire there are four stone pinnacles, with stone roof running back into the spire. The edifice is built of stone, and is in the English Gothic style of architecture. The dressings are of Bath stone, lined internally with pressed bricks. The interior of the church is almost severely plain. There is no carving or ornamentation on the walls, and the same course has been pursued with regard to the seats, which are of red deal. The pulpit, which is of carved Bath stone, was presented by Mr. J. Jaffray; the font presented by Mr. J. Wilson; and the weather-vane and finials by Mr. Keyte. The floors are paved with encaustic tiles. The architects were Messrs. Martin & Chamberlain; and the builder, Mr. Charles Jones.

York.—St. Martin's Church, situated in Coney-street, is now undergoing a restoration. The interior is completely gutted, and the flooring is taken up. The whole of the windows on the north side of the clearstory have been taken out. They are of stained glass, and are in course of being releaded by Mr. Knowles, of this city, so as to preserve their original character. The stonework of this part of the structure, and the mullions of the windows will be replaced with new material. The west window has also been taken out, to undergo a similar process. The east window, of seven lights, hitherto of plain glass, will be filled in with stained glass illustrating incidents in the life of our Lord, and the choice of the various subjects will be finally agreed upon in the course of a short time. With regard to this particular window, which is in the Perpendicular style, it may be stated that, owing to the umbrous character of the woodwork affixed to the east wall, the lower part of the window was obscured from view. By the restoration this interference with it will cease, and the whole of the seven lights, from the base to the tracery, will be filled in with stained glass, below which will be erected a reredos.

Loughton (Essex).—The foundation-stone of a new church, dedicated to "the Blessed Virgin Mary," has been laid. The church is to consist of nave and aisles, north and south transepts, chancel and chancel-aisles, and vestry. Bath stone is freely used, inside and outside. The facing is of Godalming stone, from Messrs. Lisle's pits, in random work, brought up to stretching-courses of squared stones, with plain tile bands, laid as headers, sparingly introduced. The roof-covering is of plain tiles, with tile hip-knots and crochets, to be made by Mr. Cooper, of Maidenhead. Mr. John Bentley, of Waltham Abbey, is the builder. The contract is 3,800*l.*, and accommodation is provided for 600 persons. The architect is Mr. Thomas Henry Watson, of London.

Bushey.—The parish church of Bushey, after undergoing an extensive restoration by Mr. Gilbert Scott, has been re-opened. The edifice had fallen into a state of extreme decay and dilapidation, and the church accommodation it provided had become quite inadequate to the requirements of the population of the parish, which has increased to a very large extent during the last ten years. It was, therefore, decided to enlarge the north aisle, and to add a south aisle with organ-chamber and vestry. The old roof of the nave has been preserved in its original form, and the new roofs, which as far as possible correspond with it, are of English oak. Stained glass has been inserted in the windows of the Early English chancel; the east window has been restored to its original design; and a new chancel roof has been erected. The altar and chancel steps are of marble, and the floor is paved with Godwin's encaustic tiles. The reredos, altar-table, and rail are also new. Three memorial windows have been placed in the south aisle. There is also in the north aisle a memorial window. Before the restoration the tower

was in a ruinous and dangerous condition. It has been strengthened by the addition of iron ties; the piers of the tower arch and the turret have been rebuilt. All the architectural features of the original building have been preserved or reproduced. The principal subscriber to the restoration fund was Mr. E. Majorbanks, of The Hall, Bushey. He subscribed 1,000*l.* in the first instance, and 250*l.* afterwards, besides a number of special gifts, amongst which were the east window, which cost 185*l.*, the reredos, which cost 280*l.*, the altar-table and cloth, the encaustic tile paving and marble steps, the decorations of the sanctuary, the chancel plate, which cost 200*l.*, and the new organ, which was built by Mr. Hodgland, of Gower-street.

Withington.—The church at Withington has been re-opened, after its entire restoration. The old church had become exceedingly dilapidated; efforts were therefore made to obtain subscriptions for a new building, which were so successful that a sufficient fund was speedily raised to justify the promoters in commencing the works. The services of Mr. Street, architect, were obtained to furnish plans, &c., and the contract for building was taken for about 1,700*l.* by Mr. Espley, of Eccleshall. The present building occupies exactly the same site as the old church did, consequently the formalities usual upon the consecration of new buildings were not observed. The style of the edifice is Gothic, plain, with nave and chancel, calculated to accommodate about 160 persons. At the western end there is a spire. In the tower the two old bells are re-hung and the old clock is replaced, but the dial in front of the tower is of new design by Mr. Hanny, of Shrewsbury. The material of the church is red stone, from Sugden Quarry, near Bodington. It was presented by Mr. Tyleur, of Bontingdale, upon whose estate it lies. There are three chancel windows, each filled with stained glass by Clayton & Bell, of London. Underneath is a carved reredos, in Cæan stone, by Earp, of London, containing seven figures, the subject being "The Crucifixion." The font base is of carved white stone, the cover of carved oak. The aisles are floored with coloured quarries, diamond-shaped, from Godwin's, of Hereford. The roof is open-timbered, and varnished. The communion table was made from old oak which was found in the former building.

Whittingham.—The new chancel of Whittingham Church has been re-opened. Lord Ravensworth issued instructions some time ago for the removal of the chancel built in the last century, and the erection of another more worthy of the ancient ecclesiastical history and knightly associations of the church. This intention has been well carried out, and the new structure, with a new chancel arch, is now thrown open to the nave. The architect was Mr. F. R. Wilson, of Alnwick. The masonry was undertaken by Mr. G. Armstrong, Alnwick; the joiners' work by Mr. Southern, Whittingham; the painting by Messrs. Adam Robertson & Sons; the slaters' work by Messrs. Lamb & Miller, Glanton; the plumbing and glazing by Messrs. Wilkin & Dickman, Alnwick.

SCHOOL-BUILDING NEWS.

South Hinksey.—The new Boys', Girls', and Infants' Schools, at South Hinksey, have been formally opened. The building is of brick, with a tile roof, and cost about 560*l.* It is situate in Post Office street, close to the new church, and Messrs. Honour & Castle, of Oxford, builders, were the contractors. The new schools will accommodate from 150 to 200 children, and the total average number now attending school in this parish is about 120.

Bristol.—The corner stone of St. Barnabas new schools has been laid. The design, which has been prepared by Mr. J. A. Clark, of Bristol, architect, will include boys', girls', and infant schools, with several class-rooms, and a master's residence, but the present contract, which has been taken by Mr. G. Humphries, of Bristol, embraces merely the provision of girls' and infants' school-rooms, with class-rooms attached. The contract has been accepted at about 1,200*l.* The complete building will cost 2,200*l.*, but the total sum required to cover the outlay, inclusive of preliminary expenses, cost of land, and fittings, will be about 2,800*l.*, 800*l.* of which remain to be raised. The present section of the building will accommodate about 350 children, and the completed structure about 600. The schools are to be used as Sunday as well as day schools. They are to be built of Pennant stone, with free-

stone dressings. The work of erection is already in a very forward state.

Walsanton.—The foundation-stone of a new National School building has been laid here. The old building has been removed, and in its place a much more commodious one will be erected. The late Mr. R. Sneyd gave a considerable plot of land at the rear of the old building, which will not only allow of an extension of the new schools, but will be sufficient to provide a suitable play-ground. The style of the new building will be Early English, and will take the form of three sides of a quadrangle. It will be of red brick and stone, covered with the tiles of the neighbourhood. There will be boys', girls', and infants' schools, affording accommodation altogether for 600 children. The boys' and girls' rooms will be capable of being thrown into one when necessary for meetings and other parochial purposes. A house for the schoolmaster is also to be provided.

Liverpool.—The foundation-stone of National Schools in connexion with St. Saviour's Church, Breckfield-road North, has been laid. The building, which has been designed by Mr. G. E. Grayson, of this town, architect, will be in the Gothic style, built of brick, with stone facings, and is to cost, including the land, about 5,000*l.*, the whole of which sum, with the exception of 750*l.*, has been already raised. Messrs. Holme & Nicol are the contractors.

New Malden.—New national schools are to be erected here for 120 boys. Messrs. Spearing & Stewart, of Surbiton, have been selected as the builders, and the works will be carried out under the superintendence of Mr. H. T. Freshwater, of New Malden, architect. The tender was one of eight, which ranged from 340*l.* to 449*l.* (with extras in each case), and the contractors have undertaken to complete the school extension, inclusive of class-room, hat and cap room, two divisional walls, and the necessary offices, for the sum of 423*l.* 15*s.* Messrs. Spearing & Stewart have just carried out the enlargement of the National Schools at Hook; architect, Mr. Luck. A total sum of 500*l.* will cover all expenses.

Barboursne.—There has been an opening of a new school at Barboursne. The building, which is a small one, was erected by Messrs. W. & E. Holders, the contractors, Mr. Rowe being the architect. It is intended to accommodate 150 children, and consists of one room 45 ft. by 18 ft. wide, adjoining which are two class-rooms, each 16 ft. by 12 ft. The roofs above each room are open; the height between the floor and ceiling is 20 ft. Means for ventilation are provided by flues, admitting fresh air through the floors. There are corresponding openings also in the ceilings. The building is in close proximity to the boys' and girls' schools. The design is plain Gothic. The windows and entrance are finished in Ombersley stone.

Prior's Lea.—The foundation-stone of a new Church of England infants' school has been laid here by Mrs. T. E. Horton, of Prior's Lee Hall. The want of such an institution has long been experienced in the locality. The situation of the school is open and airy. The style of the building is Gothic. In the south side of the elevation is a stone tracery window, 8 ft. by 12 ft., and a stone bell-turret on eight columns with carved stone cap. The principal entrance to the school will be through a porch on this side of the building, and there will be a corresponding entrance on the north elevation while on the south side will be two large entrance gates. On the north side will be an oriel window, 8 ft. in diameter, and two Gothic headed windows below. Internally, the roof is of pitch pine, moulded and varnished. The school will accommodate about 200 scholars. Inside the school an effect is produced by an artistic arrangement of white and blue glass windows, and the room will be well ventilated. The contractor is Mr. J. F. Cobb, of Newport, and the architect, Mr. Fogarty, of London. The building will cost about 1,400*l.*

Swindon.—The new church schools at O Swindon have been opened. The buildings include school-rooms for boys, girls, and infants. The boys' school is 71 ft. in length, and 20 ft. wide, and has two class-rooms adjoining. The girls' school is 51 ft. in length, and 20 ft. wide, and has also two class-rooms annexed. The principal gable, which is situated on the south side, is 45 ft. in height, the front measuring 75 ft. The depth of the building is 109 ft. The buildings are approached by three separate entrances. The front or south entrance is surmounted by a bell-turret, 50 ft. in height. The

schools are heated throughout with Parri's hot-air apparatus. The desks, which can be changed into tables or backed-seats, are known as the "Excolior" (patented), and have been supplied by Mr. J. Platt, of Windsor. Adjoining the school is the master's residence, containing sitting-room, kitchen, washhouse, pantry, &c., and three bedrooms. The whole of the buildings will be enclosed by a strong fence. The builder's work has been executed by Messrs. King & Jodwin, of Gloucester, under the directions of Messrs. Landowne & Shopland, architects, of Winton. The total cost is a little over 2,000*l*.

Southwater (Sussex).—Considerable alterations have been made to the schools at Southwater, near Horsham, and a convenient residence, with outbuildings, for the accommodation of the master and mistress, have been added to the south-east end of the buildings. The works have been executed with red brick, and local stone dressings; the roofs being covered with coal tiling in pleasing patterns. The works have been executed by Mr. Henry Terry, of Torrington, builder, under the direction of Mr. John Birch, of the Adelphi, London.

Gravesend.—The new schools in connexion with St. Mark's Church, Rosherville, have been formally opened. The buildings consist of a school of three divisions and house for schoolmaster. Messrs. Wadmore & Baker were the architects, and Mr. J. Gould, the builder. The dimensions of the chief room are 50 ft. by 20 ft., infant room 30 ft. by 18 ft., and class 14 ft. by 8 ft., and they will accommodate about 100 scholars.

York.—The chief-stone of St. Lawrence and Fulford parish schools has been laid. The schools will occupy a position on a plot of ground immediately in rear of the Church of St. Lawrence, and will comprise a boys' school, 45 ft. by 20 ft.; girls, 50 ft. by 20 ft.; and infants, 50 ft. by 14 ft. There will be in addition two class-rooms, and the building will have three entrance porches. The boys' school will be divided from that of the girls by an arch resting on stone oribels with granite shafts, and the Gurney store will be employed in heating.

Rochester.—St. Nicholas's Infant School, recently have been opened. The new building is situated directly opposite St. Nicholas's Church, at the corner of the road leading to Temple-street. The measurement is 57 ft. by 26 ft., with a pitch of 14 ft. at the sides and 18 ft. in the centre. It is ventilated in the roof, and has three large windows at each side. At the west end is erected a gallery, which is approached by steps from the raised part of the doorway; at the east end is a class-room on one side and a cloak-room on the other, with a passage-way leading to the accessories and playground of the school, the whole being inclosed with a brick wall. The school will accommodate about 200 children. The contract price for the erection of the schools was 790*l*. Mr. Clements was builder, and Mr. G. Rack, of Maidstone, was the architect.

Hastings and St. Leonard's.—St. Paul's Schools have been opened. They have been erected in Schemia, on a piece of ground given by the Charity Trustees (the value of which was estimated at 1,000*l*). As originally planned, the buildings were to consist of a boys' school-room and class-room for 100 scholars, a girls' school-room and class-room for 120 scholars, and an infant school-room for 100 scholars, with a lavatory and cloak-lobby connected with each school. Only a small portion of the girls' school has yet been erected, and this has been thrown into the boys' school-room, which will be used for the present as a mixed school for about 150 children. The infant school has been completed, and connected herewith are a soup kitchen and blanket store. There is a large playground attached to each school, and a residence for the master and mistress has also been provided. The buildings have been executed in red brick and bath stone, with pent-timber roofs, the design being intended to harmonise with the style adopted in the church of St. Paul's. The principal school-room has been adapted for divine service on Sundays, and for that purpose a recess has been formed, fitted with an ornamental wood screen and a reading-desk. A bell-turret is fixed over the centre of the building. The work has been carried out by Mr. George Bridgland, of St. Leonard's-on-sea, from the design of Messrs. Jeffrey & Skiller, of Hastings, architects.

Uxley.—The foundation-stone of new National Schools has been laid here by the Bishop of Ripon. The new schools have been designed by Messrs. T. H. & F. Healey, architects, Bradford.

The style adopted is Gothic. They are being erected on a triangular plot of ground at the junction of the Wharfe View and Leeds roads. They are expected to cost about 2,500*l*, and give accommodation to about 300 children. The dimensions of the boys' school-room will be 52 ft. by 20 ft.; of that of the girls', 50 ft. by 20 ft. They will be separated by a partition, which can be removed so as to throw the two rooms into one, for use on the occasion of public meetings. An infant school, 48 ft. by 20 ft., will form part of the premises; and class-rooms will be provided for the older boys and girls. There will also be a residence for the master. The new edifices will be built of local stone, hammer-dressed, the windows being ornamented by ashlar dressings. It will be heated with hot air, in addition to which there will be an open fireplace. Ample playgrounds will be provided.

Newent.—At Gorseley, in the parish of Newent, the foundation-stone of a new school for 190 children has been laid. The site was presented by Mr. R. Foley Onslow, who headed the subscription-list with 100*l*. The owners and occupiers of Newent have subscribed between 400*l*. and 500*l*., but there is still a deficiency of about 460*l*. to complete the school and teachers' residence. The district is very poor. The building will be used for divine service, and will be the only convenient Church place of worship for a population of nearly 1,000 people. It is proposed to form a new parish of Gorseley with Clifford's Mease.

PROVINCIAL.

Osselt.—The new bank premises for the Wakefield and Barnsley Union Banking Company have been opened for the transaction of business. The bank has a frontage of 40 ft. to Town-street, and 50 ft. to a new street running at right angles therefrom. The design is Classic, and is executed in hard Huddersfield stone. The entrance to the bank is in the centre of the front elevation. It is a circular-headed doorway, and right and left are two circular-headed windows. Above runs a moulded cornice and frieze. On the first floor to the front are five circular-headed windows, and above them are moulded strings and cornices, surmounted by ornamental blocking and moulded coping. The side elevation having the entrance to the manager's residence is similar in character. The building is wholly faced with stone. The banking-room is 21 ft. by 20 ft., and 13 ft. high. Adjoining is a strong room fitted with a Milner's safe door; also the directors' room. The manager's residence consists of ten rooms, the dining-room, 23 ft. by 17 ft., and the drawing-room, 21 ft. by 20 ft. The windows of the bank are fitted with Burnett & Co.'s patent steel shutters. All French is fitted complete in mahogany, all French is polished. The entire cost of building and fittings is 2,450*l*. The contract for the whole of the buildings was taken by Messrs. Eastwood & Tolson, of Osselt, and for the bank fittings by Messrs. Craven & Lloyd, of Wakefield, from the designs and under the supervision of Mr. William Watson, of Wakefield, architect.

Middlesbrough.—The foundation-stone of the new National Provincial Bank has been laid on the site of the old bank, Durham-street. The architect of the building is Mr. John Gibson, of Westminster, and the contractors are Messrs. Potter & Wilson, of Middlesbrough.

Redcar.—The first pile of the Redcar Pier has been driven by Rear-Admiral Chaloner, in the presence of a large concourse of people. The pier will be completed by the 1st of June, 1872.

Co-operative Hotels and Homes.—A conference has been held at the Whittington Club, Strand, to consider the propriety of forming a company to build co-operative hotels, or associated homes. The chairman, Mr. Lowe, explained the necessity for such a company to build co-operative hotels, where persons could have all the advantages of a superior home without being burdened with a house or enduring the inconvenience and unpleasantness of lodgings, and at much less cost. Mrs. Johnstone Robertson described the kind of building that would be most suitable, and the best mode in which the business might be conducted. She would invest 300*l*. in a company, and more if necessary; and she knew twelve other ladies ready to do the same. This lady also mentioned several localities suitable for a co-operative hotel. A provisional committee was formed to

Books Received.

VARIORUM.

In the current number of the *Dark Blue*, Mr. Alexander Redgrave tells the tale of "The London Needlewoman:"—

"Who could wonder that here was no sign of health, that every eye was weary, every cheek colourless, except when tinted with a hectic flush, or that the ear was pained by that fatal husky cough! Who, amongst the throng of well-dressed men in any of the fashionable places of resort, imagined that that superbly-fitting coat and faultless trousers had only that morning left an abode such as we have described, and that, the night before, this coat and trousers had fulfilled the place of blanket and counterpane, upon a wretched bed of flock or shavings, spread upon a floor, thick with the incrustations of years from crumbs and splishings, and from the constant smoking and chewing of tobacco. This is not overcharged; types of similar misery may still be seen here and there, but in a much less degree, for the whole system has been broken into, and happily will soon be a thing of the past. The work here described was that which was done in the house of a middleman, who found room, fire, light, thread, and trimmings, and the workers had nothing to do but stitch, and were paid according to the work done. The middleman possibly did not take the work direct from the merchant or tailor, but obtained it from a contractor; so that, although in the first instance a fair price was given yet the actual sum for labour was only a portion of the original price, a heavy profit being deducted by each middleman."

—The *Mechanic's Magazine* has an article on the Statues on the Thames Embankment. Touching pedestals, the writer rightly says, as the *Builder* has often said before,—

"It seems impossible to get either sculptors or those who commission 'public statues' to see, what is the fact, that the moment one of such statues is erected in an open space the monument becomes amenable to the principles of architectural composition. It is essential that the statue should have a base, and that the pedestal should be in keeping with what it carries, and should be well grouped with the platform or ground and the surroundings. Not many modern sculptors, since Sir Richard Westmacott, who produced the Nelson Monument in Liverpool, and the statue of the Duke of Bedford in Russell-square (the latter with a most elegant support), has known how to design a pedestal. The sculptors seem to have nothing else at hand but the commonplace form, with dado, cornice, torus-base, and plinth, or some mere mass of masonry. It is essential to the effect that the pedestal should be of commonplace, that it should be even highly decorated, that its mouldings should be neither the very common forms nor designed in ignorance of such forms, and that it should stand well on, and well grasp, the ground. A sufficient platform to the pedestal is essential to the effect of the whole monument; and accessories which may be of the most inexpensive kind, such as mere posts and curb-stones, have a value which will be apparent to any one who studies the subject. We suggest a reference to the memorial of Charles I., admittedly unequalled since; and as regards the platform to the statue of James II., in Whitehall-gardens."

—A hint on "The Warehousing of Furniture," from *Cassell's Household Guide*, may be useful to some of our readers,—

"Many of the warehouses for this purpose are in connexion with the establishments for removing, and have fire-proof rooms. No lights are allowed, and these warehouses possess so great a reputation for security, that goods placed there can be insured for lower rates than at other depots. The general charge for insuring at a warehouse being nearly double that demanded on the same articles when in a private house. For separate articles, the charge for warehousing in a fire-proof room is sixpence per article per month, regardless of size; and the whole of the furniture of an eight-roomed house may be warehoused there at about 2*l*. per month. At some other establishments lower prices are charged, and separate packages are received at from fourpence upwards, whilst a compartment large enough to contain the furniture of an eight-roomed house is to be rented at two guineas and a half per quarter. At some of these places rooms are kept at special temperatures for the storing of musical instruments. On goods being deposited, an exact inventory is taken, and a copy of it sent to the depositor. The proprietor of the warehouse is usually responsible for the value of the property, except as regards damage by fire, against which, however, an insurance may be effected for the owner, though some descriptions of property, such as deeds, jewellery, and works of art, have generally to be made the subject of special agreement."

—The *Lancet* points out that during the last five years the donations of 1,000*l*. each, chiefly anonymous, made to the metropolitan hospitals, amount to 71,000*l*. Besides these, the German Hospital, Dalston, has had a munificent gift of 10,000*l*. from Baron von Diergardt, of Vienna, and the Brompton Hospital for Consumption, the Victoria Park Hospital, University College, and the Middlesex have each received 2,000*l*. from Sir Richard Wallace, bringing the total money value of these monster donations up to 89,000*l*. The great majority of these donations have been given since the beginning of 1869.

—The *Irish Builder*, which has lately taken up sanitary matters with much spirit, gives the following hearty piece of advice:—

"A word to public boards or other bodies holding money in trust for deserving objects. Messieurs, if you really desire to inaugurate a new era in the voting of public testimonials and statues, strike out a fresh and untrodden path, and there is one before you. Honour your sanitary reformers. Honour the men who gave you towns and cities pure water, good sewerage and drainage, pure air, increased your public asylums and hospitals, retained your open spaces, furnished you with new roads, ways, illuminated your dark lanes and entries, exposed

vendors of light weights and measures and nefarious adulterators of your food and drink, opened parks for your amusement and health, gave you public baths and washhouses, and stood by you in press and forum for every necessary liberty for the subject. Honour these, one and all, whenever or wherever you can, for they are the true friends of the human race."

—The *Art Journal* says of the Castellani Jewelry:—

"This famous collection of products of ancient goldsmith's work is now to be seen in the British Museum. It is, as it were, on view pending deliberations as to the expediency of adding it to the national treasures in the Jewel Room. The price asked is 24,000*l.*; and whether this sum be given or not, it is earnestly to be hoped that the chance of acquiring an assemblage of objects so precious will not be thrown away. Such a collection could not fail to have a world-wide reputation. Its formation was begun more than forty years ago by Signor Castellani, of Rome, who, with a taste in advance of his time, conceived the idea of improving the modern manufacture of jewelry by reverting to antique design. He perceived that such of the models as the Greeks and Etruscans had left us transcended in taste everything of modern make, inasmuch as to suggest the adoption of ancient design, which has been done so judiciously and successfully, that the name of Castellani has for years been an unquestioned guarantee for the classic elegance of every object that passed from his hands."

Miscellaneous.

A Building Removed.—A Californian paper states that "a large frame building situated on Channel-street, opposite the Stockton Bakery Hotel, and formerly occupied by Condy, Brothers, as a planing mill, was removed yesterday (July 27th) by Hiram Fisher to a lot near the intersection of Miner-avenue and Aurora-streets. The house is 20 ft. by 45 ft. and is constructed of very strong and heavy materials. When Mr. Fisher's workmen had the whole structure placed upon wheels, it was remarked by on-lookers that it would be difficult to get a team of animals able to haul the house to its destination; but when all was in readiness for transportation the fears expressed in relation to difficulty in removing it were soon dispelled by a patent road steamer being hitched to the huge pile, and travelling away with it as easily "as rolling off a log." It was hauled about ten blocks in distance, part of the way along smoothly gravelled streets and a short distance over uneven streets. The road steamer moved along about as fast as a person could easily walk. The time occupied in the removal was exactly three-quarters of an hour. The engineer informs us that the engine hauled the building, which, it is computed, weighs not less than thirty tons, with as little trouble as if it had been a match-box. It was taken round sharp corners without the slightest difficulty, and landed in its position with the utmost precision and without any difficulty whatever. This is both a speedy and economical method of house-moving."

The Mont Cenis Tunnel.—The *Turin Gazette* states that the first locomotive drawing an express train passed on the 27th of August through the whole of the tunnel. A letter from Modane, in the *Salut Public*, says:—"The whole work is now open. The ventilation is excellent, and the current of air perceptibly felt; in fact, the heat was so moderate that a great coat was not to be disdained. All the Swiss stories about heat intense enough to produce asphyxia are pure invention." The total expenses of the Tunnel amount to 65,000,000 francs; of these, 20,000,000 francs are to be contributed by the Victor Emmanuel Railway, or Railway of Northern Italy. This sum was to be paid on or before the opening of the Tunnel. The French Government was to pay 19,000,000 francs if the work was accomplished within twenty years, reckoning from 1863. But if the work was accomplished at an earlier date, France bound herself to pay 500,000 francs more for every year gained upon the stipulated time. As there have been eleven years thus gained, France will have to pay 5,500,000 francs, besides the 20,000,000 francs of the original stipulation.

Underground Furnaces.—A new invention in mine engineering has received attention lately,—that is, the precipitating or condensing of smoke and gases from underground furnaces. The object of this invention is to enable the mine engineer to place an engine at any point underground, at a distance in the workings from the shaft, and also to generate steam at that point to work the engine. This object has to a considerable extent been obtained, and the products of combustion are condensed by means of pipes surrounded by water, &c. Horses must be dispensed with as much as possible underground. The introduction of the locomotive in the levels has been long desired.

Accidents.—An inquest has been held on the four persons who were buried alive in Watling-street, City. Charles Brown stated that he was employed with other men digging ground out of an old house in Watling-street, for a foundation for a new building. The deceased, who was foreman over a gang, was at work with others under the ground floor. There was a crash, and before deceased had time to move he was buried alive under the ballast and flooring. He was taken out in half an hour, and was then taken to the hospital. His ribs on both sides were broken. The lower jaw was fractured, and he had received other injuries from which he died on the following day. The jury returned a verdict "That the deceased was accidentally killed, but what caused the floor to fall, there was no evidence to show." The jury at the same time added, that more care should be taken in such work in future. —At the Whitley Agricultural Show, a platform, erected to enable visitors to witness the leaping trials of horses, gave way, and a number of persons were severely, but none fatally, injured.

The Sewage of Cambridge and the Purification of the Cam.—The local authorities at length appear to be aroused to the importance of attending to the purification of the Cam and the diversion of the sewage of the town from that stream. The local *Chronicle* states that Mr. G. W. Stephenson, the town surveyor, has recently received instructions from the joint committee appointed on the subject to communicate at once with Mr. J. Bailey Denton, of London, who has since been down to Cambridge, and visited various sites suitable for the purposes of sewage irrigation, and it is expected that at the next meeting of the Board of Commissioners in October, certain schemes will be submitted for their consideration. It is expected that the present system of sewerage will be utilised in either scheme now under consideration. It is also in contemplation to consider the advisability of introducing a material for foot pavements, composed of gravel incorporated with prepared gas-tar, which has been successfully tried for many years at Dover.

The Trades Movement.—The masons of Wakefield, who now work 52½ hours a week, and leave off at four o'clock on Saturday, are on strike for reduction of hours, wishing to leave at twelve o'clock. —The bricklayers and their labourers at Barnsley have given notice to leave work at twelve on Saturday, instead of four. —Although the masons' strike in Berlin is at an end, other strikes are expected. The filemakers, boxmakers, and others are about to hold meetings with a view to obtain increased wages. The carpenters have meetings every day, but the masters still refuse to yield. One result of the masons' strike is said to be that 1,000 new dwellings are not yet completed, which would have been ready by the 1st of October. House accommodation in Berlin meanwhile continues to be so inadequate to the wants of the population, that if a stranger has no certain prospect of finding a dwelling, permission to remain in the city is to be refused him. On the 1st of October, 1,600 families will, it is calculated, be without homes.

A New Building Estate.—It is said that an extensive area of land on the side of Clevehill, and comprising the Ames Farm, and some other property lately owned by Sir James Pakington, has been purchased by a London building company, with a view to the erection of a number of villas thereon. 20,000*l.* is named as the price at which Sir John disposed of the property. —*Cheltenham Examiner.*

Birmingham Assize Courts.—Mr. Lynn is not contented with the title we gave to the plan of his design, published in our last number, and says it should have been inscribed, "Placed first in order of merit." The article accompanying the plan we gave fully describes the position that was assigned to the design. Our own good opinion of the design was expressed long before it received the attention of the referee.

Rochester Cathedral.—The work of restoring the cathedral, under the direction of Mr. Gilbert Scott, is proceeding. The decayed clearestory windows of the nave are now being restored. The earth has been removed around the east end of the building, to ascertain if the foundations are in a proper state, and it has been found that they are safe. Mr. White, of Vauxhall Bridge-road, is executing the work.

Wood-paper Making.—At Lydney, in Gloucestershire, paper is made from wood by a process involving patents of Mr. Lee for slicing, rolling, or breaking, and further preparing the timber by a caustic ley into a mash, which then undergoes the usual bleaching and other processes of paper-making from other materials. Six to ten tons of breakings are prepared per hour by a 24-horse power breaking and rolling machine. The material is then put into wire cages or nets, into steam boilers containing a solution of caustic soda, where it is digested into mash for the paper, which, it is said, has a good surface, and is so tough that large quantities are now made for emery and glass papers. Packing paper and paper for the envelope-makers are also turned out. The fibre-boilers and evaporators are the subject of Houghton's patent, which embraces the principle of boiling and compressing wood-fibre for paper-pulp; and the rights, as far as England is concerned, have been acquired by the Gloucestershire Paper Company.

Mortality of Children of the Upper Classes.—The directors of the National Life Assurance Society profess to contemplate the formation of a plan of educational and other endowments on a wider basis than has heretofore been attempted. The difficulty, however, presents itself, that at present there are not in existence any sufficiently extensive and reliable data as to the rate of mortality prevailing among children in the upper classes upon which to base the calculation of the necessary tables of premiums. To get over this obstacle, they propose to collect the requisite data themselves, and have issued largely a series of questions to be answered in writing, and returned. Our own experience does not lead us to suppose that the replies will be very numerous. People will not take the trouble.

Malignant Injury to Drainage Improvements in Westmeath, Ireland.—The extensive works in process of formation for draining the lakes Derryvalah and the river Inny, in the county of Westmeath, have been maliciously injured. The cofferdam at Ballyharney was cut and torn down, and, in consequence, the whole works were flooded, and more than 150 men thrown out of employment. The cost of repairing the damage will be at least 1,000*l.* The contractor for the works is Mr. Robert Arthur Williams. About a year since an injury of a similar kind, but not so serious in degree, was perpetrated at the same dam. It is a pity the soundrels who did the mischief were not drowned. The district is proclaimed.

Practical Co-operation.—Arrangements have been made for carrying on the Jackfield, Enoastio and Geometrical Tile Works on a much more extensive scale than heretofore. A new company has been formed. All the old buildings are to be pulled down, and new works combining all the latest improvements will soon be rising up in their places. In addition to Mr. F. C. Hulton, of Manchester, and the partner of the old firm, Mr. Alexander H. Brown, M.P. for Wenlock, and Mr. J. P. G. Smith, of Liverpool, have joined the company of proprietors with a view of promoting the welfare of those employed, upon the express condition that a who labour or are employed in the works shall receive a moiety of the profits made after setting aside 10 per cent. for dividends on the capital of the proprietors.

The British Association and Discoveries in Electricity.—A well-known electrician, Mr. Henry Highton, claims to have made some discoveries which are the most important since the time of Volta; and he complains of the treatment he has received in reference thereto at the hands of the British Association, certain members of which would appear to have done the best, by petty jealousy, to prevent the publication of Mr. Highton's discoveries. These discoveries he says, "double or even treble the power of ordinary batteries, and show how electricity of great power can be produced at a nominal cost from what are at present waste materials; thereby cheapens enabling electricity to be used for many important purposes to which it now makes it at present inapplicable."

Condition of Sheffield.—The inhabitants are awakening to the necessity of improving the condition of Sheffield, and a Health Committee is inquiring. Several years ago we pointed out the deplorable and scandalous state of parts of the town.

Hospital Accommodation in Villages.—The following remarks appear in a recent Privy Council minute on hospitals for infectious diseases:—

"Hospital accommodation for infectious diseases in towns is wanted more constantly, and in a larger amount, than in villages. . . . For a town of any importance, the hospital provision ought to consist of a permanent building, having around it space enough for the erection of temporary structures as occasion may require. Considerations of ultimate economy make it wise to have the permanent building equal to somewhat more than the average necessities of the place, so that recourse to temporary extensions may less often be wanted. In small towns, for instance, if a hospital consisting of two wards and the necessary administrative offices is to be provided, the original expense of making each ward serve for (say) eight persons, will be far less than double that of making the wards for four. And, in any case, it is well to take the administrative offices somewhat in excess of the wants of the permanent wards; because thus, at little additional first cost, they will be ready to serve, when occasion comes, for the wants of the temporary extensions, and so avoid great inconvenience and outlay. In huts, or in permanent buildings for the treatment of infectious diseases, not less than 2,000 ft. cubic space, with 144 square feet of floor, should be given to each patient. The ventilation of huts, also, is of equal importance with that of permanent hospital buildings. It is best secured by the combination of side windows with roof-slating, the latter protected from rain, and running the whole length of the ridge of the hut."

Leith.—The Dock Commissioners some time ago resolved to carry a new bridge across the harbour, so as to establish direct communication between the Albert and Victoria Docks, to the latter of which the Caledonian Company has accommodations access. The necessary designs were prepared by Messrs. Rendel & Robertson, engineers; and although the bridge itself has not yet been contracted for, some progress has been made with the subsidiary works, the execution of which was undertaken by Messrs. Macdonald & Grant. The site selected for the new bridge is at a short distance to the north of the wharf actually occupied by the Newcastle steamers. It is necessary to avoid interference with the water-way, the bridge has been designed on the principle, with a clear span of 120 ft. The bridge itself, for the construction of which contracts have just been invited, is described as a substantial structure of wrought iron on the plate-girder principle. The bridge will have a width over all of 39 ft. The Dock Commissioners have on hand another undertaking calculated to promote the interests of the port. This is the enlargement of the Commercial Dry Dock.

New Works at the Euston Railway Station.—Several new works of an important character, for the enlargement of the Euston station, and increasing the accommodation in various departments, which have for some time been in progress, are just upon the eve of completion. One of these is the still further extension of the large clearing-house, already employing upwards of 1,000 clerks. Additional accommodation for about 100 more clerks being required, an additional story has been added to the wing, the new portion of which has just been completed, being 102 ft. long, 27 ft. wide, and 14 ft. high.

Another Mountain Railway.—MM. Naff, Chokier, and Riggensbach, the engineers of the Rigi Railway, have arrived at Interlaken to examine the Scheidegg-Platte, with a view to reporting upon the feasibility of laying a railway, the same principle as that on the Rigi, to the top of this mountain, which is situated at the entrance of the Lutschinethal, near Interlaken. The *Swiss Times* says it is believed that the project is perfectly feasible, and that if it is taken up with spirit the Oberland will be able to offer tourists similar attractions to those which they at present find so great on the Lake of Lucerne.

Brickyards.—In the new Act on Factories & Workshops, just issued, a provision was inserted, through Lord Shaftesbury, declaring that after the 1st of January no female under the age of sixteen, and no child under ten, shall be employed in the manufacture of bricks and tiles, not being ornamental tiles, and the employment of such persons to be offences under the various statutes in force on factories and workshops.

Monumental.—The Earl of Durham has decided to erect a monument near Lambton Castle to his late wife, who was a daughter of the Duke of Abercorn. Designs for a cross, founded on the proportions of one of the celebrated crosses of Monasterboice, have been prepared, and the work is to be executed by Irish sculptors in Dublin. The cross itself will measure 20 ft. in height and nearly 6 ft. across the arms, and consist of one single stone. The limestone quarries of Balinacloe will furnish a monolith of these dimensions.

Inspection of Workshops.—By an Act which has recently received the Royal assent, the administration of the Workshop Regulation Act, 1867, is vested in the inspectors of factories, and we understand that the provisions of this Act will now be enforced. It will be desirable, therefore, that employers should take care that all children under thirteen years of age attend school regularly, that no person be employed beyond the proper hours, and that the Saturday half-holiday be duly given.

Stepney Church.—For many years past the condition of the exterior of the venerable Church of St. Dunstan's, Stepney, has pointed to the necessity for systematic and extensive restoration; and, at the instance of the Rev. J. Bardale, the present rector, a restoration fund has been established, which has already reached upwards of 2,000l. The work has accordingly been commenced. Stepney Church occupies the site of one of the earliest of the Christian churches erected in this country.

A New Iron Pier at Lambeth Stairs.—Within the last few days a new iron pier, intended to serve the double purpose of giving access to the watermen's boats, and also as an approach to the ferry steamers, by being connected from the Embankment with the present floating bridge, has been completed at Lambeth. The new structure is about twelve yards square, the flooring of the pier being supported by twelve fluted columns, which rise from the bed of the river.

"Female Art Gallery."—We are asked to mention that a fancy sale and bazaar, also a ball and concert, will be held early next month in aid of the funds of the Ladies' Art-Union and Female Art Gallery, Great Russell-street. We add on our own account that the right disposal of the money raised ought to be made very clear. The affair has long looked like a private speculation.

Glasgow.—The Earl of Shaftesbury has been "starring" in Glasgow, where he went to lay the foundation-stone of a new Mission Church, which is in course of erection at Stonefield, Hutchesontown. His lordship afterwards addressed a crowded meeting of the working-classes, and specifically made "love" to "all the women in Scotland."

The Liverpool Autumn Exhibition of Modern Pictures.—This exhibition was to be opened on Monday last. There are 430 oil paintings alone, and nearly 450 water-colour drawings. The Royal Academy, the Old and New Water-Colour Societies, the Dudley Gallery, and the Suffolk-street Gallery are all represented.

Water in Whitechapel.—It gives no satisfaction to be able to announce, on the authority of the medical officer of health for Whitechapel, that the constant system of water supply, by the use of waste-preventers, is increasing in the poorer neighbourhoods of his district.

Society of Biblical Archaeology.—The following Continental archaeologists are announced as contributing papers for the next session:—M. Henrich, Brugsch, F. C. Chabas, Clermont, Ganneveau, and the Chev. de Saubey. The first part of the Society's transactions will be ready early in the spring.

Somerset Archaeological Society.—This Society commenced its annual meeting on the 29th ult., under the presidency of Mr. E. A. Freeman, who delivered an elaborate address. We will give some particulars in our next.

The Architect of the London University Buildings.—We mention with extreme regret the death of Sir James Pennethorne, which took place on the 1st inst., at his residence, Worcester Park House, Surrey.

School Boards.—About 170 to 180 Boards have been already formed, and nearly half of them are in Wales.

Mr. W. P. Frith, R.A.—The Royal Academy of Belgium has elected Mr. W. P. Frith a member of its body.

TENDERS

For the erection of St. Peter's Church, Bengeworth, Messrs. T. D. Barry & Sons, architects. Quantities supplied:—

Gill	£1,780	0	0
Epley	4,275	0	0
Collins & Cullis	4,241	0	0
Griffiths	4,151	0	0
Gardner	3,948	0	0
Hunt	3,937	0	0
Everal	3,895	0	0
Moreland	3,800	0	0
Yates (accepted)	3,550	0	0
Williamson	3,523	0	0
Hawkins	3,395	0	0

For new laundry buildings, at Bethnal House Asylum, Messrs. Tolley & Dale, architects:—

		Deduct for Old Materials.
Forest	£1,574	£80
Condor	1,569	18
Wicks, Bangs, & Co	1,507	60
Smith	1,500	63
Kilby	1,429	12
Pritchard (accepted)	1,423	28

In accordance with revised drawings for new laundry buildings, Grove Hall Asylum, for Mr. E. H. Byas, Messrs. Tolley & Dale, architects:—

Wicks, Bangs, & Co. (accepted)	£985	0	0
Richardson, Slade, & Co.	£220	0	0
Hart, Son, Peard, & Co.	184	0	0
Messrs. Francis	124	0	0

For erecting the Star Music-hall, Neokinger-road, Bermondsey. Mr. J. L. Stewart, architect:—

Nutt & Co.	£1,425	0	0
Elses	1,393	0	0
Elliott	1,309	0	0
Preston	1,291	0	0
Winship	1,270	0	0
Faulson	1,269	0	0

For alterations and repairs, No. 13, Duke-street, Portland-place. Mr. James Harrison, architect. Quantities supplied by Mr. A. W. Q. Nicoll:—

Parks	£425	0	0
Stephens	405	0	0
Mashman	377	0	0
Watson, Brothers (accepted)	357	0	0

For alterations, additions, and repairs to No. 11, New Quebec-street, Fortman-square, for Mr. John Sach. Mr. Chas. Bradley, architect:—

Harris & Sons	£2550	0	0
Simpson & Son	542	0	0
Longmire & Burge	455	0	0

For alterations and repairs to No. 46, Seymour-street, Portman-square, for Miss Davis. Mr. Phillips, architect:—

Wadsworth	£107	10	0
Harris & Son (accepted)	112	0	0
Mark	107	0	0

For pulling down and rebuilding premises, No. 13, Padlington-green, for Mr. J. Pollack. Mr. F. Wilkinson, architect:—

Green	£1,530	0	0
Mark	1,518	0	0
Thompson & Smith	967	0	0

For new beer-house (The Enterprize), Thres Colts-lane, Linscombe, for Mr. J. R. Harper. Mr. William Scott, architect:—

Hodges & Perry	£275	0	0
Allen	473	0	0
Salt	393	0	0
Sheffield (accepted)	345	0	0

For additions, &c., to national schools, at Wooburn Town, Bucks. Mr. Arthur Vernon, architect:—

Corby	£448	0	0
Baughurst (accepted)	433	13	2

For rebuilding No. 79, Oxford-street. Mr. C. Eales, architect. Quantities supplied:—

Clements	£2,370	0	0
Bywater	2,567	0	0
Yanson	2,568	0	0
Watson, Brothers	2,530	0	0
Brown	2,807	0	0
Holland & Hansen	2,775	0	0
Kelly, Brothers	2,759	0	0
Servinier & White	2,687	0	0

For alterations and additions at No. 39, Wimpole-street. Mr. W. A. Baker, architect:—

Kelly, Brothers	£297	0	0
Watson, Brothers	659	0	0
Hyde	910	0	0
May	695	0	0

For kitchen and domestic offices, Duke-street, Lisson-grove, for Messrs. Spencer, Turner, & Bolender. Mr. T. R. Parker, architect. Quantities supplied:—

Myers & Son	£2,073	0	0
Patman & Fotheringham	4,965	0	0
Higgs	4,735	0	0
Longmire & Burge	4,590	0	0
Brown	4,527	0	0
Morsman	3,910	0	0

For alterations and repairs at No. 13, New Cavendish-street, Portland-place. Mr. Harrison, architect:—

Parks	£435	0	0
Stevens	405	0	0
Mashman	377	0	0
Watson, Brothers	357	0	0

In list of tenders, as to 74, Aldermanbury, for "Bosh"
read, *D. Bostel*.


E. F. & Co., -M. P. R. -J. S. R. R. -H. H. S. -F. C. C. C. -
E. F. A. -J. P. E. G. B. J. R. C. D. -W. South Australia -
W. W. L. C. B. D. H. & Sons. -B. W. J. D. R. S. W. -S. P. R. -
T. H. S. W. -W. R. F. J. J. B. M. L. H. Q. J. M. R. S. R.
(Must look for himself to the proper formula.) -L. M. M. (beyond
our province. As to Thames Embankment, ask at Metropolitan
Board of Works.) -T. G. C. (thanks for offer.) -Concrete (we cannot
give estimates. Apply to one of the concrete builders.) -J. H. (next
week) -C. R. A. (next week) -R. O. S. (in type).

We are compelled to decline pointing out books and giving

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings rests of course with the authors.

Advertisements cannot be received for the current week's issue later than **THREE** o'clock, p.m., on **THURSDAY**.

 NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and NOT to the "Publisher."

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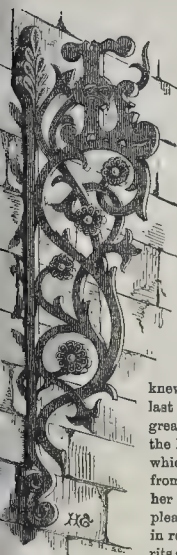
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The Builder.

VOL. XXIX.—No. 1493.

Sir James Pennethorne.



LAST week we briefly announced the decease of this distinguished and estimable man, who, as an accomplished architect, and able and energetic administrator of important public interests in this metropolis, had, by his amiable character and devotion to the duties of his official position, won the regard and esteem of all who knew him. It was but last year that we, with great pleasure, recorded the honour of knighthood which, when he retired from the public service, her Majesty had been pleased to confer on him, in recognition of his merits; and his friends hoped that for many years he might enjoy his well-earned repose; but on Friday, the 1st inst., having been in London apparently in the enjoyment of the fullest health and spirits, on his return home to Worcester Park House, reclining on a sofa for rest, he passed tranquilly from this world.

He was born in Worcester, in June, 1801, and was the son of Mr. Thomas Pennethorne of that city. In 1820 he came to London, and entered the office of his uncle, Mr. John Nash, under whose care and that of the elder Pugin he received his professional education. In due course he travelled in France, Italy, and elsewhere. He sojourned for some time in Rome, and devoted considerable attention to the study of ancient remains, and especially to the elucidation of those questions relating to the restoration of the Forum which have so much excited the interest of antiquaries, and to which he, in recent years, reverted with a keen interest. During his stay in Rome, he was elected an honorary member of the Academy of St. Luke. On his return to London, he became, in 1828, principal assistant of Mr. Nash, and, in that capacity, conducted the carrying out of the Strand Improvements, Carlton House Terrace, St. James's Park, and other important works of similar character, and in 1832 was first employed by the Commissioners of Woods. The nature of the works which he had superintended under Mr. Nash led him to direct his attention specially to plans for the improvement of the metropolis, and in 1838 he submitted to a committee of the House of Commons plans which were approved, and portions thereof recommended for adoption, and he was ultimately appointed, conjointly with Mr. Chawner (then one of the surveyors to the Board of Woods), to carry into execution four of these plans authorised by the Act 3 & 4 Vict., cap. 87, viz.:—The extension of Oxford-street eastwards to Holborn; the extension of Bow-street north-

wards to Charlotte-street, Bloomsbury; the widening and extension of Cranbourne-street, to form a new street from the west end of Long-acre to the east end of Coventry-street, Piccadilly; and the new street from the London Docks to Spitalfields Church, subsequently extended into Shoreditch at the terminus of the Great Eastern Railway, and now known as Commercial-street. A mistaken spirit of economy which actuated the controlling authorities led to these very important thoroughfares being carried out in a manner far inferior to the original designs, but even in their contracted form they have proved of the utmost service to the circulation of the traffic of the metropolis.

Mr. Pennethorne having, in June, 1840, been appointed joint surveyor of houses in the Land Revenue Department, in place of Mr. Rhodes, who retired, began to withdraw from the private practice he had previously carried on, in the course of which he had erected, among other buildings, the St. James's Bazaar, at the corner of King-street and St. James's-street, now converted into chambers; St. Julian's, Sevenoaks, for the Right Hon. C. J. Herries; Dillington House, Ilminster, for Mr. John Lee Lee; Swithland Hall, for Mr. Butler Danvers; Christ Church, Albany-street; Trinity Church, Gray's-inn-road, &c. He also submitted a design in competition for the Royal Exchange, which was one of the five selected. In 1844 he published an octavo volume, entitled "Elements and Mathematical Principles of the Greek Architects and Artists."

The retirement of Mr. Chawner, in 1843, resulted in Mr. Pennethorne's acting as sole architect and surveyor to the Commissioners; and being restrained from continuing his private practice, his whole time was devoted to the duties of his office. In 1843 he visited Ireland as royal commissioner to inquire into the construction of workhouses, then recently erected there, and on his return resumed with great energy the carrying out of the four great lines of improvement which had been authorised by Parliament. The formation of a public park for the north-eastern district of the metropolis also engaged the attention of the department which he represented, and under his sole direction the surveys were made, the park and its approaches designed, the properties acquired, and the whole of the works of the formation and laying out of Victoria Park carried out. A few years later he designed and executed the even more important work of converting the marsh lands of Battersea, the greater part then lying many feet below high-water mark, and becoming the haunt of the most disreputable characters, into one of the most picturesque and enjoyable of the London parks. It was always subject of great regret to him that the delays which in the early part of this work arose from the difficulty in obtaining sufficient funds and the needless haste with which, at a later date, the works were hurried on, prevented the full realisation of his wishes; but both in this park, and in the hardly less appreciated Victoria Park, he has done much for the enjoyment of the public. The conversion of Kennington Common from a resort for roughs and vagabonds of the lowest class to an agreeable recreation-ground was also carried out under his directions. In 1852 a scheme for the formation of a large public park (Albert Park) for the borough of Finsbury was fully elaborated by him, and if at that time it had been energetically pushed forward it would have proved no less advantageous to the public than those last named. Year by year the scheme was again brought forward reduced and pared down, and at last withdrawn, to become afterwards realised to some extent in the far distant Finsbury Park, recently formed by the Metropolitan Board of Works.

In connexion with Battersea Park, the approaches from Silcote-street and the Wand-

sworth-road to the Suspension Bridge at Chelsea and the Chelsea Embankment, were carried out by him (the latter work being a continuation of the embankment executed by Mr. Thomas Cubitt in front of the Crown estate at Millbank). The improvements in Pimlico, on the south side of Buckingham Palace, and the laying out of the old kitchen garden of Kensington Palace, forming the well-known Kensington Palace Gardens, were directed by him; and at Windsor, in 1851-2, he carried out the improvement in the High-street, by which the unsightly mass of houses which obscured the base of the Castle walls were removed, and the whole thrown open from the "hundred steps," along the entire line to the Grand Entrance.

After 1855, the improvements of the metropolis fell under the care of the Metropolitan Board of Works, by whom the Covent-garden improvements, Garrick-street, and the southern approach to Victoria Park, have been carried out on the basis, we believe, of Mr. Pennethorne's designs, prepared many years before; and the new South-west-street, for which, in 1852-3, he made extensive surveys, and submitted to the House of Commons propositions for various lines. A project which about the same time engaged much of his attention was the formation of a "central thoroughfare," to prolong the line of Piccadilly eastwards, passing along the north side of the Record Office, crossing Farringdon-street by a viaduct, and terminating at the west end of Cheapside, where a space of ground was for many years reserved unoccupied in anticipation of this idea being realised. Many other schemes which would have been most beneficial to the metropolis were elaborated by him, but from want of power to raise funds (a difficulty which the Act of 1855 removed), were from time to time abandoned,—some, as the Victoria Park approaches and Albert Park, after having been brought before Parliament in successive sessions.

When considered with relation to these extensive works and projects, his architectural works, although not numerous, assume considerable importance. The Museum of Economic Geology, in Piccadilly, is a happy example of his power of design, and remarkable talent for ingenious planning and contrivance. The difficulty of providing, on so limited a site, a spacious lecture-theatre and a museum, with the accessory laboratories and record-rooms, has been cleverly overcome, and the arrangements are in every respect worthy of careful study. The removal of the colonnade from the Quadrant, Regent-street, gave him an opportunity for skilfully devising a simple arrangement of balcony, &c., by which a certain dignity and harmony were given to what would otherwise have been a bald and unsightly range of shops. In 1851, he commenced the central section of a design for the General Record Office, to be built on the Rolls estate, and to extend from Chancery-lane to Fetter-lane, the "Central thoroughfare" passing along the north side. The realisation of this design has gradually proceeded, as the necessity for providing adequate accommodation for the records of the kingdom has arisen, and the east wing was completed as recently as last year. At the period of his retirement Mr. Pennethorne had completed the designs for the western block, abutting on Chancery-lane. The State ball-room, supper-room, and galleries forming the south wing of Buckingham Palace were completed in 1854, and subsequently the private chapel of the palace was remodelled, and other works consequent on the Pimlico Improvements were carried out under his direction. The removal of the Exchequer Office from Broad-street, and the concentration of the Inland Revenue Department at Somerset House, required that additional accommodation should be there provided; this work was entrusted to Mr. Pennethorne, and in the west wing facing Lancaster-place, completed 1856

he has faithfully carried out the spirit of the work of Sir William Chambers. Additions to the Ordnance Office in Pall-mall, 1852, led to the preparation of designs for a War Office to be built on the sites of Buckingham House, Schomberg House, and the adjoining properties. The great competition for public offices, Downing-street, led to this design being laid aside, and the War Office remains located in a range of dwelling-houses converted into offices. In 1860 he increased the accommodation of the National Gallery by the removal of the central hall, and the construction of a large exhibition-room, a sculpture-room for the Royal Academy, new staircases, &c.

The alterations of Marlborough House, for the occupation of H.R.H. the Prince of Wales, and the extensive range of stabling connected with it, were carried out in 1860; and in 1870 his last and greatest work,—the University of London, Burlington Gardens,—was opened by her Majesty. Of this work we have given full illustrations (as we did of his Record Office, Museum of Geology, and other buildings), and its remarkable merits are so generally recognised that we need only remark that it is not only the *chef-d'œuvre* of the master, but is one of the most successful of the public buildings of the metropolis. The history of the three designs for this edifice (exhibited side by side at the International Exhibition) would form a curious chapter in the records of architectural vicissitudes; but the profession may be congratulated on the result, which has given an excellent example of how happily, even in this smoky city, the sister art of sculpture may be brought in to aid and complete the designs of the architect. Among less important works may be mentioned the stables at Claremont, the new Stationery Office, Westminster; the Duchy of Cornwall Office; the Post-office at Pimlico, and additions to that at Liverpool; works at the Probate Court, Patent Office Library; temporary works in connexion with the South Kensington Museum, including the very successful circular lecture-theatre now removed; and many others.

In 1849 and subsequent years, he prepared, by order of the Government, several designs for the enlargement and for the rebuilding of the National Gallery, and also for a new gallery on different sites. The removal of the central hall, and construction in its place of the large exhibition-room, was the only result of all these labours; and in like manner the elaborate designs he prepared in 1854, for the Public Offices in Downing-street, and subsequently in 1855, for the concentration of the Offices of the Public Service, on the site extending up to Great George-street, were all put aside to give opportunity for the trial of public competition.

Although less prominent, not less important were his duties as surveyor to the land revenues of the Crown in London, and by the consistent manner in which he was, until the reconstruction of the Office of Works, consulted by the Government on professional subjects, the influence of his advice has had a very wide range.

The preceding is necessarily a brief notice of the principal works in which this distinguished architect was engaged during a practice of nearly forty years, devoted during that time to the public service, engrossed with the responsibilities which his duties involved, and seeking no honour other than that of having righteously performed them. He mixed but little in society at large or with his professional brethren, but although the nature of his duties brought him in contact frequently in an antagonistic manner with many, he won their respect and esteem by the kindness of his manner, and straightforward honesty of purpose. But, placed as he was in a very difficult position, the duties and responsibilities of his office ill defined, all his courtesy and unflinching rectitude could not shield him from the troubles to which public men are exposed. Soon after Sir Benjamin Hall became First Commissioner of Her Majesty's Works a pointed attack was made on him in a public journal, and the new First Commissioner, having introduced changes in the organisation of the department, instituted an inquiry into the conduct of all the important works which had been carried out by him. These incidents were, to his sensitive mind, the cause of very serious annoyance. The fully detailed reports which he made on these subjects, and which were laid before Parliament, fully vindicated his conduct throughout the whole of these complicated transactions. But the grave annoyance he suffered, till he had succeeded in this, was not a little aggravated by the almost

simultaneous abstraction of the more important and lucrative portion of his practice, which was transferred to the Metropolitan Board of Works without compensation to him, although he had been expressly precluded from entering on private practice. About the same time his professional brethren, anxious to congratulate him on the completion of the west wing of Somerset House, and to express their sense of his ability, courtesy, and frankness, and of the skill and intelligence he habitually brought to bear upon complicated and difficult questions of a technical nature, presented him on May 18th, 1857, with a gold medal,—a flattering mark of esteem which afforded him deep gratification. Subsequently he was further honoured by being selected as the recipient of the Royal Gold Medal for Architecture, presented to him May 29th, 1865, and he was also elected a member of the Society of Architecture, Amsterdam.

In 1840 he had been elected a Fellow of the Royal Institute of British Architects; and although he but seldom was able to attend the meetings of that body, he ever took a lively interest in its prosperity, and in all that concerned the interests of his profession, and he was ever ready to assist in maintaining its dignity and privileges. On the still vexed question of ownership of drawings, it may be well here to note that although employed exclusively by the Government, he always claimed and maintained the ownership of the contract and working drawings of his buildings; and only on his retirement last year, in accordance with a long-expressed intention, he handed them over to the department under whose charge each building had been placed.

From his influential position and large practice it might have been expected that Mr. Pennethorne's pupils would have been numerous; but he declined to accept the responsibility which he felt would be attached to their reception, and, in fact, he received one only.—Mr. John Robinson,—who, having distinguished himself as Gold Medallist and Travelling Student of the Royal Academy, on his return from Italy resumed his position in the office as Chief Architectural Assistant.

In 1834 Mr. Pennethorne married Frances Parker, daughter of John Deane Parker, of Canterbury, and who died a few years since; and he leaves a family of five sons and three daughters.

A portrait of the regretted subject of this memoir will be found in our volume for 1869.

CHARACTERISTICS OF ARTISTIC COMPOSITION.

WHEN it is proposed, in the treatment of whatever subject, to follow it even to its ultimate principles, the student is apt to find himself conducted into the very midst of the difficulties that beset the determination of first principles of universal philosophy. He may be led, in his difficulties, if he is not wary, to surrender himself into the hands of the professed thinkers, from whom clear statement of their thought is the last thing to be looked for, who are never so positive as at points where, always failing to convince or learn from one another, they can have but small claim to impose authority on the rest of the world. Failing, then, of help where, if at all, it should be forthcoming, and disinclined to be drawn into a dizzying and hopeless eddy of debate, it were perhaps more prudent for us to leave the last abstractions aside,—by no means, however, disallowing their primary importance,—and be content to make the best of coarser instruments of analysis, and to approach the problem modestly lower down. No more unscientific a medley of incompleteness and confusion is to be found than Euclid's page of Axioms and Definitions; but engineering and architecture cannot stand still to await its satisfactory revival,—work for hands that are somewhat more than mathematical,—so accept its contents with all their faults, and make the best of them, which proves to cover more than the occasional or momentary need.

In the present case, if we attempted to draw a perfectly sharp distinction between Harmony of Design and Harmony of Proportion, we might soon find ourselves committed parties to the debate, as to not only how far the notion of Quantity itself involves an apprehension of Quality also,

inasmuch as we must entertain concurrently an apprehension of kind of Quantity,—as positive or negative at least,—but how far what seems the still higher abstraction of Quality does not necessarily involve Quantity no less; number at least, if not degree, making an inevitable part of our conception. The pursuit of the analysis must be left to those whom it directly concerns. We may be here content to recognise, without detaining cavil, that Qualitative Harmony, or Harmonious design, take it as generally as we may, must still be allowed some certain definiteness in respect of Quantity; that we need not, and cannot, be bound to the vain endeavour to theorise on the proprieties of the members of a column independently of some notion of their order of magnitude at least, though reserving as a distinct problem for Harmony of Proportion to assign dimensions with the last exactness.

Well warned by these preliminary difficulties, we descend to our own ground, treading cautiously as we proceed with our analysis of the conditions of Architectural Harmony, and endeavour to find a track from the higher generalities that alone assure a broad outlook over the question, to the special applications we are interested in: by such circumspection only is it possible for the theorist to avoid turning off prematurely into bypaths that only concern particulars,—that lead but to a block rudely, or, after false promise of abridged labour, only back again to the point of departure. Let us take, therefore, one more preliminary survey from the ground already conquered.

It will be of advantage to familiarise ourselves with the relative import of the definitions we have recognised, and for this purpose to scrutinise more in detail the scope of some of the conceptions and circumstances that they apply to. For this end let us bear to approach them from another aspect.

Harmony, let us say, is a prime characteristic predicable of artistic composition. What, then, we may inquire, is Composition, and what are the conditions by which it becomes, or fails to become, harmonious?

In bald definition, Composition is the putting together of sundry things. What things are to be put together, and how may they be held together? What are the elements treated, and what the principles of their effective treatment?

Manifestly anything in nature may be made the subject of composition of one kind or another; but Composition, as matter of art, is distinguished as having correct reference to a definite end, and the things that are the subject matter of it are such as naturally, or more surprisingly by the fact and manner of composition, may become contributory to that end. Wood and leather, iron and paint by composition, form a carriage, as drawing, colour, light and shade, and the rest form a picture,—plot, dialogue, music, &c., an opera,—or notes in melodic and rhythmic sequence, a tune.

Composition is most salient when the materials thus brought together and reconciled are most contrasted; but it is only significant when the conciliation carries with it a definite import; then is most significant, most emphatic, when the elements combined are brought into most intimate union as being united in such forms that whereas they had no marked use or sense independently, they prove to have acquired the most distinct and effective as conjoined.

The selection of elements of composition, therefore, as of the principle of their arrangement, depends largely upon the end proposed,—upon a foregone conception,—a pre-conceived ideal; and a composition of great excellence presupposes an excellent conception of worthy purpose according to degree. When emphatic composition is in question there is implied a certain standard of interest and importance, however ultimately limited,—the predominantness of effort towards effectuation of a grand advantage of specific nature.

But such exceptionally distinguished advantage can only be realised by limitation of aim together with concentration of resources; the highest enhancement of one purpose prescribes that for the time all others must be made subservient to it when not entirely neglected,—be subordinated if not sacrificed. Hence, every such purpose,—every purpose of high artistic intention, has and by its nature must have, as a leading character, a predominant expression, and herein consists the soul of every great work. Unity; completely embodied, it must be and cannot but be, one and entire, not several and uncertain,—single and simple, not undecided nor equivocal.

This does not exclude the utmost internal variety and even complication which may, indeed, be indispensable for the precise definition of a refined sentiment. The highest art delights in combining the most numerous effects with a subtlety of which it often tasks the keenest critic to evolve the secret, however may be too sensitive to the value in result, to condemn what he cannot explain, as interpolation or excessiveness.

But the very same principle that prescribes or induces a certain antagonism between the composition, as an independent whole, and the surroundings that are excluded from it, must also have a certain operation within that independent world of the composition itself. Here it asserts itself by requiring as a condition of the greatest possible effect the concentration of importance and interest upon one main portion or feature to which all others are subordinate; while each of these, again, is aided in efficiency of its contributory service by others, in their turn, subordinate. All members thus take position in an order of hierarchical dignity, and are reconciled to dependence as owing to that alone, whatever consideration they enjoy.

The qualitative characteristics of the main purpose have, of course, their full and entire expression only in the completed creation; but, as all parts,—as in case all parts,—contribute to this in their degree, they must of necessity participate in it, with various degrees of imperfections but still in their degrees.

The highest visible expression of the unity that is essential to a harmonious composition, are, first, Symmetry, a subject on which we have already disserted in these columns,—correspondence, on either side of a median line, of parts that do not severally admit of such symmetrical division; secondly, the decidedly predominant importance of a central portion and its still more marked incapacity for repeated symmetrical division. Only for the avoidance of seeming rigidity and constraint is a relaxation of this rule permissible, and then only to the extent of rendering its law emphatic. In the Parthenon the variety of the important sculptural decoration might be thought sufficient relief; but something was admitted, as we may hereafter see, in the architecture, though with a moderation that exemplifies how slight a difference was held by the Greek to be admissible and sufficient, and yet how difference so slight was thought by him worth providing for at the expense of what might seem extravagant pains and labour.

While the reduction of diversities to commonality is of the very essence of composition, the law of reference to a predominant purpose and a principal expression exerts itself in another direction to promote a constant repetition of similarities and analogies. By observance of this law a tendency becomes manifest to rely upon, and even exhaust, the applicabilities of a primary motive or type,—to modify rather than interchange it to meet all new exigencies,—to gain force or enrichment now by multiplying it and now by its simplification.

The predominance, in fact, of a certain set and a certain arrangement of primary elements, as due to the force of one certain motive, becomes that motive's natural expression; and as naturally the one pervading energy operates to constant incomplete approximations and variously differentiated examples. Repetition or iteration, and variation, exhaust the expressive powers of the combination concurrently with its effective influence.

It is a special characteristic of architecture, that its harmonies will bear, and, indeed, require no large an employment of simple repetition,—so undismissible a display of all but unimpaired symmetry.

It is only by the simplification which may thus be introduced into structures of vast extent and magnitude that the compositions become "easy on the eye"—readily appreciable by the eye as wholes,—and that their range and variety of cheerful aspects submit to the repose that is essential to expression of self-collected dignity and beauty.

Of all works of art, architectural works are those which alone place themselves in competition with nature; which confront the large features of natural scenery, and claim to fill the eye that can take in a landscape. The power of this competition depends upon command of a vital contrast; the beauty of nature is linked with impressions of indefinite boundaries or limitless extent, susceptibility of constantly changing effects, and varieties of growth which to all appearance are more akin to the caprice of

will than to the development of law; and associated or brought into comparison with this,—architecture presents itself as an embodiment of most strongly defined immobility, permanence,—stability,—order. Every work of every fine art reflects nature more or less directly; but a fine, a grand building, by its symmetry, regularity, unity, reflects nature as subdued and disciplined,—as broken in, so to speak, most perfectly, and yet only to the enhancement of original strength and spirit, by well-judged economy consenting with culture and refinement. This contrast with outer nature lends a charm to nature back again,—to that of cities, so far as it exists, no less than of the country;—not more distinctly amidst ancestral avenues and hanging woods, than under the mere canopy of clouds that cannot be quite unseen even in a smoke-polluted metropolis, and subject to the shifting lights that even gain in variety by interruption. In a great city, an important structure is lost to dignity at once, if, instead of appearing as the culminant type of all the civil energies that are straining towards outward expression in every minor structure around, it shows itself as only fitly symbolising a wrong-headed revulsion to whatever is order, fragmentary, and confused,—a re-assertion in stone of the expurgated barbarisms of the statute-book,—a new refuge for the quips and quilletts that have made law a labyrinth wherein Justice on a time lurked but as a Minotaur as fatal to those who held on by the clue to her lair as to those who lost it.

The repetitions of parts, features, characteristic and primary, are most simply differentiated by introduction of the easier contrasts, as between strong and weak, prominent and retiring, light and dark, curtailed and uncurtailed,—catalectic or acatalectic, as the metrics would say,—as these are, indeed, matters of degree, that lead to quantitative considerations,—to the correlative subject of the Composition of Proportions. Far more liberal differentiations are, however, required to reinforce qualitative coherence for the more important subsidiary purposes. Identity then seems sometimes lost altogether in a degree of modification that emperils the last traces of resemblance, or to be only recognisable by the sagacious in some recondoite bond of analogy. Arm repeat's arm, with only difference of presentation; but its principle of composition is also present in the comparative anatomy of a member so contrasted in function,—let us rather say, in balance of compound functions,—as the leg. Foot and hand both partake of both adductive and repellent action; but adduction,—grasping,—is most vigorous and instinctive in the hand, and repulsion most effective in the foot. However, again, the professed physiologists may hesitate or demur, the insight of artists may be appealed to confidently to recognise in seizing jaws and teeth, still higher differentiations of the type that furnishes rudiments of hands and nails of feet and claws.

The extent to which forms of agreement are masked by details of differentiation is, of course, therefore most variable; but it is on the fact of such agreement, covert or manifest, that qualitative sympathy and harmony mainly depend. The illustration of this principle in architecture must await a detailed analysis of the development of forms. There we shall find that under the instincts of inventive genius, even as in the not unaltered expansions of natural force, the formal type ever struggles for reproduction, even in nonessential details, as if in mere exuberance of germinant self-assertion. Its manifestation in such instances, however destitute as it may seem to be of justifying use, is, nevertheless, invaluable for expression; and, while it is supplying hint and motive for details that are no more than ornamental, it serves to corroborate thereby a primary energy that governs the distributions that are indispensable. Typical identity of parts is always most extensively applied in the best works, though by no means there ever most salient to observation. Infinite repetition of almost identical parts is a mark of the lower organisations, while concentration of classified functions upon a few equally-defined and specifically-modified organs is characteristic of a nobler grade of being, and has its reflex art of the grander style. Organisation, composition, and all the glory it implies are equally foregone by the artist when he presents as his result either a mere assemblage of undistinguished similars, or a huddle of unarranged dissimilars, that neither palpably to reason nor effectively to sentiment can ever avouch themselves as otherwise than irreconcilably at odds.

When we would study the harmony with which

elements, as such, are in any given instance, or may be generally, composed, the tasks lie before us first to identify the most characteristic type that is involved and the specific appropriateness of that type as adjusted to the particular case and purpose and their circumstances; then to trace, if we may, how inventive art has evoked varied developments from this single type, to answer in concert to the varied requirements of a more or less complex result, marshalling the contrasted elements of the original combination in varied form and degree to match each new exigence which ever bears some cognate impress of that on which it principally depends. And so a rigorous analysis may be found to lead us on from the primary need to even the last almost superfluous ornament. The attempt is of no trifling difficulty; should it be achieved we succeed in solving a problem in Art that the student of Nature, who from the given leaf would fain infer the unknown anticipated flower, has many a long day to wait for.

In accordance with the definitions already given, when we speak of the Qualitative harmony of a composition we intend to signify that it comprises all the elementary parts or members that are required to complete its specific and characteristic purpose. It is by completeness to this effect that an architectural work,—a structure,—is open to become properly organic or susceptible of organic efficiency by the final introduction of appropriate proportions. A structure is of one kind or another, according to its general purpose, and requires to be made up of apartments of various kinds; these again demand various kinds of members in various kinds of distribution of various kinds of materials and construction. The well-devised definition of the purpose of the structure is the dominant condition of appropriateness throughout, however the determination of purpose in the first instance may be hampered by limiting control of resources in money and means, in time or site, or even by the nature of materials at command.

Besides the combinations that are more or less stringently exacted by use and purpose, there are others that have more immediate reference to æsthetic effect, but are no less indispensable; and, as we shall see, true qualitative appropriateness,—fitness in kind,—is no less incumbent on decorative details,—on the ornamental development that supervenes upon utilitarian members. It is in these details, indeed, that resides the essence of what is usually understood as style in architecture. Such styles are for the most part as established by traditional assent as the dialects of a language; have vindicated their excellence by approval of ages, and might seem to require only learning to be available for practice. But even as the truly accomplished speaker were scarcely secure if unacquainted with the etymologies of his expressions, it is of no inconsiderable use as well as interest, to study the primary derivation of ornaments,—the proprieties of curved or rectilinear profiles,—the meaning of mouldings. Only so may we move with confidence in introducing those quantitative variations that open such large opportunities of new refinements.

It is with Quantitative adjustment, with the assignment of positive masses and dimensions, whether of parts of a moulding or of a plan,—of an apartment or an elevation,—that remains the final determinations on which depend both the efficiency and the beauty of the happiest qualitative invention. Here enters in the second but co-ordinate application of Composition, in the selection and appropriation of proportions; and it is only when these are distributed and related with systematic accuracy and elegance, that the result is entitled to the full honours of an embodied harmony.

Qualitative harmony resides in the organic invention of efficient and expressive combinations of the elements of structures,—Quantitative in the realisation of efficient and expressive proportions of the same as distributed in space. The same general theory of Composition is common to both. With Quantity, as with Quality, it is among the conditions imposed by a predominant purpose that resides the primary decision and control; certain proportions are thus inevitably prescribed for those parts and features that, by original propriety and natural endowment, declare most emphatically the unity of the design.

Iteration or repetition of a definite proportion or ratio, whether as applied to similar or to different elements, answers to iteration of definite elementary combinations; so, again,

preferential resort to cognate ratios, the differentiation on certain principles of a primary and characteristic proportion to form a special scale, corresponds to the differentiation qualitative of structural or decorative types.

That principles thus enunciated should appear somewhat blankly abstract, can scarcely be avoided; they must await full and easy illustration from detailed examples that cannot be abridged with advantage, and that in any case would here overload the column. After all, the resources of most students will supply sufficient provisional illustrations to justify the immediate text.

We shall find abundant proof that the Greek architect of the best school attached the highest importance to the proportionate determination of every dimension he employed and to the construction of his guiding scale,—proof no less ripe of his confidence in the sufficient resources for the development of beauty to be found in the artistically-studied combinations of a very restricted set of simple elements and ratios.

At present the theory of Composition as applicable,—as common, indeed, to all the arts,—may be most advantageously studied in writers on the Theory of Music, an effort being only required to dismiss the purely technical and to read off the seeming and professedly specific into generals. It was otherwise in antiquity; and when Plato is engaged,—in the *Philebus*,—in marshalling the arts in order of accuracy, he does not doubt to make Music the type of a class that he undervalues as based on very little certainty and proceeding chiefly on trial and guesswork. The passage intimates what I have ever suspected, that the Greek music, as practised, was not only far ahead of their skill in notation, but even more so of the fragmentary theory that has come down to us, and that it is as difficult to reconcile with the accounts of the influence of Greek music as with the possibility of music at all.

A more satisfactory class of Art, in the view of the philosopher, as working with the utmost numerical and metrical accuracy, has "*Tectonic*" for its representative,—Architecture of buildings and of ships no less, that attained the last accuracy by employment of a great variety of ingenious measuring instruments and tools. (*Philebus*, § 131.)

And so the feeling for the value of proportions in architecture, and those most precisely executed, was first, if it has not been exclusively, revealed to the Greeks,—if we may not be doing an involuntary injustice to some Egyptian whose work it is quite possible may still remain inadequately measured and recorded.

It is true that much of the effect of the best architecture of the Middle Ages depends upon observance with considerable exactness of certain simple canons of proportion. But the principle of the canons so happily adopted was assuredly not perfectly mastered. So only can we account for more varied and more extensive applications not having flowed from their development. Architect evidently followed architect where the track of a great predecessor demonstrated safe ground; and, so far as the limited principle set forth in the example permitted, very much indeed was done. Still, if we are to be candid, it is not easy, for all our admiration of Gothic architecture, to suppress the conviction that it was because the philosophy of architectural proportion stopped short of that development that it received with the Greek, that no Gothic composition anywhere is absolutely satisfactory to the taste, as being throughout as perfect as it might have been, and that possibilities remained in reserve for that style to the last, and do remain, that should eclipse the very best of all its glorious achievements.

THE COMMERCIAL OR NON-COMMERCIAL CHARACTER OF THE INTERNATIONAL EXHIBITION.

We have before us a correspondence (extracts or abstracts of which have appeared in the *Times*), and which we have perused, it is only fair to say, with regret. The matter involved is one of so much importance, with reference to the steps now being taken for the development of industrial art in this country, that it is impossible to pass it over in silence. It involves the question whether the International Exhibition is, or is not, to become something not readily distinguishable from a great bazaar. The correspondents, hitherto, have been Mr. Alfred Copeland, of the well-known firm of Copeland & Sons, and Lieut.-Colonel (now Major-

General) Scott, C.B., in his capacity of Secretary to the Commissioners of the International Exhibition.

The Exhibition was announced as one of an æsthetic or educational character. No objects admitted for exhibition were to be removed before the close of the display. This is distinctly and formally stated. It was not until somewhere in July, the open and rather pressing sales conducted in certain parts of the Exhibition led to the address of pointed inquiries. A different character from that generally understood was then given to certain halls and galleries in the Exhibition series. The word "annex" has been generally understood to signify those buildings which may be added to the original design of an exhibition structure, either for the protection of machinery, which it is undesirable to have under the same roof as the public, or for the accommodation of portions of the main display which overflow the space originally assigned. A permanent set of galleries, integrally connected with the main galleries,—to which admission is given by one and the same payment, and between any of which no difference of cognisance exists,—public can in any way take cognisance exists,—cannot with propriety be termed an annex. Nor—if this inappropriate term be applied—does it make the slightest difference in point of fact.

To say, then, that sales are permitted in the French and Indian Courts because they are annexes, and not integral parts of the Exhibition, is not a satisfactory explanation.

Foreign exhibitors, we are told in a temperate and well-written letter from one of their own body, cannot afford to send goods to this country except for sale. No doubt such is the case. It was anticipated by all those who foresaw the difficulties or heard of the perpetual Exhibition. But it does not follow that it is proper to meet this difficulty by turning the International Gallery into a sale-room.

That the æsthetic character which alone entitles the project of an International Exhibition to public support must be ultimately entirely destroyed by the conversion of such an establishment into a nest of shops it is perhaps not worth while to stop to demonstrate. That this result will be not obviated by dividing your shops into two, and calling one gallery and the other annex, or one show-room and the other sale-room, we have too much respect for our readers to attempt to make plain. But leaving, for a moment, this important feature of the case, let us see how the nominal-*rent* annex plan, if unopposed, would work as among exhibitors themselves.

What is the plan of the perpetual Exhibition? A decennial round of subjects. What is the term for which a lease of the annex, built at your own expense, is to be allotted to you,—with liberty to the Commissioners at any time to turn you out, he remembered? Five or seven years? Suppose, then, the French Commissioner, or the Danish Commissioner, or any other foreign Commissioner, goes to the cost of an annex. During two years they fill it with pottery and fine art, next year with glass, the year after with whatever may be the subject decided on. They have nothing to do but make domestic arrangements with their producers, and have value for their money year by year.

Now suppose that Messrs. Copeland, or Messrs. Wedgwood, or any other English manufacturer, or combination of manufacturers, had received as much information as, somehow or other, the French Government appear to have received, and had built, on corresponding terms, an annex of their own for the sale of duplicate articles of those which they exhibited in the interior galleries. In this year well and good. How about next year? Next year the competitors with the French Commission will not be the pottery chamber of commerce, but Messrs. Powell, Peltall, Chance, and the other English glass-makers. Are they to build fresh annexes? Are they to bargain with Copeland & Co. for those of 1871? The idea merely requires stating in plain terms to be seen to be utterly impracticable.

Nor is the difficulty less as between different English manufacturers than that between Englishmen and foreigners. The English difficulty is a double one. First, is the want of fair play between large and small manufacturers. This is no imaginary case. Setting aside the fact that the primary province of the Exhibition was to give as much publicity to the signed work of a single workman as to any single product of the largest firm, there can be no doubt that fair play between exhibitor and exhibitor is essential to the existence of the Exhibition.

No less grave than the difficulty between large and small manufacturers is that between wholesale and retail houses. Of the London salesman comparatively few are themselves manufacturers. In the case of those manufacturers who have themselves shops in London, the value of their retail business is only a fractional part of that of their wholesale trade. To keep themselves well before the public, and perhaps to keep up a special connexion, it is worth their while to go to the expense of a London establishment, at which they sell their own articles at identically the same price at which their large customers,—the other salesmen,—themselves sell them to the public. The proportion between the wholesale and the retail price is undisturbed. Were it otherwise, no salesman would buy anything of any manufacturer who had a shop in London. Now the character, hitherto, of the annex sales is their great cheapness. Rent is saved, and prices are reduced accordingly. Danish pottery, for example, is purchasable at this moment from the agent in the International Gallery at little more than half the price at which it is sold in Bond-street. Is the manufacturer to come to Kensington in order to undersell his own customers in London? The idea is absurd.

A perpetual exhibition is either a wise or an unwise scheme. If the former, it is only necessary that excrecences and anomalies should be removed, and the thing will stand on its own merits. If the latter, no attempt to galvanise it into life by offering any unfair advantage to any class of exhibitors will be permanently successful. If it is worth the while of foreign artists and manufacturers to send, year after year, valuable objects for exhibition in this country, it is worth their while to establish agencies for the sale of their products. Nothing can be more simple. The highest retail tradesmen would gladly display and sell French or Belgian articles for the same profit, and on the same terms, as English ones. The more noisy they excited, the better for them. Nor is there anything to prevent foreign producers, by their commissioners or otherwise, from establishing shops of their own—not on Government land.

We cannot omit to notice the appearance, in the letters signed by General Scott, of an argument which is brought forward as though it were unanswerable, while it really is quite irrelevant. The sale of objects in the Exhibition, says the counsel for the defence, is a success. The public like it. Very possibly they do,—or a large portion of them do. What has that to do with the question of propriety? The object with which a million and a third of public money has been spent by the Science and Art Department has been, not to please the public, but to educate them; not to conform to a low standard of taste, but to furnish a better one. The lower we descend in the social series, the less education, the less refinement, the less taste is to be naturally expected. Coarser and coarser attractions thus draw larger and larger followings. No doubt if the whole series of halls, courts, and galleries, from the Albert Hall to the most neglected member of the entire series, the Patent Museum, were adapted to the public taste on the principle of a certain establishment not far from Leicester-square, the success, measured by the intake—the new criterion appealed to by the Commissioners—would be very great indeed.

But even on the very low ground of pecuniary profit, we are inclined to hold that the conversion of the Exhibition into a bazaar is a mistake. The great charm of all these displays has been what we may call their palatial character,—the absence, in fact, of the vulgarity of the shop. Introduce sales, and all elegance and æsthetic refinement will take wings. Once begin to sell, and you will rapidly go on to sell most eagerly that which pays best, be it fine-art objects, furniture, or beer. The resolution to make the Exhibition a bazaar must be committed to the flames; and the more speedily, decidedly, and graciously the false steps that have been taken are acknowledged and retraced, the better for all those concerned in the success of International Exhibitions.

A Heavy Aerolite.—Two ships belonging to the Swedish navy, the gunboat *Ingegard* and the brig *Orladam*, have arrived at Plymouth, from Greenland, having on board three aerolites, the largest weighing nearly 30 tons (?), which are to be conveyed to Sweden, and made the subject of close investigation.

WALTON-ON-THE-NAZE, ESSEX.

ALTHOUGH we have frequently in these pages intimated on the sanitary shortcomings of our English watering-places, and insisted upon the necessity of even greater attention to the enforcement of the laws of health in these localities than in other places having a fixed population, the subject is by no means exhausted, and it is infinitely evident that our warnings and exhortations with respect to many of what are called health resorts of Great Britain have been hitherto without avail. We have, however, the satisfaction of knowing that in many instances the observations made in this journal have been the means of awakening the authorities to a sense of their duties, and of promoting some important reforms; and we have therefore considerable encouragement to continue our exertions.

At a risk of repetition, it may be well to recapitulate some general principles applicable to watering-places, because there is not by any means anything like agreement among the general public with regard to sanitary matters, and there still exists a numerous body of people who look upon the introduction of sanitary measures into the country as superfluous or even impertinent. The belief of these persons in the *vis medicatrix nature* is unbounded, that they imagine they may live a time unharmed under the most unwholesome conditions,—conditions from which they could shrink in a metropolis, simply because they are in the country. As easily might they be fired in their hand by thinking on the frosty tuncus, as disregard the inflexible laws of nature with impunity; they pervade all space, and no locality is exempt from their operation. It is one thing to live in a sparsely-peopled district many miles from a more populous locality, but it is quite another to be crowded to an extent which seldom prevails in towns among a similar class of houses. All reference to the country as regards population is thereby destroyed, and it is important for the health of the community that more rigorous regulations should be put in force than would be required in any ordinary congregation of people. This proposition seems self-evident when it is explained, and yet we find persons who will scarcely enter a cab or attend a public entertainment for fear of infection, taking up their abode in places of the sanitary condition of which they are entirely ignorant, and occupying houses directly deficient of some of the commonest requirements of healthy life, not only without complaint, but with absolute satisfaction. They are ready enough to fly from a place upon the first whisper of epidemic, but are utterly blind to the signs which indicate the presence or possibility of disease. And yet it requires but a very small amount of observation and the exercise of a very ordinary judgment to enable one to arrive at a tolerably accurate conclusion as to the healthiness or unhealthiness of a given spot. The locality of outbreaks of cholera, small-pox, and similar disorders has been frequently indicated with wonderful accuracy a considerable time before their occurrence upon the indications presented, and these indications are so plain that they may be read by anybody of ordinary capacity. If, instead of listening to rumours (often ill-founded), that the small-pox is prevalent in such and such a place, or scarletina another, the father of a family were to visit the watering-place he had selected before pitching his tent there, and were to use his eyes and nose, and make a few simple inquiries, he might readily satisfy himself whether the spot selected were suitable for a residence for himself and his family. The indispensable requisites are, first, a thorough and complete system of drainage of surface-water and sewage. It will not be enough that the new part of the town is drained and sewered, while the old part (as is too often the case) remains in its original filthy condition. The outfall should not be carried into the sea,—the misdeed created by the contact of sewage with sea-water, and the ill effects of the gases disengaged in the process, are well known to most practical men; and although every precaution may be taken with regard to the discharge of the sewage, it is a very difficult and dangerous system. The proper method of disposing of the sewage is to apply it directly to the land; and although the realisation of this proposition may occasionally present difficulties, they are by no means insuperable.

The next desideratum for a seaside residence is an abundant supply of water, laid on to every house, which should be, if possible, obtained from some source removed from the possibility of contamination by sewage. These two requisites are indispensable for the health of every watering-place, and no resort can be considered safe that does not possess them. It may escape for a time the consequences which naturally attach to a violation of natural laws, but sooner or later its punishment will follow, and rich and poor alike will share its infliction.

Besides these indispensable wants, there are many other particulars which are necessary to insure the comfort and convenience of seaside places which should be insisted on when the primary requisitions are fulfilled. Foremost among these is the recognition of the practice of letting lodgings as a business, and (as it really is) a business of a very important character. If this fact were properly recognised we should soon obtain better accommodation; the gains of lodging-house keepers would be less precarious than at present, because people would not object to pay for increased comforts, honesty, and civility; and a better feeling would be promoted between landlord and tenant. At present, for the most part, lodging-house keepers are a needy, grasping, dishonest set of people, who have neither the capital nor the intelligence to carry on the business they undertake successfully. They make large sums during a prosperous season, but are at their wits' end when their rapacity and extortion have driven their usual visitors away. A proper system of inspection would do a great deal to improve the character of seaside lodgings. Every householder who wished to let apartments should be registered, and should give some security for good behaviour and integrity. At the commencement of the season the house-keeper should give notice to the town council, board of health, or other local authority, of his or her intention of letting lodgings; the house should be inspected by the surveyor, who should certify as to the fitness of the house so intended to be used, and the number of persons it could safely accommodate. A certificate would then be issued to the applicant setting forth the number of persons to be accommodated and any other information desirable; and this certificate should be affixed in the house in some conspicuous position, so that everybody applying for the apartments might read it. There would be no great hardship in this arrangement, which is somewhat less than what is required of common lodging-house keepers in London. It is of no avail to exact penalties for letting lodgings that have been occupied by persons suffering from contagious diseases without having them disinfected, if you permit lodging-house keepers to let houses with defective or inadequate sanitary conveniences, or deficient water supply, which must inevitably engender disease.

The condition of the lodging-house keeps themselves also requires attention. During the summer season they are almost invariably driven to inhabit the basement stories of their houses, and the overcrowding and discomfort that must ensue are dreadful to contemplate. Many of these people pass some five to six months, from May to September or October in underground dwellings that are quite unfit for human habitation. A false sense of consideration has hitherto prevented any interference with this evil, but some prohibition should be imposed upon the practice, and the lodging-house keeper should no longer be permitted to endanger the health and even the life of his lodgers, as well as his own life, on the plea of his poverty, and his inability to provide proper accommodation for his family. If he is too poor to afford proper accommodation for his tenants without endangering his own health, he is too poor to let lodgings, and ought to be prevented from doing so.

A simple code of building regulations should also be drawn up; the erection of wooden buildings, as well as noxious trades and the keeping of animals, such as pigs and cows, within certain limits, should be prohibited. In fact, the watering-place should be put under municipal regulations as soon as it becomes a popular resort, and provision should be made for its future extension. The good effects of a proper system in laying out the streets may be seen in Llandudno, which was a few years ago only a small village, with a few scattered houses. Some enterprising speculator purchased a large portion of the neighbouring ground, and laid it out with broad rectangular streets, which are now covered with houses built of a uniform elevation, which offer

a very agreeable contrast to the usual purposeless pell-mell arrangement common to most watering-places.

Some of the foregoing reflections have been induced by a recent visit to Walton-on-the-Naze, on the Essex coast. Although not much further from London than Margate or Ramsgate, Walton is but little patronised by Londoners, but is chiefly resorted to by people from Colchester, Chelmsford, Cambridge, and the Midland Counties. It is a very pretty place in some respects, the bathing is good, and there is an absence of pretension about the town and the visitors which is pleasant after the vulgar gentility and assumption of some other places on the south coast. Everybody goes to Walton to bathe, and to do nothing and cares but little for anything else.

The progress of Walton has not been rapid, and until within the last year or two the town remained in pretty nearly the same condition as it had done before it became a seaside resort. In 1869 the new pier and the Clifton Hotel were opened, and two or three rows of houses were built on the West Cliff, near the new pier. Still farther to the west, beyond the railway-station, some detached and semi-detached houses have been quite recently finished, and some one or two more are in progress. These houses are for the most part well built, except that the common mistake is perpetuated of planning them as if they were intended for only one family, whereas they usually contain two or three, if not more. There are also some good houses at the opposite extremity of the town, near Stone Point, built apparently about twenty years since, but they depend, like the rest of the town, upon wells for their water, and are no better provided with regard to drainage.

The old part of the town is in a very unsatisfactory state: the streets are narrow and unpaved, a large number of the houses are built of wood; they are mostly small, and quite unfitted for the reception of lodgers. Untrapped privies are common, and are frequently placed close to the houses; pigs are kept in the back yards, and are fed upon the refuse of fish and other offal. The low-lying land to the east of the town is intersected with numerous wide, stagnant ditches, filled with black mud, the nest of swarms of flies and gnats, which descend in swarms, and indicate clearly the presence of danger.

In the rear of the Bath House Hotel (a favourite resort of excursionists), heaps of oyster-shells and manure are allowed to accumulate, and about there the pig-styes are most abundant. There is also in the same neighbourhood an outrageous nuisance, in the shape of a urinal, built of wood, with a wooden floor, without water and without a drain. This is very disgraceful, and should be abolished at once.

The water-supply of Walton is lamentably deficient. Some few houses have pumps; but they are generally disused, as the water is totally unfit for drinking. All the drinking-water is brought in carts from Kirby, a village two miles distant; and fresh water as well as sea water, if you indulge in a tub, figures in your bill as an extra. As may be surmised, where water is scarce the cleansing and watering of the streets are neglected,—the scavenging is left apparently entirely to individual efforts, and, as a matter of course, is badly done.

It is hardly necessary for us, after what has been said, to point out the urgent necessity that exists for immediate action on the part of the inhabitants of Walton-on-the-Naze, if they are desirous of keeping up the reputation for healthfulness, and the immunity from epidemic they have hitherto enjoyed. It is stated that only about five or six people die every year in Walton, and that recently not a single death was recorded in the course of the year. This speaks well for the health of the town, but even if the inhabitants escape the consequences of their acts, it is not so certain that the visitors will do the same. The inhabitants of Walton are nearly all extremely poor, subsisting during the winter upon fishing, and picking up coprolite upon the beach, for which they obtain twopenny a bushel. In the face of this fact, it may seem hard-hearted to discover the nakedness of the land; but we would point out that the town depends almost entirely upon the visitors, and that if once an epidemic were to occur, it might be several seasons before the place recovered its reputation, and during that time the inhabitants would starve. It would be true economy for them to raise the money required for the improvement of the town rather than risk the occurrence of such a calamity as we have fore-

shadowed. There is a local Board in existence already, which have apparently done something towards the sewerage of the town, and this body might raise the money required upon the security of the rates. If the reform we have indicated were carried out, Walton-on-the-Naze might become one of the pleasantest and healthiest, as it is one of the prettiest watering-places on the eastern coast.

There is really no hardship in insisting upon the need for these improvements. "All that makes existence valuable to any one," says John Stuart Mill, "depends upon the enforcement of restraints upon the actions of other people." It is impossible for any community to exist without limit being imposed upon the liberty of individuals. The author before quoted, in examining to what extent society is entitled to interfere with the individual members in the way of compulsion or control, lays down the principle that "the sole end for which mankind is warranted, individually or collectively, in interfering with the liberty of action of any of their number, is self-protection." This is the ground upon which we urge the inhabitants of Walton-on-the-Naze to interfere with the pigs, the cess-pools, and the open ditches in their midst.

SANITARY PRECAUTIONS REQUISITE IN DUBLIN.

We are glad to believe that our latest remarks concerning Dublin have had some effect. Unusual activity in every quarter of the city, on the part of the local, corporate, and general public has been displayed, and nuisances have been unearthed with commendable zeal. As far as we have been able to see, the *Dublin Daily Express* has been foremost of the daily press in drawing attention to the neglect we pointed out; and it has given publicity to several very useful letters on the unsanitary condition of the metropolis. Some of the other journals are following the good suit. We also notice that a few of the provincial town commissioners throughout the country have begun to bestow a little more attention to this most vital question, Public Health.

In the city, some parties are urging strongly the use of disinfectants; a system very desirable under certain conditions; and a ready means of destroying foul effluence; but the fact should not be lost sight of that disinfectants would not be needed if there were nothing to disinfect. The immediate removal of nuisances existing should be brought about. The daily application of the hose is required in many of the narrow courts and lanes in Dublin, and a proper morning cleansing of all the streets. It is not in the principal thoroughfares that danger may be expected, but in those quarters where the very poor are located, and are allowed to sodden and vegetate in chronic dirt, victims to disease, and victimised, at the same time, by a despicable class of landlords. There are lanes and courts which we passed through, during our recent visit, a scandal to civilisation; and we have good reasons for knowing that the corporation is not in ignorance of their condition.

Cleanliness and morality, if they come not of free will, must be made compulsory. Drunkenness is a public nuisance; the penalties enforced are very inadequate. The man who can afford to get drunk, can afford by abstention from a degrading practice to keep his home more home-like, and in failing to do this the law is justified in enforcing penalties for dirty habits in connexion with home and person. A little discrimination is, however, required; and a little latitude ought to be allowed to the poor in some quarters of our cities and towns, for, no doubt, it will be discovered in some cases that it is impossible for them to meet all the requirements without being helped.

In quarters of Dublin we found many of the poor so situated, that the blame that a casual observer would be inclined to mete out to them by right should be apportioned to the Corporate authorities.

He would be a bold individual who would attempt to deny that the city of Dublin is in a very neglected state, and he would be no less daring a personage who would assert that the city receives an approximation to what could be termed scavenging. The very streets and lanes we have pointed out are again instanced by residents as being in the condition we mentioned.

The hospital accommodation at present in

Dublin is very limited, and is in no wise fitted to meet an increase of fever, small-pox, or cholera cases. The danger that may occur through the incoming of foreign vessels seems to be lost sight of. The Government would, no doubt, if appealed to, grant a ship or two for the purpose of a floating hospital, as it has already done in London.

The water supply of Dublin, the Varty water, is good, but it is required henceforth to be more copious and continuous in its flow, in many of the poor districts. The proper utilisation of the water supply is a most important and vital consideration, and it is a matter that demands every attention at the present crisis. There is another matter in Dublin which, though the result of customs of the country, deserves looking to—the subject of wakes and funerals. The custom of nursing the dead, in close, ill-ventilated rooms, amid the fumes of bad tobacco and worse whisky, with the accompaniments of the usual indecencies of very low life, is not at all conducive to health, as we have shown again and again in times gone by. In the matter of public funerals, an alteration was made a few years ago in Dublin as to their conduct. All city and suburban funerals must now take place before twelve o'clock in the day. After that hour no funerals are allowed to pass through the city, except those coming from the country districts. Viewing an Irish funeral belonging to a humble local celebrity passing through the streets of Dublin, a stranger would be impressed *instantly*, that he was witnessing a vehicular procession to the far-famed Donnybrook Fair, of historic notoriety. Jollity, not gloom, is more apparent in the faces of the friends and supposed mourners.

All funerals, Sunday or week day, in the sister island are characterised too often with drinking excesses, and a loss of valuable working time on the part of the working classes.

En passant, many of the old city graveyards are in a disgraceful state, and we wonder at this, as respect for the graves of the dead is a virtue that can be to some extent accorded to the Celt. Glasneven Cemetery, called the *Père la Chaise* of Ireland, is very creditably kept, and great taste is evinced in the artistic arrangements of its walks and evergreens, and ingenuity is displayed in the manner the registration of the graves is effected. There is considerable room for improvement, however, needed in the way in which the very poor and pauper bodies are interred, and a little more show of decency, and less of huddling and packing into deep-mouthed pits is desirable. Respecting the purchase of graves on the part of the poor, and the abrogation of their claims after a certain period, if they fail through necessity to fulfil the stringent conditions exacted by the directors of Glasneven, a change is urgently required.

The outflow of the streams and drainage beneath this churchyard passes, if we mistake not, into the Jolka River. Now this river is utilised for drinking purposes by a few small villages, between Glasneven and its confluence with the tidal water at Richmond, or Ballybough. Its purity and properties may be guessed under such startling conditions. If we are incorrect in our statement, we shall be glad to be corrected; but we fear it is only too true that the waters of the Jolka are in a great measure fed by tributary drainage from Glasneven Cemetery.

In the matter of the regulation of the public markets (cattle and vegetable), the rules, if any proper ones exist, are very lax indeed, and the dirt and refuse are allowed to remain many hours upon the pavement, before it is removed. We would again direct attention to vendors of diseased food, and would earnestly press the consideration of the subject of light weights and measures on the attention of the corporate authorities of Dublin. This important matter has always been very insufficiently looked after in the city. Some few former lord mayors have run amok by ordering a raid in certain poor districts, eliminating altogether from their list reputed fashionable quarters, where rich and poor alike have been victimised with unheeded impunity.

We write with a thorough knowledge, after a careful inquiry, of these matters, and we do so with the hope that our slight exposure of Dublin practices, indulged in to the damage of the needy and industrious, will soon have an end.

Sanitary laws must be enforced, or public health must suffer. The city that cannot secure the general health of its population, though it may call itself Christian, is not yet civilised.

HINDOO AND FRENCH ART: A COMPARISON.

AMONG so very many things not a little noteworthy in the now so shortly to be closed International Exhibition, there are none more significant and full of instruction than the contents of those two representative collections of Eastern and Western thought and skill—the Hindoo and French Courts. It will not, we trust, be unattractive to elicit a few lessons from them before they are dispersed and no longer available for study and comparison. It is not only while such collections are on view that they are valuable, but when gone they are not a little useful as having shown what the world artistically is doing, and what it is likely in the immediate future to accomplish. A great deal has already been said on the art value of these collections, but there is one special feature in them which has not as yet been touched on, but which has struck us as not a little remarkable, not to say in some sense inexplicable; it is this, that while the Hindoo, or Indian, collection of the art of the present time will be found to contain what the Hindoo now does, out of his own head and of his himself, there is not in the French Court or collection of art works which the modern Frenchman has produced, any one single object,—we speak deliberately,—which is, or can be, considered as the special product of the modern Frenchman, of the French mind and hand, and as specially adapted and peculiar to the time in which we at this day live. This may seem to many a somewhat startling announcement, and certainly if true may well excite the wonder, not to say consternation, of those who contend that the modern world is in a perpetual state of progress and advancement, and that the present age, in art as in everything else, is steadily going on to something better than has been hitherto done. In other words, that the modern Frenchman is a better man and doing better things than his Middle Age ancestor; and moreover, that there is a great gulph between the "poor Hindoo" and the enlightened and highly civilised modern Frenchman of to-day. There are few things better worth a little study and thought than this modern French exhibition of French skill and handiwork. Let us say a few words about it, and ask the powers that be to explain it all if they in any wise can. First let us glance for a moment at a few of the things which the Hindoo Court contains, reminding the reader that the Hindoo is not an "educated man" in any way, and that the "Western mind" is now occupied in some sort in the effort to "educate" him, as the term is, and is expending a good deal of sterling coin in the effort to make him, as far as may be, one of themselves. The Hindoo collection may be divided broadly into two great and quite distinct divisions, viz., one wherein is shown what the Hindoo man can and does do of himself, and without help. This is the genuine Hindoo work, and peculiar to the man and the country. The other is to be found in all those objects wherein the native mind and hand have been assisted from without: some object or other of Western manufacture has been either directly copied by the Hindoo workman, or the general forms of it have been covered up so to phrase it, with Hindoo ornamentation. In the first case, the native workman has worked as an artist: he has invented and ornamented a something of his own, and a work to be accomplished by one, but himself, however rude it may be. In the other case, he is at the best but a copyist, and the work has indeed only as a machine, part of a machine, and has known perhaps hardly the use of the object he has produced. Any one, therefore, who desires to understand this Indian Court, must begin by making this division, and must separate the genuine products of the Hindoo mind and hand from those composites works wherein he has been unfortunately, some may think, assisted by others so different from himself. In order to see this, we would specially point to the rude native specimens of Pottery. They can, fortunately, be well seen and handled, and closely looked at. The water coolers, and pots, and basins, are made out of the roughest material, and without any sign of them whatever of being copied; they are the genuine results of the requirements of the people of the climate and the country, and are ornamented by the Hindoo workman in his own way, and in his own native style of ornamentation, a subject not a little curious in itself; for, comparing the casts of Hindoo architecture close by, and the mouldings of them, it will

and that the same idea which dictated the buildings, so many and so complicated in the capitals and bases of the columns of a temple, like to be found on a smaller scale, but with the feeling and method of cutting, in the neck of a water-bottle, or round the rim of the top or bottom of a common basin, and produced evidently by a skillful working of the thumb-nail of the workman on the soft clay. This is not the opportunity to go into the very curious subject of mouldings, but we cannot help observing how thoroughly national these mouldings are, and how completely they tell of the country of their birth. Every primitive people seem to have invented a series of mouldings of their own, and they are, like their language, peculiar to themselves alone. These rude specimens of pottery are genuine native Indian work, and with the casts from the architecture, and the altogether valuable series of photographs of Hindoo building show what the native mind and hand can do. Can such a people "progress?" And what is progress? For we see in the catalogue that it is intended that these rude specimens of the Hindoo potter's art are to be circulated among the provincial art schools for the purpose of "instructing" the students and workmen here in England, while, at the very same time, the poor Hindoo workman who made them is being instructed artistically by us in return, as may be seen in a photograph showing the interior economy of a modern art school in Calcutta!

But whatever may be the fate in the future of the poor Hindoo, and whatever the prospects of the great and curious art and architecture which he may so truly call his own, what is to be said of the "French art," as shown at present and prospectively in the collection in the French Court? No one will or can deny the ingenuity and delicacy of handwork to be found in this French work. It is a lesson to all our workmen. Nothing can surpass the delicacy and finish and eagerness of the French workmanship. It matters not where it is, or on what object it is bestowed, no pains seem to have been spared to finally finish all up to the highest possible point. No one will dispute the ingenuity of the French designers and workmen in adapting apparently incongruous things to one another, and the counselling them to come together, if not in one way, then in another. Indeed, nothing would seem to be lost sight of, for not only have things been brought together which had better, perhaps, been kept apart, but a most ingenious system as he worked out, by means of which a real artistic element "has been forced into a work of art-manufacture," and so made a part of it. We refer to the ingenious process of taking, say, a Chinese painted vase, or other object containing some genuine artistic work in the shape of a Chinese painting or picture on porcelain, and then putting it into a modern French framework, or metal stand, bigger and more important than itself, so that the completed object is truly French, but the true artistic work in it is foreign.

What a curious thing it would be if the purchasers of such articles as these were to insist on knowing the names of the painters of them, as well as the names of the who designed them, as they are reminded of the well-known name of the firm who exhibits them.

But this is not all; for there is in this French Collection of French Art the most curious evidence of the art-spirit of the time which it is possible to imagine. No one, as we have said, will or can possibly deny the ingenuity and inventiveness of the French artists and workmen, or their readiness to take up any idea which may offer itself; and there is in this court hardly a style of art or method of work in the world which has not been copied, or in some way or other been made use of. All sorts of pottery have been copied and imitated; all kinds of architecture and mouldings may be seen in wood and metal by the attentive eye. All sorts of woven fabrics, carpets, tapestry, and hangings, have been sought out, and copied and reproduced; indeed, there is hardly any art, in any age or country, which does not find a sort of representative in this modern French show; but one thing there is not, most surely,—and, to our mind, it is a truly wonderful thing that it should be so,—and it is, that there is not in the whole of this collection of modern French skill and thoughtfulness one single object of purely native French thinking out and French skill of hand. Every object is either a direct copy of some older work, or it is, so to speak, a modern recollection and reproduction of it. Let us be understood. Everything in this court is, of course, "French,"

and designed and worked out by Frenchmen; but the ideas and methods of work are antique and old, and are the ideas of races of men long since passed away, some of them forgotten,—nay, some of the objects would seem to have no sort of practical usefulness at all, and have simply been brought into existence because no one knew what else to do. Some "old wars" have been reproduced, and is exhibited as an "ornament." What we mean is that there is nothing in this French collection which has been wrought out as a purely French idea, answering some modern want, and expressive of the French mind and method of design, in the same way as the water-bottles of the Hindoo above mentioned are expressive of the Hindoo mind and mode of design and work. In the Hindoo Court we see what the Hindoo man and his native art are; but in the modern French Court we can see nothing of the kind: there is no modern French art as such. The Frenchman has travelled everywhere,—into all lands, and into all times, for an art to show to Londoners; but surely it can never be said that he has worked in his own. To our mind this is not a little curious, considering the inventiveness and resources of the French artistic mind; and surely it may raise a question as to how far on the right road those who are now teaching art; for what is the art they are teaching? What, to wit, is modern French art, and from what source did it come?

There is, however, one single object which would almost seem an exception to this sad rule: it is the Renaissance chimney-piece in white marble at the end of the room. So much has been said of late against the bad and vile art of the Renaissance—of the French especially—that it is almost dangerous to say a word about it at all, still less in its praise; but of one thing there can be no doubt, it is French. Our own Wren imbibed a good share of it, and the interior of St. Paul's would have been quite French had he been permitted to complete his work. This special work is a fine recollection of it, and is magnificently wrought out. No one has ever been able to throw about bundles of fine drapery with the ease and grace of the French, and quite sure we are that no one else could have carved it out so finely and truly as is here done. It seems a pity that the French artists do not take up their own Renaissance art, and again work it out. It is a voluptuous art, and would work out magnificently in French hands, as is here quite visible. What is the workman's name who carved this clever work? It shows among this dry collection that the French have an art of their own!

THE ALTERATIONS IN ST. PAUL'S CATHEDRAL.

SIR,—As Mr. Shone, acting on behalf of the committee for the St. Paul's completion fund, has, in his reply to my letter, stated that I have made mistakes, I trust you will allow me a small space in your columns to justify the accuracy of my statements.

Mr. Shone states that the great organ was placed in the south transept, with Sir Charles Barry's approval, his only objection being to its being placed upon the columns of the old screen. If Mr. Shone will refer to the life of Sir Charles, written by his son, the Principal of King's College, p. 320, he will find this assertion denied.

"To the position chosen for the new organ and the arrangements for the nave congregations depending on that position, he (Sir Charles) was very strongly opposed; so much so, that at one time he thought of resigning his place on the commission, and, when he refrained from this, considered it his duty to protest formally against the scheme adopted. . . . The great organ in the south transept he considered to interfere with the simplicity, spaciousness, and grandeur of the central area of the cathedral."

At page 321 of the same work will be found *in extenso* the protest that was sent to the dean.

As to the other mistake with which I am charged, as to lowering the stall-work, I never gave an opinion whether these stalls were better 18 in. higher or lower. My complaint was that needless alterations were made, and much money wasted in doing mischief.

The great organ,—its purchase and erection,—is now acknowledged to be an error, and consequently a waste,—a waste of nearly 2,000,000. Have been spent in lowering the stalls, and an equal, or nearly equal, sum must be spent in raising them again to their former height. The lovely, beautiful gables were removed, and now they are put back; I ask at what cost? The

original organ, which they thought good to sink behind the stalls, in one of what are called the ladies' closets, is now to be removed thence, and erected in a way which I equally condemn; and at no distant day it will have to be removed again. I condemn, also, the two screens now in the course of erection in the north and south transepts, by which the doorways are half hidden, and prevented giving that air of grandeur to the Cathedral which Wren intended.

The public are not likely to give their money thus to be wasted. I have had great experience of the munificent liberality of the merchants and leading men of London; and if a defined plan of ornamentation, with all its details, were put before them, which they could approve, I make no doubt the proposed work would be soon accomplished.

Mr. Shone "would make believe" that what is now being done has the approval of the great architects of the day. Sir Charles Barry has gone, and it is well known that both Mr. Street and Mr. Butterfield disapprove of present proceedings.

Has Mr. Shone nothing to say about the windows?

JAMES LEPTON, Minor Canon of St. Paul's.

SPIALFIELD'S AND ST. BRIDE'S.

We have before now alluded to discussions by the vestrymen of St. Bride's Fleet-street, as to the disposal of some property belonging to that parish in what was formerly called Union-street, Spitalfields. If we understand rightly, they have determined, notwithstanding the protest of their surveyor, to patch up and relist the property, in order to get as much out of it as they can, although, if they had the money, they would not know what to do with it, the parish having already more charity money than can be used. Mr. Hancock said that, as regarded a great portion of the property, it was in such a state that no repairs could place it in a satisfactory condition. This was especially the case as regarded Union-court.

We have paid a visit to the place since, and fully endorse this remark. Union-street is now called Brushfield-street, and the wretched court in question has been turned into Paternoster-row; why or wherefore we know not. It is a close, confined alley, with houses on both sides in a ruinous state, thickly populated, and ought to be at once cleared away for a more sanitary occupation of the ground. It is to be hoped the vestry will give the matter further consideration, and not allow such a nest of evils any longer to exist.

THE SOMERSET ARCHÆOLOGICAL MEETING.

THE president for this year was Mr. E. A. Freeman, D.C.L., who in his able inaugural address enlarged upon the functions of such a society, and how these functions may best be fulfilled. He also made reference to some chapters in the national history of Somersetshire. Treating of the architecture of the county, Dr. Freeman said:—The Early Gothic ecclesiastical architecture of Somerset is a style of its own, a style which has more in common with contemporary Continental work than with the work usual in other parts of England. It is a style not absolutely peculiar to the district, but which appears beyond its border in Gloucestershire and South Wales. The later Gothic of Somerset is what we call the central and culminating form of a style which in less fully developed shades is common to the whole West of England and which again appears in South Wales. Its peculiarities cannot be so well understood as by comparing it with the style common in the other district of England which is equally rich in the later Gothic—the distant land of East Anglia. This comparison I tried years ago to draw out before our own Society, but I feel that there is still much to be done. The causes,—local, personal, or accidental, to which the architectural divisions of different districts are owing,—are a subject which has never yet been worked out as it deserves to be. But ecclesiastical architecture is not the only form of architecture in which Somersetshire is especially rich. Our ancient domestic buildings, our manor-houses, and our parsonages, chiefly of the fifteenth and sixteenth centuries, but in some cases of much earlier date, are among the characteristic antiquities of the county. In fact, we need not stop at the sixteenth century. A very respectable style of house-building went

on, chiefly in smaller houses, all through the seventeenth and even far into the eighteenth century. Indeed, it might not be too much to say that the old feeling in the way of house-building never wholly died out, that the late revival of better taste in these matters was in this district something not utterly new, but simply the giving of a new strength to something which still lingered on, though in but a feeble guise. But the older houses are among the most precious remains that we have, and they are among those which are least understood and valued. The wanton havoc which has been wrought in this way, within the last ten years, in the one city of Wells, is enough to make us tremble for the buildings which have still been spared there and elsewhere. This is a class of antiquities to which our Society, chiefly under the care of Mr. Parker, has for a long time given special attention. It will be something if we can awaken in the public mind enough care for these things to save what is still left to us. It will be something if we could even persuade people in general that domestic buildings are domestic buildings, that every Mediaeval house was not necessarily a dwelling-place of monks or nuns, and that the laity or secular clergy of those times sheltered themselves with walls and roofs, just as their successors do now, and that in the days when our great parish churches were rising the patron and the parish priest did not dwell in tents or in dens and caves of the earth, but were to be found in houses in this district,—in goodly houses of stone, beneath the shadow of the greater buildings on which they lavished all the wealth and skill of their age. The prevalence of stone building in Somerset at once carries us back to those pre-historic studies at which some time ago I glanced as nearly as I dared. Stone building was common here when wood was commonly used in many other districts, because Somerset supplied good building stone in abundance.

"The Church Bells of Somerset" was the subject of a paper read at the congress by the Rev. H. N. Ellacombe, well known to our readers as a campanologist. In the course of his essay, Mr. Ellacombe spoke of the bell-founders, who formerly resided in the county,—the most noteworthy being Roger Simpson, of Ash Priors. There were, however, bell-founders at Chewstoke, Clowworth, Bridgwater, and Montacute. Simpson lived in the sixteenth century, as in the parish books of Woodbury a charge was entered in 1548-9 for the journey of the churchwardens, seven men, and nine oxen to Ash Priors to fetch the bells which had been re-cast. He next alluded to the Legends. The first, with the monogram I.H.S., were called Jesus's bells, of which there were eleven in Somerset and forty-six in Devon. Of the second Legend, dedicated to the Virgin, there were only two in Somerset and nineteen in Devon. The third Legend, "With my lovely voice I drive away all noise," was associated with the old belief that the ringing of bells drove away storms and tempests. The fourth was, "All rejoice when they hear my voice." In Devon there was a much larger number of such bells than in Somerset. The fifth Legend was—"There is no better bell than I under the sky," and the sixth—"Refresh us in the Holy Mysteries," from the sixth chapter of St. John. Mr. Ellacombe then spoke of the crosses on many of the bells in the county, and to the bells upon which were inscribed the letters of the alphabet. One bell at Stoke St. Gregory ran from A to N, but a bell at Creech St. Michael had the whole alphabet, and was dated 1590. What those letters meant he could not explain. Upon a bell at Shepton Beauchamp was the following:—

"Knock me rightly, ring me well,
They will hear my sound at Hamdon Hill."

The excursions were to various churches, houses, and other objects of interest in the neighbourhood, Mr. Freeman making an instructive guide. One or two points we may mention in connexion with the excursions. At Montacute House were shown the original depositions taken at the trial of Guy Fawkes and others for the Gunpowder Plot conspiracy. The depositions are in excellent preservation, and the evidence seems to have been taken with great care. The signatures of Sir Francis Bacon and several noblemen who officiated at the trial are appended to most of the depositions. Upon visiting Stoke and Norton churches Mr. Freeman deprecated the removal of plaster from the walls of churches, which was, he said, a great fancy with people nowadays. To his mind bare walls were very

unsightly and uncomfortable. At Norton, the Rev. G. J. Blomfield, the rector, took exception to the statement, and said that there were others present of the same opinion as himself. Plaster had never been put upon the church. Where plaster was intended a moulding was left to receive it. There was no moulding in that church, which showed that the walls were never intended to be plastered. The discussion, which was beginning to wax warm, was put to an end by the sound of the secretary's whistle. The incident was referred to by Mr. Freeman in a subsequent "lecture," which he prefaced by the remark that he must be careful, or whilst speaking of scraping he might scrape upon the feelings of the scraper. The visit of the Society to Hinton House, which is now occupied by Lord Westbury and his family, was interesting from the fact that the Hon. Miss Bethell contributed a paper on Sir Amias Poulett, who was so much employed by Queen Elizabeth in diplomatic and other services. Miss Bethell produced a passport, in an excellent state of preservation, written by the Parliamentary General Fairfax, authorising Lord Poulett to travel from London to Hinton with a retinue of six servants.

At Ham-hill, where Roman and ancient British remains have been found, the Rev. Mr. Searth explained the construction of the fortifications of the hill and the ramparts, and gave it as his opinion that a Roman camp had been formed there to protect the main road leading from Seaton to the northern parts of England. This was confirmed by the fact that an amphitheatre existed just outside the camp, and which was used, no doubt, for the gladiatorial games common in those days. Mr. Searth stated that the hill was inhabited long before the Romans. One of the largest querns or hand-mills he had ever seen was found upon the hill, as well as a chariot-wheel belonging to the Romans, who undoubtedly occupied it. Mr. Searth referred to the destruction of the camp at Bomer Walls, opposite Clifton-down, on the Somerset side of the Avon. A building committee had taken it, and had annihilated the centre camp. He asked them why they did it, and they replied that it was because the material was so valuable. If these historical associations had been preserved, it would have rendered the houses in the neighbourhood doubly attractive. He wished that the attention of the leading men belonging to that company could be drawn to the circumstance, so as to induce them to preserve these relics of the early inhabitants of Britain. Mr. Searth also stated that the quarrying for the Ham-hill stone was destroying the face of the ramparts, and in a few years it would be doubted whether there had been any ramparts there at all. He hoped that the Prince of Wales would give instructions that the most interesting part of the hill should be preserved for the information of posterity. Every trace of Roman occupation would be gone in a few years if a stop were not put to the quarrying.

The congress lasted three days, and was fairly successful. Many places of interest were visited, and the party separated at Crewkerne, where they held their formal meetings, and whence they made their excursions.

NEW ALTAR AT ST. PETER'S ROMAN CATHOLIC CHURCH, STALYBRIDGE.

This altar was opened on the 10th inst. The table, which is of Sicilian marble, is supported by four green marble columns, with carved caps and bases in Caen stone; the intermediate spaces being panelled, and containing figures of angels. From the centre of this table springs the tabernacle, which is of coloured alabaster, with metal door inlaid with crystals, and guarded by two angels carved in white alabaster. The throne comprises an open niche, with a canopy supported by red marble columns, and is richly crocketed.

The reredos consists of an arcading in the centre of pointed-headed panels, with sunk quatrefoils in spandrels, and a carved cornice. The two outer ends consist of buttresses with clustered marble shafts and carved caps, that are surmounted by two tiers of niches; the lower ones have angel figures bearing the symbols of the Crucifixion. The upper canopy, which is also supported by marble columns, and finished with a rich and crocketed pinnacle, has the figure of a kneeling angel inside; the centres between the buttresses: immediately over the reredos, is formed a gable richly crocketed and moulded,

and containing a life-size group of our Lord, supported by the two Marys, St. John, and the Centurion; the final above these consists of the pelican and young.

The stone used for the sculpture and moulded work is of Caen, Painswick, and Bath stone. Mr. Edmund Kirby, of Liverpool, is the architect. The whole of the work has been carried out by Messrs. T. B. & E. Williams, of Manchester.

THE ECCLESIASTICAL DILAPIDATION BILL.

As might be expected, the number of persons who think themselves exactly the right sort of men for the appointments under the new Act, "Surveyors of Dilapidations," is very considerable. One or more are to be appointed for every diocese in England before the 1st day of November next, by the bishop, archdeacons, and rural deans of each. We take the liberty of advising the exercise of great discretion in making these appointments, if it be desired to make the Act work successfully.

The surveyors are to be paid according to a rate of charges, and not by way of salary; and these charges are now being fixed in the various dioceses by the electing body. It is to be regretted that this is not being done, to some extent, in union or after conference, so as to obtain uniformity. A question arising out of the proposed payments has already arisen, touching the meaning of part of the Act, as mentioned in our last. The Act says "that where the surveyor shall report that any works are needed for putting into repair any dilapidated buildings belonging to a benefice he shall report,—

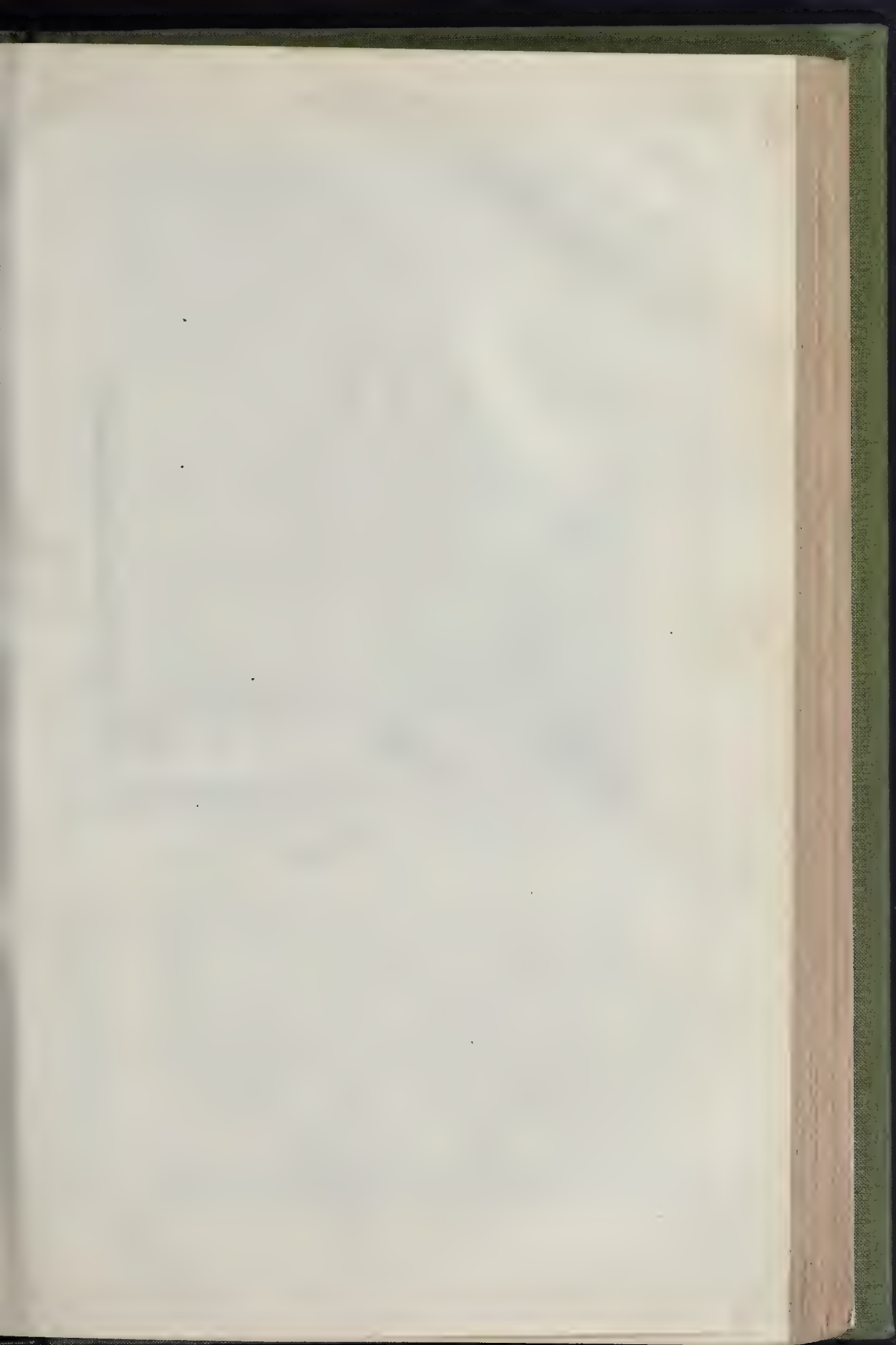
1. What works are so needed, specifying the same in detail.
2. What he estimates to be the probable cost of such works.

3. At or within what time or times such works respectively ought to be executed." The surveyor already appointed for Winchester is maintaining that the report here called for is not to be "a specification" such as a builder could estimate from, but simply a statement in general terms of what repairs are needed. We have no doubt in our own mind that a specification is intended, and that it will be so understood generally. We refer to the difference as showing the necessity of coming to a general understanding before settling the scale of fees to be paid. These fees, by the way, should be made properly remunerative, so as to insure the services of thoroughly competent and judicious persons.

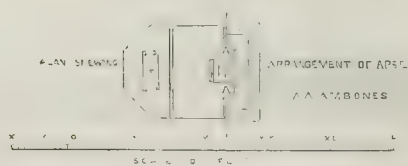
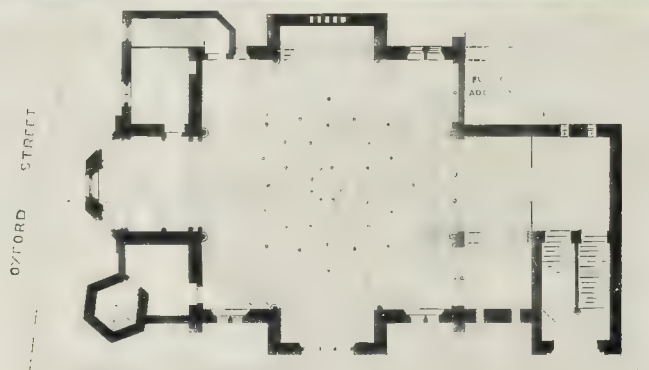
ST. SAVIOUR'S CHURCH, OXFORD STREET FOR THE DEAF AND DUMB.

This building, now in course of construction from the design of Mr. Arthur Blomfield, is situated in Oxford-street, at the corner of Queen-street, Grosvenor square. It consists of a lecture-hall below, and a church above. The entrances are in Queen-street. The site is given by the Marquis of Westminster. The shape of the site, and the peculiar requirements of its future occupants, have led to a somewhat unusual plan. The absolute necessity of an uninterrupted view of the chaplain, and the absence of all the usual accessories of organ, choir, &c., seemed to suggest an arrangement somewhat like that of a theatre. This, however, would have been entirely wanting in anything like ecclesiastical character, and would, moreover, have rendered it impossible to light the lower floor sufficiently. The plan (of which a woodcut is given), was therefore adopted as one which, while meeting all the requirements of the case in a utilitarian point of view, is not without precedent as a form for a church, and is capable of effective and picturesque treatment.

The general arrangement and the external appearance of the building will be seen from the illustrations. The materials are red brick and Bath stone. The extreme length of the building, internally, is 78 ft., and the width 43 ft. The floor of the church is 10 ft. above the street level, and the height from floor to centre of groining will be 42 ft. The height from pavement to apex of roof will be 95 ft. The church is intended to accommodate 250 deaf and dumb, but it is intended to be used occasionally for ordinary congregations, where upwards of 300 can be seated. The builder, Mr. J. M. Macey.



ST. SAVIOUR'S CHURCH, OXFORD-STREET, LONDON: FOR THE DEAF AND DUMB.

MR. ARTHUR BLONFIELD, M.A.,
ARCHITECT.

THE NEW YORK LIFE ASSURANCE COMPANY'S OFFICES, BROADWAY, NEW YORK.—MR. GIFFITHS THOMAS, ARCHITECT.



THE NEW YORK LIFE ASSURANCE COMPANY'S OFFICES, BROADWAY, NEW YORK.

This costly structure, which is in the Broadway, Leonard-street, and Catharine-lane, has a frontage of 60 ft., measures 197 ft. on each of the two side streets, and 72 ft. in the rear. It is built of pure white marble, of the quarries of Masteron & Hall, Tuckahoe, New York. The Ionic order adopted is studied from the Temple of Erechtheus, on the Acropolis at Athens, though the general character of the building will not be considered Greek. The architect is Mr. Griffiths Thomas, New York, who designed Pike's Opera House, the Park Bank Buildings, and some similar buildings of the same class. The ground cost 475,000 dollars, and the building about 1,000,000 dollars. It is called fireproof throughout.

The principal entrance has a portico, 25 ft. wide, with coupled columns on each side, projecting 4 ft. in front of the building, supporting a cornice, with broken pediment, and a piece of sculpture-work, representing an eagle's nest, with an eagle feeding her young, the emblem of the company. A basement, with a sub-basement, cellar, and two stories of vaults, extend to the curbstone of the two side streets. The cellar is 8 ft. high, sub-basement 12 ft., and basement 13 ft. 6 in.; the first or ground story, 21 ft.; second, 17 ft.; third, 16 ft.; and fourth, 18 ft., at the two wings or ends of the building. The intermediate part has one story less, and is composed of pilasters, columns, cornices, balustrades, and urns, circular-headed windows, with plate-glass. The arms of the City of New York, sculptured in marble, crown the front of the edifice.

Ascending a short flight of marble steps, 12 ft. wide, the visitor finds himself in a long hall of the same width, and obtains a good view of the structure and its appointments. Fresco decorations are introduced on the ceilings. Two offices, one on either side of the hall, occupy the front part of the main floor; one of these is 25 ft. wide by 80 ft. deep, with walnut furniture. 62 ft. from the entrance, on the south side of the hall, is the main staircase leading to the upper stories, and which is 18 ft. wide here. There is in the well-hole of the stair a steam-elevator, connecting every story with the basement. Passing through the vestibule, 25 ft. square, the office of the company is entered. It is 60 ft. in width and 110 ft. in depth. The central space is for the customers, while on each side are counters of Italian marble, surmounted by brass rails, crowned with wrought framework in bronze. There are also, besides the waiting-rooms, book-rooms, burglar-proof safe-rooms, rooms for the principal officers, private offices, medical examination, directors, &c.

The building is heated by steam forced into it by the fan principle. The rooms are ventilated. The roof is of iron. When completed, the whole of the first floor will be finished with black walnut, inlaid with marble, as will also be the grand staircase to the third story, and the hall floor tessellated marble; the rear stairs of iron, and the internal columns to the sub-basement and basement will be fireproof.

OPENING OF THE NEW JEWISH SYNAGOGUE AT BRISTOL.

The new Jewish Synagogue, in Park-row, Bristol, has been consecrated by Dr. Adler, the Chief Rabbi. The edifice has a vestibule with a broad flight of steps leading thereto and up to the place of worship itself, and a reader's house is attached to the synagogue. The entrance to the vestibule is surmounted by an inscription in Hebrew characters, which translated means—"Come, we will walk in the light of the Lord." The synagogue will seat on the ground floor 90 persons, and the galleries, which occupy three sides of the quadrangle, 150. The ground floor will, as is customary among Jews, be occupied solely by the males, and the galleries by the females of the congregation. The interior measurement of the building is 46 ft. by 35 ft. The reading-desk is, as usual, in the centre of the floor. The sanctuary was specially designed by Mr. Collins, of London, architect, and the carving has been executed by Mr. Margetson, of Bristol. The carving represents the foliage of Eastern plants, all of which has an allegorical meaning. The floor of the synagogue is 12 ft. above the level of the road. The cost of the site and building has been upwards of 4,000l.; more than one-third of

which amount was expended in excavation, occasioned by the inequality of the land at this point, which is about 30 ft. above the level of the roadway. The architect was Mr. Frigg, one of the city surveyors, and the contractor for the work, Mr. R. M. Bryant. Messrs. Beaven & Son, Badminton, were the sub-contractors for the masons' and plasterers' work, and Mr. Williams, of Bristol, for the gas-fitting. Mr. Krauss, of Bristol, has put up the fittings on the ground floor and gallery, which are of stained wood. The synagogue is lighted by means of a sun-light and bracket lights underneath the gallery.

THE NEW WINDOWS IN GLOUCESTER CATHEDRAL.

Among the many recent additions of painted glass to Gloucester Cathedral, are the clearstory windows, and the great window of the south transept, the erection of which has just been completed by Messrs. Hardman, of Birmingham, at the cost of Mr. T. Marling, mayor of Gloucester, and which is described by the local *Chronicle*. This window consists of double four-light transomed windows, the upper portion being filled in with tracery of the Late Decorated period. The highest opening of the tracery, a sexfoil in the apex, contains the conventional representation of the Holy Spirit, a dove with wings extended, and golden rays descending towards the other portion of the window. Below this, on either side, are two large trefoil-headed spaces, in each of which is one of the cherubim with outstretched wings. In the sexfoil at the head of each of the two great divisions of the window are represented the Cross Keys, emblematical of St. Peter, whose life is portrayed in the great lights below. All the smaller portions of the tracery are filled in with quarried glass, in each of which is the letter P, in Gothic character. Descending to the principal openings of the tracery, we find under each of the sexfoils two large trefoil-headed spaces. Beginning at the dexter side, or left-hand of the spectator, the first couple of openings illustrate Christ walking on the water. The corresponding pair of openings of the second division of the window contain the giving of the Keys. In the first light is our Lord surrounded with sheep and lambs, giving the Keys of the Kingdom of Heaven to St. Peter, who, in the second light, is seen reverentially kneeling to receive the gift and commands of his Divine Master. Below these four spaces is some beautiful tracery, in the four larger lights of which are repeated the Keys, and in the smaller ones the "P." We now come to the sixteen great lights that form the main portion of the window. The eight upper lights contain scenes in the life of our Lord in which St. Peter was an active participator, while the eight lower lights depict events of which the account is to be found in the Acts of the Apostles. In the first light, again beginning at the dexter side, is the miraculous draught of fishes. In the next light we have a continuation of the same subject in the call of St. Peter and St. Andrew. In the third light we have the raising of Jairus's daughter. The fourth light represents the scene of the Transfiguration. The four lights of the sinister division of the window are filled with scenes more particularly connected with our Lord's Passion, but in which St. Peter is still an active agent. In the first is represented the washing of the disciples' feet after the last supper. In the second light is the betrayal of our Lord. In the third light we have the Denial. The last light represents the scene at the sepulchre. We now proceed to the eight lowermost lights, and which represent events that occurred after the ascension of our Lord. The first is the cure of the lame beggar. The next light represents the death of Ananias. Thus mercy and justice are contrasted in the first two lights; in the next two are grief and joy. The third represents the widows showing the coats and garments. In the next light is the raising of Tabitha to life. The fifth light of this series represents the baptism of Cornelius. In the sixth light we have St. Peter preaching. The seventh light shows the deliverance from prison. The eighth and last light represents the final scene of the crucifixion of St. Peter. With regard to minor details, it will be sufficient to say that the upper tier of lights are treated on a quarried background of the old Gloucester pattern, examples of which remain in the cathedral; and the bases of the same lights are composed of three arches, treated like the piers of a bridge, underneath which is a flowing stream of water

with fishes, in allusion to the original occupation of St. Peter. The lower tier of lights are on coloured backgrounds, alternately blue and red, the bases and other architectural accessories being in harmony with the period of the window. This window occupies a site of unsurpassed advantage as regards aspect and unimpeded light, and Messrs. Hardman, says our authority, may well be congratulated on the undoubted success which they have achieved. The west window of the choir has also been filled with painted glass, most of which consists of the fragments of ancient glass found in the chapels of the crypt and elsewhere.

Too much praise, adds the *Chronicle*, cannot be accorded to the dean and chapter, and especially to the dean, for the unstinting and energetic manner in which the whole work has been carried out, despite the comparatively small amount of help contributed by the public; to Mr. Gilbert Scott for the general designs; to Messrs. Clayton & Bell, by whom the vaulting has been adorned, and who furnished the beautiful glass for the five north clearstory windows; to Messrs. Brindley & Farmer, to whom the providing of the new carved benches, and the restoration of the ancient canopies, &c., were intrusted; and to Mr. Ashbee, of Gloucester, under whose personal superintendence the work has been executed.

PROVIDENT INSTITUTION SAVINGS BANK.

The premises in St. Martin's-place, occupied at present by the Provident Institution Savings Bank, being required for the purposes of the National Gallery, under the National Gallery Enlargement Act, have been purchased by the Government, together with other property in the neighbourhood.

Another site has been obtained by the trustees in the immediate locality, and a new building is to be erected by Messrs. Myers & Sons, from the design of Mr. David Brandon. The amount of the lowest tender was 6,700l. for that portion of the work to be erected on the part of the site for which the purchase has been completed; there being yet negotiations proceeding for additional space in Hemming's-row.

This bank has the largest amount of deposits of any of the savings banks, nearly one million and a half sterling.

HOW A WOMAN ASSISTED IN TAKING THE CENSUS.

UNDER the heading "Taking the Census: Experience of a Lady Enumerator, and how I became One," the *Ohio* gives a graphic and interesting paper signed "M. B." The writer is the wife of one of the oldest London Registrars, who had found it necessary on this occasion to engage upwards of eighty gentlemen to act as enumerators. One of them appears to have failed in the proper discharge of his duty, no schedules having been delivered at a certain terrace and court, and on the eventual 3rd of April, "M. B." found herself compelled to endeavour to supply the omission, by taking round schedules, and filling them up on the spot,—a duty which she discharged with an equal amount of pluck and intelligence. We quote a portion of the account, as serving to show the over-crowded condition in which parts of some of the metropolitan parishes are:—

"Seeing her child [one of the inhabitants of the court]—a little blue-eyed darling of eight years—I gave her a few pence, and told her to run on before me and knock at the doors, which she did, saying—'The lady is coming with the census paper.' At the next house I was rather roughly treated, and the room that I went into was filled with men and women. I was told to 'stand some gin,' otherwise I should not leave. After some little difficulty, I succeeded in making out the return, then proceeded with two black eyes, who daily refused to give me any information. She said 'Government never did anything for her, but let her starve; and the money they were spending over these papers they had better divide amongst the parish.' I tried to explain that if they had done so, I was afraid her share would not amount to a halfpenny. This seemed to surprise her. After spending half an hour in endeavouring to persuade her to give me the required information, I left the house, saying, 'I must inform the priest, who, I know, had told the people in his church the night before to get the papers made out, and not keep the gentlemen waiting.' This appeared to take some effect, as she sent for me to return. When I got back to her room a number of the inmates came upstairs and began

teasing the old woman, who, becoming rather excited, seized hold of an old, dirty-looking frying-pan, and hit those who were within her reach with it. The stairs leading to her flat were so dirty that I could not put my schedule on them. While in this fit, I suddenly heard a voice exclaim, "Look out, missus, will this do?" and an old, worn-out blacking-brush was thrown into my lap, upon the back of which I managed to make out the papers. After this all was plain sailing. In one room I found a man of seventy, with his wife of fifty, and eight children. In an upper room there were seven children, without shoes or stockings, and the place was very dirty; the eldest child—a girl of ten, gave me all the information; all the children were 'scholars,' even the baby. At the top of the house I discovered a girl-mother of eighteen, with a husband nineteen; their child was nine months old. In the next room was a woman who endeavoured to make me insert ten children on the schedule, but four only lived with her. She said that if I did not enter all, I should not put any. She told me all her children were born in the parish, and she might want help from it; she knew the parish well, and they would gladly cheat her if they could. Though born in Ireland, she had a grudge against the parish, and would serve them out yet. One room in the next house was being disinfected for the small-pox; I endeavoured to proceed to another room in the same building, but the odour was so fearful that I was forced to turn back, and I was told that the smell made the inmates quite ill."

It would be a good thing for the health of the public if other enumerators would give an equally vivid account of the state of some of the streets and courts they visited in discharge of their duty.

THE SEWERS, ST. GEORGE'S, HANOVER-SQUARE.

In the St. George's, Hanover-square, Committee, of Works, on Tuesday, Dr. Love is in the chair. Mr. Walker called the attention of the surveyor to the following statement in the *Builder*. "The whole of Belgravia, Eaton-square, St. James's-park, and Westminster, down to the river, is a mass of stagnant sewage in nine flat-bottomed sewers, swarming with rats, those rats being a sure test of the existence of sewers of deposit." He wished to ask if there was any foundation for it. The surveyor (Mr. Tomkins) replied that there was some slight foundation, but the statement was a long way from the truth. The district spoken of was a flat district. Mr. Walker remarked that flat-bottomed sewers were mentioned. The surveyor said the district was thoroughly drained. He did not know there were any flat-bottomed sewers. There were one or two in the wards, but they had been improved. The statement about the mass of stagnant sewage had no foundation of truth. Mr. Walker thought it desirable the *Builder* should be made aware of this, and it was resolved the surveyor be requested to communicate this statement to the editor of that journal.

SIR,—My attention having been drawn to an article in your paper, headed, "The Metropolitan Cesspools," I think it is only due to the residents and holders of property in Belgravia to make the following statements:—

The sewers in that district are not flat-bottomed, but are either egg-shaped or have invert bottoms. In so low and level a district it is, of course, impossible to get, in every case, that amount of fall which is desirable for proper and efficient drainage; and while some of the sewers have, in consequence, a large amount of deposit, a large proportion have a good and uniform fall, and are almost wholly free from deposit.

Moreover, the general condition of the brick-work is very far from being "ruinous," and my own experience proves that these sewers are generally free from rats.

H. T. TOMKINS,
Surveyor to the Parish of St. George,
Hanover-square.

"* We know of no article in our paper headed, "The Metropolitan Cesspools." The statement in question was made in an article entitled, "A Voice from the Dumb Wells," and we are compelled to believe it strictly correct, notwithstanding Mr. Tomkins's note. We will go into particulars on another occasion.

DILAPIDATED HOMES, AND HOW TO MEND THEM.

SIR,—We hear a great deal from time to time of the wretched and dilapidated state of the places occupied by the poor in London and elsewhere, and that efforts are being made to remedy the evil by building model lodgings-houses, and other means; but I say, advisedly, there is no reason whatever why house property should be allowed to fall into dilapidation.

Vestries and Local Boards can do much to compel the owners to do their duty; but while those who grant leases neglect their duty, we shall continue to have dilapidated homes for the poor.

There is usually a clause in leases giving the owner, be he ground-landlord or lessee, power to enter twice a year, or oftener, to view the state of repair, and give three months' notice, &c. There is also a covenant to keep in repair,

and the lease can be forfeited and the tenants ejected if this covenant is not complied with.

Now I want to know, why do not the landlords, periodically (say every ten years), survey and give notice of dilapidations, and see that they are reinstated. If they did this there would be no houses and premises allowed to get into the fearful state in which they are often found; and besides, in cases of encroachments and questions of light and air, they would know what had been done during the last ten years.

Some years since a leaseholder came to me to survey upwards of forty small houses, and a public-house among them, at the east-end. They had been let many years ago to various tenants, at improved rents, and they were nearly all of them in a very dilapidated state,—so much so that he was afraid they might be thrown on his hand, and he would be liable to reinstate the dilapidations with scarcely any remedy, as many of the holders of the underleases were men of straw, living by the weekly rents screwed out of the wretched tenants. I served the usual three months' notices of dilapidations, and nearly all of them were put into good and tenable repair. Some of the notices were not attended to in due course, and notice was given that they would be ejected unless the repairs were done forthwith, and this had the desired effect. Now I hold that if the freeholder had done his duty, and had the usual notices served on the premises, none of the houses need have got into such a bad state: and why is not this regularly done by the freeholders, owners, and great public bodies? I will tell you. If the owner has the dilapidations surveyed and notices to reinstate served on the premises, the expense falls on him, and in order to save that expense the property is neglected, and hence the numerous wretched homes to be met with at every turn.—*Tennis-court to wit.* If the property is neglected and the owner cannot afford to do his duty because of the expense, he has another remedy, which, however, should be used sparingly, but it would have the desired effect, and the expense would fall on those who neglected to keep their premises in repair. I have said before, all leases contain a covenant to repair, and an action of ejectment would lie, irrespective of the three months' notice covenant. I have known several cases of the kind lately. All expenses then fall on the tenant or holder of the underlease. In some of the cases I allude to the parties have been frightened, and they have paid all expenses and put the premises in repair.

In a case I have had lately, where several houses were held under lease from one of the old City companies, the houses were in an awful state; there was scarcely a room fit for occupation; the mud, hardened on the floor of the passages for years, was more than an inch thick. Many of the doors were gone, and the privies and drains were simply horrible. I never saw anything so bad before, and yet an application had been made for a renewal of the lease. Every room was occupied by a separate family. How they existed in such a place I cannot tell; and how the parochial authorities could allow such places to be tenanted is beyond my comprehension, as they have power, by an application to a magistrate, to have them closed. These filthy houses (or ruinous places) were near to a large public school, I think a National School. I need hardly say I recommended that the new lease should be granted, only on the condition that all the houses and premises should be put in complete repair, to the satisfaction of the surveyor of the company. E. O. SYMONS.

THE SEWAGE QUESTION.

Leamington.—The sewage of Leamington will presently, it is said, be used for irrigation, on a scale unequalled in the country. Lord Warwick has purchased the sewage of the town for a term of thirty years, at a rental of 450*l.* per annum, and has set apart a considerable portion of his estate near Warwick for its reception. This will be devoted to the cultivation of Italian ryegrass, cereal crops, roots, and vegetables. By means of a loan of 14,000*l.* the Board have constructed a model pumping station just outside the town, from which powerful engines will force the sewage along mains up to the sewage farm, about two miles away. It is expected that the sewage farm on Lord Warwick's estate will be a source of profit, and a model for the country.

Birmingham.—A deputation from the Sewage Committee of Birmingham have paid a visit to the sewage farm at Warwick for the purpose of

inspecting the system of irrigation in operation there. They were received by Mr. B. Richard, C.E., borough surveyor, who showed them the growing crops, some of which are despatched twice a week to the London and Birmingham markets; also the grass lands, the plan for distributing the sewage by means of gravitation and the contour canals, and the effluent water which discharges itself into the Avon.

HALIFAX CORPORATION.

The following officials have recently been appointed under the control of Mr. P. Borrie, the borough engineer and surveyor, consequent upon the reorganisation of his department. Mr. E. R. S. Escott, of the borough engineer's office, to be the district surveyor for Northwood, North, and Ovenden wards, at a salary of 186*l.* per annum. Mr. Alfred Cress, of the town surveyor's office, Birkenshead, to be the district surveyor for Southwood and Shirood wards, at a salary of 130*l.* per annum. Mr. Robert Richardson, of the borough surveyor's office, South Shields, to be the engineering draughtsman, at a salary of 130*l.* per annum. Mr. Tom Sunderland, of the borough engineer's office, to be junior draughtsman to assist Mr. William Wood, of the same office, who is the district surveyor for the Halifax Township, comprising West, Central, East, South, and Market wards.

THE LATE M. DUBAN, ARCHITECT.

THE announcement made early in the last session of the Royal Institute of British Architects of the death of its distinguished honorary fellow, M. Duban, will be fresh in the memory of most of your readers. The Institute being now in vacation, I desire to make known through your columns to our scattered members the intention of his French colleagues to give a public funeral to their great confrère, at which it is desired that foreign architectural bodies should be represented. The funeral is to take place at Paris on the 7th of October, and as it is probable that many of our members will be travelling at that time, it is hoped that the Royal Institute of British Architects may be well represented. I shall be glad to receive communications from any of our members who may be disposed to attend, and to secure them a proper reception.

FRED. P. COCKERELL, Hon. Sec. R.I.B.A.

TEACHING FOR ARTISTS.

SIR COURTIS LINDSAY, in his report on Paintings in Oil in the International Exhibition, makes some remarks on a long-felt want, which we reprint, as entirely in accord with our own observations on former occasions:—"We are not accustomed to put our artisans to work before they have become thorough masters of their tools, and of the method of their work. In higher spheres of life, the lawyer is obliged to pass through a state of pupillage before he commences the practice of law; the doctor, the priest, and the soldier, all undergo a period of probation under trained instructors; our artist alone stumbles onwards, without guidance or direction. The effect is the more disastrous because he, like the musician, must unite a dexterity of hand resembling that of the mechanic, with that mental education of a liberal profession which enables him to see and understand nature, and to compose works of imagination and art. Owing to this want of an early and systematic training, the works of our greatest masters are often unequal; their drawing and colour halt behind their conception in a manner that a complete art-education would have made impossible. Through this cause some of the finest works of our school are falling to pieces, the mechanical knowledge of the artist having been at fault; in others, the colour flies, the glazes change, the varnish cracks, a thousand misadventures arise. And, finally, from this same cause, the school makes no aggregate advance. In the days of Medieval art each master was the centre of a group of pupils. The experience of his life became the possession of his school; his followers, in their turn, bore onwards, and added to the traditions he had taught, so that the knowledge accumulated from generation to generation became the means of raising art to a height which it has never since approached.

In conclusion, I would urge all those artists of our own school who appreciate the pain of an

unaided struggle with the difficulties of painting, but who have themselves attained at last a complete knowledge of their profession, to devote some part of their time to such pupils as may seek their guidance. The schools of the Royal Academy and of the South Kensington Museum are excellent in their way; the South Kensington, in particular, gives instructions in painting, sculpture, and architecture, with their various offshoots; but these schools are not capable of guiding the student beyond the initiatory period of his profession, after which a fostering hand is urgently required."

DRY ROT.

Sir,—Will you kindly invite some of your correspondents to describe the symptoms, the cause, and the remedy for dry rot in timber? We fear that it has made its appearance in the joints of a church in this district (Bilton), which has been recently built.

CHURCHWARDENS.

* Papers on the subject will be found in earlier volumes of the *Builder*.

"MANSION HOUSE BUILDINGS," LONDON.

Sir,—I am much disappointed to observe the manner in which the building at the corner of Victoria-street and the Poultry is being disfigured by shop-fronts of such a character as to greatly detract from this otherwise meritorious building. I find, on referring to the description accompanying the excellent illustration in your number for the 1st of July, that you state,—"The shop-fronts have been designed and are being carried out in keeping with the rest of the building."

What can the architects be about? Surely the shop-fronts have not been designed nor carried out in keeping with the rest of the building? The building and details, combined with blue facias and various-coloured plaques, render them perfectly incongruous with the rest of the building.

I except from the above charge of incongruity the shop-front of the premises occupied by Mr. Dorcy.

S. F.

HOARDINGS ON THE PUBLIC FOOTWAY.

Tax Committee of Works of St. George's, Hanover-square, have considered the following question, referred to them from the Vestry, "to inquire if the erections in Piccadilly and over the public way have been licensed by the parish, and under what law it is competent to convert the public road into workshops and storehouses for the benefit of private individuals."

The licensing in question is at the corner of Down-street, Piccadilly, and the complaint is that a platform has been erected over the pavement for the storage of bricks, large stones, &c.

The Surveyor of the road to the 122nd section of the Metropolitan Local Management Act respecting the licensing of a hoarding.

Mr. Baldock remarked that at the corner of Down-street there was a hoarding of a large post. If a horse ran away and dashed against the post, the whole of the platform would very likely fall with its contents, and the consequences might be fatal.

The Chairman said he considered hoardings over the footway objectionable.

The question stood adjourned till the next meeting.

"MAY DIFFERENCE OF OPINION NEVER ALTER FRIENDSHIP."

Sir,—Having a house-d Mr. Rouse's ire by his remarks in reference to his quantities for the work at Notting-hill, I must bear the painful consequences thereof. He charges me, however, with mis-statements in my letter. If I have made any, they of course will not tell in my favour in the action which he intends to bring against me in a "superior court" for defamation of character,—for so writes Mr. Rouse to me this week. I may perhaps be allowed to state (in self-justification) that Mr. Jones only asks me to retract a small portion of my letter and thus, &c., at all events, does not deny that the "Post-card,"—i.e., the wrong figures, the scribbling, and the scrap paper about which I complained were not mis-statements, and, if the action ever comes to trial, I can show that the quantities for fully a fifth of the work were never taken out by him at all.

In the meantime, I confirm my last letter to you,—Mr. A. Rouse and Mr. A. Jones notwithstanding.

FRED. J. GAMBLE.

P.S.—I am in total ignorance as to who has been selected to carry out the works; but I am not the only builder who tendered curious enough to inquire who made the estimate for the successful competitor.

* THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—The negotiations opened by Mr. B. Samuelson, M.P., with a view to the termination of the strike at Newcastle had, owing to the absence of the leading members of the Nine Hours League, made no progress last week, but were to be resumed. From the returns published by the League it appears that during the fifteen weeks that the strike has lasted 6,500 or 6,600 engineers must have found employment either in other trades or in engineering factories outside Newcastle. At the present time there are 2,100 more or less dependent upon the funds of the association.

Meantime, the places of the men on strike are being rapidly filled up. At the Elswick Works there are about 1,500 hands, about half the usual complement, and the other works are equally well supplied. It is expected that in less than a fortnight all the factories will have as many men as they can employ. Many foreigners are still arriving. The strike is looked upon in the town as virtually at an end.—On Saturday evening a public meeting, convened by placard, of the artisans and skilled workmen of the metropolis, took place on Blackheath, for the purpose of considering the nine-hours movement, and the best means of preventing the employers from obtaining workmen to supplant those men now on strike in Newcastle, as also to raise subscriptions for their support. Some 300 or 400 persons, chiefly composed of engineers from the factories of Messrs. Penn & Co., and other large engineering firms on the banks of the Thames and at the eastern end of London, assembled. They were, generally speaking, well dressed, and were evidently of the superior class of artisans. Mr. Wheatley, president of the Amalgamated Committee of Trades, opened the business. Mr. Barnes moved the first resolution, "That this meeting pledges itself to support the nine-hours movement in the north of England, believing the same to be an equitable request on the part of the workmen, commercially considered, and in perfect consonance with all those principles that are conducive to the greatest welfare of society." Mr. Barnes denied the assumption of the Newcastle employers that they could not afford to grant this concession of one hour per day. They had amassed immense wealth by the labour of their workmen; but, besides that, how was it that the employers of London, notwithstanding the fact that they had to incur larger expenses in taking the raw material to their establishments, that they stood at far heavier rents, and paid for higher rates and taxes than the northern employers, also gave their employees better wages, and yet were enabled to go into the market and compete with the employers of the north. Mr. Morris seconded the resolution. He had worked himself in Sunderland, and was prepared to state that although the men there received 3s. or 4s. per week more than men who did the same work at Newcastle, the masters had really lost nothing by the concession. Mr. Wilson supported the resolution, and said it was time that labour and capital should be a little more equalised than it had been. Until wealth and labour were more evenly balanced they could not expect to hope for the end of strikes.

Mr. Mothershead, in supporting another of the resolutions, said he hoped there was no working man in that assembly who would degrade himself by going to Newcastle to replace men who were on strike for the nine-hours movement. He denied the argument of a portion of the press, which said that the effect of granting this diminution in the hours of labour would be to reduce the productive powers of the country, as well as to reduce the social status of the working men themselves. Just the opposite was the fact. If a man had a fair amount of time apportioned to him for labour, he usually did his work well; but overtax him, and the produce of his labour would be sure to be of inferior quality; and as to his social condition, since the engineers' and carpenters' societies had succeeded in lessening the hours of labour, they had become the finest trade societies in the country, whilst the weavers and other trades of that stamp, to which he (Mr. Mothershead) himself belonged, in which they were compelled to work 16 and 18 hours per day, were the most miserable in existence. Since the introduction of free trade, the real property of this country had increased from 2,000,000,000 to 6,000,000,000, or, in other words, had trebled itself; but how much had wages increased with all this wealth? Why, Mr. Judkin had given evidence before the Royal Commission that the working man's wages were still 36s. per week, and that was his rate of wage thirty years ago. Every man produced at the present time double the amount of wealth to his employer that he did twenty years ago, and it was only fair that he should have some share in those profits which he produced, and which he could take in the reduction of the hours of labour. These and other resolutions in support of the Newcastle men were unanimously passed at this meeting.

Leeds.—The men employed at Messrs. Akeroyd & Sons', Harehills Quarry, Leeds, have struck work, their employers having refused, in compliance with a notice given a week before, to

reduce the hours of working from ten to nine per day. The turnouts number about 100. The men employed at other quarries in the district have sent in similar notices. The labourers who struck work at the Victoria Foundry, Leeds, for an advance of wages, have returned to work on the old terms. The strike is becoming general, the men employed at all the quarries except two,—Gibson and Potternewton,—having struck work for nine hours a day. The turnouts number nearly 300. The members of the Leeds police force are agitating for an advance of 3s. per week, a day's leave of absence once a fortnight, and service-money; and the Newcastle police have been threatening to strike.

Barnsley.—The whole of the bricklayers and their labourers working in Barnsley are on strike for a reduction of the working hours on Saturdays. At present they give over work at four o'clock, and they now wish to cease work at noon, which will make a difference of three hours per week. Before the strike they began work at seven o'clock in the morning, and gave over at half-past five o'clock on each day except Saturday, making 52½ working hours. If the wishes of the men were complied with, the working hours would be reduced to 49½, which the masters state would be less than in the majority of places in the country. The masters have positively refused the application.

Lancashire.—An interesting account is furnished by Mr. Holland of the beneficial results arising from the transfer of labour from London to the operative districts of Lancashire. All of the persons removed were pauper widows and children, who were permanently on the relief lists of the Union in which they resided. After an experience of only a few weeks, these families are now earning an average of 23s. a week. Such a result is highly satisfactory to those engaged in the transfer of labour, and if all the unemployed of the metropolis could be dealt with in the same way, migration would certainly be preferred to emigration.

Brussels.—The large engineering firms have closed their workshops in pursuance of a resolve previously announced. Considerable bodies of workmen on strike are parading the streets. The engineers on strike demand that the day's work shall be ten hours,—that is to say, eleven and a half, with an hour and a half for dinner,—and that overtime shall be paid for at double rates. The strike commenced in one large factory, the men continuing to work in three others, and avowing their intention of supporting those on strike. As soon as one firm had agreed to the workmen's terms, the men employed in another were to strike, so that all the different employers were to be compelled in turn to yield. The masters were thus compelled, in self defence, to look out those willing to work, and have done so accordingly.

CHURCH-BUILDING NEWS.

Wootton Bassett.—The church of Wootton, which has for a long time past been under the process of restoration, has been re-opened by the Bishop of Salisbury. The restoration is extensive, both as regards the exterior and interior, and a south aisle and chancel have been added to the original building. To a great extent the original design of the church, namely, that of the Perpendicular style, has been adhered to throughout the whole of the improvements, alterations, &c., with the exception of the tower, which was originally of a perpendicular style, but now it has been entirely rebuilt in the Early English style of architecture. The nave has been restored, but no alteration from its original style can be observed. The architect has inserted as little as possible of modern work. The nave windows have been restored with new mullions, and filled in with cathedral glass. An embattled parapet has been added to the porch, which is of the Perpendicular period, and the original windows have been restored. A south aisle, in the Decorated period of architecture, has been added to the church, and also a commodious vestry. There have also been added two stained windows, designed and executed by Messrs. Thomas Hardman & Co., of Birmingham. The east window, which consists of three lights and tracery, is of the very Early Decorated period of architecture. The artist has chosen for the treatment of the main lights two rows of subjects; the larger and upper one containing three of the principal events of our Lord's life, and the lower ones three other scenes connected with those above. The subjects represented in the upper part of the lights are as

follow:—The dexter light, St. John Baptising our Lord in the Jordan; centre light, the Crucifixion of our Lord, St. John and the Virgin Mary standing on either side of the cross, and Mary Magdalene prostrate at the foot of the cross; and in the sinister light our Lord is represented rising from the tomb, bearing in His hand the banner of the cross—and below are the soldiers sleeping, or in the attitude of fear. The lower subjects are: beneath the baptism, the Temptation of our Lord. Under the Crucifixion is the Agony in the Garden of Gethsemane. Beneath the Resurrection, is the appearance of our Lord in the Garden to Mary Magdalene. The heads of the lights are occupied with a canopy, in keeping with the general design of the window; and the lights are surrounded with colours peculiar to the works of this Early period of architecture. The tracery is occupied with lamenting angels, and angels bearing the sun and moon—as accompaniments of the crucifixion; and at the extreme top of the window is represented the Holy Spirit. The east window of the south aisle is also of three lights, with tracery above, and the narrowness of the lights and its comparative length have made it a suitable window for the Tree of Jesse. At the foot of the window, and extending through the three lights, is the recumbent figure of Jesse, and from his loins springs the mystical tree, bearing on its branches representative kings from the genealogy of our Lord. The porch, which is perpendicular, has a vaulted roof, and over the door is the niche which at one time contained the image of the saint to whom the church was dedicated, but it has now disappeared, and it is difficult to say which saint it was. The entrance to the church is laid with plain hard tiles, and the church aisles are paved with the same material, but of a superior kind. The original pillars still exist, though scraped down, and restored where necessary, but the pillars of the south aisle are entirely new. The mullions of the windows have been scraped and restored, throughout the church. The roof has been cleaned, restored, and decorated. The ground colour is that of a dark red, upon which are mounted yellow stars. The screen is of oak, worked in an artistic manner. The reredos at the back of the altar is 9 ft. by 6 ft., and represents the adoration of the Magi and the three Eastern Kings. It was executed by Mr. Earp, of London, from the design of Mr. Street, who was architect. Mr. Phillips, of Swindon, was the builder, and Mr. Wyckham was clerk of the works. The chancel pavement was laid by Mr. Newman, of Minchinhampton, and the gas-fittings were by Messrs. Potter & Son, London. Mr. Haßen supplied the heating apparatus.

Haltwhistle.—After undergoing a restoration at a cost of 2,500*l.*, the ancient church of the parish of Haltwhistle has been re-opened for divine worship, by the Bishop of Manchester.

Knarsbro'.—Considerable progress has now been made with the parish church restoration; but owing to a dispute as to the legality of removing certain galleries and other sittings, the carpenters have had to leave off work for the present, and nothing more can be done in that department until some amicable arrangement has been come to by contending parties. The subscriptions now amount to about 2,500*l.* The contract, with extras, is put down at 2,717*l.* The church generally has been found in a worse state of decay than was expected, the pillars and arches of the tower being in a very dilapidated state, involving considerable additional outlay to render them perfect and safe. The heating and lighting of the church, the re-erection of the organ, and sundry additional expenses in carrying out a large work of this kind, will raise the total cost to not less than 3,300*l.*, leaving 750*l.* yet to be raised.

Witney.—The restoration of Ducklington Church is contemplated. Mr. Bruton, of Oxford, architect, estimates that 700*l.* will be required for the purpose. The amount necessary for the renovation of the chancel will be obtained partly by a loan from Queen Anne's Bounty, and partly by private subscriptions, and the rector has already collected 50*l.* for the purpose.

Brent (Devon).—The parish Church of South Brent has been reopened by the Bishop of Exeter, after a restoration, which has been in progress more than twelve months. The church is dedicated to St. Patrick, and consists of a nave, side aisles, north and south transepts, and chancel, with a tower at the west end, and adjoining it a vestry, formerly a part of an earlier church. The building is chiefly Late Decorated and Perpendicular, with, however,

Early English remains at the west end. The restoration of the building has brought to light many architectural features which had been concealed for centuries under numerous coats of plaster and whitewash. Internally, the roofs, walls, piers, and arches presented a decayed waste of whitewash; and externally, the walls were disfigured with rude alating and plaster, the tracery of the windows patched with cement and wood, and the tower covered with slapdash. The roofs were hopelessly rotten, and have been replaced by new ones of Memel. The whole of the internal plastering has been removed, and the masonry throughout has been scraped, repaired, and pointed, plastering being nowhere used as a covering, inside or out, except over a small portion of the plain masonry at the west end, where the stones were extremely small and rough. A great deal of the stonework of the windows has been renewed, the original form of tracery having been preserved, and the old stone, where sound, worked in. Open benches of pitch pine have replaced the former high and square enclosed pews. The sedilia and piscina in the chancel, which had been partially destroyed and blocked up, have been opened and restored to their original beauty. The piscina also in the north chancel aisle (where was an altar to "Our Lady") and the stoop within the south porch have been opened. Built into these niches and recesses, blocked up either at the Reformation or at the time of the Commonwealth, were found some fragments of a life-size recumbent effigy and high tomb of the early part of the fifteenth century, with the original colours,—vermillion, emerald, and gold,—on them. The removal of the west "singlers" gallery has disclosed a Late Norman tower-arch; and in the further restoration of the tower it has been clearly ascertained that this structure, which is Norman, excepting the top stage, was originally the central tower of a cruciform Norman church, of which the curious old building on the south side, now used as a vestry, was a transept. To archaeologists, therefore, this part of the restored building is of considerable interest. The chancel is laid with ornamental tiles, supplied by Mr. Minton Taylor, and the nave and transept passages with the Poole Pottery Company's tiles. The new pulpit is of Bath stone, with diaper carrying on its five sides. The chancel stalls and reading desks are of pitch pine, with carved poppy-heads, and the sacristy is fitted with a carved oak altar table and altar rails. The whole of the restoration has been carried out from the drawings and under the direction of Mr. Hine, of Plymouth, architect, by Mr. Pethick, of Plymouth, contractor. The windows are filled with cathedral glass, with the exception of a two light decorated window at the west end of the north aisle, which is a memorial window put in at the cost of Mr. Elliott, the lord of the manor. It illustrates the parables of the Good Samaritan and the Prodigal Son, and is by Heaton Butler, & Bayne, of Covent Garden. Provision has been made for heating the church with hot water by Mr. P. J. Marshall, of Plymouth. The total cost of the restoration will be under 1,900*l.*

Bristol.—The restoration of the fine old historical city edifice, the Temple Church, being contemplated, the vicar and churchwardens have taken a practical step towards carrying out the project, and are able to make a beginning with promised subscriptions of 1,000*l.* "But as at least 7,000*l.*" says the local *Times*, "will be required to do the work thoroughly, they are bound to look to the citizens at large for the same liberal support which the latter have given to kindred undertakings, in the Cathedral, St. Mary Redcliff, St. Stephen's, &c. Next to the Cathedral and St. Mary Redcliff, Temple is the most remarkable sacred edifice in this 'city of churches.' It bears on a portion of it the manifest stamp of the peculiar architecture which characterised the structures raised by the Order of Knights Templar; and in the work that is about to be done we believe care will be taken to follow as closely as possible the distinguishing style. In the restoration of St. Mary Redcliff, the Cathedral, &c., we have recognised the duty and policy of preserving from decay our best ecclesiastical monuments, and we are sure that Temple is also worthy to be maintained in a condition befitting the parish church of a historic and ancient part of Bristol."

Littleover.—On the Feast of St. Bartholomew the parish church, which has undergone considerable improvements, was formally re-opened. A new organ-chamber has been built, and the chancel, which has been laid with encaustic

tiles, is now arranged for the choir. The steps to the altar and the foot-pace are of Derbyshire fossil marble. A reredos of Caen stone and alabaster, inlaid with Derbyshire marbles and spar, has been erected by Mr. Hall, of Derby, who has also in hand for the church a new pulpit, also of Caen stone and alabaster. Several special gifts have been made, among which we may notice three windows of stained glass, one by Hardman, of Birmingham, and two by Powell, of London, and a lectern of brass. The ancient font has been removed to another position, and rests on a block of alabaster. The architect employed was Mr. F. J. Robinson, of Derby, and the work has been carried out by Messrs. Slater. The whole of the seats and roof of the church have been varnished, and the chancel roof has been decorated in gold and colours by Mr. Cantrill.

Farningham.—The restoration of Farningham Church, which has been in process about three months, is now approaching completion. Mr. W. Gumbrell, of Dartford, is the builder; Mr. Christian the architect.

Derby.—On the Feast of Bartholomew the parish Church of Littleover, which has undergone considerable improvement, was formally reopened. A new organ-chamber has been built, and the chancel, which has been paved with encaustic tiles, is now arranged for the choir. The steps to the altar and the foot-pace are of Derby fossil marble. A reredos of Caen stone and alabaster, inlaid with Derby marbles and spar, has been erected by Mr. Hall of Derby, who has also in hand a new pulpit of Caen stone and alabaster. Several special gifts have been made, among which are three stained-glass windows, one by Hardman, of Birmingham, and two by Powell, of London. The ancient font has been removed to a better position, and rests on a massive block of alabaster. The architects were Messrs. Stevens & Robinson, of Derby. Messrs. Stators were the contractors; and the decorations in gold and colours were done by Mr. Cantrill.

Leicester.—Some time ago it was discovered that the upper portion of the spire of St. Mary's Church was in a shattered and dangerous condition. A scaffold was erected for the purpose of examining it, and for doing such restorations and repairs as might be found to be needful. Mr. J. Goddard, of Leicester, architect, was appointed to make a general survey, and to report thereon. From his report the apex portion of the spire has been restored in new Hollington stone: portions of the spire have been repaired, the whole pointed down, and the pinnacles at the four angles of the tower, erected some years ago by the late Mr. Benjamin Broadbent, have been modified, and some necessary repairs done to them. The works have been executed by Messrs. William Neale & Sons, masons, &c. of Leicester.

—The top stone and weathercock of the spire to St. Mark's Church, Belgrave-gate, has been fixed. The first stone was laid on June 12th, and the last on September 8th. The height from ground level to top of vane is about 180 ft., so that the spire can be viewed from nearly every part of the town. The donor was Mr. W. Perry Herriock, of Beaumanoir Park, Loughborough. The architect was Mr. Ewan Christian, of London; and the builders were Messrs. Osborne, Brothers, of Leicester.

Horsham.—St. Mark's Church, which is called the district church of St. Mark, Horsham, is at present undergoing considerable alterations and improvements, and is being enlarged by the addition of a tower and spire, and a new south aisle, &c., the expense of which will be defrayed by the Rev. Alexander Bridges, of Beddington Park, who was the former incumbent. The church is built of local sandstone, with Bath stone dressings, and is designed in the Early Decorated style. The architects for the present works are Messrs. E. Habershon & Brock, of London. The additions are being carried out under a contract by Mr. William Shearburn, of Dorking, builder. The cost of the works now in operation amounts to between 3,000*l.* and 4,000*l.*, but some further improvements are in contemplation. The tower from which the spire will spring has already been carried up between 40 ft. and 50 ft. from the base. The top of the spire when completed will be about 135 ft. from the ground.

Buxton.—The new church at Horstwood has been consecrated. The plans were provided by Mr. Christian, of London, architect. Mr. Lulham, builder to Colonel Harcourt, carried out the plans. The church stands on a gentle westerly slope, about half way between Uckfield and

owborough, a third of a mile north of the old apople Inn. The material is native stone, and a roof is of red tiles, relieved by a bell gable or the chancel arch. The style is Early English. The church consists of nave, north aisle, and apsidal chancel. The roof is of open al, plastered between the rafters; and the pings, pulpit, reading-desk, and sittings, are stained deal. Four steps lead up to the chancel, which is paved with Minton's tiles. The altar is of stone, carved and embellished. The cost of the fabric and ground is estimated at 3,000l., nearly the whole of which will be de-ayed by Colonel and Lady Catherine Harcourt.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

Stanbrook.—The new church of the Benedictine obey, Stanbrook, near Worcester, has been in-erated. The church is but a first instalment of the new Abbey buildings, which, when ished, are to accommodate 100 religious per-ns, with apartments for the same number of ung ladies, who will receive their education in a new establishment under the direction of e nuns. The interior of the new church con-ains every feature of a monastic church of the iddle Ages. The stalls and choir screens are of New Zealand satinwood, artistically carved. The organ-case was carved by Messrs. Farmer & indley, the spandrels being filled with angels in the style of the Nuremberg work of the 16th century. The altars, by Messrs. Morley & Boulton, are pieces of stone carving. The pavement, by Messrs. Minton, Taylor, & Co., is composed of rich marbles, interspersed with encaustic tiles, with emblems appertaining to the Benedictine order. The chancel roof and reen, by Mr. Hardman Powell, are wrought in on. The whole of the interior of the church of Caen stone, the exterior of Bath and brick. The western tower is of great size. The building ill cost about 10,000l., and is executed from e designs of Mr. E. W. Pugin.

ESSENTIAL CHURCH BUILDING NEWS.

Liverpool.—Fabius Baptist chapel, at Everton, as been opened for divine service. The new chapel is an unpretending building, the style opted being that of Northern Italy, colour ing used by having red pressed bricks in front, ith white brick dressings. Several new fea-ures have been introduced by the architect, ith externally and internally. The interior is ted with open seats, of pitch-pine stained and arnished; the platform, with rostrum, is also of pitch-pine, arched; the shafts of the columns ing stained of a darker tint to look like rose-ood. The baptistery is in front of it, and is ned with white glazed encaustic tiles, relieved ith a border of buff and red, to form panels. It is not seen except when in use, the space ing required for the choir. There are three rge vestries at the back, with cloak-rooms, e; also a school-room above them, which will commodate about 200 children, with separate rances from the side of the chapel. These oms are warmed by open fireplaces. The chapel is heated by one of Blake's patent hygro-thermic warm-air apparatus under one of the vestries. There are eight gas pendants, each aving eighteen lights in trios, suspended from e queen-bolts of the roof principals. The roof eing an open one, the main timbers are stained nd varnished, with a white plaster ceiling on ne under-side of the spars, the walls being oured a warm lilac tint. The chapel is ranged to accommodate about 550 persons on e ground floor, and it is high enough to admit galleries being erected when required, so as o give, ultimately, seat-room for 1,000 persons. he cost of all the buildings is about 2,200l. f this about one-half has been raised by vol-ntary contributions. The architect was Mr. Wil-on Penney, of Liverpool, who was also the architect engaged for the rebuilding of the Cong-regational chapel, Chadwick-mount, which was opened at the beginning of the year. The builder was Mr. Thomas Hughes, also of Liver-ool.

Walkley.—The chief stone of a new Wesleyan chapel has been laid, at Walkley. The site of he proposed building, which is now in course of rrection, is situated in Prospect-street. The ict of the promoters of the building is to ro-vide a place of worship, so constructed as also o admit of its being used for both day and Sunday

schools. The site is the gift of Mr. John Wood, and there will be sufficient space left on which o build a separate chapel, should the necessity arise for doing so at any future time. The edifices will be after the Gothic style, with a rock-faced front, the stone being obtained from Crookes. The measurements are 47 ft. by 30 ft., with a high-pitched roof, 23 ft. from the floor inside. The total cost of the structure is esti-mated at 600l. Mr. J. D. Webster is the archi-tect, Mr. Butler the mason, and Mr. J. Robertson, the joiner.

Bowling.—Prospect Methodist Chapel, the foundation-stone of which was laid on the 30th of July, 1870, has been opened for divine service. The chapel is in the Italian style of architecture, and has cost about 4,000l. Towards this sum, about 2,500l. have already been raised. Beneath the building Sunday-schools are situated, in which accommodation is provided for 500. The architects are Messrs. Andrews & Pepper, Brad-ford. When the building was in course of erec-tion, it was found that a pit-hill, which ran parallel with the windows of the schools, would seriously tend to exclude the light. The teachers and scholars (having obtained the necessary permission from the owner of the land) at once commenced, themselves, to remove this obstruc-tion. They succeeded, after a period of hard work, in making a good road, on which the scholars living in Hall-lane and neighbourhood could approach the schools and chapel. It is calculated that when, by these praiseworthy en-deavours, the obstruction referred to is removed, a saving of about 200l. will have been effected.

Middleton-in-Teesdale.—The new Wesleyan chapel at Middleton-in-Teesdale has been opened. The edifice is 52 ft. by 40 ft. in the clear, and 27 ft. 6 in. from floor to ceiling. There are two vestries behind, over which is a school-room, and underneath a basement for heating purposes. The style is an adaptation of the Italian. There are galleries giving accommodation to 350 per-sons, and having a recess at the north end for an organ. The floor of the chapel will seat about the same number. All the pews are open. The rostrum is capable of being used as a pulpit or platform, at missionary and similar meetings. The ceiling, which is plain, is surrounded by a cornice. Two large centre flowers assist the ventilation, and from them are suspended two chandeliers, each giving thirty-three jets of gas. Standards give light under the galleries. The chapel is heated by Lewis's patent. The archi-tect was Mr. Ranger, of Lewes, Sussex. Messrs. J. & R. Walton were the masons, Mr. Readshaw the joiner, Mr. Brown the plumber and glazier, and Mr. Bell the painter. The entire cost, exclusive of the site, but including gratuitous labour, will be about 2l. per sitting.

PROVINCIAL.

Hull.—The Hull Banking Company's new premises are situated at the corner of Silver-street and Lowgate. The building is of An-caster stone, three stories in height above the basement, and is of Italian type. The street facades exhibit three orders of pilasters and carved capitals, and in each story are recessed arched-headed windows of plate-glass. The whole is terminated by a cornice with consoles, and balustraded parapet above the eaves of the roof. The principal entrance to the banking-office is in the played angle at the junction of the two streets, there being to the doorway an arched stone canopy with panelled soffit, sup-ported on polished columns of grey Aberdeen granite, with carved capitals and other orna-mental features. The banking-office and manager's room occupy nearly the whole of the ground floor, the former being a lofty apartment about 42 ft. by 40 ft. Its walls are relieved with pilasters and arabesque correspondent with the windows on the opposite sides. The ceiling has a cornice with modillions, and is divided into five compartments with ornamental circular panels, one of which is open, and surmounted by a domical skylight of plate-glass. In the central panel is fixed a sun-burner, from which is a ventilating shaft carried up through the roof of the building. The floor in the public space will be of Minton's tiles. The basement story extends over the whole area of the site, and is divided into fire-proof strong rooms, with Chubb & Son's fittings. There are also lavatories and other necessary offices, and a lift or hoisting machine communicating with the banking-office above. The first and second floors comprise a directors' board-room and a residence for the

principal cashier. The architect is Mr. William Botterill, of this town; the clerk of the works, Mr. James Griffiths; and the contractor, Mr. Benjamin Masgrave.

Books Received.

Geometry and Drawing.
A Rudimentary Treatise on Analytical Geo-metry and Conic Sections. By JAMES HANN. New edition, re-written and enlarged, by J. R. YOUNG. London: Lockwood & Co.
Mathematical Instruments. Enlarged edition. Vol. I. Drawing and Measuring Instruments. By J. F. HEATHCOTE, M.A. Lockwood & Co.
The Workman's Manual of Engineering Draw-ing. By JOHN MAXTON, Engineer. Lockwood & Co.

THERE is now surely a sufficient variety of works on geometry and drawing among which to choose even for all modern requirements: some may suit one taste and some another, but there is generally something special in each that is commendatory of it in particular.

Students of the first of these treatises are expected to bring to the use of it a previous acquaintance with the principles of algebra and of plane trigonometry, particularly of the former. But little of the original work of Hann has been retained in this treatise, which has been rewritten on Hann's plan, but without negligence. The present editor or author was formerly professor of mathematics in Belfast College.

The treatise on drawing and measuring in-struments, as first published in 1849, is in use continuously in Government military and naval schools, and forms, by authority, part of a midshipman's kit: it is stereotyped, and can still, of course, be had; but it has here been entirely re-written, with special reference to recent improvements in mathematical instru-ments.

The object of the third of the treatises under notice is to enable the working engineer to instruct himself in an important branch of his business,—that of engineering drawing. The latter part of the volume, moreover, will be found useful to the general student. The author, Mr. Maxton, is instructor in engineering draw-ing, at the Royal School of Naval Architecture and Marine Engineering, South Kensington.

A Treatise on the Application of Iron to the Con-struction of Bridges, Girders, Roofs, and other Works. By FRANCIS CAMPIN, C.E. London: Lockwood & Co. 1871.

THIS treatise is arranged for the special use of practical mechanics, all mathematical formulae and symbols being excluded. It is intended to show the principles upon which iron struc-tures are designed, and the practical appli-cation of these principles. There are nume-rous illustrations. The author, who is a past-president of the Civil and Mechanical Engineers' Society, has given several years' consideration to the special object he had in view, as he has found that the great proficiency in mathe-matics requisite for the comprehension of more elaborate treatises on girders, roofs, &c., has rendered such works unsatisfactory to the great bulk of engineering students, and useless to artisans.

Switches and Crossings. By WILLIAM DONALDSON, C.E. London: Spon. 1871.

THIS volume contains formulae for ascertaining the angles of crossings, the lengths of switches, and the distances of the points of the crossings and the heels of the switches from the springing of the curve. A symbol is used to denote every element, so that the formulae will be applicable to every gauge and to every section of rail. All the ordinary cases of junctions, three-throw, cross-over, and through roads are discussed.

VARIORUM.

Fraser's Magazine for September contains a sadly instructive though amusing paper, titled "Jottings from an Examiner's Note-book." Of course the examiner does not reveal his exact position nor the whereabouts of candidates ex-aminied. He says:—"If schoolmasters, and anxious parents and guardians are wise they will do well enough to think much of the 'logies' (or 'ologies,' as they are called) and the higher 'curriculum,' as it is the affectation to name the more advanced course of construction; but they

will do better to think more of the humbler elements, the three R's, of which we talk so much for the poor, and think so little, till too late, for the children of the richer classes of society." This neglect, he declares, is so remarkable that a competition between an average number of Elton or Harrow boys with an equal number from national or other schools patronised by artizans and operatives would be decided against the former in the subjects mentioned by the Chancellor of the Exchequer. By the way, in the examiner's own remarks just quoted, as the expression "the three R's" is plural, would not the apostrophe, which usually implies or signifies the possessive case, be better omitted in R's? Strictly speaking, too, this is not the only questionable grammar in the quotation.—*The American Chemist.* New York. Vol. II. No. 2. This monthly journal of theoretical, analytical, and technical chemistry, contains much useful matter of its kind. The first paper in the number under notice is on the "Industrial Production of Oxygen, Hydrogen, and other Elements." There are also articles on soluble glass, on the treatment of organic substances for preservation and purification of atmospheric air, on the preservation of meat, and numerous others, besides chemical notes, patents, &c.

Miscellaneous.

The Working Men's College, 45, Great Ormond-street.—The programme for the new term has just been issued. It comprises elementary and advanced classes in every branch of study. In Art there are six classes, the Life class being visited by Mr. Lowes Dickenson and Mr. Cave Thomas, with a special course in Perspective by Mr. Henry W. Brewer. In English Grammar, Composition, and Literature there are six classes; in French, seven; in German, four; in Latin, four; and in Greek, two. The Mathematical division contains classes in Arithmetic, Algebra, Geometry, and Trigonometry. There is also a class in Book-keeping, and, for students who desire the elements of grammar, with advanced reading, &c., a special elementary class. In addition to these, there are courses of lectures in Bible History, English History, or the History of the German Empire, on Law, in English Literature, in Geography, in Geology, and in Physiology.—the lecturers being Mr. S. Rawson Gardiner, Mr. Sheldon Amos, M.A.; Mr. Walter Braithwaite, M.A.; the Rev. Llewelyn D. Bevan, LL.B.; Mr. Jean Reinhardt, B.Sc.; Mr. J. Logan Lobley, F.G.S., F.R.G.S.; and Mr. J. Beswick Perrin, M.R.C.S.E., F.L.S., Demonstrator of Anatomy at King's College. The Saturday General Lectures will be delivered by Mr. W. H. Flower, F.R.S., Hunterian Professor at the Royal College of Surgeons; Mr. James Cairdner, of the Record Office, &c. The Principal, the Rev. Professor Maurice, will address the students at the opening of the term, on the 2nd proximo.

Mr. Ruskin's Drawing Schools.—Mr. Ruskin, in "Fors Clavigera" for September, describes the new endowment he has in hand.—"The final result of the education I want you to give your children," he says to working men, "will be in a few words this. They will know what it is to see the sky. They will know what it is to breathe it. And they will know, best of all, what it is to behave under it, as in the presence of a Father who is in heaven." After carefully considering the operation of the Kensington system of art teaching throughout the country, and watching for two years its effect on various classes of students at Oxford, Mr. Ruskin adds:—"I became finally convinced that it fell short of its objects in more than one vital particular; and I have therefore obtained permission to found a separate mastership of drawing in connexion with the Art-Professorship of Oxford; and elementary schools will be opened in the University galleries, next October, in which the methods of teaching will be calculated to meet requirements which have not been contemplated in the Kensington system. The organisation of the system of teaching, and preparation of examples, in this school, is at present my chief work—no light one—and everything else must be subordinate to it."

Cook Monument.—A memorial monument has been erected in New South Wales, to the memory of Captain Cook, at the supposed place at which he landed from the *Endeavour*, in April, 1770.

Amber.—A large proportion of the amber appearing in the various markets of the world is supplied by the province of Prussia, including the neighbouring district of Memel. The amber trade in this district is entirely in the hands of one firm, and their transactions are kept very secret. In the western portion of the province of Prussia, amber is found not only on the seashore, but also in the mountainous ranges of the interior; excepting, however, in rare cases of its appearance in so-called "neets," amber is only to be met with in isolated pieces in the latter localities. It is frequently thrown upon the shore by the sea in large quantities; it is collected there, as well as fished for in the surf; it is also dug out of the sand hillocks running along the seacoast. In these sand hillocks regular beds of amber are found inclosed in a soil of blue clay, which is to be met with at an average depth of about 100 ft., in a thickness of 25 ft. to 30 ft. There are establishments at Brusterort, where amber is obtained by divers from the bottom of the sea. The total amount of amber obtained during the year 1869 in all parts of the province of Prussia by the various means of collection is estimated at about 150,000 lb., the value of which may be taken at 550,000 Prussian dollars. The quantity collected (by fishing for it) in the sea and upon the shore is about equal to that raised by the digging and dredging works.

The Upper Thames.—The General Report of the Proceedings of the Conservators of the Thames for 1870 has been published. "With respect to the upper district, the aim of the conservators has been the improvement of the locks and weirs, and of the condition of the water. A new lock has been built at Benson, at a cost of 3,500l. Other works have been strengthened; but the small revenue applicable for this purpose has made the performance of this duty very slow and unsatisfactory. With reference to the condition of the water, they have endeavoured to prevent the introduction of sewage and other impurities into the river. Eton has set an excellent example in having diverted its sewage; and the large and important town of Reading obtained Parliamentary powers in the last session effectually to divert its sewage from the Thames; and the local Board is taking vigorous measures to carry the Act into execution. Plans for the complete drainage of Oxford and the diversion of the sewage from the river have been adopted by the local Board, and approved by the Government. Windsor and Kingston-on-Thames, both of which have received final notices to discontinue the discharge of their sewage into the Thames, have as yet executed no works."

Worcester Diocesan Architectural Society.—At the concluding excursion of this society for the year, several churches in the neighbourhood of Cheltenham were visited. The members and their friends assembled at the Midland Railway-station, Cheltenham, and proceeded in carriage to Churchdown Vicarage, whence they were conducted by the incumbent (the Rev. Frederick Smith) to the top of the hill, to examine the ancient church in the camp, the encampment with its covered way, and the ancient wall. The vicar gave a description of the most interesting features. At Badgeworth the vicar, the Rev. A. W. Ellis-Vinor, received the party, and conducted them through the church. After partaking of refreshments at the Rectory, the church of Leckhampton was visited. A short drive afterwards brought the excursionists to the parish church of Charlton Kings, which underwent the so-called process of restoration in 1824, and now shows what a church ought not to be like. At the Apostles' Church, in this parish, the visitors were received by Mr. C. Higgs, who defrayed the whole cost—about 7,000l.—of the erection of this building. At half-past three between thirty and forty ladies and gentlemen dined at the Lamb Hotel, Cheltenham, Lord Lyttelton presiding, and Mr. Severn Walker occupying the vice-chair.

New Schools for London.—In addition to the new schools now being erected by order of the School Board in various parts of the metropolis, it has been determined, as soon as suitable sites have been obtained, to build nineteen other new schools of large dimensions in the following districts:—One for the City and Tower Hamlets, three for Finsbury, one for Greenwich, one for Hackney, two for Lambeth, four for Marylebone, two for Southwark, three for the Tower Hamlets, one for Chelsea, and one for Westminster.

Manningham Mills, Bradford.—Extensive works are now in course of construction at Manningham Mills. The rebuilding of the mill is being rapidly proceeded with, and, in addition, two large extensions of the works are being pushed forward. The existing mill and offices face the east in Heaton-road. The centre is seven two-light windows wide, two stories high, and, surmounted by a small tower, rises slightly above the continuations on either side. When the additional sheds are erected, the length of the front will be about 1,000 ft., and in rear of the extension to the south the new mill will be constructed, and is already raised a few feet above the surface. It will be six stories high, 120 yards long, and 55 ft. wide, with a shed roof. Adjoining, and parallel with the mill, there will be a warehouse, five stories high, which will be fireproof. For the accommodation of the work-people, a scheme for the construction of a village in connexion with the works is at present being carried out, and several streets have already been formed, and a few of the houses occupied. 110 cottages have been already built, 105 more are in course of construction, and as many more will be required. The young village is situated in a high and salubrious, as well as cheerful position.

Sanitary Report on St. Mary's, Islington.—The report of Dr. Ballard, medical officer of health for the parish of St. Mary, Islington, for 1870, has been issued in a printed form. The estimated death-rate was 221 per 10,000 persons living; that of all London having been 241. The report gives details of a curious local outbreak of typhoid fever, which Dr. Ballard seems to have traced, with much care and trouble, to sewage which leaked into an underground tank, whence milk from a dairy was adulterated with water. The dairy master creditably aided the officer of health by giving him a list of his customers, and it was found not only that the fever was restricted to houses supplied by his dairy, but to individuals in these houses who used that milk, while others who used a richer milk from the same dairy, not diluted with water from the tank in question, were not attacked by the typhoid fever.

Fine Art Exhibition, Penzance.—The third display of works of art in connexion with the Penzance School has been opened in St. John's Hall. The school was set ago eighteen years since, and its efficiency, from first to last, says the *Cornish Telegraph*, can be well traced, in a very large degree, to the ability and zeal of the indefatigable head-master, Mr. H. Gerov, whose capacity as a teacher has been long known and acknowledged. The delivery of rewards and certificates at the meeting occupied much time, and the pictures became a rival attraction. The visitors and their payments throughout the day far exceeded those of the previous exhibition. Mr. Glasston's stall of Minton's ware was an object of general interest. The display of paintings now on view differs from its predecessors, from the fact that many professional men send a large number of drawings (beyond eighty) for sale.

Opening of a Bonded Warehouse for Nottingham.—Cellars for a Government bonded warehouse have been formally opened for use in Victoria-street, Nottingham. The entrance to the cellars, which run underneath the offices of the Imperial Insurance Company, is in Botolph-lane. On the ground floor there is a small office in which there is a boarded partition cutting off the place for letting down casks. The arrangements for the descent of these casks into the cellars winds the whole distance from the street into the cellar. The cellars are entered by a massive door, for which there are two keys, one in the hands of the Inland Revenue Department. The cellars, which are roomy and well lighted, comprise five principal cellars and eight sub-archways (these latter are under the Victoria-street footway), the whole embracing an area of more than 6,500 ft. When the cellars under the adjoining new Joint-Stock buildings is utilized, there will be accommodation for 10,000 casks.

Organs in Scotch Churches.—A congregational *plébiscite* to decide whether or not an organ shall be introduced into the parish church of Elgin has now been concluded, and although the exact results of the voting cannot yet be accurately ascertained, it is stated that the numbers are about 1,100 for and 66 against. At any rate, there is no doubt that only an insignificant minority have voted against it.

Postal Advertisement Scheme.—It is proposed by a Mr. W. H. Walker, of Bow, to make use of the Government as an advertising agent, by enclosing the usual Government stamps on letters, &c., with the names and addresses of advertisers or their goods. This he intends to be introductory to the establishment of a uniform penny postage all over the world. The Government, in notifying the time and place of postage on envelopes belonging to private persons, is thus to utilise the opportunity of perpetually stamping, "Holloway's Pills," or other of the thousand and one trade advertisements upon that private correspondence which is the duty of the Post Office merely to transmit. Would it not be quite as much in its line to sell Holloway's Pills as to advertise them? A profit might be got either way.

The Prussian Association for the Promotion of Industry, at Berlin.—The programme of this society includes an announcement that the silver medal, or money value thereof, and in addition 215 dollars, will be given for the best preparation of an opaque enamel on gold, silver, copper, or bronze;—a pension of 187 dollars to the author of the most critical essay on cements in their relation to the wants of industry;—and, amongst other distinctions, their silver medal, or its money value, and 375 dollars, to the inventor of a blue-coloured solder which possesses the qualities of ordinary tinman's solder, by which brass and similar alloys may be united without allowing the joints to be visible.

Pollution of the River Darwen.—A short time ago an action to recover 25,000l. from the corporation of Blackburn was brought by Sir William Henry Fielden, bart., as compensation for damage done to his residence, Penicookes Hall, and the surrounding estate, by the pollution of the river Darwen, through the corporation of Blackburn turning the sewage of the town into the Blackwater, a tributary of the river. The matter was referred to the arbitration of Mr. Manisty, Q.C., who assessed the damages at 1,250l., and ordered the corporation to pay costs. Sir William is now about to seek further compensation, this time from the Over Darwen Local Board.

Plumbago in Virginia.—Messrs. A. F. Robertson & Co., of Lynchburg, Va., write to the *Scientific American*:—"We desire, through our columns, to give to the public a short account of a remarkable deposit of plumbago, recently discovered near this city. This deposit, about 400 yards from the James River Canal, some miles below Lynchburg. Though only a partial and very superficial examination has yet been made, the mine is found to extend over an area of one mile in length and a quarter of a mile in breadth. Specimens taken from the surface show this plumbago to be of fine marketable quality, and the quantity is believed to be almost inexhaustible."

Recreation Ground for East London.—The large open space known as Stepney-green, having of late fallen into a neglected condition, an enclosure has been the subject of discussion, and at the instance of the Mile-end Old-town Vestry the Metropolitan Board of Works have consented to expend 3,000l. in converting it into a place of recreation and a flower-garden for the use of the public. The lord of the manor of Stepney has granted Stepney-green for the use and perpetual use of the people as a recreation-ground. The ground will be ready early next spring.

Report on Surveyor's Works in Hackney District.—The report of Mr. James Lovegrove, Esq., chief surveyor to the local board of works in the Hackney District, for last year, has been printed. It shows the aggregate approximate cost of all the works executed by the Board, and also at the expense of private owners which have been superintended by the surveyor's department at the instance of the Board, to have been 3,852l. Various improvements, by extending and widening roads, have been carried out during the year; and new sewers at a cost of 1,900l. formed.

Exhibition of Building Appliances, Milan.—Notwithstanding the loss on the late Naples Exhibition (16,000l.), Milan has now opened an exhibition for household objects and building appliances, the State only contributing 10,000l. towards the undertaking. This is the first of a series to follow.

Antiquarian Discoveries on Loch Etive. Dr. Angus Smith, of Manchester, who has been exploring in a large moor on the shores of Loch Etive for a few weeks back, has discovered the remains of a lake dwelling, the platform of which is 60 ft. in diameter, with the dwelling in the middle 50 ft. in length by 28 ft. in breadth. He also discovered in a large cairn a megalithic structure, consisting of two chambers, each 20 ft. in length connected by a narrow passage nearly as long.

Roman Pavement, Bishopsgate.—The *City Press* mentions that the workmen engaged in excavating for the foundation of a new building in Bishopsgate-street, opposite Crosby Hall, for Messrs. Frederick Gordon & Co., came across a piece of Roman pavement, some two or three yards in extent. It is of the common red tesserae and is interesting, as indicating that the spot was a part of the Roman city. The depth at which the pavement was found is about 15 ft. below the present footway.

The Hurricane at St. Thomas.—By the terrible hurricane which has recently swept over the island of St. Thomas. Hundreds of dwellings have been swept away, and not a house has been left undamaged. Some 6,000 people have been left homeless and destitute, and nearly 150 persons have been killed or mangled or disabled by houses blown down or bricks and tiles flying about in all directions during the hurricane.

Magneto-Electric Utilisation of Waste Power.—M. Edmund Martin, of Paris, proposes to connect, by very simple machinery, the screw-propellers of steamships with magneto-electric machines, and thus to secure, by the constant rotation of the magnets, currents of considerable power. These currents would be available for signal-lights when required, and might be used for driving fans for ventilation, and many other purposes.

A Cathedral Struck by Lightning.—A tremendous storm, which caused great damage, has occurred at Lucerne. One of the towers of the cathedral there was struck by lightning: bending the large cross which surmounts the spire, and entering the tower, it descended to the flooring of the interior, where it tore up the pavement in all directions, throwing large pieces of stone to a considerable distance.

Birmingham Royal Society of Artists.—The society announce in the catalogue of their exhibition now open, that a course of lectures upon Architecture will be delivered in their rooms during the autumn. The exhibition consists of 627 works of art.

Use for a Churchyard.—The vestry of St. George's, Blackfriars, have just decided to convert the parish churchyard into a pleasure-garden for the use of the inhabitants, by laying it out and planting it, and providing seats and other accessories. The churchyard, which has for some time been disused, is about an acre and a half in extent.

Mr. Parry, the New Borough Surveyor for Reading.—A Bradford paper says, "Mr. A. W. Parry, our local assistant borough surveyor, whose ability and uniform courtesy to all classes transacting business at the corporation offices have made him generally popular, has, we are pleased to hear, been appointed borough surveyor of Reading."

East Haring.—Some restorations are to be carried out in the church here. The work will consist of the restoration of the spire and roof, and entire cleaning and re-seating of the church, for which the amount estimated is about 1,500l. Mr. J. H. Brown, of Norwich, is the architect.

Building Societies.—A return recently issued by the Friendly Societies' Commission states that there are nearly 4,000 building societies in London, with a capital of something like 10,000,000l. divided amongst 100,000 members.

A New Public Park for Stockport.—The Stockport Town Council have resolved, by the casting vote of the Mayor, to purchase 17 acres of land from Lord Egerton of Tatton, as a second public park.

Royal Manchester Institution.—The Exhibition of Modern Works of Art will be opened to the public this Friday, September 15th.

TENDERS

For new shops in Colmore-row, Birmingham. Mr. G. Thomason, architect:—
Wilson & Son £11,000 0 0

For enlargement of National Schools, Plympton St. Mary, Devon. Mr. H. Elliot, architect:—
Verren 270 0 0
Milden & Bond 195 0 0
Laphorn & Goad 179 0 0
Cottis 176 0 0
Helings & Hunt 174 15 0
Brimblecombe & Crocker 172 0 0
Watts 169 0 0
Roberts (accepted) 128 0 0
Skinner & Foale 123 8 0

For the erection of a villa residence and lodge at Wickcliffe, Devon. Mr. H. Elliott, architect:—
Fosden £1,500 0 0
Bishop & Son 1,120 0 0
Stacey & Habbage 1,095 0 0

For the erection of a warehouse and offices adjoining the King Lud Tavern, Ludgate-circus. Mr. Lewis H. Isaacs, architect. Quantities by Mr. L. C. Ridgett:—
Brass £4,988 0 0
Asford 4,305 0 0
Browne & Robinson 4,915 0 0
Macey 4,825 0 0
Merritt & Ashby 4,750 0 0
Hill, Keddel, & Waldram 4,700 0 0
Foster 4,873 0 0
Elkington (accepted) 4,100 0 0

For new boundary walls to Lot 1 on the British Land Company's Estate at East Hill, Wandsworth:—
Pearson £285 0 0
J. & J. Haynes 238 0 0
Cornborough & Colman 237 15 0
Gray 210 0 0
Packer 198 0 0
Welch (accepted) 185 8 0

For the restoration of the exterior of St. Dunstan's Church, Stepney. Messrs. Newman & Billing, architects. No quantities supplied:—
Ashby & Horner £2,635 0 0
Dove, Brothers 2,538 0 0
Sheffield 2,480 0 0
F. & F. J. Wood (accepted) 2,340 0 0

For the erection of a Wesleyan Chapel, with school-room, at the corner of Landseer-street, Battersea. Messrs. Lee, Brothers, & Pain, architects. Quantities not supplied:—

	School and Chapel.	Gallery.
Carter	£2,570 0 0	£180 0 0
Belham	2,535 11 0	120 0 0
Tarrant	2,433 0 0	147 0 0
Thompson	2,340 0 0	140 0 0
Nightingale	2,351 0 0	124 0 0
Hughenden	2,181 0 0	112 0 0
Basham, Bros.	1,837 0 0	89 0 0
Pearce, Bros.	1,724 0 0	95 0 0

For the erection and completion of Christ Church Schools, New Windsor, Suffolk, to accommodate 300 children. Mr. Sherwin, architect. Quantities supplied:—

	Schools.	Boundary Wall.
Wade, Brothers	£735 0 0	£28 0 0
Herd	686 9 0	70 0 0
Wilson	635 12 0	68 10 0
Winter (accepted)	622 10 0	74 0 0

For new buildings, alterations, and repairs at Charity Farm, Elton, near Gosport, for the Vicar and Churchwardens of Fareham. Mr. Archibald H. Ford, architect:—

	New Buildings.	Alterations and Repairs.
Little	£183 0 0	£38 0 0
Rosevear	176 0 0	93 10 0
Fulford & Boys	103 10 0	91 16 0

"Accepted."

For supplying and fixing gssittings at the schools, Leasrden Woods, near Watford, Herts, for the Guardians of the Poor of St. Pancras, Middlesex:—

Deane	£485 14 0
Armstrong	479 17 0
Humphress	470 5 8
Smith	450 0 0
Duffield	420 10 0
Weston	394 0 0
Kendall	360 0 0
May	355 11 8
George	355 0 0
Cowan	350 0 0
Dyer	300 0 0
Catterback (accepted)	282 0 0

For New Church of England Schools, Bishop's Stortford. Mr. George Perry, architect:—

Barton	£1,115 0 0
Snow	1,077 0 0
Glanville	1,056 0 0
Dickinson	998 0 0
Cornwell (accepted)	960 0 0

For rebuilding No. 7, Little Alie-street, E.C. Mr. T. Flood Page, architect:—

Onkwaite & Son	£2850 0 0
King & Son	813 0 0
Beale	792 0 0
Palmer	560 8 8

For Broomfield House, Derby, for Mr. C. Schwind. Messrs. Stevens & Robinson, architects. Architects' quantities, exclusive of stabling and out-offices:—

Bridgatt	£5,533 0 0
Slator	5,425 0 0
Wood	5,328 18 0
Humphrey (accepted)	5,100 0 0

The Builder.

VOL. XXIX.—No. 1494.

The Public Works of India.

It seems to be pretty generally felt, if not acknowledged, that the material welfare of India depends very much on the Public Works Department. We have no doubt at all ourselves that the dependence is extreme and vital, and we grieve, therefore, over the constant evidences that present themselves of the unsatisfactory state of that Department, of the differences that exist between its two component parts, the military and the civil, and the costly failures that have resulted from the want of proper direction. Some of the latter have not escaped official reprehension. Thus the fall of the building at the Gun Carriage Factory at

Lahabad led to an investigation by a committee appointed for the purpose. The mortar was found to be particularly bad, and some officers were removed. An Order in Council which resulted says:—

"In conclusion, His Excellency the Governor-General in Council desires to record that he has reviewed with great sorrow this deplorable history of negligence, incapacity, and corruption—negligence in the conduct of every superior officer who was connected with the supervision of these buildings from the beginning—incapacity to a greater or less extent of almost every subordinate concerned in the work of construction—corruption on the part of those who supplied the worthless materials—and it is impossible to avoid the suspicion that some of the inferior subordinates must also have been aware of the organized system in the adulteration of the lime which was practised throughout."

The publication of this order caused considerable sensation in India, but punishment will not give experience. An influential correspondent wrote to us at the time,—"This accident and the inquiry that followed prove irresistibly how mistaken the Government, whether here or with you, are in employing military engineers to execute civil works, and thus confide to them operations which neither their education nor practical experience enables them properly to carry out. It is a miserable extravagant economy; but perhaps it may ensure a more servile obedience instead of the honest independence of those who know what they are about, and will not allow themselves to be improperly interfered with by incompetent masters." This opinion, as to military engineers in general, is shared by large numbers of persons, but many dissent. Thus the committee who recently inquired as to the employment of officers of the corps of Royal Engineers reported,—"

"That the services of officers of Royal Engineers may be turned to greater account than at present, by employing them on civil duties. The military efficiency of such officers is promoted by their employment, in time of peace, on productive or necessary civil work, of a character similar to that required of a military engineer. The manner in which the officers of Royal Engineers have acquitted themselves in the employments for which they have been selected, in almost every branch of the Government service, has justified the anticipation of fitness which their character and previous training suggest, and proves their practical aptitude for the discharge of various civil duties."

It being essential, for military reasons, to have at home, in India, and at certain military stations abroad, a large number of Engineer officers available, and ready to conduct military engineering operations, a proportion of these officers can, in times of peace, be withdrawn from their ordinary duties for civil employment. A further proportion who are, for military reasons, necessarily distributed at the several military stations, could, concurrently with their ordinary duties, undertake certain local civil duties of a permanent or temporary character."

To this particular question we may one day return; it is not precisely our business at this moment. Our object is with India, and to mention some publications in connexion with Indian engineering and public works which have accumulated before us;—the papers set for students at the Roorkee College; "Professional Papers on Indian Engineering," emanating from the same college; a new edition of "The Roorkee Treatise on Civil Engineering in India;" "Public Works and the Public Service in India," by Major Evans Bell and Col. Tyrrill; and "The Public Works Department of India: Why so Costly?" and some others, to say nothing of at least half a dozen letters containing the reiterated complaints of the civil staff.

The "Professional Papers" were initiated and have been edited until recently by Lieut.-Col. Medley. In the quarterly part for November, 1870, the last with which he was connected, illustrations are given of St. Andrew's Church, Kurachee, erected at large cost, from the designs of Mr. Newnham, C.E., resident engineer of the Sind railway. It is partly Geometric, partly Norman in style, with an iron rail-road roof, and is a terribly ugly affair. In fact, the churches that we have put up in India, in our imitative styles, are mostly beneath contempt. In his preface, Col. Medley alludes to some of the special questions of Indian engineering awaiting solution. He scarcely attaches the importance to irrigation that we should do. The introduction of proper means for irrigation would enormously increase the resources of the country. Still, we agree with him, that to make such improvements of value, railways and good roads of other kind must be proceeded with to facilitate the transport of the increased produce. The great difficulty about roads appears to be the enormous cost of the metalling in many parts of the country. And in that view we are disposed to go with those who seriously urge the adoption of stone or iron tramways, or of horse railways, or of a combination of the tram and rail for a cattle-power line, such as has been found successful in America. These have never been properly tried yet, and it is high time that they should be.

The Barrack subject is still in an unsettled state; and the whole question of Architecture for Anglo-Indian dwellings is as open as ever to the clever young architect to solve. "Look at Delhi, for example," says Colonel Medley, where the Delhi Institute in the Classical style faces a Gothic clock-tower, and both under the shadow of such a building as the Jumma Musjid! Similar incongruities abound everywhere; and while we cover the country with hideous bungalows and unsightly public buildings, we have actually set up more than one School of Art to teach the natives, from whom, I fear, we have yet very much to learn."

The "Professional Papers" for July, 1871, is edited by Captain Lang, who reprints our account of the Revenue Board Buildings, in Madras, and gives, as a frontispiece, a photograph of the engraving with which we accompanied it. The part contains a suggestive account of the failure, in four successive years, of the Weir, known as the Lower Coleroon Anicut, in Tanjore.

The "Treatise on Civil Engineering" contains a large amount of information, and will doubtless be found very useful. We can scarcely, how-

ever, avoid recognising in it a want, to a certain extent, of practical knowledge and that decisiveness which practical knowledge gives. We desire still to bear testimony to its value.

Lieut.-Colonel Tyrrill, in his essay on "Public Works," is very outspoken, and brings together a number of painful and astounding facts:—

"Under no other form of Government," says he, "could such an utter waste of money go on as we have every year to deplore in India. One of the most densely populated countries, in some parts, in the world, and one which, from its peculiar formation and climate, requires works of extraordinary magnitude to meet its wants, is delivered over to a party of amateur engineers and financiers really distinguished and dexterous only as pencil-writers, to play their pranks in. Do I exaggerate? Look at the Godavery! After that energetic and enthusiastic Engineer, Sir Arthur Cotton, had built the Great Anicut, vast sums were absolutely thrown to the dogs—to the fishes I should say—in breaking down and blasting the rocky barriers, which were found out afterwards to be natural aids of such paramount necessity that, if they had not existed, we should have had to invent them in the form of dams, in order to complete the navigation. Yet it was surely not very difficult to discover that, if they had not existed, we should have had to run uselessly to the sea which it was urgently necessary to keep back, to supply the great wants both of the navigation and of irrigation in the hot weather. There were splendid examples of similar navigation—canals round barriers—in America, which doubtless would have been within the sphere of knowledge of men properly trained as Civil Engineers. But it was not until the loss to India of much money and many valuable years, that the blunder was rectified,—or rather that the blundering plan was abandoned, and a different plan on contrary and correct principles adopted."

What more lamentable monument of amateur engineering can there be than the Ganges Canal? This immense undertaking was designed in defiance of the first principles of hydraulics, a subject in which we might expect such good theoretical men as our military engineers to be "well up." Here we have a great work constructed in apparent ignorance alike of the A B C of theory and of the text-books of engineering experience, of what may be called the historical records of the profession.

The present system has produced a few good engineers; but only a few, and for these the people of India have had, and still have, to pay a vast number of unskilled men at very high rates to superintend and execute work which they do not superintend and do not execute. We make the people of India pay for the good men who gradually learn to do their work as well as it can be done in the Department constituted as it is. We make them pay for the idle men who have been put into the Department as the means of giving them a certain income, and who never learn to do more than get through,—sometimes with great credit,—their monthly routine of clerical duty. The consequence is that India has to pay for works that fall down,—for works that are totally unfit for their intended purpose, and even for work that has never been done at all.

Captain Thomason, who has engineered in India, in the Irrigation Department, since 1854, maintains that the greatest evil of the present organisation is the total neglect of steam and all the modern labour-saving appliances at the disposal of almost every engineer in the world, excepting him of the P. W. D. India. Even the railway engineers in India express their astonishment at this peculiarity of the Department. Their system more closely approximates to that of England; they give large contracts, and thus secure substantial English contractors, to whom, however, they have to allow high rates to cover all risks. To such rates the P. W. D. would undoubtedly object. The Department is thus restricted to the very few respectable contractors of substance in the country; and these are so few that the work eventually falls to the lot of the native petty contractors, who have but one old-fashioned way of working, which, however sure, is undeniably slow and expensive, and the labour of superintending, paying, and checking these petty contractors is found by the executive engineer only a shade of an improvement on the daily labour system: while their power of combination—competition there is little or none—their dilatoriness in starting work, their system of payments in advance, for which the security is

* London: Spon & Co. 1871.

† Trübner & Co. 1871.

‡ H. S. King & Co. 1871.

of the shakiest, their liability to decamp bodily at critical seasons, and so on—all these are an unceasing source of anxiety to the executive, ever working against time.

Some of the shortcomings of the Department are, we have little doubt, in a great measure traceable to the want of workshop training amongst the officers of the Department, and more especially amongst those of the Royal Engineers, who must always exercise so much influence over its destinies. A workshop training is simply an essential to any engineer in the present state of engineering science; and some attention devoted to this important subject at Chatham, where facilities are great, would remove an important objection amongst the many that are urged by some of its civil members against the military element of the Department. It will be a fatal error if mechanical engineering and workshop training are overlooked at Cooper's Hill. The Roorkee workshops should supply the existing deficiency in the Roorkee College.

The employment of skilled British artisans, such as potters, brick-makers, cement-makers, and fitters, seems much needed. Even Calcutta, the city of palaces, sends to England for stoneware pipes! It could hardly be credited that India is rich in clays suitable for all kinds of pottery,—from the most exquisite China cup to a sewage pipe. The kaolin beds of Colong and Gongaon would be considered a mine of wealth in Europe; for manual dexterity the potters of Umroba in Rohilund would be hard to beat; but all these advantages are lost to the country for the want of steam-machinery and a little well-directed energy in developing that potter's art in which Englishmen excel.

The subject is one of enormous importance, and calls for the renewed attention of the Home Government.

ILLUSTRATIONS OF LINCOLNSHIRE CHURCHES.*

We have already mentioned the publication of the book before us. It consists of a careful summary of the points of architectural interest in the churches in Lincolnshire visited last year by the Architectural Association, under the guidance of Mr. Sharpe, of which visitation we gave, it will be remembered, a pretty full account at the time. The present volume is the result apparently of a careful going over again of the ground traversed on that occasion, and is very copiously illustrated by lithographs of details and portions of the various churches, as well as sections of mouldings, the whole being based on the sketches made at the time of the excursion by members of the party, but subject to careful revision and correction. The book is rendered more complete by small maps of each day's route, showing the line of road traversed and the relative positions of the principal churches.

Among the most interesting and best of the architectural details figured may be mentioned the two beautiful capitals from St. Mary-le-Wigford (plate 25); the early Lancet capitals from Coleby (plate 19), showing a stiff and un-matured form of the characteristic foliage carving of the period; the Norman and Transitional capitals from Whaplode and Harleston; and the very curious and unique specimen of a capital of the Decorated period, from Navenby (plate 16), a feature which seems waiting to receive its further development at the hands of some modern architect. Two of the best and most freely executed, as well as most interesting, plates are those which give details of the sedilia of the little church at Wellingore (plate 15), and the details of the peculiarly interesting late Norman work at Horbling (plate 35). The chancel arch at Whaplode, which we referred to, in an account of the excursion, as an admirable example of what could be done with Norman detail even on a small scale, is very well illustrated in plate 49; and the three little sketches on plate 43, the stair-turret and squinch arch from Heckington, and the head of the stair-turret at Fleet (sketched from the parapet of the tower), are particularly pleasant specimens of that class of detail, so important to the architect, the interest of which consists almost entirely in outline, and the opposition of different planes of masonry.

* An Account of Churches visited during the Lincoln Excursion of the Architectural Association, August 22nd, to August 27th, 1870." By Edmund Sharpe, M.A., F.R.S.B.A. London: Spon & Co.

We scarcely see why Moulton tower and spire should have been selected as the only one to be given at full length; its elegant proportion is unquestionable, and there is a remarkable unity of design about it, but withal a tameness and weakness of general expression: as a study for the architect, we would far rather have seen the grand Early English tower of Gedney (one of the churches visited) given in full, incomplete as the design is; for power, vigour, and breadth of masonic design, without inordination of ornament, there is nothing like these early towers, as witness also the lower portion of the tower at Welbourne (another church included in the route), of about the same date. We should have liked, too, to have seen the singularly pleasing and artistic spire of Silk Willoughby, of which we know sketches were made on the occasion of the excursion, and which has been done little justice to in Wicket's well-known illustrations of towers and spires.

Perhaps the most useful part of the book we are noticing is the "Summary" at the end, where the principal features of the buildings visited are summed up and compared in groups, taking those of the same date together, and noticing their broad characteristics. By taking the buildings of a district together in this way, many hints, both architectural and archaeological, may be struck out, which would be missed without such comparative anatomy, as it may be termed. In alluding to the capitals of the Lancet period, in this portion of the work, two specimens are given from the Continent (Erbach and Longpont) of the same date as the capitals of Lincoln choir, by way of showing how much advanced was the style in England, at that time, beyond the point attained on the Continent. The advantage of the English over the foreign work, however, appears, to our thinking, not so much in the carving of the capitals, on which Mr. Sharpe lays most stress (the French regular, stiff, formal leaf capital has high artistic merits, and is, perhaps, a more strictly architectural treatment than the English), as in the treatment of the junction of the pier and arch mouldings, in which the English example evinces so much more sense of the exact nature of the problem at this critical point. The German leaves heavy square separate abaci at the head of each shaft of the pier, abutting on each other at awkward angles; the French builder places a fresh base for his vaulting shafts on the top of the abacus, thus destroying the homogeneous character of the design. In the English example, the relation between pier, abacus, and arch mouldings is far more clearly perceived and defined.

SANITARY AFFAIRS IN DEPTFORD.

THE Parliamentary borough of Greenwich consists of three main divisions,—Woolwich, Greenwich, and Deptford. The ecclesiastical superior of this borough is the Primate of all England; one of its Parliamentary representatives is the Prime Minister of England; the "Local Authority," in certain matters of vital importance, for the Deptford division at least, is an irregular corps of irresponsible flying dustmen. It is quite true that there are District Boards of Works, Parish Vestries, and other bodies, appointed somehow; and rate and tax collectors, who do not, to give them their due, fail to favour the householders with their visits, and to leave copies of the interesting documents it is their business to prepare, in which the amounts are duly set forth that the respective occupiers must contribute towards the maintenance of highways, police, the poor, and other public objects, so that all things may be done decently and in order. All this may be very well, but the people of Deptford do not get a *quid pro quo* for their highway rates. Although they furnish a contingent of 60,183 persons to the population of the great metropolis, the vaulted capital of the world, they might as well live at Constantinople, Cairo, or Jerusalem, or even at Dahomey, as at Deptford, in so far as any responsible public body concerns itself, or takes proper action for the preservation of the public health.

The tocsin has been sounded that cholera morbus is coming, and the inhabitants are counselled to see at once to the cleaning out of their water-butts, tanks, and cisterns. This is good, but inconsistent, so long as the Board of Works, or whosoever has the power, and upon whom devolves the responsibility of performing certain

duties to the public, neglect such duties. The Commissioners of Sewers for the City of London have issued a notice to the citizens, that the inhabitants of Deptford who have seen it regard with painful interest. The two first paragraphs are to the effect that "the dustmen in the employ of the Commissioners are to call at every house at least twice in every week, to remove dust, dirt, ashes, cinders, rubbish, refuse, vegetable and animal matter, &c., without fee or reward. The contents of all public dust-bins wherever situated are to be cleared out and carted away by the dustmen daily, whatever may be the nature of their contents." It may seem incredible, but it is nevertheless true, that the inhabitants of Deptford have no dustman upon whom they can rely to call for and remove the ordinary house refuse, nor any public dust-bin. This large population is absolutely without a dust contractor, and the heads of families,—in most instances the wives,—are left to comply with the terms, and accept the considerations the flying dustmen think fit to impose and concede. In most instances they visit a suburban street in batches, and make the morning hideous by their howlings. They contrive—two howlers to each cart—to take, with splendid lung power, four discordant notes of the gamut all at the same time. The lady head of the house, anxious to have her refuse removed, calls in the first that comes. He demands "a pot o' beer," to which she demurs; whereupon he stamps the out, whistling "Tommy Dodd," and bangs the door after him, or leaves it open, with an imprecation. Outside, conversion ensues.—Second Metropolitan Sanitary Officer, *Insultur*: "No go, Bill?" First Sanitary Officer: "Humph! she's good for a tanner if you cut up rough." So the lady has to agree to pay 6d., otherwise a "tanner," but, to her dismay, she finds that the sanitary officer (No. 2) has simply taken the stuff that may be separated into "breeze" and cinders. These sanitary officers, in a word, come when they like, charge what they like, take from the dust-bin what they like, and leave what they do not like; and from these, in this respect the "Local Authority," there is at present "no appeal." The only alternative to this treatment left to the householders is to find out a place where "rubbish may be shot," to hire a cart, and pay, in addition to his highway and other rates, for having it,—that is, "ashes, rubbish, refuse, vegetable, and animal matter, conveyed to the place, at whatever distance, at which such material may be tipped."

It is true that Dr. Pink, the medical officer of "the Board," delivered at one of its recent meetings a very able and conscientious report on dust removal, water supply, and other sanitary matters; but unhappily it is equally true that the sensible proposal of a member that the inspector of nuisances should have powers to order the removal of dust and refuse was met by the worse than lame and impotent conclusion, that "the matter did not press so much that they should dispense with advertising in the usual way." Not "press so much!" Can these gentlemen be conscious of the terrible responsibility they incur? An epidemic may be upon them any day, may come when these foolish men are "advertising," and haggling; and be caught, as were the foolish virgins, who had not at the right time provided oil for their lamps. Mr. Glaisher, of the Greenwich Observatory, states that, in the case of former visitations of cholera, he has observed, from his vantage in Greenwich Park, a peculiar blue mist between the Observatory and the river that continued visible as long as the pestilence lasted. Ordinary mists pass away before a wind exercising a force of half a pound to the square foot; but this blue shadow of death remained steadfast and immovable with a wind at nine pounds pressure. It is greatly to be desired that Mr. Glaisher may not have an opportunity of demonstrating the truth of this statement concerning the "blue mist," and its connexion with the terrible avenger of disregarded sanitary laws.

A number of the inhabitants of Deptford have been much exercised of late in connexion with a "nuisance" alleged to be caused by the operations of the Val de Travers Asphalt Company, against whom legal proceedings have been taken successfully. It is curious that in the immediate neighbourhood of this company's works there are sewer-gratings that send out exhalations much more offensive and pestilential than the gaseous vapours from the asphalt, which are really, as are gases from other bituminous substances, anti-putrescent. The sewer-gases compel occupants to close doors and windows

sometimes absolutely to leave their premises, where are sewer-gratings in other parts of Deptford equally pernicious and offensive to those who err to. Much official counsel has been rendered to Boards of works and others, and private occupiers, as to the free and regular use of carbolic acid for the neutralization of sewage gases. We cannot ascertain that any use of carbolic acid has been used to destroy the pestilential power of the gases exhaled by the public sewers of Deptford, or, better still, to move the cause. It may be conceded that the miasma from the asphaltic caldrons are not so potent, and that they are irritating to persons subject to bronchial affections, but they are far from being the most dangerous nuisances borne unconsciously it may be, by the inhabitants. In the same vicinity, Deptford Bridge, over which there is a large traffic, the sweepings of the road may be seen lying along the kerb-stone, baking in the sun throughout the entire day, and within a few feet of the doors of the occupants concerning the asphaltic vapours. They so bear patiently the exhalations from the asphaltic, hard by, which, when the water let off, exposes a surface of mud and ordure. If the truth must be told, there are others in the Board of Works to blame for sanitary defects in Deptford. The builders and the occupants of houses will be both alike chargeable as participants in the pressing invitation to the "blue mist," and its fatal accompaniments should they visit the town. In hundreds of houses, for which rents of from 30*l.* to 100*l.* per annum are paid, there is no provision for the dust and refuse removed from day to day. As regards water supply, it seems almost incredible that the men who can in any way command means to build houses should be men of such crude and coarse ideas as is manifest in their works. In many instances small miserably inadequate uncovered cisterns, are provided in the open air for the daily domestic supply of water. In other instances, the cisterns have slop-work covers loosely put together and gaping at every joint. In many houses rented at 30*l.* per annum, and upwards, the cisterns are placed under the untongued floors of bedrooms! Although the water company now gives a supply on Sundays, which was not done until recently, there is rarely more than enough for domestic wants, and on "washing day" the water supply, in most cases, is almost invariably exhausted long before the day is done. Deptford greatly needs an institution, or the establishment of classes, at which its builders may learn not only the principles of constructive art, but the very rudiments of sanitary law and of domestic civilisation.

DUST AHOO!

At the present time, when the near approach of the cholera has to some extent stimulated the official mind to exertion, and the warnings of alarmists are less likely to be disregarded on account of the nearness of the calamity they seek to avert, it may be useful to arouse public attention to an evil in our midst, which, although apparently slight in itself, is productive of serious injury to the public health. We allude to the dust-bin system, and the methods employed for the removal of refuse from London dwellings.

Nothing can be worse than the present mode of storing and disposing of "dust" in the metropolis. We are very much inclined to pride ourselves as Englishmen upon our superiority over other nations with regard to cleanliness. A traveller visiting Rome is usually astonished at the dirty appearance of the streets, and congratulates himself that in London things are much better managed in that respect; and yet, in point of fact, the Roman system (although, perhaps, not all that can be desired) is better both in theory and practice than the London plan. In Rome a certain number of places in the public streets are marked out in each municipal division or *trione*, called *Immondissagiti*, where rubbish of every sort may be thrown, while the depositing of refuse in any other part of the streets is interdicted, and is punishable. There is no box, bin, or receptacle of any kind, but the rubbish is thrown down in a heap, and at stated periods is carted away by the municipality. The advantages of this practice are, that the dirt and refuse are removed from the houses and their appendages, and are placed out in the open air, where they are least liable to do harm; while the public character of the deposit makes its removal a matter of urgency, and any neglect on the part of the

servants of the municipality can be readily discovered.

We, on the contrary, instead of putting away our refuse as far from us as possible, construct a receptacle in the rear of our houses and as near to them as possible, or in some dark, unventilated, unapproachable part of the basement, and into this receptacle we fling not only dust and ashes but the refuse of the kitchen, decaying animal matter, oyster and lobster shells, dirty rags, everything in fact that is noisome and offensive, and this we leave to putrify and ferment for months, perhaps exposed to the summer sun, the resort of cats, a nest for rats and mice and still more loathsome creatures. If the household is well conducted, this filthy pit is emptied once a month or once in six weeks, but as it is not uncommonly in an almost inaccessible position, and is moreover not a pleasant subject for inspection, the mistress of the house, if well-to-do, leaves the management of the dust-bin to the servant, who is generally ignorant of the connexion between dirt and disease, and consequently indifferent about the matter. If the mistress is poor, she waits until the bin is filled to overflowing and the lid has been forced off before undergoing the disagreeable process of removal.

In order to still further encourage the practice of storing all manner of filth in our homes, every difficulty is put in the way of its removal by the parish authorities. The removal of domestic refuse is not looked upon in the metropolis as a matter to be dealt with by the vestry directly as it should be, but it is left to a contractor, who pays the vestry for the privilege of removing the dust. The contractor is in no wise interested in clearing out the refuse or leaving the place in which it was contained in a proper condition, but only cares for the dust and ashes, which are a valuable commodity, for which he has paid money. The duty of collecting the dust is delegated to a class of men so brutal and degraded that their very presence in a decent household is an offence. They come round at irregular times, and are difficult to find when they are required. These men generally exact money from the household under the pretence that they are not paid to remove anything else but dust and ashes, and that if they remove anything else in the shape of refuse it is a matter of favour for which they should be paid. This is a demand very difficult to resist, and if resisted these men revenge themselves by soiling the walls or leaving the floors and yards in such a filthy condition that it is usually thought best to satisfy their exactions. This black-mail presses heavily upon the poor, and it is not to be wondered at, considering this and the class of men employed, as well as the dirt and discomfort they occasion, that the emptying of the dust-bin is generally postponed as long as possible.

These remarks, it is proper to add, apply only to the metropolitan districts, and not to the City proper, where the Commissioners of Sewers have lately taken the duty of cleansing the streets and the removal of dust into their own hands with the most satisfactory results.

Much good might be done by the vestries taking the removal of the dust upon themselves, appointing competent men who should remove the dust and refuse at stated times, and employing inspectors to see that no improper accumulations take place. The only perfect remedy, however, is the entire abolition of the dustbin, and the prohibition of the storing or accumulation of dust, filth, or refuse of any kind in or near a dwelling-house. If housekeepers did their duty, and every kind of refuse that could be burned were reduced to ashes, the amount to be removed from each house would be comparatively small. A small covered iron pail or box of uniform pattern should be supplied to each house by the vestry; for this some small charge might be made, and a fine should be inflicted in cases of its being lost or injured. This pail, containing the ashes and other refuse that had accumulated during the previous day, should be placed outside the front door of the house every morning. It should not be larger than can be lifted with one hand with ease (in the case of large establishments two or more might be used), and it should be removed every morning by a man employed by the vestry for the purpose with a horse and cart, or even a hand-cart might serve. Different hours might be appointed for different localities, but it ought to be a *sine qua non* that the whole of the previous day's ashes should be removed every morning. A rigorous house-to-house inspection should be made occasionally, and if any refuse were allowed to accumulate the offenders should be punished.

By adopting this plan we should encourage the destruction of vegetable and animal matter by fire, because it would be impossible to put cabbage leaves or lobster-shells in the pails on account of their size, and we should thus do away with a fruitful source of disease and contagion. It is impossible to walk through some districts without noticing that the air is polluted with the smell of dust-bins. Our houses being so frequently built in terraces, with the yards back to back and closed at the ends, the air is but little disturbed, and is a favourable nidus for the germs of disease which are thrown off from the stagnant and putrifying contents of the dust-bins placed in the midst in the rear of every house.

We have abolished the dustman's bell—that dreadful bell that some twenty years ago used to fright London from its property—let us go a step further, and abolish the dust-bin and the dustman.

IRON AND STEEL.

THE hitherto undiscovered causes of results, apparently so inexplicable and contrary in their effects, to what would otherwise be rules by induction to guide us in our anticipation of producing various kinds of iron and steel, which should possess properties in each case varying in degree in proportion to the quantity of the agent inducted, which should in any proportion give, or appear to give, existence to those properties, must necessarily cause reflection in the minds of many readers, and should, therefore, it may be hoped, be productive of at least a few increments of further discovery and elucidation on the subject.

The consideration of these anomalies presents the following hypotheses, and their resulting conclusions, confirmed, partly at least, by known facts and experiments previously made.—Concerning the introduction of carbon in differing quantities producing apparently opposite effects, we may be led to speculate not only on the result effected *in toto*, but on the results produced on the atoms of which it is composed, considering these to be between minute cells, separated from each other by what are usually called the fibres of the iron or steel.

The cells, however minute they may be, will have a defined form, which probably will alter, at the least a little, by any change that may by any means be produced; the variations in the temperature of the weather must produce an increased or diminished size, according to its degrees (and although, perhaps, somewhat foreign to the nature of the investigations we intend at present to pursue, we may pause an instant to consider whether, when a bar of iron increases in size with heat, it increases in exactly the ratio in weight), and the fibres would necessarily alter in consequence, and the question occurs, how would they alter? Would they become thinner in proportion to the cells they inclose, or would they continue to have the same proportion to these cells? And, again, what do these cells contain?

As iron contains carbon (C) and oxygen (O) increasing in proportion as we take samples, beginning with the white iron and going through the various kinds, as mottled iron, bright iron, and the gradations of foundry iron, it would seem probable that the cells in these latter kinds are occupied by oxygen and carbon, and that one or both of these conduce to, or, perhaps, entirely cause brittleness, and that the cells in the foundry iron are much larger than those in the malleable iron. This theory will appear likely from the consideration that foundry iron is lighter than forge iron, and the equivalent of (C)=6, (O)=8, and iron (Fe)=28.04, and twice the size of (C); then the difference in weight of (C) and (O) combined in the larger cells of the foundry iron, and of the weight of the iron itself, corroborates the hypothesis that these cells exist, though, in common with atomic bodies, they are quite invisible by the most powerful microscopic observation.

But it may be urged that these could not exist in forge iron, else how could a bar be drawn out to (say) $\frac{1}{100}$ part of its previous size? Would those cells then be 1,000 times as long as they were before? If so, then the fibres would be only $\frac{1}{100}$ part in area, and how could they hold together, either to each other or lengthwise?

In answer to this, let us consider that perhaps the most important and remarkable property of the most important and remarkably property of iron is that it is almost, or quite, impossible to fuse it (and most probably because its atoms have a powerful and adhesive affinity for

one another, which is much interrupted by the carbon in the foundry iron), and therefore it is possible that it may be extended 1,000 times, and not part; but if they would not, we may consider the atoms of this malleable and pliable metal to be like marbles filling a box of, say, 3 ft. by 2 ft. by 2 ft., and their surfaces (although only touching at places) to have so powerful an adhesion as only to be moved, but not separated without being torn asunder or cut, and the interstices between them to be nearly filled by additional portions of iron, which should, being pliable (as we must consider our marbles to be), accommodate themselves to the changing form of the respective atoms to which they must be considered to belong; and let us consider that these interstices contain the cells; then it must be evident that if heat and pressure combined would cause these to slip one upon another, the pressure rendering them perhaps a little elongated or acorn-shaped, and the cells likewise, and therefore reduced in cubic space within; and if the box, in performing this, were previously to have had its ends removed, then the continuance of the pressure would reduce the contents to 12 ft. by 1 ft. by 1 ft.—its previous cubic contents. This theory of atoms and cells and adhesive properties in malleable iron must be admitted to be possible, because chemists admit atoms to exist, and that they cannot tell their form; and cubes, squares, triangular, hexagonal, or lozenge-shaped prisms can be the only atoms that could leave no interstices, and these are improbable, because they would not easily, if at all, move one upon another in laminating; therefore, as atoms of any other form must leave cells, then they are at least probable, and also because those atoms are held to be impenetrable; and if there were no cells, then there could be no possibility of their containing carbon. Admitting this, we are bound to consider that when sufficiently heated, the atoms of iron admit the passage between them of the atoms of carbon, and the increase in the size of iron when heated will, perhaps, support this idea; but in this we must not suppose that all the atoms part entirely for the time being; they may act alternately, which might account for the sparkling appearance of iron when at a white heat (the iron in which they would entirely part would, perhaps, be the molten foundry iron). The foregoing hypothesis, if adopted as probable, leads to the supposition that carbon intervenes to some extent between the places of contact and adhesion, besides existing in the cells of iron, and considerably more so in foundry iron than in forge iron; and that hammering the latter, in increasing its specific gravity, forces its atoms closer together, and the carbon more fully into the cells, and more away from between the places of contact and adhesion of the atoms; and in this case the cells cannot previously have been completely occupied with carbon, and we may infer that they will not be fully so after our hammering; and it will be as evident as universally known, that the hammering improves the tenacity and strength of the iron, because it brings its atoms closer together; and not only will they have a greater support from each other, but a greater number of them must present resistance to any given area of resisting surface.

It may also be the case, that the cells being nearly, if not quite, enclosed by the atoms, allow of little or no possibility of escape for the carbon and oxygen; and that when a considerable tensile strain is exerted on the iron, that the cells becoming elongated, and therefore less in volume, exert an elastic force to allow the partial escape of one or other, or both, of the gases confined; and that if the gas or gases were not to find a sufficiently short and ready means of partial escape, that its elastic power (if caused by a sufficient strain) would rend asunder the atoms.

In applying a tensile strain to a bar of iron the difficulty of escape for the gases must be greater the larger the area of the bar, and for the same reason a round or circular form of section would seem to be the least calculated to facilitate such escape, for if the same area were disposed in a slender star-like form the means of escape from the centre of section would be shorter and easier. This hypothesis will explain the fact that a bar of iron which would bear a strain when 1 in. square of 28 tons weight, when drawn out in the form of wire $\frac{1}{16}$ in. in diameter, bear a strain of 40 tons per square inch.

In endeavouring to discover a hypothesis which may help to elucidate the cause of the effect produced by carbon in the manufacture of steel, we shall observe that of the four kinds of

iron which could in any wise be considered as fit to be converted into steel, viz., grey iron, bright iron, mottled iron, and white iron, that only the bright iron and mottled iron will be really worth using, because the grey iron will be light and fibrous, and would take too much carbon; whilst the white iron (which is the closest grained or not fibrous), although it is the best and most suitable for forge iron, is nevertheless not open or fibrous enough to admit, even with the expansion caused by the heat of the furnace, the induction of the carbon necessary that it should receive in order that it should become good steel.

The fact, however, that steel is heavier than forge iron can leave us, perhaps, no more probable inference than that its cells are fuller of carbon than those of the forge iron, and that its bulk is not greatly, if at all, altered; and that a piece of it may perhaps contain exactly the same quantity of carbon that a given piece of foundry iron contains, but that the piece of foundry iron will in consequence be greater in bulk and inversely lighter in weight than the piece of steel; this being an essential difference between cast iron and steel, the superior strength of steel might lead us to consider that the carbon, when admitted in exactly the right proportion, acts upon and causes the atoms to act upon each other with a vastly increased affinity or attraction, and this because the atoms are near or close to each other.

Tempered steel is lighter than soft steel, and it may therefore be considered that some of its carbon must, by caloric effect, have been eliminated; it is also more brittle and harder; and there is, consequently, a striking analogy in this respect between the comparison of soft steel with tempered steel, and that of forge iron with foundry iron.

If the heat causing the elimination were not suddenly absorbed by its immersion in pure or acidulated water, brine, mercury, oil, or tallow (for a second tempering after the first in water), or metallic compositions, or by being swung rapidly to cool in the air, then the consequent continuance of such eliminations would cause the steel to lose so much carbon that it would then not be much harder than forge iron.

The tempered steel, being lighter by the supposed extraction of a portion of its carbon, suggests the possibility that its vacated space will be occupied by some other element; if so, a different tempering medium may induce a different element, or the same one in a greater or less degree: from this it will appear probable that such element will be lighter than the carbon, and possibly the carbon remaining in the steel rapidly absorbs one of the lighter gases from the medium it is immersed in: hydrogen, from its lightness and large proportion in oxide of hydrogen would suggest that to be the gas.

This element, whatever it may be, will, while existing in steel, perhaps be of a more non-conducting nature than the carbon it has displaced; and as the latter is a powerful conductor of electricity, it would, when insulated in the steel, reduce in the atoms of steel the opposite kind of electricity (one positive and the other negative electricity), and the partial presence or absence of this electrical induction will perhaps sufficiently account for the superior strength of soft steel, and the greater brittleness of the tempered steel. This hypothesis would seem to be confirmed by the known fact, that magnetic ores and hydrated oxides are unsuitable to be manufactured into steel; this would be because they would be calculated to repel the induction of the carbon; being already charged with electricity, the one would repel the same kind of electricity in another element, viz., the carbon, and the hydrated oxide would repel either kind in another element if it should contain the same.

In order that steel should resist impact to the best advantage, it should the most nearly approach the hardest of forge iron, and should therefore contain the least possible quantity of carbon.

That steel shells should prove much more tenacious than iron when striking armour-plate could not perhaps at present be investigated with a greater chance of approaching the truth, than by supposing these to be of the most tenacious untempered steel, and which would probably have an excess of resisting power to compression, an approach to the malleability of white iron, but retaining much of that elastic quality which renders steel so invaluable for springs, and so causes the shell to receive the shock somewhat in the manner that powerful springs receive the concussions of a heavy load

in a carriage or cart, the heat caused by the concussion against the armour-plate liberating the carbon, and making the steel still less brittle.

The apparent anomaly of a 68-pound shot shattering an armour-plate tempered in oil, would perhaps suggest the contemplation of the effect of concussion on a spherical body.

If a projectile resists as much as it is resisted, then on striking an (to it) impenetrable object at rest, its own momentum only will re-act on itself, and its form, if spherical, will possibly cause the resistance to distribute itself through the shot in divergent directions, somewhat in the same manner that the weight of a large arch (under erection) is distributed by the struts in divers directions, and the fact of there being nothing but air behind the ball, would allow it a mobility and power of reaction which could not belong to it if it were resting on an anvil, and were to receive a blow (of exactly the same number of pounds' weight with the concussion) from a steam-hammer above it; but here the force would also be distributed as before, and possibly to a considerable extent counteract upon itself in a partly similar manner to the counteraction of forces manifested in striking the edge of a plank with an Indian club, when, if one particular part of its length touch (the edge of the plank), and that at about one-third the length from its large end, then there will be no vibration or shock to the hand; but if any other place in its length should touch the plank there will, and the same principle is also exemplified in a sabre, when bars of lead stood on end may, by a very strong and skilful swordsman, have lengths cut off them by causing the right part of the sabre to touch the lead.

The armour-plate becoming shattered by the shot would perhaps be explained by the fact of its being steel at all, and still more so by its being tempered in oil, which is calculated to give the greatest hardness (for this reason oil is used for tempering Mint stamps), and the quality that invariably accompanies that—viz., brittleness, and the backing on which it was mounted would also affect it; and in this the particular property of the plate as to brittleness or tenacity would make all the difference in the effect of the shot in the event of the plate not being solidly mounted—i.e. if its backing does not touch it in all places alike. Suppose it to be hollow, and the shot to strike it in the centre and opposite such hollow, and suppose the metal to be tough and not brittle; then the only way in which the shot could effectively operate on it would be by driving a hole right through it, and its being hollow would immensely reduce the effect of the concussion; while, on the other hand, if this tough but not brittle plate were fixed on a backing the least convex, then the shot could operate on its centre with its full force. And, on the contrary, if the plate were brittle and not tough, then experiment would probably prove that it would more readily break when slightly hollow at its backing.

And by a similar tendency in brittle steel, and to a lesser extent in soft steel, to fracture with concussion, we may perhaps see the reason why steel vent-pieces were more liable to fracture than those made out of tough iron, and they would probably be less likely to fracture than iron, if instead of being screwed into the gun (as I believe they were), they were to be very accurately turned to fit a corresponding hole to receive them, and (as the gun and the steel vent-piece would probably expand in different degrees under the changes of temperature) it would be well to give a slight draught downwards of (say) one in fifty, so that it could always be made to fit accurately, and thus prevent the vibration the screw vent-pieces would have.

To keep it down in its place the vent-piece should be made with a strong head or flange at top, longer than it is wide, and (to use artillerymen's phraseology) in the front and rear of this head should be a projection on the gun as high as the top of the cap, and these projections should continue over the top of the cap (as far as the latter extends beyond the circular part of the vent-piece), and to have strong screws to keep the cap and its vent-piece down.

To put the vent-piece in, it will only be necessary to turn it round a half circle, that its cap shall clear the screw projection as it goes down.

The vent would be continued through the cap, and which would cause no obstruction to the lanyard in firing the friction tube; but the tangent scale and foresight would in muzzle-loaders have to be placed a little higher.

HENRY AMBROSE.

POMPEII REVISITED AFTER MANY YEARS.

EIGHT-AND-TWENTY years ago I spent two months at Pompeii, drawing and measuring and taking notes of everything. During that period an antinatural *villeggiatura*, three Germans among them who were professional architects, and they remained as long as myself, their studies serious pursuits, mine only those of an amateur; yet I managed to obtain a tolerably complete acquaintance with all which up to that time had been done to bring to light the buried city.

Last autumn I had the satisfaction of spending three weeks at Pompeii, partly in reviving somewhat faded reminiscences of what it was in 1842, and partly in ascertaining what it had come in 1870. The result of these more recent searches, and the contrast of the two periods, furnished many general facts which may not be interesting to the readers of the *Builder*.

From all that I had read and heard within this interval of the progress of the excavations at Pompeii, I expected to have found the physiognomy of the city considerably changed by the addition of new features. But here I was somewhat disappointed: Pompeii has not in this respect kept pace with the progress of our modern cities of Europe. For although many private residences and shops have been opened up, and a few public buildings brought to light, and new baths in the *Via Stabiana*, and the new theatre through which we now enter from the railway station by what is called the *Strada Marina*; yet these have only added to Pompeii without altering its character or appearance. What are its grand and leading features in 1842 are its main characteristics still: several *insulae* have been added to the excavations, and others, the lines of the original plan, are receiving their development, but essentially the city remains unaltered. The course of the walls of Pompeii forms, as most readers are aware, an irregular semi-oval, with its base on the west side towards the sea, but the wall on this side has not been cleared out. Two main streets running from north to south, and from east to west, the *Via Stabiana* and the *Via Nolana*, bisect each other near the centre of the city, and divide it into four unequal parts.

In all descriptions of Pompeii it is important to bear in mind the course of these streets, the former passing from the gate towards the sea to the gate leading to Stabia, the latter from what was probably the sea-gate to the gate leading to Nola. Regions, islands, and numbers are the only officially recognised indications used for indicating the localities in a city somewhat complex in its many byways, rather puzzling to strangers privileged to go on without a guide. The popular names which have been given to the streets from their peculiar features in their course, and to remarkable houses from some striking characteristic which they present, or objects which have been found in them, though much more important to visitors, and without which Pompeii would be to them little better than a scientific puzzle, are too trivial to be introduced in the official accounts of the *Scavi di Pompeii*. Yet the clever and useful journal which is published by the pupils of the *Scuola Archeologica*, established here by the distinguished and persevering director-general of the excavations, the commendatore Giuseppe Fiorelli, these trivial names are sometimes found. Though only about one-fiftieth of the area of the buried city have been uncovered, yet the principal temples, those in and near the Forum, and the other public buildings in the neighbourhood of that public centre of Pompeian life, will probably never be added to by any subsequent clearings. The first excavation, that of 1748, was made at the intersection of the two main streets already mentioned, the *Via Stabiana* and the *Via Nolana*, but the houses there found were left in an unfinished state, more profitable digging being pursued elsewhere, and this primitive spot, interesting to the archaeologist in the history of Pompeii, is now a very deserted-looking portion of the city. The excavations carried on for a hundred years subsequently were to the east of the *Via Stabiana*, between it and the sea, and included in the south-western quarter of the city, the Forum, the principal temples, the theatres, the soldiers' quarters, and the baths. This is considered to be the oldest portion of Pompeii, and the course of the streets is very irregular. In the north-western quarter, that which is nearest to the supposed fashionable suburb,

Pagus Augustus Felix, the streets are arranged at right angles to each other, or nearly so, and the *insulae* are mostly rectangular parallelograms. The well-known house of Pansa, and the house of the Faun, than which no domestic residences of more importance have since been discovered, form two distinct *insulae* of themselves. The *Via Domitiana*, a continuation of the Appian Way, enters this quarter of Pompeii, at its north-western angle, facing the popular "Street of the Tombs." This was the point at which in former days visitors commenced their perambulations, and it is still recommended to begin here by the editors of old-standing guide books. But the *Strada della Marina*, which brings us up from the railway station, is now the more frequented route, and thus we enter at once on that portion of the city, the Forum, which used to be reserved to the close of the tour, as the locality of most importance.

Reaching the city by the Street of the Tombs, which looks just the same now as it did some nearly thirty years ago, we pass through the *Porta Ercolanese*, and enter the *Strada Corsolare*. The houses and shops in this street have now a rather neglected aspect to what they exhibited formerly; but on the right hand, more than midway along, we observe a new feature in the *Scuola Archeologica*, situated just opposite to the former residence of that well-to-do citizen of Pompeii whose corn-mills and ovens at the back betray his honest calling, and whose stable at the side of these premises is one of the very few to be found in the city. The *scuola* is a college, on a small scale, for the education of archaeologists, who are here lodged, boarded, and instructed for a period of three years gratuitously. The establishment is fitted up with comfort and elegance, and there is a well-furnished library, with some 6,000 volumes of the best works on archaeology and the sister sciences. Many of our most esteemed English publications here find a fitting home. But the institution, in its collegiate character, is not in a flourishing state. When I visited it last year there was only one pupil remaining, the Signor Edoardo Brizio, whose name will frequently be found in the journal of the excavations as the author of some of its most interesting papers. The reason assigned for the deserted state of the *scuola* is the circumstance that the pupils on the completion of their studies do not receive public appointments, and hence the three years thus occupied are too often looked upon as time lost. Add to that, the situation is somewhat solitary and depressing to students, who desire a reasonable gaiety to be combined with their serious studies; and one Neapolitan student who came here was obliged to give it up after the trial of a year. To the visitor who has his comfortable quarters at Castellammare, or comes from the gay and hilarious capital of Naples, to breathe the healthy air of this roseland city, the contrast is agreeable enough; but the epoch of hermits has passed, and the charms of society and the excitements of social life are now recognised as desirable stimulants to the progress of science and its healthy cultivation. The additions to the plan of Pompeii consist chiefly in the excavations of the new baths on the west side of the *Via Stabiana*, where the *Strada degli Olmi*, a continuation of the *Strada dell' Abondanza*, forms an angle with it. They are of considerable extent, and are known as the *Terme Stabiane*; are isolated on three sides, from each of which there is an entrance; and contain a grand palestra with porticoes, destined for gymnastic exercises, which the wise ancients were accustomed to erect in or near to their baths, that the youths might thereby acquire force and agility. One side of these baths is in that disreputable and crooked street, the *Vico del Lupanare*; the *insula* extends as far as the narrow *Strada degli Augustali*, and contains two or three new houses of some interest, as the house of *Sirico*, of Venus and Mars, and, between the two, the Elephant Inn,—not the Elephant and Castle,—and which had its entrance from *Lupanare* lane. The house of Venus and Mars occupies the western angle of this *insula*; opposite to it, in the Street of the Augustals, is the house of the Princess Marguerite. Excavations were still going on here, and also in the continuation of this street on the other side of the *Via Stabiana*, where, in fact, was the chief seat of them. The four *insulae* on the south-west side of this main street, extending from the Temple of Isis and of Jupiter and Juno, to the *Strada Nolana*, and the site of the first excavations of 1748, are now completed; as also is the *insula* opposite to the first of these on the north-

east side of the *Strada Stabiana*. In the *insula* between the new baths and the Street of the Temple of Isis are situated two of the most important houses recently brought to light, the house of *Oleonio* and the house of *Cornelius Rufus*: the former is at the western angle of the *insula*, the latter is separated from it by the *Casa di Mesconino*. In the *insula* opposite to this, at the southern angle, is the *Casa del Citarista*, and beyond it, with a frontage in Amphitheatre-street, a large house, attached to which was a stable where the bones of two horses were found, and the wheels of a biga, a very important find considering how rare these things are at Pompeii. The *Isola* opposite to the house of the *Citarista* is known as the *Isola di M. Epidio Sabino*. Another house of much interest in the *Strada Stabiana*, and near where the present excavations are being carried on, is the *Casa di Marco Lucretio*, one of the very few with which the name of the proprietor can be associated with certainty. Houses at Pompeii often receive their names from some remarkable fresco painting on the walls, or other decoration which serves to distinguish them, or from some peculiar architectural feature, and even from what may have been found within, as in the case of the House of the Marbles, so called from the variety of beautiful marble slabs which were there discovered. Two other houses which can be assigned with certainty to particular citizens are those of *Sirico* and *Cornelius Rufus*,—the former from the still existing traces of the name in red characters on the front, the latter from a marble portrait of the proprietor. The house of ill-fame, *il Lupanare*, opposite to the Elephant Inn, forms an acute angle with the *vico* of the same name and the *vico del Balcone pensile*; the latter is so-called from the remains of an overhanging balcony which were here found, and have been carefully preserved and restored. The house in which this was a prominent feature has become one of the most instructive from its having had its original fittings and conveniences reinstated under the judicious orders of the eminent architect Signor Michele Rugiero, the director of the *scavi*. This is not the only house in Pompeii which had a projecting upper story, and the inmates of which could shake hands out of the window with their opposite neighbours. There are indications of overhanging balconies in other situations also, but it is more especially in this house and its offices that we see the admirable arrangements which were made for the supply of water, and the numerous pipes of sheet lead rolled together through which it was conveyed. The river Sarno appears to have been the chief permanent source whence water was obtained, and from this the water-towers, which are very numerous, received their supply. In this house the wooden stairs have been restored, also three rooms on the first floor. The Signor Rugiero, whom I had the good fortune frequently to meet in his periodical visits to the excavations under his direction, very kindly pointed out to me the ingenious contrivances of his Pompeian predecessors, the original architects, to provide the houses of their employers with all the requisites of civilised life, and these often on a very small scale and effected with the most humble means. Visitors to Pompeii, though taking merely a bird's-eye view of the excavations, should observe somewhat in detail the domestic conveniences of this modest dwelling. Formerly little or nothing was done to restore the buildings in Pompeii, or even prevent them from further ruin. Now, however, the system in operation is to restore so far as is needful to render the architectural arrangements more obvious, and to give a scientific character to the details. The restorations going on at Pompeii may be arranged under two classes,—architectural restorations and domestic ones. To the former belong the temples and other public buildings; to the latter the private houses and shops of the absent citizens, for it is really difficult to realise the fact that they fled from their homes nearly two thousand years ago. In the temples and public edifices, though there is often much to admire, yet there is usually also something to avoid. The architects were not here such exact and conscientious followers of their Greek masters as they might have been, and should have been.

One of the most conspicuous restorations of a public building in progress last autumn consisted in replacing the entablature over five columns of the Temple of Venus. The columns are Ionic, the entablature is Doric. On my remarking this circumstance to Professor Rugiero, he admitted the fact, but offered no explanation of it. We

do not know what was the precise state of the public buildings in the Forum and its neighbourhood when the eruption occurred of August 24th, A.D. 79. The earthquake which happened sixteen years previously had thrown down many of the edifices, which at the time of the eruption were being rebuilt, and possibly the placing a Doric entablature over Ionic columns may have been a mere temporary arrangement. We find the temples of the Forum destroyed almost to their very foundations. An eruption of ashes and scoriae and pumice would not have produced this general ruin, but as Tacitus affirms, and in all probability did, as Tacitus affirms, the first earthquake took place A.D. 63; a second followed in 64, which was almost equally disastrous, and must greatly have shaken the confidence of the citizens in the security of their houses, and probably may have discouraged the erection of their public edifices. But the population returned, and their dwellings were renewed or restored, in some cases in a rough-and-ready way, and with the materials that first came to hand; but the more stately mansions appear to have been rebuilt; hence we may fix the period of their architecture within the limit of comparatively a few years, from A.D. 64 to A.D. 79. The domestic architecture of Pompeii is peculiar, and is indicative of the habits, and manners, and wants of the people; hence the study of it becomes extremely interesting, and all the aids which it can receive from a careful and scrupulous restoration of its leading features is an advantage to the philosophical historian, as well as to the archaeologist, architect, and artist. The architects of Pompeii showed great skill in their plans and in the internal arrangements of the houses they erected. Their adaptations are often most ingenious; and the way that noble mansions, and humble dwellings, and shops of various sorts are fitted together is one of the most curious features in the uncovered city. There is here much for modern architects to observe, as also in the distribution of the water supply and the system of drainage; but it is to the decoration of the houses that the attention of students is chiefly directed.

H. C. BARLOW, M.D.

ECCLIASTICAL DILAPIDATIONS ACT, 1871.

SIR,—Will you permit, in order to elicit further expression of opinion, a few more words on this subject?

Section 15 provides that the surveyor shall report,—“What works are needed, specifying the same in detail,” &c. Section 31 has the same phrase; which, evidently and by all consent, implies that the surveyor shall define to himself what he considers necessary, to the extent required for his own careful estimate, and shall state it in his report with precision; but it does not seem so clear that such a specification, as would be supplied by a careful practitioner for works to be executed by contract for a client in the ordinary way of business, is either within the intention of the Act, or desirable on other grounds.

Section 45 would seem to throw some light on this. “The repairs to be executed in the case of a benefice under sequestration, and the repairs to be executed in the case of the refusal or neglect of the incumbent to execute the same (including rebuilding or repairing in case of fire) shall be executed under the direction of the surveyor, who may employ any builders or contractors to execute the same according to a specification and contract to be prepared by such surveyor,” &c.; the inference being that the report previously made (Sections 15, 31) is always necessarily to be supplemented in these cases by “the specification” here mentioned. In other cases, e.g. repairs executed by an incumbent on the first or final report (Section 16), it would appear that he is to be made aware precisely of the requirements of the surveyor, and then left to his own course as to carrying out the works. In the case of objections to the surveyor's report (Sections 16, 32), most incumbents would employ their own surveyors; and where no objections are made, and in the case of new incumbents, it might not be undesirable that they should make a rule of doing so.

That the language of a report may be precise and unmistakable without the features of a working specification, is shown in every-day experience in careful schedules of dilapidations under leases; honestly taken, there need very rarely be any doubt as to whether the require-

ments of a well-constructed schedule are being complied with. The working specification would, in many matters easily imaginable in the professional mind, introduce questions that otherwise would never be raised at all; and would often prevent, unless objected to at once, such adaptation of the buildings to other needs and views of incumbents as should from time to time be made,—in order to avoid stereotyping the defects of existing buildings. This may seem to be provided against in Sections 50 and 51, but the machinery there arranged would not be set in motion except in the more important cases; and to the argument that “relief of ecclesiastical persons and their representatives,”—where small outlay is in question, will be in practice one of the main uses of the Act,—it may be replied that it could be made a rule that the surveyor should supply a working specification after the final report, for some stated fee if called upon for it, (in cases of works under £)—being informed, if need be, as to any desired minor modifications by the incumbent in his letter asking for the same.

The district surveyors of the metropolis may be considered as engaged in work in ideas similar to that of the surveyor under this Act,—making sure on behalf of the community that a practical conformity with certain general standards is secured,—with this difference, that the protection may be supposed to be afforded by them mainly to property other than that of the building-owner; whereas, in the case of ecclesiastical property, the whole of the details of the works needed in the buildings themselves require to be specially looked to. It cannot, however, be to the general interest, and certainly not the interest of the architectural profession at large, to throw too much work absolutely into the hands of officials. The fact that an incumbent may (Section 11 offers no solid objection), and that sequestrators must (Section 45) employ the surveyor of the diocese in the actual execution of the works, will inevitably put in his way a fair amount of work, that with the ordinary routine, when the fees are properly settled, should make the appointment worth holding by a properly trained architect in general practice. All this no one will be disposed to grudge him, regarding it as not an undue share of the general professional work, some of which he will be able to do more easily than any one else. It does not follow, though, that one would wish it to be generally understood that there will be little or no opportunity for the employment of non-official persons.

The fact that the larger proportion of all outlay on ecclesiastical buildings will probably always be made without the Act being in question, should not be considered as reducing this matter beneath consideration. An incumbent would frequently wish to employ a surveyor known to, or previously employed by, him. In some instances a more effective supervision can be exercised over local tradesmen, especially in minor works, by a local architect. (It seems not unfair thus to put one side of the case of competent local practitioners, who are perhaps rather too hard pressed by the Levianthans from London and other remote places.) In the case of an incumbent desirous of “altering or remodelling the buildings belonging to the benefice, or any of them, or of rebuilding the same or any of them,” (Section 50), the employment of one and the same surveyor to act for the incumbent, and for the diocese, would not be the commonly accepted method of conducting business (as between two parties); to which, when it is not objectionable, and is in fair working order, it is best for all reasons to conform. In the planning of such remodelling, &c., an incumbent might fairly wish to employ his own architect. The case of the “other buildings belonging to a benefice,” is of course mainly in view, but what has been said will apply still more strongly to “chancels.”

In all cases the approval of the working drawings and specifications could be had, when considered desirable, before signing the contract—after the receipt of tenders. It is true that the Act does not prescribe any such step; but though not compulsory, it might be provided for, by a fee being stated for such service when performed by the surveyor.

A difficulty in practice seems likely to arise from the estimate of probable cost (Secs. 15 and 31), not corresponding at times with the amount of an actual builder's tender. As the sum stated in the final report is in some cases to be deposited (Secs. 37, 40, &c.), and in others (benefice under sequestration, Sec. 20), that

sum only is to be a charge on the profits of the benefice; it is very clear that a competent and wary surveyor must be appointed, who should, when he can, get placed so that he may steer his course as events require. The mere fact that such a sum has been named beforehand, would often, and to say, afford guidance of a very valuable kind to some of a set of competing tradesmen.

Another difficulty will probably come from the method of payment provided. Section 44 stipulates for certificates from the surveyor countersigned by the bishop, for payments on account as well as finally, before the governors of the Bounty of Queen Anne pay over any money. This will apparently introduce the surveyor of the diocese (in London diocese, 10s. 6d. per certificate is proposed),—though, oddly enough, in Section 57, treating of injury to buildings by fire, it is provided that cost of reinstatement “shall be paid as the works progress, out of the amount so paid to the governors, on certificates of a surveyor,” &c. The “the” in line 4, Section 44, is probably a slip (or the “a” in Section 57); it is not easy to see any reason for the difference.

These difficulties would often be more seeming than real, and only give the surveyor of the diocese a little advantage in the race for employment in a few instances. The conclusion would thus be that “the reports” should specify the works required in sufficient detail to preclude the probability of misunderstanding, but not necessarily further; and that the framers of the Act, being in some doubt as to the universal employment of the diocesan surveyor, shaped the matter judiciously, so that by the terms of the Act he will only of necessity be called upon to perform certain fixed items of duty.

On the principle that every architect may now consider himself a possible diocesan surveyor, it may seem unwise to throw out suggestions likely to tell against his pecuniary interest, when looking to that of the public and the profession. You and your readers will, however, probably pardon this, now the Act is under discussion. As to the fees and charges and the desirability of making them and the rest of the routine uniform throughout all dioceses; this may be done perhaps more effectively when, after a year's actual working of the Act, some experience has been gained. For the diocese of London it is expressly stated,—“The above fees and charges are to be of force for one year from the date of the surveyor's appointment, in order that they may then be revised and altered, if necessary,” and by Section 10 of the Act the fullest powers are reserved for alterations from time to time. A short conference this time next year would arrange this and other matters for several years to come; and in the meantime no inconvenience to speak of is likely to result to any one except the surveyors, who will be willing to arrive at the second year pretty generally,—if the *ad valorem* and other scales in other dioceses are framed as considerably for the clergy as some portions of the scale of fees for London.

S. F. CLARKSON.

SIR,—After reading the articles on this subject in your numbers of the 9th and 16th inst. I think no official explanation necessary to remove the ambiguity surrounding the question as to a surveyor's duties, as defined under the 10th section of the Act, but that it rests with those seeking appointments under the Act to submit for approval a scale of charges sufficient to meet all the requirements likely to arise.

My experience, acquired in the execution of numerous works under a similar Act of the Legislature, perfectly warrants the conviction entertained by the surveyor of the Winchester Diocese and other members of the profession. A surveyor, under the provisions of this Act, will hold a position similar to an inspector under the Acts of the Inclosure Commissioners, with the same class of duties.

Taking the 10th section in its literal interpretation, it requires some stretch of argument to make the words “specify in detail” imply the requisition of a purely architectural specification to be prepared by the diocesan surveyor for the use and guidance of a builder or contractor; of that his estimate of the cost of any work comes next upon his inspection shall be other than *approximate*; the last view being supported by the insertion of the word “probable” in the sentence referring thereto. The simple construction upon the first words conveys no more than the necessity to enumerate, recite, or point out, in the body of his report, in the form of

summary or inventory, each particular object coming under his observation which a condensed report could not convey, and he will have to state the condition of each component part as regards preservation, ruin, waste, or defect, and the requirements needed in each case to restore or put in tenable repair any premises submitted to his inspection; under which operations it will be his consequent duty to give a general or professional opinion of the total outlay that will be involved in such works,—but this only provisionally.

Probably, in many cases, specifications and estimates may be submitted by incumbents or sequestrators to the diocesan surveyor for supervision; and presuming these to meet the requirements consequent upon his inspection, he will embody them in his report accordingly. But the examination and testing of such documents will entail considerable time and application beyond the inspection and report, a reasonable remuneration for such service must be fixed by a specified fee.

On the other hand, when the surveyor finds it necessary to prepare special plans, specifications, and estimates in thorough detail, for the guidance of builders or contractors, there can be little doubt of his being entitled to the customary professional fees, as between proprietor and contractor, or an equivalent, quite irrespective of the officially established fees for inspections, reports, and certificates, as provided under the 10th section of the Act.

That this is a plain-sense view of the matter think your readers will readily admit; but, as we have before hinted, those who meditate becoming candidates must endeavour to secure a rate of compensation adequate to the responsibility to be undertaken.

SEXTANT.

SCRAPS ON THE STAIRS.

THERE are numerous practical questions connected with the principles of design and construction which deserve more consideration at the hands of the rising school of architects than they really receive. Ventilation, for example, has on the whole been much neglected; and so have the theory and practice of fireproof construction. Still more frequently neglected, although certainly not less important a subject is the building of stairs. If we consider for a moment how many questions are involved in the plan of a good stair; how many constructive problems are concerned in its execution; and furthermore, that no subdivision of a building can be of greater importance, if we except the foundation itself,—we shall easily see that the subject demands attention. Yet some how or other it seems to be taken for granted that we know all about it; and even very little progress has lately been made. More particularly we shall find this to be the case if we turn our attention to the designing of what are commonly called common stairs, which parts of a building are, in many cases, nothing more nor less than common nuisances!

It might not be difficult to write a highly picturesque paper—not unattractive to the modern architect—of the origin and primitive design of the staircase, of its ingenious early construction, and gradual artistic development. A savage of our day, according to Sir John Lubbock, has no stair,* although our own ancestors clearly had such a thing in their hill forts. Passing over its early history, it was during the Elizabethan Period of our own history that the staircase assumed an important place in our domestic architecture generally. From the splendid proportions of the staircase ataddon Hall, to that unique gem of Sir Christopher Wren's, which is hidden in the chapter-house at Westminster, a progressive catalogue might still be compiled from ancient mansions, illustrating the relative principles of design and use as well as construction and decoration. Nor would such a compilation be without its use and influence at this moment, as we have hinted. Handrails and balustrades, unlike the slender and rickety contrivances which are now so much in vogue, were always of bold and handsome proportions, presenting a picturesque outline and just proportions, together with a superadded feeling of stability and strength. Verulam House, in order to show what could be done with lightness and airiness of artistic construction, had a beautiful staircase of timber, the posts at intervals being decorated with carved figures of priests and

mendicant friars. Many other such instances could be quoted, but we can only mention two, which may be very familiar to architectural students.

Connecting two of the principal chambers of Wrexham Castle was one small and beautiful staircase, with octagon screen embossed at the top, containing double flights of stairs winding round each other, after the design of Palladio; and the east stairs at Wimbledon House which led from the marble parlour to the great gallery and the dining-room were richly adorned with wainscot of oak, with gilded fillets and with stars of gold.

Enough of this, however, at present. Our object is not so much to deal with ancient as with modern staircases; and even in this category we shall pay more regard to the staircase which is called "common" than to that which adorns the stately mansion or public building. To this end we proceed to write out one or two of the most ordinary definitions, which, although trite to most of our readers, we will nevertheless presume so far on their indulgence as to recite.

1. In the first place, "a staircase is an enclosure formed by walls or partitions, or both, for the reception of an ascent of stairs, with such landings as may be necessary." If we add to this definition (which together with those which follow, is condensed from Gwilt), the circumstance that a staircase may either be *internal* or *external*, it will then be complete.

2. A *dog-legged staircase* is one which has no opening or well-hole, and in which the rail and balusters of the progressive and returning flights fall in the same vertical planes.

3. A *bracket staircase* is one which has an opening or well-hole, with strings and newels, and is supported by landings and carvings.

4. A *geometrical staircase* is one of which the opening is down its centre (technically termed an open newel), and in which the end of each step is supported by being fixed in the wall.

5. A *common staircase*.

The whole subject, strictly speaking, belongs to the constructive science of *stereotomy*, that is, of cutting solids to certain conditions of structure and equilibrium; and no builder can enter largely into the design or construction of staircases (or anything else) without a competent knowledge of the important principles of this science. In the dog-legged staircase, for example, where the steps are fixed at their inferior termination to a solid newel or upright pillar; and on their superior termination (or broadest end, in plain language) to the circumjacent wall, how often do we see the whole stability and equilibrium of the building destroyed by a sinking of one or other of the foundations, or by an unequal distribution of the superincumbent weight? Again, how often do we find in an apparently well-planned geometrical staircase, that the auxiliary support (which is obtained obliquely upwards, from the fact of every step resting on that which is immediately below it; the lowest, of course, resting on the floor) is defective; consequently that the whole stair leans inwards towards the railing. "Staircases," says Palladio, "will be perfect if they are spacious, light, and easy to ascend."*

How many of the domestic staircases in London which are every day constructed could bear the most slender scrutiny under these rules? How many are spacious? How many are light? How many are easy to ascend? These questions we may briefly try to answer.

As to the question of space, that is really in a crowded city a matter of such unfortunate predetermination that the designer has very little room to choose. And yet we cannot help pointing out, as an extremely unfavourable comparison, the fact that some of the older houses in Bloomsbury have wider staircases than many houses in certain quarters of Belgrave-square. It is surely bad architectural practice to punish the width of a staircase for the sake of its rooms. The staircase, it should always be borne in mind, bears the same relation to the carcass of the house that the aorta does to the human heart. It is the chief artery of circulation; or, if we must run our surgical metaphors to the death, it ought with still greater propriety be compared to the alimentary canal through which the food is first of all introduced, next digested, then assimilated, and finally expelled! Above all, the staircase is the only medium of conducting fresh air from the basement to the uppermost story:

the solitary tube, so to speak, which connects the building with the earth and the atmosphere. Assuming for a moment the necessity of that connexion, how frequently is the latter wholly disregarded.

As to the property of easy ascension, a very few words will suffice. Without going into specification of the dimensions of risers and treads, it must be clear to the commonest capacity that there is a *via media* (not easy to hit sometimes) which is absolutely necessary to the plan and elevation. Some stairs are too difficult to ascend; but there are others which are far too easy! (*Facilis descensus inferni*, &c., says the poet). This latter case, which, of course, occurs the most seldom, may be easily discovered in such public buildings as the British Museum, the London University, and many other of our Classical public buildings, where the dimensions of the steps are made part of the architectural effect. It seems, however, to be almost a law of nature that the sectional angle of steps on any given wall should not much exceed or fall short of 45 degrees. And it is a very remarkable fact, although it partakes of a paradox, that a stair which is very easy of ascent is not so easy of descent.

We cannot stay to discuss the many questions involved in the material of steps. Pine, oak, mahogany, Portland stone, sandstone, limestone, granite, even *malachite* (in the Princess Matilda's salon in the Champs Elysées), have been applied to this purpose, and distinguishing them into their respective uses as regards domestic or public stairs, which, we should like to ask, is actually the best material? How many lives have been lost by steps wearing irregularly. Did ever any person who has had the good fortune to go to sea inquire into the danger of those brass-tipped, leaden-covered, and totally dangerous curtailed steps by which he was condemned to ascend and descend from the deck to the cabin? And can any readers supply a reason why this exceptional form of step should be now introduced into some of our best modern hotels. Of all places in the world, a ship and a hotel are precisely those which should not have dangerous steps! Yet there they are!

It is hardly necessary to impress on the public mind that an excess rather than a deficiency of light is required in a staircase. Yet how often do we find that the stair is the dirtiest and dingiest part of a house; and, with regard to ventilation, we very much suspect that this most important subject is in many cases treated as a mere matter of accident; and there are still many more cases, we are afraid, where there is no provision made for ventilation at all? One word more. In this climate it is surely necessary; yet how seldom is it possible to make even the most slender provision for heating staircases, and how many dangerous colds, catarrhs, and bronchial disorders are the direct consequence. Putting all these desultory limits together, we trust we have done sufficient to show that there is need for improvement in our present methods of constructing staircases.

We would now say a few words concerning common stairs, in the construction of which our Scottish neighbours and friends must be allowed to have the advantage in practice. A very curious question was raised during the progress of the last census in Scotland, which, although no one seems to have pointed out its importance, is nevertheless calculated to create much misunderstanding, and even error, in our vital statistics. The question was this, *What is a common stair?* which again resolved itself into the definition of, *What is a house?* The census commissioners held that a house must only be considered such when it is divided by party-walls,—just as it is held, under the Metropolitan Building Act; and accordingly much of the enumerators' work had to be gone over again in Scotland, with the result, we can have no doubt, of totally altering our conception of the nature and number of what are styled inhabited houses. For, as our readers must know quite well, by far the majority of houses in Scotland consist of lofty tenements containing flats or floors entering to each from the different landings of the same common stair. Sometimes each flat consists of one house; more frequently of two; in numerous cases of three; and when in the process of years such tenements fall into decay or disrepair, as they have done in the High-street of Glasgow or the Gallowgate of Edinburgh, it is quite impossible to affirm with truth how many single rooms they are not split into, and how many families may not be found living in these single rooms.

* Some of the lower animals have, however,—e.g. the cat. Vide Huxley.

* See his rules, quoted in "Gwilt," under the division of "Architectural Practice," par. 2,804.

If we wish to study the effect of common stair-cases in the walled and fortified cities of the fifteenth and sixteenth centuries, we cannot do better than go to Edinburgh. Our readers who have not had the opportunity of studying the common stairs of that celebrated city *in situ*, as the geologists say, cannot do better than read some of the graphic descriptions of Sir Walter Scott,* which were always drawn from the life. The late Robert Chambers also, in his well-known "Traditions of Edinburgh," pointed out how those ancient tenements gradually grew in height and (owing to a system of overhanging floors) in breadth until they finally excluded all light from the narrow alleys which separated them; the consequence being the creation of deadly plague-spots and hot-beds of contagion and disease.

The original common stairs of the Scottish domestic architecture were ordinarily external, commonly situated at one angle of the building. Afterwards, the exigencies of street space demanded that they should be constructed internally, usually, however, at the front or back wall, with window-openings corresponding to those of the different floors. Such was the nature of the stair-cases in the first great modern extensions of Edinburgh and Glasgow, which, to do them justice, are better lighted and ventilated than the more modern common stairs, such as we may see in Newington or Sanchiehall streets, where the staircase-wall is built in the very centre of the building, imperfectly lighted from the roof, and with positively no provision for ventilation whatever. But, the whole agree in this particular, that they are totally destitute of any provision for escape from fire. A common staircase should be open at both ends, just as much as an alley, or a cloze, or a wynd. Had the poor people in the Canongate of Edinburgh been able to scramble to the next roof, even through a hatchway or a storm window, they need not have precipitated themselves from the windows into the courtyard, as they were compelled to do by raging masses of flame and conflagration beneath and behind them. Surely that is a simple proposition; and among our municipal and police Bills, why should it not find some place? We recall this incident as a caution to local authorities and others concerned, who supposed those stairs to be fireproof, because they were built of stone. That fallacy has exploded. Recent events in Paris have taught us that we ought to look at our main principles of construction with the idea that they might one day or another be put to the same test. And if we suppose a petroleum conflagration kindled at the basement story, the first question which ought to be considered is how to get the superincumbent people out of the disaster. On this head we may also remark that the condition of the steps are often deplorable; in fact, it is pitiful to observe the manner in which those high narrow steps are worn down in some of the Edinburgh and Glasgow common stairs; and, unless we are misinformed, many fatal accidents occur thereby every year. Almost the whole of the poorer staircases should be flushed as regularly as a common sewer; and many of even the better order have as much need of a louvred ventilator on their roof as a crowded public building or a brewery. M.

THE NEW TOWN HALL FOR WIRKSWORTH.

THE foundation-stone of the new Town-hall for Wirksworth has been laid. The building will be situated at the corner of the Market-place and Coldwell-street, and extend through to the churchyard, to which it will have a small frontage. The site is irregular in form, and it has been a matter of difficulty to adapt it to meet the various requirements.

On the ground-floor the Market-hall, 30 ft. by 28 ft., is placed at the corner, and the remainder of the frontage to the streets is occupied by shops and entrance doorways. The principal entrance is from Coldwell-street, and leads into a hall, 22 ft. by 12 ft.; opening from which is the billiard-room, 26 ft. by 21 ft.; reading-room, 27 ft. 6 in. by 21 ft.; supper-room, 28 ft. by 25 ft.; cloak-room, lavatory, &c. The principal staircase leading from this hall to the first floor is 12 ft. wide, and constructed of Yorkshire stone. A second entrance is provided

* See in particular his account of Colonel Manneering's visit to Advocate Playdell, in "Guy Mannering," chap. xxiv., and elsewhere.

opening from the Market-place, and access to the upper floor is gained by a staircase, 8 ft. 6 in. in width. On the one-pair floor is an Assembly-room, 60 ft. by 50 ft. and 25 ft. high, and the remainder of the space on this floor is occupied by four rooms to be used as occasion may require. The building is Gothic in style, and from the nature of the site varied in outline; it will be faced with stone from the Beacon Hill quarry, near Wirksworth. The Assembly-room forms the most prominent feature in the elevation, and at the junction of this building with the shop adjoining, a tower, 10 ft. 6 in. square, rises to the height of 71 ft.

Mr. Edwin Thompson, of Derby, has contracted to erect the building for 4,000l. Messrs. Pictou, Chambers, & Bradley, of Liverpool, are the architects; and Mr. Alfred Roome is the clerk of the works.

STATE OF THE SEWERS, ST. GEORGE'S, HANOVER-SQUARE.

THE authorities of St. George's, Hanover-square, are, after the manner of parish authorities in some other places, apparently indignant at certain statements made in the *Builder* relative to the foul condition of the sewers in Belgravia, Eaton-square, St. James's Park, and Westminster, and as to their containing a mass of stagnant sewage, in ruinous flat-bottomed sewers, swarming with rats. Mr. H. T. Tomkins, surveyor to the parish of St. George, Hanover-square, is ordered to write to the *Builder* a contradiction of the statement. This he does, but in a very qualified sort of way. "The sewers in Belgravia," he states, "are not flat-bottomed, but are either egg-shaped or have invert bottoms." An egg-shaped sewer certainly cannot be said to have "a flat bottom," but a sewer with vertical sides and segmental invert is practically flat,—it is flat in its retarding effects on the flow of the sewage, it is flat in its accumulation of deposit, and in any description of the system must be classed in a list of sewers under the general heading of "Flat-bottomed." It is probable that some recently-constructed sewers are egg-shaped; but, as these sewers have their invert at the level of the branch or side-sewers and general level of the branch or side-sewers and tributaries, they (the egg-shaped) afford very little relief to the flat sewers over the areas on the sides. In some respects they act injuriously, by removing the whole of the scouring power along such lines, and back-watering, and so rendering stagnant the tributaries, from their juncture upwards. Mr. H. T. Tomkins, we suppose, is fully aware of this, and therefore qualifies it by writing as follows:—"In so low and level a district it is, of course, impossible to get, in every case, that amount of fall which is desirable for proper and efficient drainage; and, while some of the sewers have, in consequence, a large amount of deposit, a large proportion have a good and uniform fall, and are almost wholly free from deposit." If Dr. Love, the chairman, and Mr. Walker will read this statement of their surveyor's carefully, they must, we think, acknowledge that they had better have ordered him at once to cleanse out that "large amount of deposit," in anticipation of an outbreak of cholera, and have let contradictions of the *Builder* alone. But will Mr. H. T. Tomkins fully explain to his committee how, in "so low and level a district," he gets "a good and uniform fall in certain parts, almost free from deposit," but "large amounts of deposit over the generally flat area?" There is an evident contradiction in this statement.

The next qualification comes with a round-about assertion of, "Moreover, the general condition of the brickwork is very far from being ruinous [Query, How far?], and my own experience proves that these sewers are generally free from rats." Now, what has this word "generally" got to do with the question? The sewers harbour rats; and, as they are animals averse to publicity, they probably have not turned out or swarmed for the surveyor's special inspection. Mr. H. T. Tomkins may, or he may not, have made himself acquainted with the condition of the first-constructed sewers of Belgravia,—those with flat invert, vertical side-walls, and semicircular arches,—miles of which sewers are officially reported to have distorted and ruinous side-walls. These sewers were examined officially, and there should be an available record of their condition (with sectional diagrams) somewhere, unless it has been lost in the break-up, change, and removal of the Old Sewers Commission.

We do not accept the vague assertion that "these sewers are generally free from rats," as any proof worth listening to. There are rats, and the men (sewer scavengers) who occasionally work in these sewers report that the Belgravian sewers swarm with them. We believe the sewer-men in preference to accepting the qualified statement of the surveyor. But there is another source of danger in the sewers of St. George's, Hanover-square,—namely, dumb-sewer shafts; that is, contrivances liable to be injurious to human health, and dangerous to human life. These shafts rise from the crown of the sewer to within 1 ft. or 2 ft. of the street-surface, and in place of an open grate ventilator, are covered with a flag or plate of iron, and are paved or macadamised over. Early in this month (September, 1871), a workman, using a naked light beneath one of these dumb-shafts, caused an explosion of sewer-gas (said to have been coal-gas), which injured him so seriously as to necessitate his removal to the hospital. The committee of St. George's, Hanover-square, must know of this. They do know of it; and Dr. Love, the chairman, had, therefore, better at once, we think, request Mr. H. T. Tomkins to report to the committee the number of these covered shafts on the sewers within their district, which are liable to store explosive gases beneath the public road-ways, and to order their immediate and permanent ventilation, as such gases, accumulating until undue pressure fill the sewers, permeate through the drains to the houses in connexion, causing fevers occasionally, but always depressing sickness.

Sewers which contain putrid deposit, which harbour rats, which are partially in ruins, and which have dumb-shafts filled with explosive and deleterious gases, do not admit of valid defence. The duty of the committee of St. George's, Hanover-square, and of their surveyor, is not to defend their foul sewers, but at once to cleanse, repair, improve, and ventilate them to the utmost.

SIR.—The sewers in Belgravia are not egg-shaped, nor have they, strictly speaking, invert bottoms; they are of the old Westminster shape, with flat segmental bottoms, upright sides, and semicircular crowns, the sizes being 6 ft. 6 in. by 3 ft. and 6 ft. by 2 ft. 6 in. in the clear. They are, therefore, sewers of deposit, in many the deposit partly in some it entirely, while in others it more than fills what is called the invert; and the liquid in consequence meanders to the outlets in rills between banks and mounds of deposited filth. Formerly this was removed periodically, by lifting to the surface and carting away, but of late years it is supposed to be removed by flushing. The capacity of these Westminster sewers is such, that if the outlet ends were to be bricked up so as to turn them into reservoirs, those with house-drains on one side only, as in Belgrave-square, would hold all the sewage produced for three weeks, and those with house drains on both sides, as in Eaton-place, would hold all the sewage produced during any one day would fill little more than one-half the capacity of the curved invert in the one case, and little more than their whole capacity in the other. The quantity of sewage, however, does not run, as you know, into the sewers in regular proportion through the day.

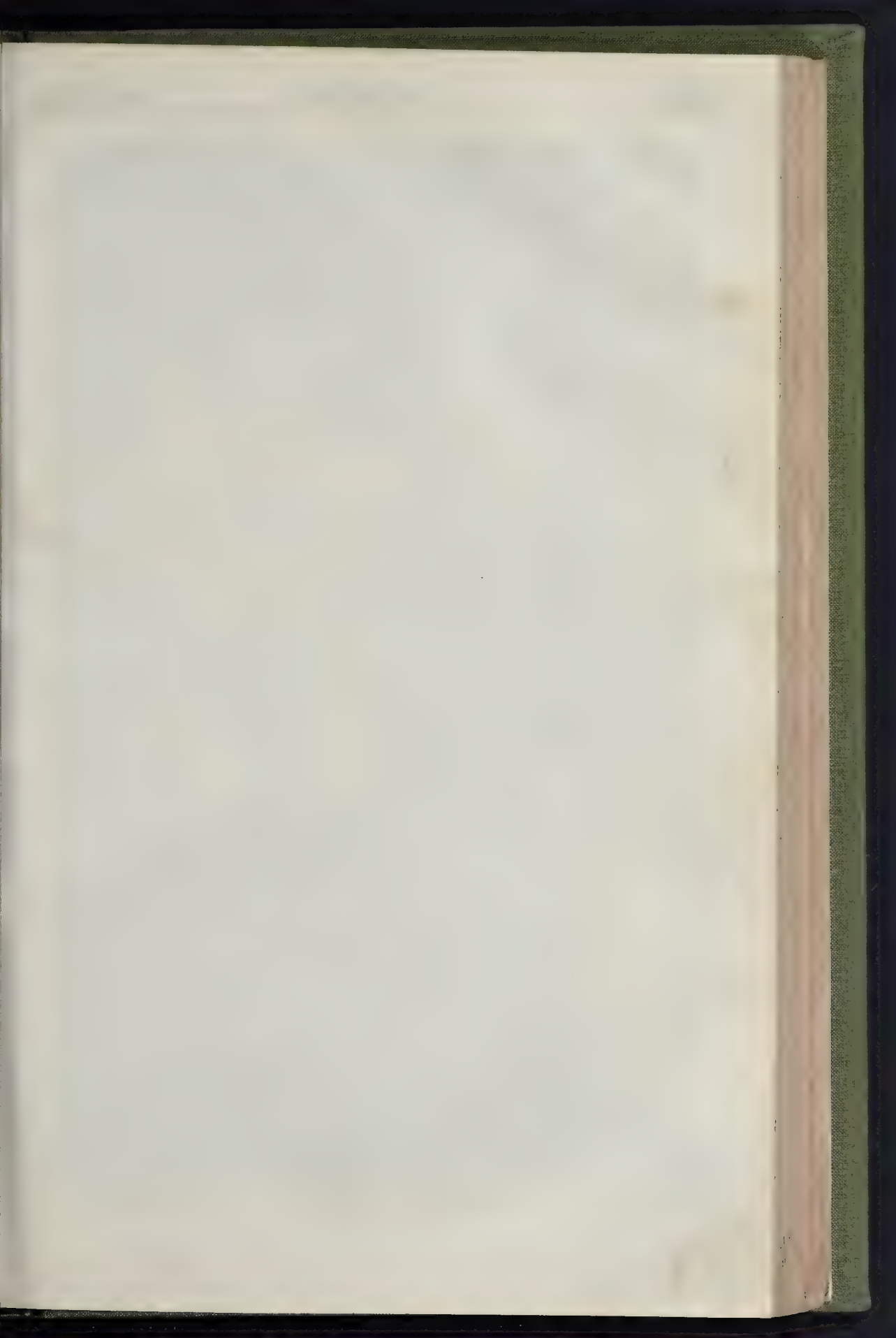
The maximum discharge from a sewer with house drains on both sides of it, as from that in Eaton-place, for instance, is no more than twenty-two gallons and a half per minute, or three pints per second. From this it should be obvious to any one at all acquainted with the subject that even the maximum flow in the sewers (great as it is over nearly flat bottoms 3 ft. and 2 ft. 6 in. wide) is utterly powerless to remove heavy substances, such as fecal matter, wet paper and rags matted with hair, condensed balls of fat from scullery washings, &c.; and hence such matters must necessarily deposit and accumulate. This has been and is the condition, not only of the sewers in Belgravia, but of those all through the metropolis. And such will continue to be their condition until a general plan is prepared for improving the level and narrowing the invert so as to concentrate the flow, whereby it may be made sufficiently powerful to sweep all ordinary sewage matters before it and prevent deposit.

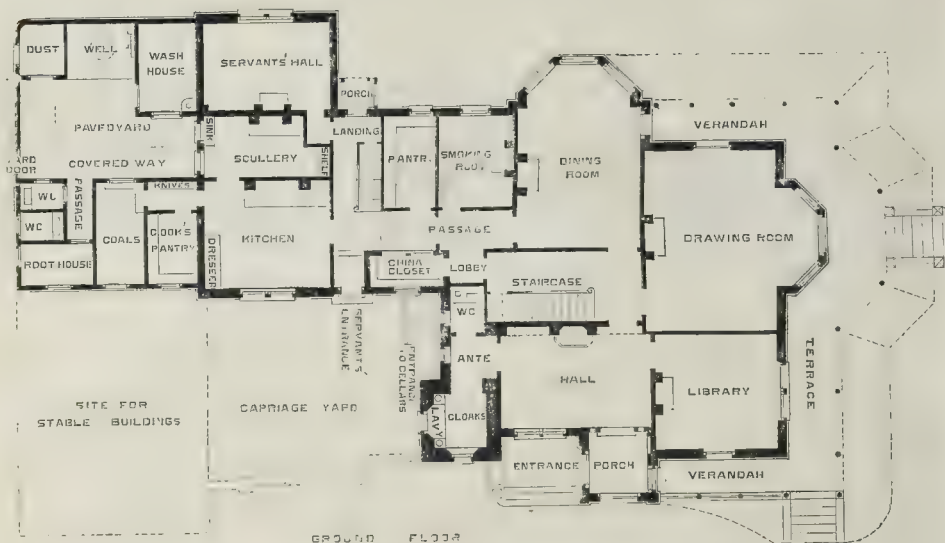
From the practical experiments I made in the sewers while I was chief surveyor to the Westminster and Metropolitan Commissions, I satisfied myself that all sewers of deposit could be made self-cleaning. The first really egg-shaped sewer in the metropolis in Pimlico by Thomas Cubitt in 1846, soon after the Westminster Commission adopted them. These, you will remember, were of my form. The streets and sewers in Belgravia were much longer before this was known, so that you will be correct in saying that there are no egg-shaped sewers in Belgravia, which lies south of Pimlico.

If the sewers of deposit in Belgravia, in Westminster, and in other parts of the metropolis, were to be altered generally in accordance with the section I send you, I would stake my existence that they would be self-cleaning. The money expended in flushing such sewers during ten or twelve years would pay for, so that you will be correct in saying that there are no egg-shaped sewers in Belgravia, which lies south of Pimlico.

J. F.

New Bridge at Leeds.—On Wednesday afternoon the foundation-stone of the new bridge which is to cross the river Aire was laid by the mayor. A public banquet took place in the evening. The cost of the new bridge will be nearly 20,000l.





SCALE OF 1" = 10' 0" 1" = 20' 0" 1" = 30' 0" 1" = 40' 0" 1" = 50' 0" 1" = 60' 0" 1" = 70' 0" 1" = 80' 0" 1" = 90' 0" 1" = 100' 0"

MR. HORTON'S HOUSE, PENMANMAUR.

Plans.

A RESIDENCE IN PENMANMAUR, NORTH WALES.

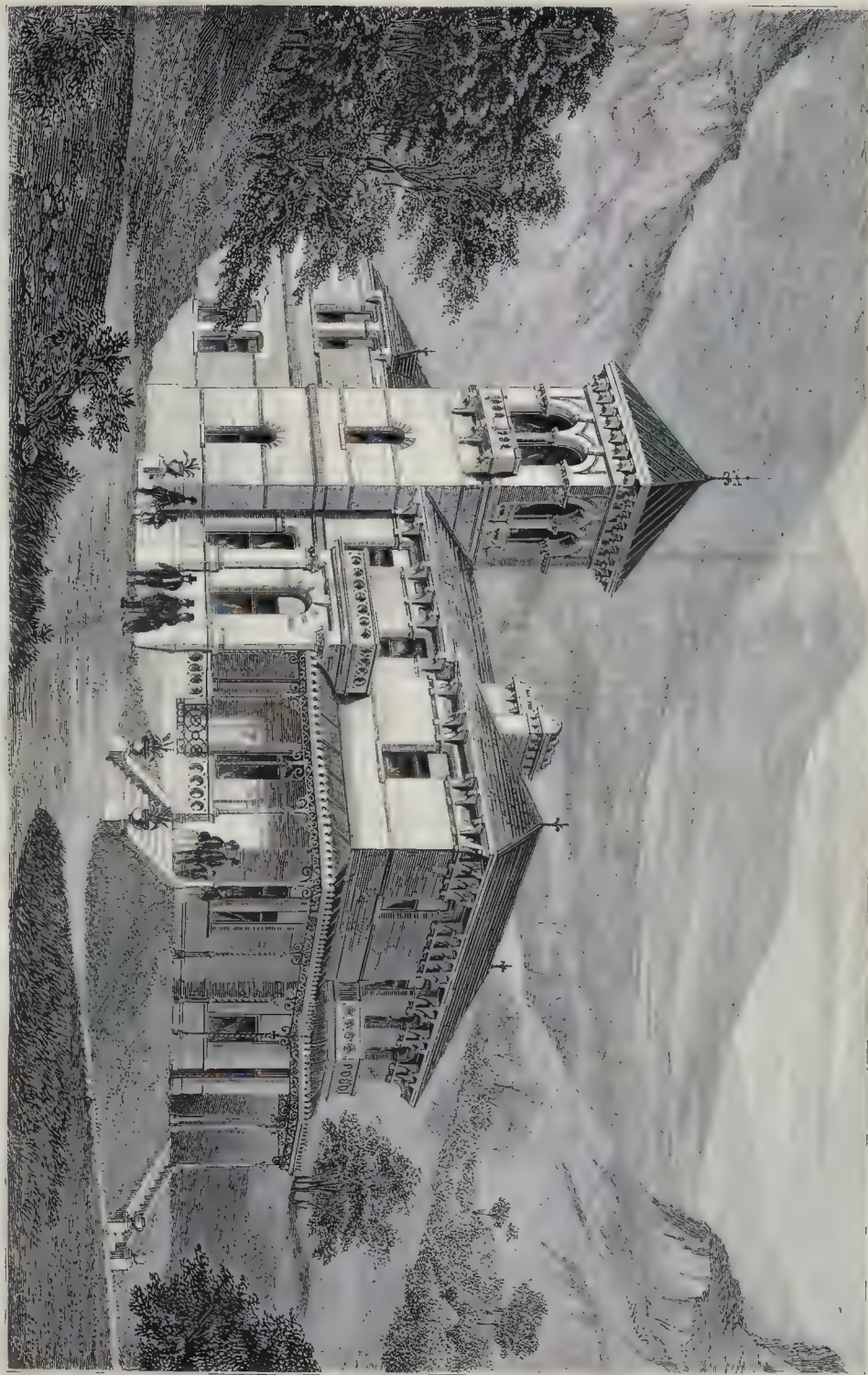
Our engravings illustrate a residence which has just now been erected for Mr. Horton, in the very delightful neighbourhood, Penmanmaur, from the designs of Mr. J. Fogerty, architect.

The external walls of the basement, to the level of the plinth, are of native ashlar stone, lined with brick, with fender-walls where required. The remainder of the walls throughout are of hard brick, with white stone dressings to the windows, porch, tower, &c. The roof is

covered with slates. The large entrance and staircase halls and the porch are laid with Minton's mosaic tiles. The floors of the dining and morning rooms have a border of parquet, laid by Messrs. Howard, of London. The drawing-room ceiling is handsomely decorated by Messrs. Jackson & Son. Gas-pipes are laid throughout, and pneumatic bells are fixed. The ventilating arrangements have been considered, and flues are built with Byd's patent plates in the chimney-stacks, to carry off the vitiated air from the rooms. These flues are trapped with valves to prevent down-draught.

The house is heated throughout by hot air, supplied by iron tubes from an apparatus in the basement, and so arranged that the temperature in any room may be regulated. This is of great consequence, and enables the house to be left uninhabited in the winter without danger of the furniture receiving injury from damp. The verandah was supplied and fixed by Messrs. McFarlane, of London.

The builder was Mr. C. N. Foster, of London, and the total cost of the house, including chimney-pieces and grates, was 4,850*l.*, exclusive of the architect's commission.



A RESIDENCE IN PENMANMADR, NORTH WALES.—MR. J. FOGHARTY, ARCHTCT.

THE LATE MR. A. D. GOUGH,
ARCHITECT.

ALEXANDER DICK GOUGH was born on the 3rd of November, 1804, and at the age of 19, after having travelled on the Continent, where he evinced a taste for the study of architecture, entered the office of the late Mr. Benjamin Wyatt as a pupil, and was subsequently entrusted by him with the superintendence of the erection of Apsley House, the Duke of York's Column, and other important works. After remaining with Mr. Wyatt as pupil and assistant for several years, he commenced practice in partnership with his fellow pupil, Mr. R. L. Roumieu, in the year 1836. Among the principal works carried out by them may be mentioned the Priory, Southampton, the seat of the late Lord Justice Knight Bruce; the Islington Literary and Scientific Institution; St. Peter's Church, Islington; St. Matthew's Church and Schools, Camberwell; the reconstruction of St. Stephen's Church, Islington, and the erection of schools and parsonage-house for the same. In the year 1848 the partnership was dissolved.

The following may be named as some of the principal public works carried out by the late Mr. Gough, after that event, viz.—St. Matthew's Church, Islington; St. Paul's Church, Schools, and Parsonage, Chatham; St. Mark's Church and Schools, Tollington Park; St. Jude's Church, Schools, and Parsonage, Midway Park; St. Philip's Church and Schools, Arlington-square; St. John's Church and Parsonage, Tunbridge Wells; St. John's Church, Marchington, Woodlands, Staffordshire; Christ Church, Ore, Sussex; St. Mary's Church, Horney-rise; St. Barnabas, Mission Church, Kennington; St. John the Evangelist Church, Hull; St. Saviour's Church, Camberwell; St. Anne's Church, Poole's Park; the Soldiers' Institute, Chatham; Industrial Schools, Cardington, Bedfordshire; and the building, enlarging, or restoration of other churches, schools, and parsonages, besides the erection of residential buildings, and the usual routine of his profession.

In the midst of an active career, extending over thirty-five years, Mr. Gough was suddenly seized with an illness occasioned by an internal injury, and after twenty-four hours' intense suffering, borne in the knowledge of approaching death, with the greatest patience and resignation, he passed calmly to his rest on the evening of the 8th inst., leaving a large circle of friends to mourn their loss.

His funeral took place on Wednesday, the 13th of September, when he was laid in the family grave in Highgate Cemetery.

We understand that the practice carried on for many years by the late Mr. Gough will in future be conducted by his sons, Messrs. Charles H. & Hugh E. Gough, of Whitehall, both of whom were for many years associated with him in his professional career.

THE INDUSTRIAL CLASSES ABROAD.

LAST year a series of carefully compiled tables, relative to the condition of the industrial classes in foreign countries, were published in the *Journal of the Society of Arts*. An inquiry of a more general and extended character has since been made in accordance with instructions given by the late Lord Clarendon to her Majesty's diplomatic and consular agents. The result has appeared in what is termed "Further Reports respecting the Condition of the Industrial Classes, and the Purchase-power of Money in Foreign Countries."

The first of the series which claims attention concerns the working-classes in Belgium. The workmen's dwellings are described as being better in the villages than in the towns, mainly on account of the difference in rent. It is in the narrow and unhealthy quarters in towns, where there is but little circulation of air, that entire families live, and this is observable generally in large towns. The workmen's homes in the country are healthy and well kept. The generally wear the blouse, week-days and holidays alike; it is the costume of the masses, as the cap is their usual head covering. Primary schools for young children and adults are not wanting, but scholars are wanting for the schools. The price of labour per day varies in the different employments in the country according to the season, and averages, in summer, for men, 2 francs 25 cents; for women, 1 franc; in winter, respectively, 1 franc 50 cents, and 80 cents. Glass-making is an immense branch of industry,

and has its headquarters in the environs of Charleroi.

In Germany, by the incorporation of the smaller German States with the North German Confederation, liberty has been granted for each native to settle and seek his livelihood in any part of Germany, so that there is an increasing change of journeymen in all branches of industry. So recently as 1862, every workman was bound to be a member of a guild, or "innung," before he could enter on a profession. By the new law this has been abolished, and every one is free to practise his particular trade without let or hindrance. We learn from Mr. Anseeley, our consular representative at Hamburg, that by many the moral position of the workman is considered not so high as when the protective system of guilds was in full operation in every trade, and that the freedom which they have obtained has been taken advantage of by them to the injury of their employers; and that those artisans who formerly competed for quality now look upon quantity as the only thing worthy of consideration and effort.

Throughout nearly the whole of Prussia, we are informed by Mr. Petre, artisans, journeymen, and apprentices work regularly in summer from 5 a.m. to 12, and from 1 p.m. to 7, and even later; and in winter, from daybreak, sometimes from 6 a.m. to 8 or 9 in the evening. The extreme length of the hours of daily labour is, indeed, one of the dark features of the condition of the working classes in Prussia, and generally throughout Germany. According to some researches made by Dr. Engle, the cost of food has been ascertained to absorb 62 per cent. of an annual income of between 300 and 400 thalers (45*l.* to 60*l.*), and when the income is double, 55 per cent. In incomes which fall as low as 33*l.*, this per-centage rises to 67 per cent., and in incomes of 26*l.* to 71 per cent. On the other hand, the outlay for lodgings generally falls in such cases from 12 per cent. to 8·3 per cent. and 9 per cent., and only exceptionally rises, preserving, on the whole, its fixed character.

The Saxon consumes more bread, but less meat, coffee, and sugar than the Englishman; at the same time that, as a married man, he abstains to a large extent from the favourite beverage of both countries, which is beer. The rent of Saxon dwellings is about 2s. 6d. weekly, for a working man with a wife and three children; for two rooms and a kitchen, from 6*l.* 15*s.* to 7*l.* 10*s.* per annum. The rooms in which working men live are usually healthy, and are chiefly in the upper stories.

SPITALFIELDS AND ST. BRIDE'S.

Sir,—With reference to your paragraphs in last week's *Builder*, headed "Spitalfields and St. Bride's," permit me to point out that the property in Spitalfields belonging to St. Bride's parish occupies a site in Fashion-street (formerly "Fosson-street"), nearly 280 ft. long, with a frontage of about 80 ft. to Brick-lane. It adjoins Spitalfields Churchyard, and comprises three houses in Brick-lane, a public-house at the corner of Fashion-street and Brick-lane, twelve houses in Fashion-street (two of them public-houses, and one a common lodging-house), and sixteen houses in Union-court and Union-place in the rear entered by two passages from Fashion-street. Several of the houses in Fashion-street are very old, and certainly ought to be pulled down. So beyond doubt should the hovels called Union-place, and the small cottages, the sheds, and similar erections in Union-court.

Looking at the character of the neighbourhood and its inhabitants, I submit that an opportunity now offers for effecting one of the best improvements made in the vicinity for many years past by clearing away all the old and dilapidated houses and buildings on the property in question, and placing thereon well and economically designed erections for letting in tenements. Large houses and warehouses are not needed, but tenements are, and this need is the want of the neighbourhood. Not only so, but the site is admirably suited for the purpose, as I look at the churchyard, with its avenue of plane-trees, some of the finest in London, as a permanent source of light and air extremely valuable in connection with this property. As an evidence of the want referred to, I venture to assert that nearly all the existing houses are let in tenements,—a separate family in almost every room,—and that in houses quite unfitted by structural arrangements for the purpose.

At the same time care must be taken to prevent the erection of nightly common lodging-

houses on the property. Spitalfields has enough of them, and to spare.

As a public officer, with over twenty years' thorough acquaintance and official association with Spitalfields, I beg, through you, to urge these views upon the consideration of those connected with the matter. A PUBLIC OFFICER.

BRATTON ST. MAUR, SOMERSET.

A MANSION is now in course of erection here for Mr. Charles Penruddocke, of Compton Park, Wilt. The architect is Mr. James Sopitt, of Shaftesbury; and the builders are Messrs. W. Clarke & Son, of Bratton.

The walls are built of "Forest marble," quarried on the spot, with Doubling stone dressings; the roofs are covered with Whitland Abbey green slates; and the interior joinery throughout is of red pine, varnished. The encaustic tile pavements are by the Poole Architectural Pottery Company; the parquet flooring by Messrs. Howard & Sons, Berners-street; and the cooking and warming apparatus by Mr. T. Richards, of Wincanton. "Claridge's Patent" Asphalt is used for protecting walls from damp adjoining the terrace garden.

The water supply is obtained from an ancient well at a considerable distance below the house, whence it is raised by one of Messrs. Warner & Son's double-action horse-power deep-well force-pumps, to a reservoir built on the highest point of the estate, whence water is laid on through galvanized iron pipes to all parts of the house.

The style adopted as a *point d'appui* by the architect is English Gothic of an early and simple type, modified where necessary to meet the requirements of modern society.

THE DRAINING OF THE TIBER.

Sir,—Observing that you have written an able article on this subject, it occurred to me that I might take the liberty of calling your attention to a curious old Latin volume (which I have in my library), published in the year 1580, containing, in addition to the letter-press, forty-nine plates, showing proposed new mills and bridges, and also a proposal to obviate the inundations of Rome, by diverting the course of the Tiber. As the plan there proposed seems to me not only feasible but in accordance with the views of the best engineers and architects of the present day, and as it is desirable that when they have drained the river, they should avail themselves of the opportunity to alter its course, and otherwise improve it, I think it well to call the attention of the public to the matter. I have made a translation (which accompanies this), and a copy of the original Latin. The engravings are executed by Caesar Titian, a nephew of the great painter of that name. It would be wise if the King of Italy were to renew the Roman era by doing the work as splendidly as those works which were executed by the Fabii, Paolo Emilio, and others, who in time of peace employed the Roman legions to execute the public works, and spare the public erarium, as well as avoid the soldiers becoming effeminate and unworthy of the name Roman. The military engineers in Italy are perfectly at home in the conduct of such works, and the soldiers could easily be induced to do what is required by a small increase in their daily pay.

F. O. BEGG, M.D.

Very frequently I reflected in my mind, and I have also asked the opinion of many friends, and yet I have not been able to understand the cause, or discover why the Roman princes,—who never feared the greatest expenses, either for the public good or for their private grandeur, and for the public comforts and ornaments of the city of Rome, although there has been always an abundance of clever architects, nevertheless,—have not been able to repress the impetuous inundations of the Tiber, which ever brought great dangers and excessive damages. There is no doubt to those who have read their history that formerly they effected what they undertook. Is it, then, no impossible to find means to check the impetuosity of the Tiber which so violently assails and desolates the city? Is there no money for such works? Certainly, at this time the Romans have not the riches they possessed when the Roman Empire was swaying every where, but assuredly there is enough and quite sufficient for these and other works necessary for the city. Are there no expert architects? Yet in our days many have spoken and written upon this subject, but, nevertheless, I cannot assent to their opinions. Amongst them some think of diverting the Tiber by the deep valley of Hell; others propose to carry off part of the river out of Rome above Monte Celio, which could hardly be done with the riches of Cæsar; and others propose to attempt with strong dams to repress the force of the river far above the city to divert its course. I am of the opinion of those who think that all this work can be done by carrying the river around the city at a moderate expense. To demonstrate

my assertion, first of all it is to know the causes of the foundations, of which there are two chief ones. The first is that the bed of the river is occupied by many edifices, and besides the public and private bridges which serve for the mills, many of them are massive, and greatly retard the flowing waters, preventing their free course. Here I wonder with what judgment those ancient architects dared to construct those bridges. They did not reflect that they were occupying the third part of the bed of the river with the piles; therefore, they should have at least widened the bed in proportion where they built the piles. But, to say nothing of the others, what shall I say of the bridge which is now called St. Mary, which fell lately by the memorable inundation that happened in the time of Clement VIII? No doubt that in olden time it had frequently fallen, and that it will fall again whenever it is rebuilt in the same manner. It being placed in the confluence of two currents caused by the upper island, it receives the other part of the current obliquely, which is a great over-abundance of water pressing against the piles; according to their extension, it must necessarily fall. The second cause is, that the river, with its three curves, prevents the waters flowing straightly to the sea, and these curves not only retard the waters, but cause the swelling to retrogress. Let any one say what he likes, I think that these evils should be remedied in the following manner. First of all, at the three curves three recilinear ditches ought to be made. The first is to begin from St. Andrea up to the right flank of Castello St. Angelo; the second, from Ponte Sisto up to Porta Portuense; the third, from about halfway of the road which leads from the city to the sea, as the third curve of the river occurs there. After that it is necessary to widen the bed of the river where the Farnesian Garden is up to the Colombari, and consequently to destroy all those houses which are erected on its banks from the Farnesian Garden up to Ponte Sisto, which occupy a great part of that bridge. Thirdly, to demolish all those stone bridges which are in use for the mills, and substitute for them wooden bridges (suspension bridges will be preferable). There are other things that I might say to the purpose, but I am loath to add more, as I am of opinion that things will remain as they are now. I have said enough to satisfy my own opinion, and to administer a subject of discussion to those who delight in such speculative subjects.*

LEEDS SANITARY EXHIBITION.

THE proposed exhibition of sanitary and domestic appliances and contrivances in connexion with the Social Science Congress at Leeds is just now causing some little interest among manufacturers and dealers in all kinds of apparatus and things relating to the advancement of the public health.

The applications for space have been numerous, and as the trustees of the Old Cloth Hall have very kindly placed at the service of the Association their large and commodious hall, there will be no scarcity of room for the proper display of the articles sent. Specimens, models, drawings and plans, samples of food, drinks, and scientific appliances conducive to the health of the community at large, will find a place.

THE NORTHERN CRYSTAL PALACE.

A WELL-WRITTEN pamphlet, by Mr. Francis Roubiliac Conder, C.E., on the "Alexandra Palace and Park,"† draws attention to its importance to at least one-tenth of the population of the whole country, as a means of cheerful recreation and amusement, with the view of urging, from much higher motives than any merely pecuniary one, how desirable it is that the Northern Crystal Palace of the metropolis should be completed and fairly set agoing, for the advantage of the people, not only of the metropolis but of many neighbouring and other country towns.

With right feeling and thoughtful foresight, Mr. Conder discourses on the sad circumstance (to which allusions have for long been occasionally brought to mind in our columns) that the extremes of wealth and poverty in this country are becoming greater and greater, and the isolation of these extremes, with some few distinguished individual exceptions, more and more complete; that a deep-seated and terrible dissatisfaction with regard to these extremes is firmly established in the minds of the multitude of the workers throughout the country; that a revolution such as has never yet taken place upon the face of the earth,—of which even that of the Communists in Paris was but a mild specimen,—is threatened, whereby the very foundations of society,—of social and individual independence,—are placed at stake; and that it behoves all who have the social welfare at heart to do everything in their power to strengthen these foundations, and to paralyse the impracticable theories of dreamers who think to sink the natural selfishhood of mankind into the common good by natural means and progress alone; while, in truth, their communistic ideas are just the climax of the selfish-

principle itself, involving a thievish desire to seize from others what they possess, and to appropriate and divide it all into a few perishing morsels for themselves: a strange and futile attempt to transform the selfish principle of nature into the Christian principle of self-denial, and not at all like the community of the disciples of the true Lord and Master of life.

We are glad to hear that the tontine scheme as to the Alexandra Palace for the people is making hopeful progress.

BUILDINGS FOR MUSIC.

SIR,—A short time since I noticed various contributions in the *Builder* towards finding fixed laws for the proper construction of buildings devoted to music, lectures, &c. One of your correspondents seemed to think that a series of experiments was desirable in order to discover these laws. With the view of helping in this direction, I beg leave to send you the result of an experiment which I lately made in an empty room.

I tried singing in various parts of it, and always found that on approaching the walls, the difficulty of singing was increased, and the melody diminished. In approaching close to the walls the sounds of the voice would hardly flow out,—they seemed to be forced back; and this I attributed to the extra force of the reflected air-waves, owing to the proximity of the reflecting surface, and came to the conclusion that the proper position of the sound-producer should be in the centre of the room, so that the air-waves might be reflected with a similar velocity, and in similar directions. This would make the flow of sounds even, and one wave would not be driven for want of room across another. It would not, perhaps, be too much to assert that a spherical shape would be the best for an auditorium with the sound-producer in the centre making some allowance for the extra weight of the air in the lower part of the said sphere. But as this would be inconvenient, it could be modified, using a half sphere for the shape of the room, or raising the sound-producer somewhat nearer than is usual to the actual centre of the enclosed space, so that all the air-waves should be reflected, and meet together again in equal times and spaces. This would be treating the air as its nature requires, and the result would be, I think, satisfactory.

G. F. HUTCHINS, Architect.

MONUMENT TO THE LATE DUCHESS OF SUTHERLAND.

A MONUMENT has been placed in Trentham Church, to the memory of the late Duchess of Sutherland. Mr. Noble was the sculptor. The figure rests between Life and Death in its full length, on the tomb as its last bed. The monument is placed at the east end of the south aisle, and the light of a south window falls on the countenance of the figure on the tomb beneath. The floor is laid with encaustic tiles, bearing the arms of the Trentham family and the cipher of the deceased.

The inscription was written by Mr. Gladstone. It runs thus:—

"Henriette Duchess de Sutherland
Fido marmore descripta edifies
Ejus carissima imago
Nasqum non videtur inter suos morari
Quippe que et malum et a multis amaret
Haud scias an non magis ipsa amaverit
Egregia mentis et formæ dotibus
Gusta soror uxoris mater parentis
absolutissima
Habit inasper e cordis benevolentia
Quod in amicis large dimanaret
Dulcedinem et deliciarum omnia
Quæ fuit datum est hominibus
Illi carere diutius habet
Nil quod rarius circa se diffunderet
Sub extremum vite spatium
Etiam in doloribus appetita
Nasqum medicorum se prebuit
Denique Dei Opt. Max. consilium liberit amplecti
Et usque ad finem suum molitur lætissima
Tranquille in Christo obdormivit
Londini xxvi. die Octobris
Anno Redemptionis mcccclxviii."

It has been thus translated:—

"The faithful effigy, in marble, of Harriet, Duchess of Sutherland. Her beloved image will ever seem to linger amongst her own, as of one who, much loved and by many, loved perhaps yet more in return. Eminent in gifts of mind and person, and as daughter, sister, wife, mother, kinswoman, most perfect—she possessed furthermore, in the wealth of her heart, an abundant store for her friends. Whatever of sweetness and delight is given to mortals to enjoy she was permitted long to taste, and had the rare faculty of spreading it around her. During the latest period of her life, tried she was, as she proved ever equal to herself. At length, embracing freely the

purposes of God, and to the last most tender, but not weak, she calmly fell asleep in Christ, in London, on the 27th of October, A.D. 1868."

On the panels on either side of this inscription are the texts:—"I am the resurrection and the life, saith the Lord: he that believeth in me, though he were dead, yet shall he live, and whosoever liveth and believeth in me shall never die." "I heard a voice from heaven, saying unto me, Write: blessed are the dead which die in the Lord, saith the Spirit; yea, that they may rest from their labours." "He will swallow up death in victory, and the Lord God shall wipe away tears from off all faces." "And there shall be no more death, neither sorrow nor crying, neither shall there be any more pain; and sorrow and sighing shall flee away." On the upper moldings of the tomb occur the words, "When the ear heard her then it blessed her," and "He giveth his beloved sleep."

At the head of the tomb we read,—
"In te misericordia in te pietas
In te beneficentia in te adans
Quantunque in creatura è di bontade;"
and at the base, "In memoriam matris," the following:—

"This monument to the beloved memory of Harriet, Duchess of Sutherland, wife of George Granville, 2nd Duke of Sutherland, is erected, in the church which she rebuilt, as a loving tribute to her spotless life. A.D. mcccclxviii."

THE SCHOOL REQUIREMENTS OF LIVERPOOL.

THE local statistical sub-committee have submitted a report on the school accommodation and requirements of the borough, supplemental to that already made, and explanative of differences of statistics with those of the census. This report gives the following statistics:—

	Accommodation for
Existing public elementary schools	66,865
Schools intending to become elementary	5,908
New public schools in course of erection	5,049
Non-inspected elementary schools	3,622
Industrial schools	3,740
Private schools	1,561
	8,913
Balance to be provided for	76,436
	26,595
	102,021

Although accommodation for 76,436 children is already provided for throughout the town, the average attendance is said to be only 40,895. The report was adopted.

FACTORIES AND WORKSHOPS.

A BLUE-BOOK has been issued, compiled by the inspectors of factories, showing, county by county, the number of factories and manufacturing establishments coming under the supervision of the inspectors of factories by the Factory Acts 1833 to 1867, and also (so far as could be ascertained) the workshops under the Workshops Regulation Act of 1867. The information was chiefly collected in the last two months of the year 1870; and the former part of the return may be considered as nearly as possible accurate, the information having been supplied by nearly every manufacturer in the United Kingdom; but the statistics of workshops are in many places only partial. The returns show, county by county, the nature of the manufacture, the amount of machinery, the moving power, and the number and class of persons employed. The returns for England and Wales give an account of 97,074 works, employing 2,006,978 persons,—viz., 1,364,713 males and 642,265 females; 54,853 boys and 43,878 girls employed are under 13 years of age. Of the whole number of persons employed 573,521 are in Lancashire and 414,709 in Yorkshire. The returns for Scotland show 30,139 works, employing 409,921 persons,—viz., 264,507 males and 145,414 females; 3,566 boys and 3,418 girls are under 13. 144,498 of the whole number are employed in the county of Lanark. The returns for Ireland show 3,129 works, employing 123,890 persons,—viz., 65,009 males and 58,881 females; 766 boys and 1,399 girls are under 13. 49,905 of the persons employed are in Antrim. There are separate returns of the occupations carried on in large towns, in manufacturing establishments in which the hours of work are regulated by an Act of Parliament. The number of persons employed in such establishments in the city of Glasgow is 114,864,—viz., 76,054 males and 38,810 females; in the borough of Manchester, 45,433 males and 27,807 females; and in the

* Translated from "Machiem Novæ Fanstî Verantî Sיעי."† Spottiswoode & Co., Printers, New-street-square.

borough of Salford, 13,310 males and 9,997 females; in Leeds, 37,628 males and 14,904 females; in Sheffield 40,306 males and 5,586 females; in Bradford, 24,212 males and 18,700 females; in Dundee, 15,700 males and 21,610 females. The returns fill 275 folio pages. It may be well to explain that the term "workshop," as used in the Workshop Act, does not include every place of work, but only those in which children, young persons, or women are employed in manual labour in the way of trade or for gain in making any article or finishing or otherwise adapting it for sale.

THE SEWAGE QUESTION.

Brentwood.—It seems that a considerable portion of the sewage of Brentwood is conveyed daily to Mr. Preston's farm at Harold Wood by the main outfall sewer, which is said to be now in working order, although, as may be remembered, there was lately a serious sinking in the line of large drain-pipes there. The inverted iron syphon has been proved, it is said, by gauging, to discharge the quantity estimated by Messrs. Russ & Minns, the engineers, who have carried out the work, and the velocity at which the sewage travels through it may be judged by the fact that upwards of 1,000 gallons per minute are discharged by it at the highest point, while at the lower levels the quantity is considerably in excess of this amount. There are altogether about 85 acres of land laid out for cultivation by irrigation; many acres have already been irrigated; and appearances are said to warrant the conclusion that the problem of conveying the sewage of Brentwood and distributing it upon land suitable for its reception is satisfactorily solved. It is anticipated that the entire main drainage works will be completed in less than a month from the present time.

Kingston.—Windsor and Kingston-upon-Thames have received formal notices, as we have already noted, that they must discontinue the discharge of noxious matter into the river. The sewage question there is likely therefore ere long to have the careful consideration of the local authorities of these two places. Mr. Danscombe, the borough surveyor, at Kingston, is, we understand, preparing a scheme for utilising the sewage of the district over which he has charge. His idea is to group with Kingston some of the outlying villages, the sewage of the whole to flow into a large reservoir, from which the liquid and a certain proportion of rainfall shall be pumped and carried over land laid out for irrigation. The effluent water, which should, of course, be thoroughly purified, would fall into the Thames. The irrigation scheme adopted at Croydon is said to have fully realised the expectations of its promoters, the land over which the liquid is conveyed yielding unusually large crops; and that the system is not injurious to health is believed from the fact that villas within one-eighth of a mile from the Beddington Irrigation Fields are let at from 60l. to 70l. a year each.

Bradford.—The question how sewage can be best purified and utilised has long engaged the attention of the Bradford Corporation. The adoption of Goux's system of earth closets, it is thought, will tend to diminish the foulness of the sewers, and, if successful in working, form an important aid to the efforts of the Corporation in the direction of purification. After mature consideration and full discussion, a sub-committee of the local Finance and General Purposes Committee has decided that it is desirable to make arrangements with the Peat Engineering and Sewage Filtration Company, subject to satisfactory terms being agreed to on their part, for the purification of the Bradford sewage. The engineer and the manager of the company, which has its headquarters at Liverpool, stated to the committee that they had examined land of the Corporation on which the sewage would have to be defecated, and were satisfied that there would be no difficulty in treating the sewage so as to discharge the effluent waters colourless and odorless. The company proposes to purify 6,000,000 gallons of sewage daily; and, as liberal terms were offered to the Corporation, the company was requested to prepare plans and estimates, with a view to obtaining plans for the necessary works. The plans were to be submitted shortly; and, when approved, the scheme will be put into practical effect as soon as possible.

COMPETITIONS.

The Halifax Infirmary.—A special Board meeting of the governors of the Halifax Infirmary has been held at that Institution, for the purpose of receiving and deciding upon the report of the quarterly board as to the best mode of giving effect to Sir F. Crossley's offer, and as to the plans procured, with a view of utilising the site for the new Infirmary. The chairman, Mr. John Crossley, said they would all be aware that plans had been advertised for, and that the award of the quarterly board had been given, the one selected being that of Mr. Bakewell, of Leeds. Twice, however, that week, a meeting had been called; but upon both occasions they had failed to obtain a quorum, and there seemed no alternative but to adjourn the meeting until more of the members of the quarterly board were at home. The mayor said there were ten gentlemen present, but only three were members of the quarterly board. The meeting was adjourned for a month.

The Dundee Town House.—The council have received the report of Messrs. Clarke & Bell, architects, Glasgow, regarding the competitive plans of the new Town-house Buildings. The plans, sixteen in number, were all sent to Glasgow, with the printed instructions issued by the council as to what accommodation in the new buildings was wanted. The report said:—

"In accordance with instructions contained in your letters of the 14th and 16th of August, we have carefully examined the plans submitted to us, and in our opinion the premiums ought to be awarded as follows, viz:—

First, to the design signed 'Esperanza.'
Second, " " " 'Prudentia.'
Third, " " " 'Ea Avant.'
In coming to this decision it may not be out of place to say that all the designs are susceptible of improvement, and although upon the whole 'Esperanza' approached nearest to the instructions and the probable wants of the Corporation, we could not recommend his plan to be carried out without alteration."

The report pointed out certain defects in the design.

The letters were then opened by the clerk, when it was found that the plan signed "Esperanza" was prepared by Mr. David Mackenzie, Dundee; "Prudentia," by Mr. MacLaren; and "Ea Avant," by Mr. George Shaw Aitken, Dundee. They accordingly resolved that the premiums offered of 50l., 30l., and 20l. respectively should be awarded to those gentlemen. It was also agreed to request Mr. Mackenzie to report upon the suggestions of Messrs. Clarke & Bell, and to furnish an estimate of the cost of the buildings.

THE FREAKS OF THE FUNGI.

SIR.—Although the *Builder* has repeatedly furnished information on this topic, it would seem that the knowledge will again and again be sought by those who wish to do without professional aid, or who have ignored it originally. Let that class of persons be informed plainly and unmistakably that bad construction and bad materials are the chief causes of dry-rot in timber. Unseasoned wood, timber in which the sap is retained, will, when put into situations having no access of air, generally exhibit the fungi known as dry-rot. Ground-floor joists and flooring, skirting, plugging, and even joists raised on dwarf walls, will be liable to dry-rot if under-ventilation is not provided. If sea-sand, sea-water, or saline substances get into the composition of the mortar or brick, this, where there is a want of ventilation, will produce dry-rot. Many of our brick clays, particularly those near the sea-coast, are strongly impregnated with salts or saline matter, and brick clays of this nature should be turned up and exposed to the action of the winter months, to prepare them for fitting use in brick manufacture. If it be in a ground floor the dry-rot is discovered, a very good remedy is to excavate the earth for some depth beneath, and fill with foundry-ashes (but not house-ashes); if these cannot be had, quicklime will be a good substitute.

The fungi sometimes present a yellow colour; on other occasions, a white mould will be spread about by a plant like a sea-weed, or, as some say, a vine, in shape. If dry-rot shows itself in a damp closet or pantry, the inside of the china or delf lying there will be coated perhaps with a mould, or a fine powder like brickdust.

Several anti-dry-rot solutions have been recommended during the last quarter of a century, of more or less efficacy; but none of them have turned out completely satisfactory. Unless the timber previously, or at the time of putting

into use, be treated with these solutions, it can never be properly done afterwards. The timber, of course, should be seasoned before subjecting it to any of these processes; a solution of chloride of zinc or a solution of bi-chloride of mercury forced into the pores of the wood by the air-pump. This latter is the well-known and, at one time, much-used method of "Kyanising," called after its introducer. Creosoted timber is now much used for railway and tramway sleepers, and in other situations; but it is out of place for church or open timber roofs and varnished work. It is a grave question, too, if it is not highly injurious to the lasting qualities and tenacity of the wood, as well as those other solutions spoken of. In timber exposed to the action of water, or buried in the earth, something may be said in its favour.

Indeed, the freaks of the fungi are so numerous and so variable, that they resemble the whims of some of our churchwardens, who would rather pray for the cure than pay for the prevention of the disease.
A CHURCH BUILDER.

THE NEW SEAMEN'S ORPHAN INSTITUTION, LIVERPOOL.

THE designs of this edifice, the chief stone of which has just been laid, have been prepared by Mr. Alfred Waterhouse, and are to be carried out by Messrs. Haigh & Co. A façade nearly 300 ft. in length will be so situated as to present an oblique perspective from West Derby-road, the building itself facing about south-west. The elevation will be varied in outline, and, indeed, the architectural effect will depend more upon its grouping than upon elaboration of details. At the southern extremity of this principal façade, and standing in advance of the rest of the building, will rise a tower, 25 ft. square, and about 120 ft. in height. Towards the centre of this front will be the next most prominent feature in the elevation—the block containing the dining-hall, the principal apartment in the building. The roof of this block is to be taken to a greater height than the adjoining roofs, and, to resist the thrust of the principals, buttresses will project between the windows. These windows are to be over 16 ft. in height, and divided into three lights, both in width and height, the head of each light being trefoiled. The materials to be used are grey bricks with red Runcorn stone dressings. Over the window-heads, which are generally square, there will be relieving arches in red bricks, and at the eaves of the roof a cornice of the same material. The roofs will be covered with slates. The building will be generally four stories in height, and consist, roughly speaking, of a main block running parallel with the road, and at either end a wing at right angles with the main block. The basement floor, which will be level with the surrounding grounds, will contain in the northern wing a covered play-ground for boys, about 90 ft. by 30 ft.; in the south wing, a similar play-ground for girls, and the laundry department; and in the central block, the kitchen and other useful offices; a swimming-bath, and a boys' workshop of about the same dimensions as their play-grounds. The main floor is to contain the dining-hall, 70 ft. by 36 ft. by 30 ft. high; two school-rooms for boys over their play-ground and workshop respectively. A similar school-room for girls, and the necessary accommodation for the administrative department are to be provided. The first and second floors are mainly appropriated to dormitories; there being four dormitories for boys and two for girls, each dormitory being capable of accommodating fifty children. Thus accommodation will be provided for 200 boys and 100 girls. The building will be warmed throughout by the hot-water system of Messrs. Hayden, of Trowbridge.

The estimated cost of the building and furniture is 27,000l. The corporation gave the site, a plot of 7,000 yards on the boundaries of Newsham Park.

NO. 36, LATE 118, SAINT MARTIN'S-LANE.

OBSERVING in the *Builder* of September 16th that you notice the change of site of the Provident Institution Savings Bank to other premises in the same locality, I take the liberty of calling your attention to my notice, in the front page of the same number of the *Builder*, as to the removal of a "London landmark," not only from the fact of the premises I have parted with to the Provident Institution having been in the glass trade for a century and a half, and since 1746

occupied by my great-grandfather, grandfather, father, and myself, in succession, but from the associations connected with such occupation.

In Walpole's "Anecdotes of Painting," article "Peter Oliver," vol. ii., pp. 29, 30, he mentions my great-grandfather (Palmer) as purchasing parcels of painted glass (till then a rarity) from one Asciolto, an Italian, who brought them from Flanders (1753); and again, in a letter to Sir Horace Mann (1754), Walpole relates an amusing anecdote of a visit he paid to St. Martin's-lane, when he called to settle with my great-grandfather for the painted glass he supplied to Strawberry Hill. I have heard my late father speak of visits paid on business by Sir Thomas Lawrence, Jackson, and G. Morland; and during the present century (as connected with metropolitan and other improvements) we had frequent communications with Sir John Soane, Sir B. Smirke, Mr. Nash, and others, down to the latest of the Classical school, Sir J. Pennethorne.

PHILIP PALMER.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—The critical position of the strike at Newcastle for the nine hours has created considerable uneasiness amongst the London society engineers, and it has been generally reported through the London shops that, disheartened by the daily arrival of so many skilled mechanics from the Continent, a considerable number of the non-society men who have been on strike had returned to work upon the old terms, being induced to take this step, not from want of present support, but from the knowledge that should the struggle result in favour of the masters, and the strike be declared at an end by the committee, they would be left to their own resources without employment, while the society men would continue to receive their weekly donation money from the fund of the society until they obtained employment in their old shops or elsewhere. The committees, both in London and Newcastle, are using every effort to counteract this feeling, and state that the number of old hands who have returned to work are so few as not to be likely to have any appreciable effect upon the result of the strike. They admit, however, that great danger exists from the number of foreign workmen daily arriving, and that the strike will be a failure unless this immigration can be stopped. Under these circumstances, several of the leaders are considering the propriety of offering a compromise, and a suggestion made by Mr. George Potter, that while the masters should concede the nine hours, the men should give up half an hour per day in wages, has been received with much favour as an honourable way of settling the dispute. Another element of discussion has also arisen. As a body, the Engineers' Society are strongly opposed to political feeling being mixed up with their trade disputes, and the proposal of some of the political leaders to hold a demonstration in Trafalgar-square in support of the strike has been violently opposed in the committee, and given rise to stormy discussions, in which much personal feeling has been indulged in. The committee refused to find the money to pay the expenses of the meeting.

At a meeting of the Labour Representation League, the following resolution was carried:—

"That in the opinion of this meeting the conduct of the Newcastle employers in introducing foreign labour for the purpose of defeating their workpeople in their present struggle for the nine hours, is fraught with national danger, inasmuch as it tends to denationalise English workmen by driving the flower of our artisans into emigration; and this meeting denounces such conduct as a dangerous political precedent, giving countenance to the importation of foreign mercenaries for political and social purposes, which has been so severely denounced by the press and middle class during the last few years."

The joiners' strike in Newcastle for the nine hours movement is not yet at an end, as has been reported. Sixty-seven employers conceded the demand of the men, but thirty-two refused. The master house-builders who have conceded the nine hours to their men, have held a meeting in the Neville hotel. They met to hold an interview with the Master Builders' Association, working on the ten hours, and the men on strike. The members of the Master Builders' Association did not attend, however. The meeting was held in compliance with a resolution come to at a preliminary meeting held in Gateshead, viz., "that the master builders who have conceded the nine hours endeavour to ascertain from the secretary of the Masters' Association the names of the whole of the masters who are working on the old terms, and the number of

men employed by each, and those who are working fifty hours per week, men receiving 28s. per week, only to be counted; and if the majority of the men working are on the old terms, we agree to give our men notice to return to the old terms." At the meeting it was found that there were 376 working for the nine hours, and 266 for the ten hours. It was thereupon resolved that there was a necessity in favour of shortening of the hours of labour and their adherence to it; and the chairman, in putting the resolution to the meeting, said he believed they would all agree with him that the nine-hours masters had succeeded in getting the best workmen, and could do the work as cheaply as the ten-hours masters.

Leeds.—The marble masons and polishers employed by Messrs. Welch, of Goodhouse-lane, having applied for a reduction of the hours of labour from 58½ to 56 per week, have been met by their masters with a lock-out, their money having been paid with the intimation that their services would no longer be required. Some of the other masters in the town have agreed to the reduction. The plumbers are about to ask for an increase.

Glasgow.—At a meeting of the Clyde Engineers' Association, held at Glasgow, it was resolved, taking into consideration that the carpenters' strike continued in the Glasgow district, notwithstanding the advance of wages offered at Greenock and other places at which they work, that a lock-out of all the carpenters of the Clyde should take place, unless the strike was brought to an end.—There is just now a disposition among engineers here to strike for a ten-hours day, with which (instead of the present long stretches of fourteen and twenty-one hours a day, several times weekly) they would be well satisfied. It so happens that the trade, as connected with shipbuilding, is extremely good at present, and in several establishments the men must work till ten p.m., or all night frequently. Against this excessive overtime there is a feeling arising. Taking into consideration the number idle at Newcastle, and the number over-employed here, the state of matters looks anomalous; and the employment of the strike men by the Clyde firms would settle matters in both places in the meantime. In connexion with the extensive works of Randolph, Elder, & Co., there is another grievance afloat the overtime question. If one of their workers is behind time,—although only fifteen minutes,—in the morning, and "the shop" works late that night, the latter hand loses all extra time and allowances for overtime, besides his late time in the morning. That is, suppose a man works from 6 a.m. till 10 p.m., he is paid fifteen hours and 6d. for "allowance;" but should he only work from 10 a.m. till 10 p.m., he is only paid eleven hours and no "allowance," so that for being late three hours he loses four hours and 6d. Against this rule a number of the men employed in the works at Centre-street struck, leaving the shop at six o'clock in a body; and unless some alteration is made a general strike is regarded as by no means unlikely.

Brussels.—The employers have accepted the compromise proposed by the engineers—ten hours' work, with an additional 50 per cent. pay for labour beyond that time. The men have everywhere resumed work.

Berlin.—The masons' strike having ended with the defeat of the men, and a strike of the pianoforte-makers with the almost immediate submission of the masters, a very confused struggle in the cabinet-makers' trade now occupies public attention. The cabinet-makers' trade is the most extensive in Berlin, except that of the engineers. The Berlin cabinet-makers work for the whole north of Germany, and, to a large extent, even for exportation to Poland and Russia. Their secret is extreme cheapness, brought about by division of labour, carried to its utmost limit. They work chiefly in oak, in mahogany, in birchwood, and in pine. In walnut and in rosewood they have not been able to get the mastery of the other German cities. The workshops are generally not large, yet a great many of them employ steam machinery. The work is all paid for by the piece, the same man being always engaged on the same article. Wages, measured by time, vary greatly; for very many articles they are decidedly low. The masters have adopted a quite different proceeding from those in other trades to meet the strike. They are availing themselves of a provision of the law, treating of the contract between master and man, for compelling the men to complete the work,—so many dozens of chairs, &c.,—which they had consented to do. The law provides

that the working man who refuses to do what he has undertaken to do, either by oral or written contract, may be imprisoned for a fortnight. The provision of the law has now been put to the test in a series of cases by the masters, and has been found to answer their purpose. Yet it has become too too evident that the odious nature of this compulsion to work has added to the bitterness of feeling between the two parties.

ERECTION OF A LARGE MILL.

In Brighouse, last week, the foundation stone of what is to be one of the largest mills in Brighouse was laid by Mr. George Hepworth, architect, by whom the plans and specifications have been drawn. No little interest was added to the occasion from the fact that Mr. Hepworth that day was seventy-three years of age, and appeared hale and hearty. Further to mark the event, he was presented with a handsome silver trowel, the inscription on which stated that it was presented as a mark of esteem on reaching a good old age. Mr. Hepworth, in reply, remarked that it was an uncommon and novel duty which fell to his lot that day, being entrusted with the privilege of laying the foundation-stone of another of those hives of industry which had added so much to the prosperity of Brighouse, in which he had lived exactly seventy-three years that day. He was much pleased and gratified with the mark of respect which had been shown him, and however many years might yet be added to his life, he should bear a grateful remembrance of that day's event. With respect to the building just commenced, he trusted it would be completed without accident to any, and that its erection would be creditable alike to himself and to the contractors, prove a source of wealth to the proprietors, and afford a comfortable livelihood to all who should be employed therein. The mill, which is the property of Messrs. Ormerod Brothers & Cheetham, silk-spinners, will be 168 ft. long, 53 ft. wide, and six stories high. It will contain upwards of 5,000 yards of flooring. The chimney will be 51 yards high. Altogether the contract is the largest ever let at one time in Brighouse. The following are the contractors:—Mr. Jas. Dyson, mason work; Mr. Thos. Bottomley, carpenter and joiner; Mr. C. H. Broughton, ironfounder; Mr. D. Smithies, slater; Mr. J. Shaw, plumber and glazier; Messrs. Hirst & Barraclough, painters; Mr. Joseph Wood, plasterer.

THE MONT CENIS TUNNEL.

A CORRESPONDENT of the *Journal des Débits* thus describes this newly-inaugurated and remarkable triumph of engineering and geological science:—

What engineer did not smile incredulously, fifteen years ago, when it was proposed to pierce the Alps, to cut through from side to side of a mountainous mass of nearly 3,000 metres in height, and more than 12,000 metres in thickness? What a dream! Where will you find air for the workmen 2,000 metres under earth? How will you break the rock for such a length? Half a century would not suffice; and if the work of piercing is begun at both ends, how is there any certainty of meeting? Would not the workmen soon get astray amongst those masses of lime and quartz? Objections of all kinds were not wanting. To-day the dream has become a reality. The mountain is perforated, and it has only required thirteen years to finish this unparalleled task. The tunnel, begun at the end of 1857, is absolutely finished, and ready for use. But what progress has been made in the art of mining during ten years! By the ordinary means of piercing in a rock of average hardness, an advance of 17 metres per month is all that is reckoned on. With the method employed in the Alps, they reached the rate of 70 to 75 metres. The force of the miner has been more than quadrupled. In 1858, 250 metres of the tunnel were excavated; in 1870, 889 metres. The piercing of mountains, yesterday considered almost impossible, has now become mere child's play for the engineer. With the modern appliances, with skilled and experienced workmen, he can excavate the calcareous rock his two kilometres a year. Henceforward it is only a question of time and money. The technical problem is solved.

After a long survey of the mountain, it was decided that the most favourable spot and the most direct line for the perforation was from

Fourneaux, Savoy, to Bardonnèche, Italy. The cutting at the shortest is from N. 22 deg. W. to E. 22 deg. E., and traverses the body of Mont Cenis, and passes near Mont Cenis, which is situated to the north. The title of the Mont Cenis tunnel has never been correct. The St. Michel railway has been prolonged as far as the tunnel. The Fell Railway, the new line follows the valley de l'Aro. The slopes have been modified by the aid of embankments, and the curves by the use of some underground passages. It was necessary to carry the line on far beyond Fourneaux, and to bring it back upon itself, the length of the mountain making it describe a curve to get over the great difference of level between the valley and the entrance to the tunnel. The station of Modena will be on the shore of the torrent de l'Aro, at 100 mètres from the arch of the tunnel. The travellers can therefore contemplate at leisure the passage (of about eight miles, he remembered) through which they were to traverse the heart of the mountain while they are describing this curve. On the Italian side the junction is complete. The old railway from Turin to Susa has been prolonged to the entrance of the tunnel at Bardonnèche.

The substance of the rock was perforated at a thickness of 12,233 mètres. The entrance of the gallery is, on the French side, 1,202 mètres above the level of the sea, and on the Italian, 1,334 mètres. There is, consequently, between the two extremities of the subterranean passage a difference of 132 mètres level, which has been adjusted by a corresponding slope. The profile of the mountain as described, on leaving Bardonnèche, by a curve at first slightly raised, which is raised only to a distance of 4,000 mètres from the entrance. At that point it is sharply raised, and rises almost vertically to a height of 2,969 mètres above the sea. This is the culminating point. It does not correspond with the centre of the tunnel, but is some hundred mètres nearer the French side. The curve then slopes down rapidly to Modena, and terminates almost perpendicularly at Fourneaux. Such is the sketch that would be obtained by cutting the Alps according to the axis of the gallery. The rock entering the passage is varied in its character. The opinions of the geologists have been examined at all points as to the composition of the mountain, and there is much to excite wonder and admiration in the exactness with which science has shown the thickness of the different strata that the engineers have had to perforate in the mountain. It was calculated that there were 8,000 mètres of schistose and limestone on the Italian slope, and in reality they found 8,000 of some hundred odd mètres of limestone. Further on, in exact conformity with the calculations, they came across 356 mètres of compact limestone, then 388 mètres of quartz, and 2,096 mètres of anthracite, on the French slope. A further prediction could not have been made had the mountain been transparent, and it is altogether a great triumph for the geologists. We early gave particulars of this remarkable tunnel from personal examination.

CUMBERLAND AND WESTMORELAND ANTIQUARIAN AND ARCHÆOLOGICAL SOCIETY.

A MEETING of the members of this society, in conjunction with the Durham and Northumberland and Archaeological Society, took place last week at Kirby Stephen. About noon the members of both societies assembled at the railway station, and proceeded in conveyances to Wharton Hall. Afterwards, after thoroughly examining the hall, one of the visitors returned to Kirby Stephen, whilst others went to visit the ruins at Penrith, on the banks of the River Eden, where tradition tells us the father of King Arthur died. The members and their friends met at Kirby Stephen Church, which is now undergoing restoration. A paper, touching the history of the building, was read by the Rev. J. F. Hodgson, of Staindrop. From Kirby Stephen members proceeded to the ancient castle of Brough, formerly one of the seats of the Viponts. On the inspection of Brough Castle and the ruins the visiting for the day ended, and the party returned to Kirby Stephen. It was the opinion of Mr. and Mrs. Simpson to entertain the members of both societies at a *soirée* to be held in a marquee which had been erected for the purpose; but owing to the serious illness of Mr. Simpson, the intention had to be abandoned.

In the evening, however, the members met at dinner, at the King's Arms Hotel. Mr. Mason, of Kirby Stephen, presided. Next day the members of the societies left Kirby Stephen for Appleby. On reaching the town, they proceeded to the church, and under the guidance of Archdeacon Bontflower, examined closely the objects of interest in and around it. From the church they proceeded to Appleby Castle, the residence of Admiral Elliott, who received the visitors with the utmost courtesy. Previous to examining the interior of the tower, the Rev. C. F. Weston read a portion of a pamphlet upon Appleby Castle, prepared a few years ago by the Rev. J. Simpson, who was unable to leave Kirby Stephen, owing to the death of Mrs. Simpson. The members returned to the King's Head Hotel, where luncheon was provided for them. After luncheon they left Appleby in conveyances for Brougham Castle, Yanwath Hall, and Penrith, for the purpose of inspecting the interesting prehistoric remains in the immediate neighbourhood of these places.

THE NEW BUILDING OF THE BRADFORD MECHANICS' INSTITUTE.

A LARGE portion of the ground floor of the newly-erected building is occupied by shops, which, in fact, take up the whole of the three open sides on that floor with the exception of the space occupied by the entrances. Of these there are three; the grand entrance in the Bowling-green, and two others, of equal importance so far as their external appearance and size are concerned: one of them opening into Tyrryl-street, and the other into New Market-street. A wide corridor runs through the building from the Market-street to the Tyrryl-street entrance, and access to this corridor can also be gained from the grand entrance. The general arrangement of the building is this: the section which is on the inner side of this central corridor is chiefly devoted to the lecture-hall, while the other portion, parallel with the Bowling-green, is arranged for class-rooms, news-room, and library. The great difficulty with which the architects have had to contend in contriving the internal arrangements has been to provide a sufficiently commodious lecture-hall.

The new lecture-hall is considerably larger than the lecture-hall of the present Institute, being especially of much greater height. A spacious platform is placed against the party-wall which divides the Institute building from the pile of shops and offices next to it. The wall at the back of this platform is relieved by four pilasters, supporting an ornamental cornice. The platform, which is rather more elevated than is usually the case in such halls, contains a well, into which a pianoforte can be lowered. Immediately in front of it is a level space which will be known as the area of the hall. It will be seated with stalls constructed in the same way as what are known as the balcony-stalls at the Royal Albert Hall, and at more than one of the London theatres: the seats lifting up so as to enable persons to pass to seats in the middle of a row without real inconvenience to anybody. It is expected that this area will seat about 360 persons. Behind it are some tiers of seats rising one above another to a considerable height; so high, indeed, that access to them is gained from the second-floor corridor. This part of the auditorium will be known as the balcony. Above it again is the gallery, which goes round the three sides of the apartment, much as the gallery of a chapel. It is of great size, being constructed to accommodate 600 persons. The front of the gallery is being ornamented with relief work, in Louis Seize style, and in a patent material which has the appearance of cement. The gallery entrances open from the central corridor on the third floor. Thus there are no fewer than five entrances to the hall available for the audience, and, by an arrangement of doors in the corridors, any one of these can be shut off or confined to one particular class of the audience. The platform can be ascended from the body of the hall, but two doors open on it, one at each side, from ante-rooms. In the daytime the hall is lighted by the third-story windows of the building, in Tyrryl-street and New Market-street. The ceiling is elaborately ornamented. In the middle is a large square, within which is a circle, and in the centre of this is a ventilating shaft which passes through the class-rooms above to the roof. The centre of the ventilating shaft is spanned by one of four great iron lattice girders which carry the

weight of the upper portion of the building, and of the roof. From this girder will depend the chandelier—one of an ornamental description, with two rings of gas-jets, and which will have from 140 to 150 lights. The hall is intended to accommodate an audience of 1,200 persons, and it is believed that its acoustic properties will be good.

The art and other class-rooms are in the highest story of the building. As below, a central corridor divides the building into two sections. On the bowling-green side, the entire area is occupied by one large room, the art class-room. It is of precisely the same dimensions as the news-room, which is below, and is lighted from the roof. The roof is open, and the heavy wooden beams are connected and strengthened by iron tie-rods. The room will be divided by movable wooden screens into separate departments, where the different kinds of drawing,—elementary, light and shade, drawing from the round, &c.,—will be taught. The space on the other side of the corridor, and over the lecture-hall, is divided into four large class-rooms, in which will be carried on the elementary classes forming the night-school proper of the Institute. The two middle ones are the largest; the other two being shortened by the space appropriated to lavatories, closets, &c. Similar conveniences are provided on the lower stories, near the entrance to the lecture-hall. The four large class-rooms will accommodate altogether 350 pupils. There are arrangements for ventilation in these, as in the other rooms.

A skylight in the corridor affords a view of the top of a ventilating-shaft, which, coming from the bottom of the building, projects some 12 ft. outward above the roof. Adjoining this, there is to be a sort of observatory, where various meteorological observations will be taken.

The cellarage is extensive. Here are boilers and furnaces, by means of which the building will be warmed throughout by hot air and hot water. Here also is the space underneath the lecture-hall,—a large room more than 20 ft. high, but unfortunately very imperfectly lighted in the daytime. It might be turned to account as a gymnasium. Great progress is now being made with the completion and furnishing of the building; but a good deal remains to be done, if the Institute is to be completed on the day fixed for opening,—October 2nd. The contractor is Mr. Noll, Messrs. Andrews & Pepper are the architects.

CHURCH-BUILDING NEWS.

Windermere.—The new chancel of the parish Church of Windermere has been consecrated. Messrs. Paley & Austin, of Lancaster, architects, have carried out the alterations, the cost of the whole being upwards of 4,000l., which is to be defrayed by subscription. The church is interesting from its erection with the rubbly building material of the district. The whole of the nave and aisles have been furnished with open oak seats; the chancel has been supplied with a new altar-table, six rows of choir-stalls, pulpit, and lectern, all of the same material and design. The organ, also new, has been placed at the east end of the north aisle, being enclosed from the choir by a light open oak screen, and a new vestry has been built to the rear of the organ, and opening into the north aisle by a screened arch. The old oak roof has been cleaned and repaired. The removal of the west gallery would allow the lower portion of the tower being thrown open, and the hidden west window exposed. A reredos of alabaster, carved and inlaid with mosaic panels bearing the emblems of the Evangelists, has been presented to the church by Mr. W. H. Schneider, of Belfield. The woodwork of the nave has been executed by Mr. Blades, of Lancaster; of the chancel, by Mr. Brownrigg, of Bowness; and of the roof, by Mr. Holmes, of Bowness; the stonework being by Mr. Pattinson, of Bowness. The builder of the new organ was Mr. Edward Wadsworth, of Manchester.

Beer Ferrers.—The ancient church of Beer Ferrers has been re-opened after a restoration, including new aisles. During the progress of the restorations, a number of interesting details were discovered. A piscina and sedilia were found in the chancel, an aumbry in the chancel aisle, and in the north transept a shelved piscina, and a hagioscope. A string course against the eastern wall of the transept marks the spot where the foundation priest's altar stood; and a feature in the other wall, a Medieval fire-

place, appears to indicate that the nightly duties were found rather irksome. What may have been the slab of the chief altar—a huge carved stone, is now placed in the wall behind the communion table, forming a reredos. The ancient roofs have all given way to others of later construction. Those of the aisles and transepts are plastered. Those of the nave and chancel are new and open timbered. Care has been taken of the ancient interior woodwork; and the old bench ends, of which there are many, have been repaired. They are chiefly carved in panels, with flowing decorated tracery; and upon one the arms of the Ferrers—three horse-shoes,—are distinctly to be seen. The lower part of the rood-screen is likewise retained. On its panels are traces of the saintly figures which were emblazoned thereon. The rood staircase remains, but is closed. New stalls have been fitted in the chancel, and new seats in the transepts, all of pitch pine varnished. The stonework has been cleaned, the walls replastered, the roofs re-slatted, the windows reglazed, and the rough-cast outside repaired and coloured. The walls being built of slate rubble, it was not easy to treat them in any other way. The tracery of the older windows is of Roborough stone; the mullions and the arcades of granite; the old font is of Hurdwick stone, and the canopy of the Champernowne tomb, with part of the other interior stonework, is of polyphant, and in good preservation. Some of the old windows, long stopped up, still remain so. The characteristic features of the restoration are substantiality and economy, governed by a desire to preserve all that is worthy of preservation. The works have been executed from the designs of Mr. J. Piers St. Aubyn, of London, by Mr. P. Blowey, of Buckland Monachorum.

ROMAN CATHOLIC CHURCH-BUILDING NEWS.

"*Stambrook*."—With reference to paragraph under the above heading in your paper of the 16th instant, as the manufacturer who supplied this pavement, I beg to state that the correct style of my firm is "Robert Minton Taylor," not "Minton, Taylor, & Co." The pavement is composed of tiles; the bands of the patterns being formed of glazed tiles, and not of marbles.

ROBERT MINTON TAYLOR.

SCHOOL-BUILDING NEWS.

Penzance.—A new Wesleyan Sunday-school in St. Clare-street, Penzance, has been opened. The prison premises have been converted into the school. The cost was 200*l*. Tenders for alterations, &c., were invited, when Mr. Henry Carnes's tender of 120*l*, for carpenter's work, and Mr. Philip Thomas's, of 100*l*, for mason's work, were accepted. Under the superintendence of Mr. John Trounson, as architect, the undertaking has been brought to a successful issue. The room is 44 ft. long, 33 ft. wide, 16 ft. from floor to ceiling, and has been constructed in every way capable of conducting a moderately large school with comfort. The front, back, and end walls of the old prison have been raised, and the cells occupying the inner space have been demolished. Four cells in the rear of the building have been converted into convenient class-rooms; necessary offices have been provided; and all sanitary arrangements (as to ventilation, &c.) have been attended to. The room is lighted by three large windows in front and two in the rear; and, altogether, the premises are capable of accommodating about 300 children.

Deal.—St. George's National Schools, Deal, situated in Middle-street, Deal, in Kent, have been formally opened. The buildings have been erected from designs prepared by Mr. William E. Smith, of London. Messrs. Gibbons & Collins, of Deal, have executed the works, which have amounted, including the purchase of an additional site, to above 1,000*l*. The boys' and girls' schools are each 40 ft. long by 20 ft. wide, and each school has a class-room. The style adopted is plain Gothic, and the materials are red and yellow brickwork, with stone dressings. The building has open timber roofs, stained and varnished. Ample playgrounds are provided.

Reading.—The new Grammar School has been opened by the Lord Chancellor, in the presence of a numerous assemblage of ladies and gentlemen. The foundation-stone was laid by the Prince of Wales on the 1st of July, 1870. The architect was Mr. Waterhouse, and the builders were Messrs. Farnell & Son, of Rugby. The school fittings were supplied by Messrs. Sidebotham & Co.,

A sum of 5,000*l*. was required to purchase the fee of the 10 acres which comprise the school site and grounds; and the contract for the erection of the buildings,—and for which they will be completed,—amounted to something under 20,000*l*. The style is Elizabethan, and the structure is of red and brown brick. As seen from the London-road, the cricket-ground is in front of it. There is at present accommodation for 60 boarders and about 800 day-scholars, and additions now in contemplation, in the shape of master's house, will allow of the reception of a larger number of boarders. The buildings comprise a school-room, 83 ft. by 26 ft.; ten class-rooms, one head and second master's private houses, &c.; and it has accommodation for sixty boarders. Each boy has a separate dormitory, and there are rooms for hospital purposes out off from communication with the rest of the building. The school stands in the "open" to the north-east of the town, in a picturesque and healthy position.

Gloucester.—The chief stone of St. Nicholas's Schools has been laid. The cost of site, school, and furniture is expected to be 1,800*l*. Mr. Jones is the architect. The buildings have been designed in two stories. The ground-floor contains the girls' school, 40 ft. by 20 ft., with class-room adjoining. The infants' school will be at right angles to the girls' school, and will measure 35 ft. by 20 ft. 6 in., and both schools will be 14 ft. high. The upper floor contains the boys' school, 62 ft. by 20 ft., with class-room, 20 ft. by 14 ft. 6 in. The height of this story will be 13 ft. to the wall-plates. The roof will be ceiled to the underside of the rafters, with the principals and purlins showing. Fresh air will be admitted into the buildings by openings under the floors and by the windows. The warm air will escape through ventilators in the roofs and walls. The schools will be warmed by open fireplaces. The boys and girls will have separate entrances in Quay-street; the infants' entrance will be in Upper Quay-lane. The bell will be hung over the gable in the Quay-street elevation. The inside of the walls will be painted and lime-washed, and each room will have wall-hanging of wood, 4 ft. 6 in. high. The floor of the boys' school will be planked to prevent the noise disturbing the occupants of the lower rooms. The schools will accommodate about 330 pupils. The elevations will be plain, with no attempt at ornament, the walls being built of red brick, relieved with strings of black and white bricks; and the roofs will be covered with Broseley tiles. The usual offices have been provided.

Bishop's Stortford.—The Education Department has just sanctioned the plans for the new boys' and girls' schools in St. Michael's parish, and has approved the title of the proposed site. The grants from all sources amount to 555*l*. The Building Committee have considered the tenders, and accepted that of Mr. Corwell, which was the lowest, for 980*l*. This sum does not include the desks and other apparatus, or the making of the playground; and the whole expenditure, including the purchase of the site, the actual legal disbursements, and architect's commission, cannot be estimated at less than 1,750*l*.

St. Alban's.—At a meeting convened by the trustees of the Abbey National Schools, to consider the advisability of continuing the present system of parochial schools, and what steps should be taken to increase the existing accommodation for educational purposes, it was resolved "That in order to meet the requirements of the Elementary Education Act, 1870, it is necessary that greatly enlarged school accommodation should at once be provided." It was resolved also that a committee should be appointed to assist the existing trustees in carrying out the object in view.

Tarporley.—The school of Lord Crewe, built at Sparrow, on the verge of Houghton Moss, is rapidly being completed. The buildings, which comprise schoolroom, 38 ft. by 18 ft.; class-room, 13 ft. by 12 ft.; and mistress's residence, with living-room, 12 ft. by 12 ft.; and kitchen, 11 ft. by 9 ft.; with three bedrooms on second floor, and the usual outbuildings, are in the Perpendicular style of architecture. The materials used for the construction are local red bricks relieved with diapered patterns of Staffordshire blue bricks, and freestone from the Burwardesley Quarries is freely used in the window-dressings, &c. The schoolroom, which is lined internally with blue bricks to the height of the window-sills, is lighted by three two-light traceried windows in the side wall, and a four-light window in the gable end, divided into two heights by transomes, the upper part being filled with tracery characteristic

of the period. The roof is open-timbered, with three principals of the hammer-beam description supported on moulded stone corbels, and is constructed of pine, slightly stained and varnished, the whole being covered with grooved and tongued boarding, on which the tiles are laid in ornamental bands of different colours, felt being placed between the boards and tiles. The entrance to the schools is by means of an outer porch, over which is a clock-tower, carried up above the ridge of the main building, and surmounted by an octagonal high-pitched roof, with overhanging eaves, carried by carved brackets springing from a moulded stone string-course. When completed the roof will have ornamental iron finials. The mistress's residence is carried out in the same style throughout, with ornamental open-timbered porch to entrance, the internal fittings being of pine, stained and varnished to correspond with the woodwork in the school. The warming of the whole is by means of open fireplaces, the chimneys being constructed with projecting breasts with stone weatherings; the shafts, which spring from splayed and throated stone bases, being surmounted by ornamental moulded caps. The whole of the roofs are finished with gable-boards, which project beyond the face of the walls. They are pierced with tracery, and have octagonal finials, with moulded caps and pendants. The windows are glazed with lead lights of diamond pattern, those to the schoolroom having a margin of cathedral-tinted glass. All the principal floors are boarded, and the ventilation is carried out by means of wrought-iron casements in the windows, hung on swivels, the foul air from the schoolroom escaping by means of piercings in the roof, which communicate with four louvres, with trefoil in each, covered with perforated zinc. The works are being carried out by Mr. John Stringer, of Sandbach, at the sole expense of Lord Crewe.

Romey.—The foundation-stone of a new school-house has been laid here by the Hon. Mrs. Cowper-Temple. The old school (built by Lord Palmerston) was greatly dilapidated. The Right Hon. W. F. Cowper-Temple decries the cost of the erection of the school, which is to be devoted to the education of boys alone. The plan is by Mr. William Eden Nesfield, architect, London, and the building has been undertaken by Mr. George Wheeler, of Romey. The site, given by Mr. Fleming, is in North Gaston, between the railway station and the town. The dimensions of the school-room will be 71 ft. long, 19 ft. wide, and it will be lighted by nine windows, the entrance porch at the south-west corner having a bell-turret. At the south angle the school-house will be situated: it will be two stories high, and supplied with all domestic offices. The whole block will be built of red bricks, with Bath stone gables, and the bellcote will also be of Bath stone. The foundation-stone is at the south-west corner.

Sittingbourne.—In order to comply with the requirements of the Education Act new schools are to be erected for the Trinity District, on a site which is the gift of the Rev. G. S. Simpson, and Mr. P. Simpson. The contract has been taken by Mr. Seagar, of Borden, and the work has been commenced. The Government has made a grant of 364*l*. towards the building fund. The new schools are intended to accommodate 300 children.

Miscellaneous.

State of the Wandsworth Drainage.—Mr. F. W. Goddard, a resident in Wandsworth-road, states in a letter to the Lambeth Vestry, that having recently had the misfortune to lose a son from scarlet fever, he set about to see if he could ascertain the cause of the prevalence of the disease in his neighbourhood. He found that zymotic diseases were in existence to a very alarming extent. Some of the houses were not drained into the sewer, which has been completed for over five years, and the ordinary sanitary requirements in dwellings were generally neglected. The neighbourhood has been a known pestilential den for over thirty years, and in 1851 the cholera raged there in all its virulence. Members of the vestry speak of taking the management of sanitary affairs out of the hands of the General Purposes Committee and transferring it to a special sanitary committee.

The New Town-hall, Wirksworth.—The chief stone of this building has been laid, with Masonic ceremonial.

Birmingham Architectural Society's Excursion.—The annual excursion of the members of this society has taken place. The party visited Albrighton, Tong, Weston, Lilleshall, Sheriff Hales, and Shiffnal. On reaching Albrighton, a drag and four-in-hand were waiting, and they proceeded to Albrighton Church, where the Early Norman work in the tower, and the tomb of Sir John Talbot in the chancel, were examined and discussed. A pleasant drive brought the party to Tong Church, where they were met by the Rev. Mr. Lawrence, who conducted the visitors through the church, which is believed to be the one which Dickens described, and Cattermole drew, in connexion with the story of "Little Nell." The party then went on to Weston Hall, the seat of the Earl of Bradford, which had been courteously thrown open to the visitors, who also went through the church. Returning along the line of the Watling-street, the party proceeded to Lilleshall Abbey, which they left reluctantly to proceed to Sheriff Hales Church and Shiffnal, where dinner was provided at the Star Hotel, the president (Mr. Y. Thomas) in the chair. After dinner the party proceeded to the church, which was lighted up specially for their inspection, and after a full examination of the recent restoration by Mr. Gilbert Scott, the return to the station was completed, and the party reached Snow-hill soon after ten p.m., after a very pleasant and instructive day.

Papers for the Institution of Civil Engineers.—The Council of the Institution of Civil Engineers have issued a list of subjects on which they invite communications. It includes the following:—On the Application of Graphic Methods in the Solution of Engineering Problems; an Experimental Inquiry into the Strains upon Arched Ribs, variously loaded, to ascertain the agreement between Calculation and Experiment; on the Methods of Constructing the Foundations of some of the principal Bridges in Holland and in the United States; on the most suitable Materials for, and the best Mode of forming, the Surfaces of the Streets of large Towns; on the Advantages and Disadvantages of Subways for Gas and Water Mains, and for other similar purposes; on the Theory and Practical Design of Retaining Walls; on the Use of Concrete, or Béton, in large masses, for Harbour Works and Monolithic Structures; on Excavating by Machinery, with a description of any Excavating Machines which have been brought into successful practical use; on the Water-supply of Towns, including a description of the sources of supply, of the different modes of collecting and filtering water, of the various incidental works, of the distribution to the consumers, and of the general practical results; on the Theory and Practice of the Modern Methods of Warming and Ventilating large Buildings.

Proposed Public Hall for Handsworth.—A preliminary meeting towards the erection of a public hall on the site of the old Soho Gate Toll-house, has been held. Mr. Blackham laid before the meeting a plan and elevation, prepared by Mr. W. H. Ward, of Birmingham, architect. Mr. Ward proposed a building of red brick, with a stone-faced front, and clock-tower, in the Gothic style. The hall would seat 440 persons on the floor and 66 in the gallery. Retiring-rooms were to be attached to the hall, at the platform end. The estimated cost was from 1,700*l.* to 1,800*l.* A provisional committee was appointed to make enquiries as to the number of shares which would be taken up, and whether the local Boards and other societies will agree to occupy the rooms, and on what terms. It was stated that the Philharmonic Society would take the hall, if erected, one night a week, at 25*l.* per annum.

Co-operative Hotels.—An adjourned conference of persons interested in the erection of co-operative hotels has been held at the Whitlington Club, Arundel-street, Strand, Mr. J. S. Lowe in the chair. A report from a committee appointed at a previous meeting was brought up. The committee recommended that a limited liability company, to be called the Club Hotel Company, be formed, with a capital of 100,000*l.*, in shares of 10*l.* each. These resolutions were eventually approved, except that it was resolved that the company be called the Residential Hotel Company. Mr. Swindelhurst moved that a committee be appointed to draw up articles of association and a prospectus embodying the principles on which the company was formed. This resolution was adopted, and a committee was nominated.

The Money-order System Extended to the United States of America.—On the 2nd of October next, and thenceforward, money-orders may be obtained at any money-order office in the United Kingdom, payable at any place in the United States of America. The commission chargeable will be uniform with that charged on money-orders issued on Canada and the colonies generally, viz.:—1*s.* on sums not exceeding 2*l.*; 2*s.* on sums above 2*l.* and not exceeding 5*l.*; 3*s.* on sums above 5*l.* and not exceeding 7*l.*; 4*s.* on sums above 7*l.* and not exceeding 10*l.* No single money-order will be issued for more than 10*l.* The issue of money-orders in the United States, payable at money-order offices in this country, will also commence on the 2nd of October next.

The Columbia Market.—The Court of Common Council have unanimously agreed, in accordance with the desire of Lady Burdett Coutts, to take over Columbia Market, and maintain it as a general market for ten years, at the expiration of which time, should it prove a failure, measures are to be adopted to utilise it in a way that will most conduce to the attainment of her ladyship's object,—the material benefit of the poor people of Bethnal-green and neighbourhood. It was said that the market had cost nearly a quarter of a million of money. The estimated annual cost of managing and keeping it in repair is between 1,000*l.* and 1,500*l.* Our original fears as to its success have been sadly confirmed.

Improvements in Scarborough.—A prospectus has been issued from a company proposing to form nine acres of pleasure-grounds on the North Bay in Scarborough, contiguous to the new promenade pier, with a marine aquarium, refreshment-rooms, &c., in a large glass-covered hall; and to connect these grounds with the South Bay by a tramway laid on the level, through a well-lighted and ventilated tunnel under the cliff, which will enable visitors to pass in comfortable carriages from the attractions of the south to those of the north side, in about four minutes' time. The project is intended to be supplemental to the existing Spa Gardens.

Shipbuilding, Hull.—The prospectus has just been issued of a new shipbuilding and engineering company at Hull, for the acquisition of the old-established works of Messrs. C. & W. Earle. The firm has long been held in good repute, and the reason of the present transfer to a joint-stock company is the death of one partner and the serious illness of the only survivor. It is stated that the works have recently been removed to a new site on the bank of the Humber, with deep water sufficient to launch the largest iron-plated ships of war, and the works have abundance of land for present use and future extensions.

Contemplated Tunnel under the Clyde. Boring operations have been commenced at Clyde-street Ferry, in view of the contemplated construction of a tunnel at that point of the river. Three-bores have already been put down, one on each side of the Clyde, and a third within the quay wall; but it is proposed to carry the experiments a little farther. All the borings will be carried to the depth of 85 ft., and the results obtained up to the present time are satisfactory. Estimates are now being prepared with the view of ascertaining the cost of the undertaking, and the revenue likely to be derived therefrom. The construction of a tunnel under the Clyde is not a new idea.

Sir James Penesthorpe.—In our notice of Sir James Penesthorpe in our last (p. 717), we attributed to him the authorship of a book on the "Mathematical Principles of the Greek Architects." This is an error. The book referred to was the work of his brother, Mr. John Penesthorpe, also an accomplished architect, and who has devoted his life to the investigation of the principles which governed the designs of the Greek architects, and on which he is now engaged in preparing for publication a very elaborate work.

New Public Hall at New Mills, Derbyshire.—This hall has been opened. It has been erected by public subscription, at an estimated cost of about 1,800*l.*, contains news-rooms, library, class-room, a room suitable for a savings-bank or committee-room, and a large hall suitable for public meetings, lectures, and entertainments.

Newcastle Improved Industrial Dwelling Company.—The ordinary general meeting of the shareholders of this company was held in the Merchants' Court, Guildhall, Mr. James Hall in the chair. The directors' first annual report said there were never fewer than fifteen or twenty applicants on the books for accommodation on the occurrence of any vacancy. The directors regretted that only 3,660*l.* of the capital of 5,000*l.* had as yet been subscribed. The company could pay 5 per cent. per annum on a capital of 5,000*l.*, and at the same time permit of a reserve fund being formed of 10 per cent. on the gross revenue to meet depreciation and repairs. The report was unanimously adopted.

Proposed Public Baths for Chatham.—A public meeting, convened by the high constable, in accordance with a numerously signed requisition to that effect, has been held in the Lecture Hall, Chatham, for the purpose of taking the necessary steps for providing public swimming-baths for the town. At the commencement only some few persons were present, but the attendance was afterwards larger. It was resolved that public baths would be an important acquisition, and a committee was appointed to consider any plans for the erection of public baths and to seek an interview with the trustees of Watts's charity, and report thereon to a public meeting to be convened that day month.

Metropolitan School Requirements.—The London School Board is advertising for sites for schools in different parts of the metropolis. These schools are to accommodate 10,000 children, and are to be built by a loan of 100,000*l.*, obtained from the Loan Commissioners, with the sanction of the Education Department, on the security of the Education-rate. The districts for which this provision is to be made are the City and Tower Hamlets, Finsbury, Greenwich, Hackney, Lambeth, Marylebone, Southwark, Chelsea, and Westminster.

The Lancashire Statue of the late Lord Derby.—At a meeting of the Health and Recreation Committee of the Preston Town Council, on Monday, for the purpose of considering the form of the contemplated statue of the late Lord Derby in the Preston Miller Park, a number of plans and models were submitted, and after some discussion, it was suggested that the statue should not be covered by a canopy, as the one laid before them by Mr. Gilbert Scott. Eventually it was decided to place the statue below the promenade, and nearly opposite the fountain.

Improvements in Bath.—Our Bath readers will learn with satisfaction that there will be no more delay in the formation of the new street by the Midland Railway Company from James-street to Kingmead-square. The demolition of the houses will be proceeded with on the 20th inst. The tender of Mr. Robinson, of Bristol has, it is stated, been accepted for the erection of new bonded stores by the Midland Company, near their station, the outlay being something like 5,000*l.*

Batley Waterworks.—The Mayor of Batley, on Tuesday, cut the first sod of the new Batley Waterworks, which are to be constructed at Yatcholme, a little distance from the village of Holme, several miles beyond Holmfirth. The four reservoirs, when completed, will give a supply of two million gallons of water to the town of Batley per day; and had it not been for the rapid falls of the valley there, the supply would have been two millions and a half gallons per day. The whole cost of the undertaking will be about 200,000*l.*

The New School of Science at the Hartley Institution, Southampton.—Rapid progress is being made with the new buildings at the Institution. The main building now has the roof on, as well as the corridor. The School of Science is slated in, and the Archimedean screw revolving ventilators are fixed. The museum roof is also on, but not yet slated. The greater portion of it will be glass. The contractor is Mr. Crook, of St. Mary's-road, and Mr. Lemon, the borough surveyor, is the architect.

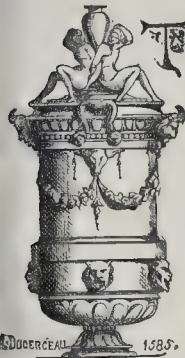
New Hospital at Lanark.—The foundation-stone of a public hospital for the district of Lanark was laid on the 14th inst. by Mr. Robert Monteith Carstairs. The institution, for which plans have been prepared by Mr. James Watson, architect, Dundee, is to be under the charge of the Sisters of Mercy.

Ashton & Green, Slate and Slab Merchants and Quarry Proprietors.—Shippers of Merchants, and Contractors furnished with Price Lists of every description of ROOFING and MANUFACTURED SLATE, Railway-rates, &c. Agents for London and Country for the Sale of the celebrated WHITLAND ABBEY GREEN SLATES. Drawings and Prices of A. & G. RED RIDGE TILES, specially prepared for use with these Slates, on application.—Offices at Show-rooms, 11 & 15, Bury-street, St. Martin's Lane, London, E.C.

The Builder.

VOL. XXIX.—No. 1495.

The Primary Elements of Use and Construction
in Architecture.



THE requirements of Use prescribe the nature, and in a general way even some limitations, of relative dimension and mass, of apartments, passages, openings, members, and so forth.

The conditions of Construction, again, have their word to say even in these approximate determinations; and again prescribe, recom-

mend, or enforce, in a general way, the nature and some larger limitations in respect to arrangement and magnitude, of the parts of the structure and their members.

But it is the supreme requirement and obligation of Beauty,—"the strong necessity of giving,"—that ordains the last decisions of precise measurement for all. There is no admittance here to be allowed for "there or thereabouts;" and if some lines are drawn at last by free estimate,—adjustments of not trifling import made by "swool of brow,"—then only is it with justifying success, when artistic aptitude has attained to "something like prophetic vein," and acting by impulses harmonised within, can work in accordance with numerical law when not by law,—can take sure flights even beyond boundaries where curvatures, for instance, become while still regular, regular too subtly for mathematics to lead forward to, or it may be to be competent to follow. When Beauty comes into question, decision rests, in Homeric phrase,—strange that it should be Homeric,—on a razor's edge. The too much and too little that range at large without interference within wide limits of Use and Construction, are there confronted without escape, on either side of a mathematical line. The engineer may systematically proceed by working out carefully first the theoretic strength required for his beam, and then doubling the result in execution with content and security; but the difference of an inch in the profile of a column or capital could scarcely be more destructive of expression if made in the profile of a beautiful face.

Beauty, then, working by proportion, develops the suggestions of Use and of Construction into elegance and ornament,—deals freely and inventively with these suggestions in originating kinds, styles, of enrichment and decoration,—and at last decides the precise contact and impact of mind and matter, the quantities, the degrees and proportions, for actual execution in distributed forms, and even light and shade and colour.

So Proportion holds sway throughout the entire realm of architecture, in variously modified application. Relative, proportionate, sizes and loveliness have to be considered in combining stories, distributing offices, adjusting communications and openings. It is no less authoritative in decisions as to the responsibilities of bearings and supports or the appropriation of

materials; but the injunctions so imposed are at last but lax,—are elastic in at least one direction, and there to almost any extent. Provided one requirement in one direction has been answered, any proportion whatever out of multitudes, and these with no special relation to each other, may be competent to secure it, and so far be equally admissible. Only when Beauty is to be realised does Proportion become exactly precise and exclusive in its indications, and only through proportion so applied is Beauty to be realised.

To enable us to study and define the principles of these ultimate applications, it will be desirable to review, however generally, the antecedent conditions of Use and Construction, and to attempt a certain classification of their developments.

The conditions of more pure usefulness in a building have reference either to Exterior or Interior circumstances; and in each case the circumstances to be considered may be classed as those dependent on human will and action, or such as originate in the independent forces of nature. Every structure that we need take account of is, more or less, a fortification against external foes that are capable of attacking either the inmates or the building itself. Wilful and Climatic damage have alike to be reckoned with and resisted. These necessities postulate a definite continuity below, around, and above, a certain solidity and compactness, effective security of openings, limitation of accessibility. The requirement for the protection of the building itself on the exterior against climatic influences, has ever made characteristic impress on details and even larger elements, of architectural style. The tendency to settlement, or unequal settlement, through the omnipresent power of gravitation, is a constant consideration, of course, to which are added incidentally the possibilities of fire, of lightning, or of flood in storms, and constant exposure to vicissitudes of temperature,—warping heat and disruptive frost,—to impact of furious winds and downfall or driving of rain, hail, and snow.

Every building thus requires to be armed and armoured against wilful damage and disintegrating influences; and differences of climate should, therefore, naturally induce as great differences in external architecture as the differences of social development that in successive ages modify liability to hostile attack.

This is, no doubt, to a great extent, the case; and the very physiognomies, so to speak, of Greek and Egyptian buildings severally display, as accurately as could be wished, the anticipation of heavy storms of rain in one case, and the contrasted unconsciousness of any such liability at all in the other.

The master-hand—the master-mind—is recognised when such modifying proprieties are responded to with prompt sensitiveness, and are made motives of new developments. But we shall err egregiously if we assume that this was ever invariably so in the development of historic art. It is not here that we can rely on possessing a key to every successive problem. All other forms of incompetence apart, that will have their royalties in every age, subjection to tradition, whether at first hand or at second, hampers many an even daring soul; and original genius is not only subject to original blunders, but can scarcely escape all hereditary sin; and it is well if the tenacity of prejudice only keeps down a single lagging wheel in the old obstructive rut. The cult of genius is, at any rate, only disgraced by admission of a factitious saint-worship; and till we can bring ourselves to hold the noblest predecessors strictly to account for error or shortcoming, we shall hardly have the brave heart to bring to bear a duly sharpened scrutiny inexorably upon our own. This stringency of criticism will but enhance our admiration when the retention from earlier time of characteristics no longer essential, is so managed that the inte-

rest of the historic link is valuable, while yet art and its proprieties are unimpaired.

As regards the conditions of usefulness of a building towards the Interior, it is only necessary here, for the sake of formal completeness of classification, to distinguish,—

1. The scheming and distribution of apartments, sets of apartments, and communications, for haunt and transit, occupation and intercourse.

2. The arrangement and management of openings generally for ingress and egress, outlook and prospect, entrance and circulation of light and air and warmth.

All stages of civilisation, all varieties of national habits and of social position, originate special combinations of these, to meet more or less successfully,—we must be prepared to admit, very often unsuccessfully,—the special needs.

A complementary history of architecture should render an account, in series and in detail, of these solutions, or approximate solutions, of the architectural problems presented in successive ages and different nations. The history of architecture is not exhausted by the very best histories of design in façades or in plans exclusively, of structures that, while of the highest dignity, are still most simple in general distribution. The domestic dwellings of several grades of society of all nations, at any time, at the present time as well as any other, might be the subject of a work that, with full elucidations, would be of highest interest. The statement of the problem that the architect was in each case called on to solve,—such as Wootton gives, but still in too brief and general terms, for the Italian palaces of his time,—would be one of the very best illustrations of national manners; while keen and conscientious criticism of the value and perfectness of the solutions, would give a concurrent chapter in the history of Art. Much as the interest in the revolutions of Florence, as we follow them in the many pages of the "History of the Commonwealth," by A. T. Trollope, is enhanced by familiarity with the aspect of all its streets and structures, it is impossible not to feel that the last illustration is wanting till we know every inner chamber and gallery and closet of the Biccardi and Strozzi Palaces.

The conditions of Construction have also to be reviewed, no less than those of Use and Occupation, and for our purpose scarcely require to be classified more broadly,—characterised less summarily.

Construction is a word that implies combination of detached materials, but, for the sake of theoretical exhaustiveness, must be extended to cover a case apparently so contrasted as excavation. A grand temple, no less than a stately apartment, may be hollowed and carved out of the living rock,—and has been. Such a structure, so to call it, is, after all, in the same category, as compared with a Cyclopean gallery, as a like apartment composed of a mass of artificial but continuous concrete. The seemingly important distinction between the rock and the concrete, that one was always as it remains a single piece, and the other only became so as it grew under the hands of artificers out of fragments innumerable, is scarcely essential, when the result is identical at last, and for all time. The difference, so viewed, is but insignificant, between a monolithic granite column in original entirety and the same re-erected after division into frusta, that shall be reunited with cement equivalent in strength to the original stone. Neither, then, can we, from this point of view, admit a difference between a wall with cement at least as strong as its bricks and stones, and a wall of homogeneous concrete, wherein the stones are only smaller and self-bedded casually, and this whether the proportion of cement be greater or less; nor still further between such a wall and a breast-

work of native rock, with its natural bed and strata and still finer granulation. Nay, if we turn from constructions of brick or stone to applications of timber, a framed house may be held together as rigidly as if it were of one piece of wood, and may be liable to no other accidents of dislocation than if it were so; and lastly, iron framing again, with its struts and ties, is as much a composite beam as the framed wooden truss of a roof; and both are constructively equivalents of any solid masonry architrave. The effective tie and strut do but localise the distributed functions of the molecular attraction of cohesion and repulsion that give to any beam of any material its specific rigidity,—which cause its atoms to be in such and such proximity,—bring them precisely so close to each other and stay them with specific force from becoming closer, under penalty of dissolution.

One head of Construction, then, may be taken to comprise the cases in which material is kept in place throughout, by the mere value of its natural cohesion, or by artificial union,—cement, clamps, trenails, &c., that can make portions that were separated originally, to remain united with an equivalence to natural homogeneity. There would be convenience in regarding any mass with these characteristics, whatever its magnitude and form, as comprised in the constructional definition of a *beam*. In either case and in all cases, building material,—material,—that rests upon other below, is exerting power that tends to crush, however this result may be perfectly counterbalanced and neutralised. If and so far as it occupies a place otherwise than in virtue of the support of material below it, a beam,—a natural or artificial, a simple or composite rigid mass,—has power forthwith as a lever or a wedge which, unless counterbalanced, must operate destructively. So a cornice-stone inserted in a wall may have its weight so distributed that, while it ever tends to crush the courses below it, it may act as a lever on the blocking course above it also, or may by its own weight itself break short off.

A free voussoir unencumbered, or so loaded that cement gives way, acts as a wedge; technically, by the agreed definition, it is a beam in peculiar position, and, as a beam, tends to crush material in contact with it in vertical lines from the various points of its sloping sides; but the composition of vertical and lateral resistance to this power in varied proportion, gives to it a resultant direction more or less oblique,—produces Thrust. Crushing power, though conveniently distinguished with reference to attendant circumstances, does not essentially differ from thrust. Like that, it is a composite power, as being something more than simple push or simple pull,—driving or dragging,—so far as these, indeed, ever can occur absolutely simple. When a block of freestone is crushed, each grain of the stone becomes a wedge acting vertically and laterally on its neighbours, overcoming molecular cohesion in one direction and repulsion in the other. It is therefore against forms of disruptive leverage that act by steady compression or strain, singly or combined,—only exceptionally by percussive impact,—that Construction ever finds itself matched: Leverage, simple Crushing power, Thrust simple, or compounded as Torsion or twisting power, are expressions of modes of displacing agency, that it is ever under obligation, and vigilant to counterbalance.

Crushing by proper weight of materials themselves, may be regarded as the primary enemy of construction; to be met by distribution of materials selected for strength and weight,—by such confinement of weaker parts that movement shall be impossible,—and by mercurial subjection to weight and pressure.

Leverage is either carefully deprived of opportunity of mischief by accurate adjustment of equilibrium, or it is safely defied by a distribution of weight that keeps the strain inactive.

Thrust,—if admitted a possibility of its mass be,—is counterbalanced by increased strength in the part that is exposed and otherwise liable to displacement, as by buttress applied to wall, or by a weighting pinnacle,—*pinnace addit robur*,—upon buttress. Otherwise, the activity of thrust is precluded by so locking in the parts that but for this would thrust, that they cannot even move among themselves. It is better still if the possibility of thrust can be precluded altogether, for, if once awakened, it is a force for mischief, which never sleeps thereafter. Thus, if the voussoirs of an arch are so strong and so strongly connected that they are incapable of sliding on each other,—will not separate by their own weight, or any that they are subject to have

placed upon them, they have no living thrust,—they become dead weight; and an arch so firmly composed is equivalent to a single perforated block,—a simple beam of definition.

Utterly abrogated, however, as all the prerogatives of thrust in such a case may be, the very form of arch will nevertheless suggest, by association, its existence; and, as a mere suggestion, this has to be taken into account, and has most important consequences when the arch comes to be treated and treated of, artistically. As repose is banished by mere appearance of topheaviness, however false such appearance may be to the fact, in the same way it departs as certainly from us when contemplating certain forms, unless there is intimation apparent of the constant presence of a counter and conserving power. Architectural Construction that pretends to be artistic has the double responsibilities that were incumbent on Caesar's wife,—but there fulfilled imperfectly,—must be not more exempt from real lapse than from faintest possibility of suspicion.

In such cases the most delicate intimations of the presence of a power of the desiderated tendency may be quite as satisfying, and at the same time more graceful, than coarser demonstration. Even when buttresses are not more numerous or more massive than the security of the construction fairly requires, their services are often by no means accepted with grateful welcome when exhibited so broadly. We have to reconcile ourselves too often to tolerate them as publishing somewhat ungracefully a discreditable weakness in what they ostentatiously support, or encumbering with clumsy help, when not under suspicion of clustering over officiously where they are scarcely wanted at all. Not so built the architect of the spire of Salisbury.

The value of cusps in Gothic foliation, as of fluting in Greek columns, depends on the intimation, delicate as the lighter accents that decide the true feeling of a spoken sentence, of power that is present of a kind required and just in excess, however latent, of what absolutely suffices, to draw together what might seem liable to be strained apart,—to stiffen completely what were completely useless if less than completely rigid.

When Art shall take up the treatment of an Iron Order with a feeling that is worthy of the last developments of iron construction, we may hope to see forms that do well enough, whencesoever borrowed, to supply space and shelter at lowest contract cost, only above all most expeditiously, superseded by newly imagined and specifically appropriate expressions.

It is an exercise for Taste in its highest refinement, to determine how far Construction shall be patent both in exteriors and interiors. These are problems of proportionate adjustment for which theory can provide no numerical laws of guidance. When all joints, dependencies, and articulations are displayed in all crudity, they will be felt as commonplace, and resented as obtrusive, even on the exterior of a building, and much more so within. There the mind is ever well content that the very occurrence of a notion of insecurity as possible, whether counterbalanced or not, should be precluded where it may be, or only suggested when so it must be, to be simultaneously set aside by visible assurance that it has been provided against with a degree of ease that is best warrant for certainty. On such a point mistrust must be at rest; but it is more absolutely at rest when the signs of security appear to present themselves casually and naturally rather than at urgent summons; when they come with the demeanour of candid witnesses no more expecting to be doubted than disposed to resort in hot excitement to affidavit and vociferation.

It was thus that the Greek kept his constructive joints true in position, and then seemed to have done his very best to render them all but invisible, and yet as certainly not invisible, by perfection of finish.

It is on the same principle that the beauty of the nude figure gains sufficient expression of the indispensable healthiness of stability, from certain palpable betrayals of the hard bony frame, which yet is nowhere in sight, and scarcely to be positively followed,—from truthful swellings and sinkings of muscles as they proceed to insertions that are ever hidden, and by courses that are only gradually recognised to forthwith rapidly escape the eye. And so in the draped figure no less, the flowing and responsive folds display the spirit and action of the form below, by the very envelopments that withdraw its details from observation.

As regards interiors, an unveiled, over-frank revelation of architectural anatomy is fairly resented as especially offensive, incongruous; and even the "ornamented construction" that is urged upon us from time to time as fully adequate relief, at best only replaces the better effluence of construction into ornament; is crude in any case, and always apt to degenerate hopelessly into mere bedizened coarseness. But this is not the place to pursue the topic; the demonstrator of it will have no lack of subjects, whether the bare masonry of unrelieved cathedral walls, the exposed rafters of roofs and lean-tos, or marked joints of vault-like or cellar-like public offices.

In popular phrase, an interior so neglected or maltreated looks unfinished or unfurnished, inhospitable, rude. The first necessities of life have been cared for even ostentatiously; the building avouches itself as stable and weather-tight; but beyond this scarcely recognises the sensitiveness of the frames of the lanterns,—and as to their associations of refined delight, either wantonly insults or ignores them utterly.

The disturbing actions against which Construction has to provide, come into play chiefly in its arrangements for the support of heavy and lofty masses, and then for the spanning and covering of void intervals. The first of these cases is met exclusively, except so far as discharging arches are more or less usefully introduced, by adjustments of materials involving simple down-pressure; but in the case of openings there is an important option, and these may be spanned either by Trabeation, by employment of a simple or of a compound beam or truss supported at the ends, and requiring only to be made so secure from sagging as to exert there no leverage; or, secondly, by Arcuation, by employment of voussoirs so arranged as to involve a tendency, a certain liability, to thrust. It has been by preferential employment of one or other of these arrangements that architecture has assumed its most distinctive variations.

Greek architecture is conspicuous for its simplicity and purity in this sense peculiarly, that it did not admit of any form or application of the arch,—never recognised its use or even existence, and may not even have been aware of its possibility, though this is hard to believe.

All later styles that either admit the arch at all or resort to it whenever possible, employ also the beam concurrently, as the principle of all constructive stability, reliant ultimately of necessity on down-pressure. By further development the arch becomes the vault and then the dome, an important feature in the great basilicas, with their trabeative roofs and only secondary minor arches, and then the cupola. Santa Sophia may perhaps be regarded as still the only building of importance that exhibits the full employment of beam, arch, vault, dome, and cupola in conjunction.

Somewhat cognate combinations were adopted in the intermediate Romance structures, which in more than one direction attained the dignity of specific styles; but Gothic, renouncing dome and cupola, found full exercise for invention in exhaustless development of arch and vaulting. Greek architecture is replete with traces and traditions of framed wooden construction; that nevertheless no incongruousness with an essentially stone style offends us, is due to free modification, especially by changed proportions. Gothic architecture threw off the conditions of its antecedents much more perfectly, and yet can it be tracked up to them continuously, step by step.

Let this much, then, serve as general introduction, along with notes on the Value of Proportion in Architecture, and Characteristics of artistic Composition, to closer attention to the more special inquiries indicated as in view.

THE TUNNEL THROUGH THE ALPS.

In consequence of the badness of the Italian postal arrangements, the worst on the Continent (some of the officials, we are told, can scarcely read writing), our correspondent's account of the Mont Cenis Tunnel, and the circumstances attending the opening of it, reached us too late for our last number. We give a portion of it in our present issue, though it reiterates some particulars already before the public:—

The train of twenty-two carriages left Bardonecchia on the 17th inst., at 10.30 a.m., arrived at Modane at 11. Returning, the passage occupied twenty minutes.

To the small State of Piedmont are due the

initiating and carrying out of this wonderful work. The Italians, especially those of the north, are more given to science than literature. The Italian mind has no superabundance of imagination, and the literature of the present day abounds in translations of works of foreign authors.

In 1832, Giuseppe Medail, of Barlonbehe, drew the attention of Carlo Alberto, King of Sardinia, to the great advantages that would accrue to Italy could a tunnel uniting Savoy and Piedmont be constructed, avoiding the precarious route over the mountains, so often impeded by snow and avalanches. The designs then presented by Medail to the king have been adopted, with but very few modifications.

After much patient waiting, and patient re-organizing of plans and designs, presenting them to the Chamber of Commerce and Science at Chambéry, and other fruitless attempts to impress the grandeur of his scheme on men in power, he died, without a hope that the great work would be carried out. With pleasure we found that the name of Medail was not forgotten when the names of the great workers in the scheme were recorded at the banquet. At some future period, when the financial resources will permit, a monument to Medail, the prime originator of the grand passage of the Alps, would find a suitable place at the south entrance of the Frejus tunnel, as would that of Waghorn at the canal of Suez. However, the well-considered plans of Medail bore fruit when he had passed to live. In 1845, the Piedmontese Government saw the great advantages that must ensue could a railway communication be formed between Savoy and Genoa, thus introducing the commerce of France and Austria more direct than by Marseilles. The change of repairing the necessary plans was confided to the Belgian engineer, Mans (who then held the direction of the Gaux railway) joined with Angelo Siamonda. The former had already acquired European fame by the new system of locomotion, called the "Inclined plane of Liège," applied by him to the Ostend Railway.

Siamonda was reputed as the greatest geologist and mineralogist of his day. After much careful research over that part of the Alpine range between Mont Genis and Mont Gervier, the site best suited for the tunnel was found to be that already indicated by Medail, and was adopted, viz., between Bardolèche and Modane. In 1849 a detailed project was laid before the Government. In it the length of the tunnel was fixed at 12,200 metres, but commencing on the south side at an elevation of 1,364 metres above the level of the sea.

To arrive at this height, Mans intended utilising his plan of the Liège incline plane.

Then the excavation of a tunnel of such length appeared to the engineer Mans impracticable with the usual methods; both time and expense were against it. He would have brought into use the torrents on either side for the motive power, and that from a fixed machine placed at the entrance of the tunnel. The political disturbances of '48 and '49 obliterated for the time all thought of the Belgian engineer, but each year came more prominently forward the idea of carrying out the great enterprise, and the engineer Ranco was commanded to study anew the means of excavating the projected tunnel, and his results were accepted. Other men of science were also consulted. The greater part recommended the shortening of the passage, exposing it, however, again, by its elevation, to the insecurities attendant on the road traversed. One Piato, of Milan, suggested boring by means of compressed air. This plan was rejected. Once the plan concluded that the road must not take too elevated a range, there remained only the fact that through the bowels of the mountains must the tunnel be bored, and that at a great depth.

On the 30th of June, 1855, were patented two inventions, which have tended to lead, with temporary alterations, to the present result. The perforating machine invented by Thomas Bartlett was one simply moved by steam power, but without means of providing air for the workmen. That of Colladon was a locomotive impelled by compressed air-power, whose pistons put in motion a series of tools for boring the holes by means of varied mechanism; but the means of regulating the air-power on the dynamic pressure so that the pistons should be available to act in the same manner as if moved by steam, failed. The merit of coupling these two inventions and adapting them to the perforating of the rocks is due to Grandis,

Grattoni, and Sommeiller, who found a mode of compressing the air and regulating the necessary means of transmitting the accumulative force of the air to a great distance in order to serve the double end of moving the machine and giving breathable air to the operatives.

Aided by Cavour and Paleocapo, the consent from Government to essay the new method was obtained, and an experiment made with the machine, constructed in Belgium, on the rocks near St. Piero d'Arena, in April, 1857. Fears were entertained that the further the tunnel was pierced the more would the power of the compressed air fail, but both these, and those that the temperature would be greatly raised, proved groundless; the change, even at the distance of 6,500 metres, more than half through the tunnel, proving ultimately to be barely perceptible by the workmen. Consequent on the success of the trial came the approval of the Government, and on the 31st of August, 1857, the King of Sardinia fired the first mine, thus inaugurating the great work.

Extreme care immediately was taken at both ends for the construction of roads, canals for the deflection of the water-courses, powder magazines, workshops, dwellings for the workmen, &c., and all with such celerity that at the end of the year 1857 the actual boring of the tunnel could be begun. In January, 1861, the sides of the entrance of the tunnel were carefully supported; the machine for perforating could be introduced. Two years later it began at the other end.

From that date it might be said that the difficulties were at an end. Time and patient continuous labour alone were needed.

The blasting—for all has been done with powder,—followed the scientific boring, the clearing the debris, the propping up of rocks at parts succeeded, as in all tunnelling.

From the commencement to the end, ten years of ceaseless labour have been given. On December 26th, 1870, a day that will be registered with pride in future annals, the last barrier fell that divided the important and accurately-designed works begun at each end, and French and Italian workmen greeted each other with fervid thankfulness. Troubles to the north clouded the joy, but the great labours had ended with success, and were hailed among themselves as propitious omens of better days.

The session of Savoy to France had induced an International Convention, signed in June, 1862, by which France undertook to pay nineteen millions of francs towards the expenses, on condition that the works were ended within twenty-five years from the commencement. If finished before twenty-five years, a premium of 500,000 francs for each year was to be given. If before the end of fifteen years, a premium of 600,000 francs. This enabled the Government, in December, 1867, to make a contract with the engineers, Grattoni and Sommeiller, for finishing the entire work before the end of 1871, at the rate of 4,617 francs a metre. The whole cost of the work is estimated at 75,000,000 of francs (3,000,000 sterling).

The number of workmen employed in the tunnel was 1,500 in winter and 2,000 in summer. The village of Bardolèche, of formerly 1,000 inhabitants, had its numbers increased to 3,000; and the same was the case at Modane.

According to the project adopted, the gallery measures 12,220 metres. The tunnel actual has not been the only great work done. Leaving Turin, the old rail goes as far as Basoleno, when the train for Susa continues on the old route; that for Bardolèche starts for a new road about 40 kilometres in length, and is divided by twenty-six tunnels passed before reaching Bardolèche.

The road passes the vale of the Dora Riparia four times, twice the torrents of Bardolèche, once the River Melezet, besides numbers of torrents and rivulets. The difference of the level between the point of departure and the mouth of the tunnel is 829 metres; the median incline about 20½ metres in a thousand; the maximum, 30.

Hard compact rock has been cut through,—on the Savoy side quartz in great quantities; roads were supported with gigantic masonry; bridges made over torrents and precipices. All obstacles have been surmounted.

The entrance of the tunnel, which is 6-50 metres to the top of arch, is found to be 1291-50 metres above the level of the sea; on the south side or the north, 1158-96; at the culminating point, 1294-59. About 860 metres are horizontal. The greatest incline is on the south side.

As was remarked at the banquet, two great suns are shining through this new opening,—that of the south in increasing splendour; that of the north only dimmed by temporary misfortunes; by it may commerce and peaceable relations produce for ever a fraternal unity between the two nations.

THE DUMB SHAFTS IN THE METROPOLITAN SEWERS.

SIR,—The dumb-sewer shafts you allude to in the *Builder* of last week are to be found in the old Westminster districts, as well as in other metropolitan sewer districts, at the intersections of streets, and also between these points at about 100 yards apart. They are covered with iron plates or stones. Formerly the deposit in the sewers was removed by lifting it through these shafts to the surface, and then carting it away. While I was surveyor I put ventilating grates over a few of them, and laid pipes from a vault into the nearest gullies, but there are a vast number without any ventilation whatever. Every one of them contains sulphuretted hydrogen gas emitted from the sewage, as well as coal gas escaped from the gas-pipes. There are, or were, books in the Metropolitan Sewers Office giving the situation of these dumb-sewer shafts, by reference to which they may easily be found by measurement on the surface. J. P.

CROYDON CHURCH: PAST AND PRESENT.*

OUR parish churches being the joint property and inheritance of the parishioners, it follows that the great bulk of Britons, exclusive of those in our modern manufacturing towns, have shares in ancient structures that are as interesting in an archaeological point of view, as the mighty castle or the pleasant "house" of the neighbouring lord of the manor. In the great clusters of modern industry, the churches are chiefly new, for they have been erected since the influx of population has called for more accommodation for public worship than that which the one fabric placed there in old time could afford. But in other parts of the country, agricultural and pastoral, John Ball and Jack Robinson are in possession of venerable structures, frequented by their forefathers, in Tudor, Lancastrian, and Plantagenet days. Many a parish church, indeed, as we needly scarcely say, now standing, was built only a few years after William the Conqueror's assumption; and, here and there, in quiet nooks, is still to be found a massy, hoary edifice, with sturdy low arches and thick ripe walls, that was erected a century or more before that doughty Norman so much as cooed or crowed in his mother's arms. To these hallowed still places, in every generation since they were built, Dame Ball, smiling and proud, has brought her little ones to be baptized, and sweet mistress Robinson has come, with pretty blushes, to be married. To say nothing, therefore, of the fact that it was beneath the shadows of their walls, and sometimes within them, that they buried their dead, the family history of parishioners must be allowed to be intimately associated with their parish churches. After a little more diffusion of archaeological knowledge, indeed, we may expect an intense appreciation of these items of our mutual inheritance; and, in many instances, a deep unavailing regret that more care has not been taken of them. All those persons who have in any way assisted in the preservation of their parish churches, or of their records and monuments, or have in instances of demolition or confiscation perpetuated their remembrance by illustrations, will be held in good memory.

With this slight preface we are about to mention a work which seems likely to bring its author the recognition we predicate for those who render the services we have enumerated above. It is a history of Croydon Church, by Mr. J. Corbet Anderson, who, with his own pencil, has enriched it with about a hundred illustrations, showing the general appearance, monuments, and other details of his subject. Croydon Church, it will be remembered, was destroyed by fire, one stormy night in January, 1867. As the flames darted and leaped upwards,

* Monuments and Antiquities of the Old Parish Church of St. John the Baptist, at Croydon, in the county of Surrey. Illustrated by the author, J. Corbet Anderson, Croydon, 1871.

snowflakes whirled and fluttered and faltered downwards, and, what with the rage of the fire and the impediments to succour caused by the frost, the structure was completely gutted. Mr. Anderson has divided his work into two parts, therefore. The illuminated title-page of the first portion sets out that it contains "Monuments and Antiquities of the old Parish Church of St. John the Baptist, at Croydon, in the County of Surrey, which was destroyed by Fire, January 5th, 1867;" and another illuminated title-page announces that the second section relates to "The Parish Church of St. John the Baptist, at Croydon, Surrey, as it was Rebuilt during the years 1867-9, after the Designs of G. G. Ibert Scott, R.A." Both parts are executed in a meritorious manner. And as the subject is good, the result is an agreeable as well as useful book.

Croydon Church possesses the interest of close neighbourhood to Croydon Palace, one of the ancient seats of the Archbishops of Canterbury, and within its walls have been interred several of these prelates. Bishops, too, have been consecrated in it. Archbishop Cranmer, especially, consecrated several bishops in it, among whom was Myles Coverdale, D.D., the translator of the Bible. These facts are only dwelt upon by Mr. Anderson. For 800 years, he tells us, this was the only Episcopal church at Croydon; but the increase of the population has been so great and so rapid that it has been deemed expedient to form eleven additional districts out of the original parish, and eleven new churches have been built in them, since 1827. Thinking of this twelve-fold increase and the prosperity it denotes, it seems almost like turning over a bundle of hay to look for a needle to go back to those early days when the first Christian fabric was reared in the secluded and wooded valley, or dene, we now call Croydon. But that there was such a structure in the dene in Saxon times is indicated by the signature of "Elfise, the priest of Croydon," to the will of Byrthric and Elfawithe made in the year 960. There were no traces of Saxon work to be discovered in the building, even before the fire; but after the great conflagration, when portions of the walls fell and others were pulled down, a great many fragments of Norman work were found built up in later masonry. We may thus conclude that the first church was built of timber, and that it was superseded in the days of the Normans kings by a stone building. This was in its turn taken down to make way, successively for thirteenth, fourteenth, and fifteenth-century work. Three times, it was seen, on examination after the fire, had the old walls been pierced for lights, the last being in the Perpendicular period. In Domesday Book there is an entry of a church and a mill at Croydon; but the chief remains left bare by the fire and the subsequent stripping off of all plaster-work are those of an Early English building. Thus, Mr. Anderson thinks, the church mentioned in Domesday, which was probably only the usual chancel and nave, must have been extended in the Early English period to nearly the full size of the large Perpendicular edifice recently destroyed; and it was the Early English masonry, always excellent, that had been thrice pierced. Externally, however, the structure that perished in 1867 was, to all intents and purposes, a handsome Perpendicular edifice. In the present restoration, this fact has been handed down, and Croydon Church once more presents the appearance of a costly Perpendicular building. By the aid of a small map, we are shown its position with reference to its ancient approach through Jennett-lane, now closed; its proximity to the ancient quadrangular court of the archiepiscopal palace and the vicarage; and its insularity by means of brooks and ponds. In the gardens of the palace were many fish-ponds. Most of these courses and pools have now, however, disappeared.

The ancient church consisted of a nave, with north and south aisles and north and south porches; a chancel, with north and south aisles and a sacristy; and a tower, five stages in height, at the west end. There was a west doorway in the tower, which was ornamented with the arms of Archbishop Chicheley, "the especial repairer" of the fabric, according to Stowe, in the early part of the fifteenth century; and over it was a broad millioned window. At the east end was a large six-light window, divided into two stages by a transom, with tracery in the heading. Among other lights, those at the east end of the chancel aisles were remarkable for their beauty. The arcades of the nave consisted of five arches; and those of the

chancel of two. The arches were moulded, and the columns clustered.

In the south aisle of the chancel were two handsome marble tombs, with recumbent effigies, one being that of Archbishop Whitgift, the other that of Archbishop Sheldon. Near them was a smaller monument, with a kneeling effigy to the memory of Michael Murgatroid, who died in 1608. Eastwards of these, in the chancel, were the fine sarcophagus and effigy of Archbishop Grindall. Illustrations of all of these are given, for, fortunately, Mr. Anderson made accurate and minute drawings of them twelve years before the fire. On the north side of the chancel was the tomb of "Maister Henrie Mill, citizen and grocer of London famous cittie, alderman and sometyme shreve," and his wife Elizabeth, who was the mother of sixteen children, "the blessing of the Lords," said the long epitaph. There were two arched recesses, divided and flanked by Corinthian columns in this monument; in the one knelt the worthy alderman and on the other his wife, and these effigies being of stone, suffered less than the marble ones mentioned above; but they were taken down after the fire. In the north chancel aisle was the grave of John Singleton Copley. Here was also a Tudor monument, on which were represented in alto-relievo the figures of a man with four sons of graduated sizes kneeling behind him, and of a woman with five daughters, with a similar difference in their stature, kneeling behind her. On the tomb was the date 1568. Below was an inscription which stated that Sir Nicholas Heron was buried there. In this same aisle, a startling contrast to these stiff effigies, with their starched ruffs and prim robes, was a monument by Flaxman, in which the angel, with soft drooping wings, was stooping serenely over the form of a beautiful female in transparent drapery, and with both hands touching her outstretched arms to assist her ascent to the regions of light. This piece of sculpture was erected to the memory of Mrs. Bowling, who died in the twenty-fifth year of her age. It was completely shattered in the fire. Close by was a monument to the memory of Sir Ephraim Stannus, the Lieutenant-governor of the Military Seminary of the Honourable East India Company at Addiscombe; and nearer still laid the remains of Lewis Nockalls Cottingham, the architect. On the floor were several brasses and slabs. Antiquaries, time after time, came and rubbed them and read them, and ever and anon the old monuments figured in their portly publications. Many of the brasses were torn out, leaving only their indentations. This was the case on the Warham monument, where there were formerly brasses representing a knight and his lady, not on the floor, however, but on the back of the deep recess over an altar tomb. Mr. Anderson has sketched many of these. There were stones with indentations for brasses close to this inscription, and two perfect brasses, one showing Sylvester Gabriel, a priest, who died in 1515, and the other a knight and his lady, with their coats of arms, and nine children. On the floor of the nave, too, were several brasses of a later period. One represented a comely young woman robed in a long tunic, which opened in front to show the rich skirt of a garment below. On her head was a high-crowned hat, with a broad brim turned up over her ears, and round her neck was a plaited ruff. This was Elizabeth, the daughter of John Kynde and Clemence his wife, who was married to the vicar, Samuel Flynche, bore him five children, and died, at the age of twenty-one, in November, 1589. There was another brass of a lady in a high-crowned hat, ruff, and peaked bodice, close by; but both of these, with four others, were grieved to read in Mr. Anderson's pages, were stolen by the workmen employed in improvements and repairs made in 1859. Besides brasses representing figures there were others charged only with quaint epitaphs. Most of the monuments, it will be seen, belonged, like the ornamentation of the edifice, to the Perpendicular period. When the church was cleaned in 1841 a discoloured painting was discovered; and when the gallery, built in 1714, was removed in 1857, another painting, representing St. George slaying the dragon, was found on the same wall. These are delineated.

The register was commenced immediately after Thomas Lord Cromwell issued an injunction to the effect that entries of births, or baptisms, marriages, deaths, or burials, should be made in a book kept for the purpose, in 1538. The headings of each division in the register are written with many cramped flourishes and puzzling

abbreviations, in Latin, by the curate, Thomas Sowley. The first baptism entered took place on the 25th of December, 1538. It was that of John Butler. Mr. Anderson gives a sketch of the font, which was utterly destroyed in the fire, so it is easy for us to realise the ceremony. It was new in those days, of an octagonal form, with a quatrefoil in each of its panelled sides. In the centre of one quatrefoil was a rose; in the next, a grotesque face; and so on, alternately. The first marriage entered was that of Loye Balle and Alyoe Cortys. This took place a month before the baptism of John Butler. We may picture the little cluster of wedding guests standing before the altar, the dames in high-crowned hats and ruffs and tunics, coquettishly worn open to show the embroidered undergarments, as Elizabeth Flynche were here; the bridegroom in a doublet, with a cloak over it, by reason of the November weather, a ruff too, bows upon his shoes, and perhaps at his gartered knees. For, as we have said, most of the effigies on the numerous monuments belong to this time, and they give us all these particulars of costume. There are several interesting notices in this early register. One states that "from the 11th to the 18th August, 1603," the year after that of the death of Queen Elizabeth, "3054 persons died of the Plague in London and the liberties thereof, and that many died in the highways, near about the Citty;" and "from the 25th of August to the 1st of September 3,885 persons died." The deaths of five persons are recorded who lived to be centenarians. Only one of these lived in the seventeenth century. The other four occurred in the eighteenth. Four of them were women. Mr. Anderson gives the entries relating to the burials of most of the persons to whom monuments were erected in the church. Some of the great frosts were also registered. In December, 1607, it was written,—"The greatest frost began ye xth day of this month. Ended on Candlemas Eve." Against the date 1614-15, February 12th, there occurs,—"This was the day of the terrible snowe, and the Sunday following a greater." On the 31st of March, 1722, a note was made to the effect that six men were executed that day at Thornton Heath.

In the following year, in April, another entry records the execution of four more at the same place. In March, 1749, Robert Saxby was "robbed and murdered" at the end of Breach-lane; and in the following August, "James Cooper, a highwayman, was executed on a gibbet in Smithdon Bottom, and there hanged in chains," for the mischief. There are seven entries showing the burials of seven archbishops. Most of these died at their palace close by. Two of them, however, were brought from Lambeth for burial at Croydon. In 1596 the death of Archbishop Whitgift, who stood by the side of Queen Elizabeth when dying, and afterwards crowned her successor and his queen, is thus recorded:—"John Whitgift, Archbishop of Canterbury, deceased at Lambeth, on Wednesday, at viij of the clocke in the eveninge, beinge the laste day of February. And was brought the day followinge in the eveninge to Croydon. And was buried the morninge followinge by two of the clocke in the chappell where his pore people doe usuallie sitte. His funerall was kept at Croydon the xxvijth day of Marche followinge. Anno Dni. 1604. Anno Regni dñi nri Regis Jacobi Secundo." Archbishop Wake likewise died at Lambeth, and was brought to Croydon for burial. The record adds,—"And his lady, which was buried at Lambeth the April, 1731, was taken up and brought to Croydon the next day, and put in the vault with him." But we must now turn from the old church, and those who worshipped in it, to the new.

Mr. Anderson relates that the fire that swept so much of the past away was caused by the heating of the flue of a stove which was conducted too near to the woodwork of the roof:—"There was only a brick, set edgewise, in an ordinary amount of lime mortar, between the flue-pipe and the wooden upright that rested on the corbel. Between the dry timber and the iron pipe the space did not exceed 6 in." This being the case, it only required a better fire than usual to do all the mischief that was ultimately done. On the cold January day in question the stove was seen to be red hot; and about eleven o'clock at night a small flame was observed curling along the principal and tie-beam that

* Whitgift's Grammar School, Croydon, built by funds accruing from a bequest of the Archbishop, was recently illustrated in our pages (see p. 646, ante).

were so dangerously close to the flue. The Volunteer Fire Brigade was called immediately; but no one remembered to tell the turncock to turn on the water. Thirty-five minutes elapsed before water was obtained, and then it was too late. The roof fell in at half-past eleven. A south-easterly gale was blowing, and falling snow mingled with the sparks in a most dazzling manner. By half-past twelve only the outer shell, and that terribly soathed, and the shattered arcades, were standing.

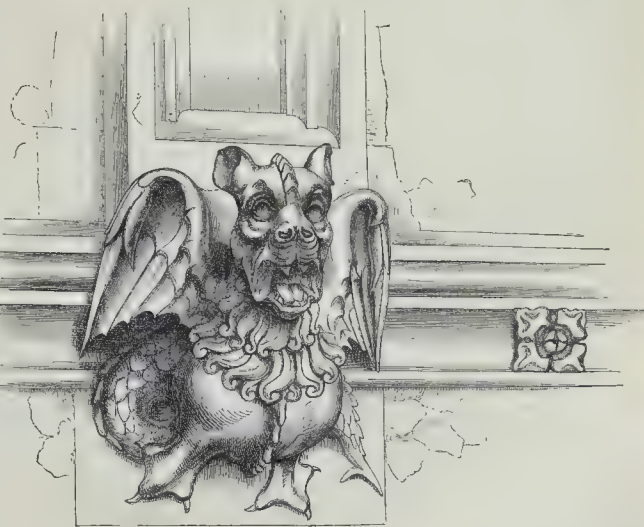
As soon as it was lawful to do so, the vicar, who had previously employed Mr. Scott to put the church in order, called a meeting; the result of which was that the same architect was instructed to rebuild the edifice. And here commences the second portion of Mr. Anderson's chronicle. In November, in the same year, the work of reconstruction began. The old flint walls were recessed as far as they went, with the exception of the east end, which was extended 18 ft. to give greater size to the fabric.

The ancient south porch, with the chamber over it, was retained; and the carcass of the tower was also used in the new structure. The tower is 29 ft. square, and 100 ft. high to the parapet. The pinnacles give it a height of 121 ft. The south porch mentioned measures 12 ft. 6 in. by 11 ft. 6 in. The length of the nave is 31 ft. 6 in.; the width, 32 ft. 6 in.; the height to the ridge, inside, 53 ft. 6 in. The chancel is 56 ft. long; thus, with the tower, giving a total length of 176 ft. Those who enter the church by the western doorway gaze upon a fine vista. There is an arcade of six lofty arches on either side of the nave. In the chancel are two more arches, supported on red marble piers, making eight, on either hand, in all. Over the arcades of the nave are six clearstory lights. And, higher still, pass and re-pass the timbers of the roof. Angels are carved on the corbels bearing the upright principals; and rich tracery is inserted in the spandrels of the tiebeams and braces. A handsome carved oak pulpit on a sculptured stone base stands at the north-eastern respond of the nave. Near the south-eastern pier is the reading-desk; and between the two, upon a marble foundation, is placed the ancient brass eagle, fortunately snatched from the burning. The chancel roof, which is wagon-shaped, is panelled and moulded. At the base of each intermediate rib stands an angel, erect; and the principals, as in the nave, are supported by corbels, each of which bears the half-length figure of an angel. The east window has seven lights divided into two stages by an embattled transom. As the eye follows the drooping, wing-like curves of the tracery in the heading, the thought of Flaxman's angel comes to mind, and we grieve that it has perished. This window, like others in the fabric, is filled with stained glass. Below it is a coloured alabaster reredos. That nothing may be wanting, there are handsomely carved sedilia on the south side, a credence-table, and oaken stalls with carved finials. Nearly every detail we have mentioned is figured by Mr. Anderson, and the names of the artists and manufacturers furnished by him. The cost of this restoration, with the purchase of the chancel, the warming apparatus, gas-pipes and fittings, organ, bells, clock and chimes, furniture, commandment tablets, with the necessary legal expenses and insurances, amounted to 30,000*l.* No accident occurred during the progress of the works. A high wind broke off the principal boughs of a great elm which grew before the tower; but no injury of more consequence cast a gloom over the prosperous progress of the task.

We are enabled to reproduce, as examples of the illustrations, Mr. Anderson's sketches of the pulpit,* a corbel, and a gargoyle.

An length, January 5th, 1870, exactly three years after the disastrous fire, the new church was consecrated by the Lord Bishop of London. About sixty clergymen were present, and a large congregation. Before the service commenced, the vicar, attended by the churchwardens, ascended the tower, to be present when the new clock was formally started, and the hour struck for the first time. After the service, a peal was rung upon the new bells. With a record of the first evening service, held on the same day, when the church was filled to overflowing, Mr. Anderson's labours came to a close. We have given but an outline of the interesting history his book contains; but, doubtless, we have said enough to recommend it to many of our readers.

* See p. 768.



ST. JOHN'S, CROYDON: CORBEL AND GURGOYLE.

THE INSANITARY STATE OF SUNDERLAND: AND ITS CONSEQUENCES.

The present year will long be remembered by the inhabitants of Sunderland. Last year, Sunderland was the envy of towns from the lowliness of her death-rate from all causes; the registrar's returns showing it to be about 16 deaths in each 1,000 persons living, per annum; yet the destroyer was near at hand, and the current year had but well set in ere he appeared in the shape of *smallpox*. The first attack, commencing early in February, gradually spread in every direction, covering almost the whole town, although isolated parts appear to have entirely escaped, to which reference will be made before closing this article.

The borough of Sunderland comprises, in its population of 100,000 inhabitants and area of 2,784 acres, the parishes of Old Sunderland, Bishop Wearmouth, Monk Wearmouth, New Hendon, and others. In a few years the authorities have spent considerable sums in improvements; still much remains to be done towards remedying the present insanitary state of the whole place, without any exceptions that we could observe. 83,000*l.* appear to have been laid out in public sewerage, exclusive of 35,000*l.* paid by private persons. Much has been done in flagging and paving; many of the main thoroughfares are highly creditable in this respect; an outlay of 64,000*l.* has been incurred by these works, independently of other sums charged the owners of property. A large additional sum has also been borrowed, to more thoroughly complete the good work already done. Nevertheless, it is our duty to write in severe terms of condemnation upon the general sanitary arrangements.

A perambulation in almost every direction reveals the fact of very deficient scavenging organisation. Many streets,—and not the older ones alone,—are simply disgraceful, the channels often resembling open sewers; indeed, it seemed to us that there was occasional evidence of as much sewage above as below ground.

Warren-street, with others, was disgusting: the gutters were strewn with animal and vegetable garbage, and were flooded with sops and slops, amongst which could often be discerned the heads and entrails of herrings and mackerel. In warm, sunny weather, such refuse must add much to the redundancy of foul smells already characteristic of many parts.

Money is being spent by the Council in clearing away the worst of the human rookeries adjacent to the High-street, and ventilating the localities by opening out breathing-spaces, although many must remain for years to come. Nevertheless, the aspect and sweetness of narrow lanes and courts require to be improved by a wholesome scavenging, with proper attention to the necessities and backyards, in too many of which we noted heaps of dirt and garbage, and infringements of the most necessary of hygienic laws.

The epidemic has made havoc in these overcrowded courts and alleys, from five to ten cases of small-pox in a single house being no uncommon thing. Some blame is attached to the corporation for pulling down so much property without providing other abodes: hundreds from sheer necessity have been driven to the neighbouring courts and narrow lanes to cram the already overcrowded dwellings at enhanced rents.

In Sunderland parish the epidemic was so rife that the mortality of some weeks ran as high as 125 per 1,000. Sunderland is essentially a midden town, the proportion of *w.s.s.* being less than one-fourth. From personal observation we should say much less.

It is, perhaps, remarkable that out of several hundred houses examined, not one of the necessities or "necessities," as they are termed, was drained. All emitted the usual smell of decomposing human ordure and rotting garbage, and in confined localities, on murky, moist nights, the stench is quite unbearable, from the confined nature of yards; many of these necessities are within a few feet of the house windows and doors. The majority examined were in a more or less fluid state. Owing to this condition, a foul smell pervades the whole town. In every direction, the intensity being one of degree dependent upon local circumstances. In this respect our evidence is at variance with that lately given by a worthy alderman, who is represented as saying that it is a frequent remark of visitors to the town upon the entire absence of sewage smell. We can only say that

the nose confirms what the eye detects, that the filth and abominations everywhere are felt and seen, and that the odours are in keeping with the conditions from which they arise. And it would be odd if it were not so.

Surely the sanitary authority of Sunderland knows that undrained privies, whose contents are in a semifluid state, are a much greater nuisance than when in a dry condition; that greater contamination to the atmosphere occurs through rapid decomposition, arising from the humidity of the foul matter, although comparatively inactive in a dry form, as easily ensured by proper drainage at the base. It was a common thing to note that the foul, watery matter oozed through the brickwork of the walls, saturating the yards and lanes with abominable filth. We fear this is a too common occurrence in this as well as other northern towns to be much noticed, for many persons remarked to us, "But what's the harm?" A tendency to aggravate the accumulation in middens arises from the imperfect arrangements for disposing of their contents; each householder removes his own by promiscuous or chance carters, at a cost to himself of 1*l.* for each load.

Thus there becomes a tendency on the one part to accumulate filth because of the cost attendant upon removal, and, on the other part, a disposition to get rid of the load at the nearest possible spot,—for the manure is not much appreciated by neighbouring agriculturists,—without regard to locality or to any evil that may hereafter arise from the act: that some of it, at any rate, is deposited in the most improper places, we know of our own knowledge,—the sites of future houses!

Sunderland ought to know that this matter of the disposal of a town's refuse is of great sanitary importance, for good or for evil, to the community, and it can only be effectually performed by a proper and an adequate staff under skilled direction; it cannot be done in the present haphazard manner, and the cost should be borne out of the public rates. Above all other considerations, there should be no question as to the places of disposal being the right ones, as cannot now be said.

On visiting New Hendon, we found that the Little Beck is crossed by an embankment some 40 ft. in height, known as "Noble's Bank." Now, this bank appears to be composed essentially of refuse of many kinds,—furnace slag, cinders and ashes, sweepings of roads and gutters, and contents of middens! The foul nature of the composition is disclosed by the condition of the water drained from the mass, and collected at the toe of the slope resting upon impervious clay, giving off countless bubbles of gas, and the whole water seems to be of the consistency of sewage in a concentrated form. The smell from this mass is unbearable at certain times, spreading far and wide, the inhabitants round about for a considerable distance speaking of the nuisance in no measured terms of disapprobation.

A similar bank is in course of formation a few hundred yards higher up the stream, and of similar materials.

As to the human filth deposited here, we have the testimony of the tenants adjacent, and the positive evidence of the foul water at the base of the stuff. The street scavengings we personally saw tipped here by the corporate carts. The nuisance and danger from this pernicious act are not merely confined to the present, for there is no question that in a few years the whole site will be built over; indeed, many of the houses now erected on each side of the stream are upon made ground of similar character. Let us hope that a Higher Power will have mercy upon those who dwell upon such filth, for the authorities have none!

Robinson-street, close at hand, consisting of fairly-built houses, let at 25*l.* or 30*l.* a year, and occupied by well-to-do tenants, presented an appearance such as to bring discredit upon any town, however well managed in other respects. The street is of considerable length, and for the most part well flagged; but of road there is none; just the ordinary black ashly formation with patches of clayey material; and it was a curious sight in the midst of summer to witness a straggling horse tagging at an inextricable builder's cart with the wheels sunk a full foot into the mire, with half a dozen passing pedestrians vainly aiding with their strength! But such we saw.

A much more serious matter is the want of sewers hereabouts. This street has two names; the one side is Robinson-street, and the opposite

side is Herrington-street. Now parallel with these runs Ward-street, and between them a lane, for convenience of the back premises: to neither of these two streets thus back to back is there any sewerage whatever! The necessities were for the most part filled with the usual semi-fluid contents, and the smell emanating from them is much easier conceived than described. It was plainly perceptible along the new Hendon-road at some distance; and, by tracing the stench, we discovered its origin. The household slops, with the wash-house and scullery water, are thrown down usually into the yards, and thence into the lane, the whole place being in flood; indeed, many of the yard doorways have miniature dams thrown abreast of them, and with stepping-stones leading to the drier ground into the lane. Many of the privies leak, thus imparting a zest to the water from the houses. Opposite the worst of these places, new houses of a well-to-do type are in process of erection, and the whole soil—for it is here virgin soil—is saturated with this filth; the foundations of the buildings are cloyed. The primitive mode of utilising this local sewage is unique, and worth placing on record.

The Irish labourers, at the construction of the new buildings close at hand, have sunk small wells, into which some portion of the said sewage finds its way,—chiefly, however, from the surface, for clay lies below.

Now, the stinking water—for we smell it—is used in the construction of these dwellings for mortar and plaster, for damping bricks, and other uses!—it appeared to be the only water; we could not discover traces of any other supply. No doubt this novel application, of waste products will, in due season, bear fruit in the shape of ample crops of sickness in the unfortunate families who may chance to live here! Notwithstanding the evils of this ill-flavoured locality, not a single case of the prevalent small-pox epidemic has occurred, yet there was plenty close by. We will refer to this again, and offer an explanation of the apparent anomaly.

The sewers of the town, judging from the contour of the ground, must have, for the greater part, excellent fall. They are discharged into the tidal Wear or the sea, the water within them and the pressure constantly varying with the ebb and flow of the tide.

The ventilation of the sewers is not satisfactory: writing from our own inspection, there is an almost entire absence of it. Certainly whole districts have not a single outlet but that due to improper leakage. Mr. Harrison, C.E., from the Home Office, very properly refused the authorities his certificate lately for borrowing powers, until he had a guarantee that proper ventilation would be provided; and we hope, for the town's sake, that he will see the guarantee performed; for, notwithstanding the testimony of the sanitary and other committees and of the corporate officers, that every part of the town was sewer ventilated by means of drop-spouts, we are bound to state, that after examining numerous districts, and making many inquiries, we only found evidence of the fact in one single street, where there were either two or three such ventilators. Moreover, several practical builders of the town stated to us, they had never seen such things, nor even heard of them, and were surprised at the question. It ought not to be omitted mention, that according to information from a member of the sanitary council, the town sewers have capital ventilation, by means of six chimney-stacks, into which branches have been run. We saw the statement in a ludicrous light. Conceive, if you please, half a dozen chimneys, indiscriminately selected, doing duty for many miles of public sewers on an area of close upon 3,000 acres!

The pernicious effects of non-ventilation to sewers cannot be too well known nor too strongly denounced, and wherever sewers open into tidal waters the evils are aggravated. Gases foul and dangerous will generate within the sewers, and, if exits for the gas do not exist at the summits of each, will find a way into the houses, out-houses, or yards, and of this there is no doubt whatever.

Not alone the sewer gases may enter these improper places for their reception, but what is of greater consequence and danger, also the contagion of any communicable disease that may happen to be life in any part of the town where sewers, provided there is a connexion with the sewers of each locality.

We examined the houses of a great many families wherein small-pox either had been or then was prevalent, and even on a cursory in-

spection grave sanitary defects were seen in most of them.

In by far the greater number of dwellings examined the slops are conveyed to a drain in the yard, so that contact with the sewer is broken from the outside. Nevertheless, a sewage smell was perceptible, and in some instances in a marked degree, with few exceptions, in all the houses looked into. More especially was the odour discernible in rooms not so frequently opened, in cupboards and small closets under the stairs, and similar close places. Numbers of the occupants were unaware of any foul smells, excepting at times, particularly after rain; others, again, stoutly denied the presence of foul odours, although when pressed, and their attention called to the locality of the noxious smell, they admitted they did at times perceive such, more so in the morning, when the house had been shut up, and the windows and doors kept closed; others, again, were loud in complaints of foul odours, arising they did not always know whence, but apparently from under the floors and passages. We will give a few extracts from our note-book, of memoranda jotted down on the spot, and selected promiscuously from a considerable number,—probably several hundreds.

"Tower-street, No. 23. Five small-pox cases here. All but infant vaccinated. Children under five years old. One death. Foul smells perceptible in the house. Tenants do not generally complain of it. Yard drain good. Not much smell from privy, which has not been cleansed and disinfected."

"No 28. One slight case. No apparent defects in the house, but the same characteristic sewage smell is obvious. The same in washhouse. The yard has a foul privy, smelling fearfully."

"No. 27. Wife died of small-pox. Had complained of the terrible stench from Noble's Bank. Necessary very foul."

From this house we had information that a person opened a mattress upon this bank whereon a small-pox patient had been laid: that a number of children had rolled amongst the straw, afterwards suffering from the same complaint. We are unable to confirm this.

"No. 7. Four cases, aged from seventeen to eighteen years. All vaccinated. Recovery uncertain. Privy quite full, and the stench caused a retching. The fluid percolates into the yard through the brick wall."

"Norman-street, No. 37. Here one child died. The ground-floor front room smells powerfully. In it the child slept and sickened. Twenty-two persons live in the eight rooms. Most of the houses in this street have had cases of small-pox. It is situated in the outskirts, near to the sea and fields, and on elevated ground. All the tenants complained of smells. Many of the houses are filthy, with foul yards and stinking privies."

"In No. 46 (five cases, with one death), the smell in this building is quite sickening."

"No. 47. Stench again overpowering, of which complaints are made."

"No. 27 has eight cases and one death, all vaccinated. Twenty-four inmates reside in the eight rooms. Water from privy flows over its floor. Drain stopped, and yard filthy. No. 19 has one case. No. 20 has two cases. Great complaints are here made of the foul smells in the house. Stench of privy is very strong. Several of the drains in this neighbourhood are broken, emitting gas. No. 12 has one case. Tenant states that at times the smells make her quite sick. Another tenant in this house complains of a terrible smell arising from beneath the floor of the room. No. 7 has one case. Again are complaints of smells from the floors; it is stated that a pair of boots placed under the bed becomes covered with green mould in a couple of nights! The whole place is foul and stinking."

Robinson-terrace, close by, in a capital position, dry, airy, and fronting the meadows and sea, is worse in some respects than the cases just quoted; and the complaints of disagreeable smells within the houses are more general, and of violent headaches and lassitude in the morning, which disappear in the open air.

Many cases of small-pox have occurred hereabouts. The Parade, occupying a capital site, has many small-pox cases, and the most insanitary state prevails.

Going from house to house in various localities of the town, we found all presenting the typical foulness of—privies and gaseous escapes within the houses—what we should term "the Sunderland odour," for it differs from the noxious smell of other towns with which we are acquainted.

The number of sufferers said to have been vaccinated will surprise those who, like ourselves, believe in its efficacy. We should require further proof that it was as stated, before reasoning on it. Even here, however, vaccination is seen to be, if not a prophylactic against attack, in a great measure a preventive of death. It is asserted that something like 90 per cent. of the total population of this borough have been vaccinated, and that 85 per cent. of the whole cases of small-pox are vaccinated ones. The relative death-rate appears to have been about 5 per cent. in the vaccinated patients, but 60 per cent. in those not vaccinated.

These figures must be taken as approximate, and the final relations may differ from them: at the same time the medical officer concurs as to their general accuracy.

As comparatively few houses had sinks or traps within-doors, we were puzzled to account for the presence of so much sewer effluvia, until a builder, who erected some of this property, let us into the secret, incidentally, on being interrogated upon the provision against damp. It appears that a special pipe-drain is usually laid down parallel with the buildings, just under their front, and that a branch is provided for each house running under the floors (there are no cellars), for the purpose of carrying off any subsoil moisture from the foundations.

At the termination of each main drain before connection with the sewer, a syphon pipe is supposed to cut off aerial connexion between the two. Vain delusion!

Here then, if this be correct, would seem to be ample provision for the general diffusion of an epidemic; indeed, for this purpose nothing could be more ingenious. Conceive the whole sewers of a large town, the tidal waters flowing up them twice in each twenty-four hours, emptying their gaseous contents under the floors of the houses of the unsuspecting inhabitants!

No wonder that the waterman's boots seen under one of the beds had turned of a mouldy green, and that sick headaches are constant. Here is ample text for a warning that should not be disregarded. Evidence shows that a town in even the most insanitary condition may for a time escape the consequences of infringement of nature's laws; but the penalty is fully imposed, and amply paid directly an enemy appears.

In the absence of sewers, and, therefore, sewage gas, in the houses of the abominable localities first referred to, such as Hornington-street, may lie the secret of their escape from present attack, and the explanation may be extended to other parts. The severity of attack in the outskirts of the town, as the Parade, Robinson-terrace, and the others around its whole circumference, may, perhaps, be attributed to their occupying positions at the termini of the sewer systems, where occurs the largest concentration of gases, and only their naturally healthy and elevated sites, with general openness of country, have saved them from even a more terrible fate than has befallen them.

THE RUSSIAN "BANYA," OR VAPOUR BATH.

The Russians are great lovers of vapour-baths, and both the capitals contain a great number of these establishments, affording generally a profitable investment for the proprietors, who often amass considerable fortunes. Not only the capitals, but the towns of the interior, are provided with this desideratum in the economy of the every-day life of a Russian; and in every village the bath-houses "banya" forms part of the peasants' establishment, although, as might be expected, it is rude and primitive, both in structure and arrangement, but the principle is the same. On Saturday evening, or on the eve of a great church festival, an unusual movement may be seen, particularly among the lower classes in Russian towns,—whole companies of soldiers, troops of mechanics and labourers, whole families, men, women, and children, are eagerly traversing the streets, with towels under their arms, containing their "change" of linen, while in one hand they carry the "vaynik," a bunch of birch-twigs, the use of which will presently appear. They are going to and returning from the bath. This propensity for bathing, or rather washing, among the lower classes of Russians, is an anomaly. During the summer months the rivers also swarm with bathers. It is no exaggeration to say that their habits are of the dirtiest, both as regards their persons and their domestic affairs; yet they will repair regu-

larly to the bath. These periodical ablutions may therefore be looked upon more as the result of a confirmed habit, acquired from infancy, the sensual enjoyment which it affords, and also, in no small measure, to the curative properties which the bath is supposed to possess. Tooth-ache, rheumatism, catarrh, and more complicated ailments, are all treated with the bath,—in fact, it is still looked upon almost as a panacea for all the evils that flesh is heir to by a great bulk of the Russian people.

The Russian bath, in its arrangements, may be regarded as a modification of what is termed a Turkish bath in this country. In the capital of St. Petersburg they consist of a spacious public dressing-room, where the attendants take charge of the clothes, which are ticketed, and placed, under corresponding numbers, into large pigeon-holes, made for that purpose. This room is more or less elaborate for the middle class of bathers, who pay about 5d. entrance. The floor is generally covered with matting, the couches upholstered with American leather or Utrecht velvet, which, with the looking-glasses that decorate the walls, constitute the furniture of this department, where shaving is also practised. The next apartment is what is termed the "milnaya," lavatory, or cold bath, which is only so comparatively speaking to the following one, which is the "hot bath." These chambers have boarded floors, the walls being wainscoted; but the lighting is bad, as a rule. The former apartment is generally the largest, is lofty, and will contain no less than from 60 to 100 people, including the washers, who receive an extra gratuity, the latter performing the operations of shampooing much in the way in which it is practised in the Turkish baths in this country, the friction, or rather washing, being effected by means of a large bast-wisp and a lather of soap and hot water, the patient being the while stretched out at full length on a wide bench, the head resting upon a small inclined plane of wood.

All the accessories are of wood, the benches fixed around the apartment and the piggins for holding the water, hot and cold, which is supplied *ad libitum* from a system of brass taps, generally arranged in a circle in the middle of the bath-room. The "donohe" is also to be found here as well as the ordinary dipping-bath. The next apartment constitutes the "hot bath." This is usually much smaller than the former one, not so lofty, and is the vapour bath properly speaking, and which the bather enters after the operation of a thorough scouring with the bast-wisp has been effected. Its arrangements consist of benches and a raised platform constructed near one of the walls, about 8 ft. high, formed of steps sufficiently wide to admit of a sitting, standing, or reclining posture. These steps, from three to four in number, represent graduated degrees of temperature, the top of the platform being the hottest. In one of the corners of this chamber is the oven or stove filled with boulder stones, which are kept red hot, water being now and then thrown upon them to generate the steam. The temperature maintained in this apartment is generally about 90° to 125° Fahrenheit. The "hot bath," it should be remarked, is the resort only of the thorough bath-goer. Here he lies on the platform alternately on his back and stomach, inhaling the heated and transparent steam in a half-gaseous state, his skin glowing a crimson red with the perspiration running down in streams. The Russians call this operation steaming themselves, and indeed it is the nearest approach to being cooked by steam that can well be imagined. The lover of the hot bath undergoes yet another operation,—that of whipping himself or being whipped with the "vaynik," which consists of birch twigs with the leaves on tied together into a bunch, and forming a sort of whiak, about 24 in. long. The operation of whipping, which is the invariable accompaniment of the steaming process, is effected by dipping the "vaynik" into cold water and slightly beating the body with it, producing a violent stinging sensation that seems to penetrate to the very marrow of the bones. This produces increased transpiration.

We have been describing a public bath in the fullest sense of the word, and conducted on decidedly primitive and communistic principles, for the costume of nature, in which we so entirely resemble each other, is that which prevails in this class of baths. The department for the women is arranged in the same manner, and in the baths for the lower classes a similar arrangement is introduced, only everything is of

a rougher description. The payment to these baths is about 2d., English money. For those who can afford to pay an extra price,—from 3s. to 5s.,—there are private baths, the miniature of those described above. These are more elegant establishments (on the same premises), where everything,—antechamber, dressing-rooms, and baths are perfect in their kind.

It would appear that the Russian vapour-bath is a very ancient institution. In olden times nearly every large house or establishment had its own bath; besides there existed for the common people the so-called Czar's baths, where a small charge was made for the use of them. These baths at one time formed all over the empire one of the sources of the revenue of the Czars. According to the account of Mr. Kotoshikhin, a great authority on Russian ancient manners and customs, the amount of 2,000 roubles was yearly received by the Czar's treasury from the baths under the jurisdiction of the Konyushenny Palace alone. The public baths were generally heated once and sometimes twice a week. During the hot summer months it was forbidden to heat them, for fear of accidents by fire; exceptions were, however, made by the voyevodas or governors of provinces for invalids and women who resorted to the bath to be confined. In olden times, Mr. Kotoshikhin further relates, these baths were usually visited after dinner, no one fearing any dangerous consequences, although the heat was next to unbearable. On the floor and benches hay was usually strewn, and covered with linen cloth. In these days a Russian would lie down in the scalding steam, and order himself to be well beaten with the "vaynik;" he would then run out into the open air, and in summer time throw himself into the lake or river on which these baths were generally situated, or, in winter time, roll himself in the snow or pour pailfuls of water iced over his body in the hardest frost (this is constantly done now, even by the peasantry in the villages). Every one going to the bath always underwent the process of being steamed,—that was the universal custom. The public baths had two departments, one for males, the other for females, divided only by a slight partition, but the entrance was general for both sexes; and the men and women going in and coming out by the same door were wont without any sort of embarrassment to pass the compliment of the day to each other, or stand chatting together, the only covering assumed for the occasion being the "vaynik" before mentioned. In still more ancient times, Mr. Kotoshikhin says, it was the custom for men and women to bathe together, and even monks and nuns used to wash and undergo the process of steaming in each other's company.

It is related that at a later period the foreigners residing at Moscow had also adopted the Russian bath, but with several improvements, so as to have acquired some celebrity. Instead of the bare benches they introduced mattresses filled with sweet-scented herbs in the dressing-rooms, which were waiting in the old Russian baths, and altogether a more cleanly mode of proceeding. The bath in olden times was the chief cure for all complaints: as soon as a Russian felt himself indisposed it was his custom to drink a glass of an infusion of spirits and garlic or pepper, eat some onion, then go to the bath to wash and steam himself. It is considered that upon the whole the Russian bath acts beneficially on the lower classes, who have much exercise, and it is said to inure them to that extraordinary insensibility to the extremes of temperature which has so often astonished foreigners. The effect upon the higher classes of a frequent use of the bath is in the long run weakening, especially for persons accustomed to a sedentary life, owing to the reaction which follows the extraordinary excitement or kind of intoxication of the whole nervous system.

ANOTHER TOWN IN SOMERSETSHIRE.

The town of Shepton Mallett, or Malet, is a town in Somersetshire with a surprising number of aliases: it may apparently be called Shepton Mallett, Shepton Malet, Shepton Mallet, or Shepton Mallard even, with an equal amount of correctness. It is a straggling town of about 3,000 or 4,000 inhabitants, situated in a valley, the north side of which is the southern side of the Mendips. Through the valley runs a stream; and, with the exception of just the heart of the place, the town through its whole length of about a mile borders the stream.

It does not strike a stranger at once that an immense amount of business is done in the place, or that it is an excessively lively or go-ahead place. It is not a corporate town. There is a high constable, but his office is nominal. The local authorities are the trustees of the Shepton Mallett turnpikes.

Two turnpike-roads, running at right angles, divide the town into four unequal portions. The other roads are, singular to say, maintained by the Highway Board, the turnpike trustees, as the local authority, doing all the scavenging, sewerage, paving, lighting, &c. Shepton Mallett has had, however, waterworks for some years that supply water of a fair quality: in that it is far ahead of most Somerset towns. There are gasworks, but the company do not possess an Act of Parliament.

The turnpike trustees govern the town under three or four Acts: the most recent is dated 1791,—eighty years ago. Under these Acts, the trustees cleanse, pave, and light the streets, make sewers, and water the turnpike-roads that are within the boundaries of the town (the other roads they have no power to water), and have the powers of a local Board of Health in a most modified degree, and as far as sixpence in the pound goes. They cannot levy a higher rate than sixpence in the pound in the year, but they possess the further power of aiding that by imposing a double toll at all the gates in their trust on Sundays. This brings in, we believe, about 40l. or 50l. less than the sum of the sixpenny rate; and, as the whole of the sixpenny rate, save about 30l. is used to pay for the lighting alone, these powers have been put in force for some years; but surely this is an injustice to the bondholders of the trust, and an evil that requires immediate attention. If from 100l. to 200l. can be so levied (though we have a great objection to an extra Sunday toll), that should go to the relief of the debt on the trust, and not towards the relief of the rates of the town of Shepton Mallett; it is, moreover, an injustice to charge travellers nine miles off with the relief of the rates of a given town.

The fruit of so restricting the turnpike trustees is evident in another way. You cannot expect a man to fight if you first tie him hand and foot, and so in this case progress is stifled, and fighting against the effects of time is impossible. Eighty years have elapsed since the date of the last Act; need we say how civilisation has progressed, or how its wants have increased in a proportionate degree in that time. Surely Shepton Mallett has been forgotten.

The trustees are continually making little improvements that lie in their power. Every year for the last few years they have laid short lengths of sewers and have put down a small portion of tar concrete paths. They have done all they can, and credit is due to them for the large amount of work they have done with such small means; but so much remains to be done of the utmost importance that is completely out of their power to do that we feel called upon to direct attention to the town. Some few of the inhabitants appear alive to the needs of the place, though they are all at sea how to act.

Into the stream that runs, we have said, through Shepton Mallett, are emptied all the sewers of the town. On its banks are many *garde-robes*; three breweries drain into it, and the new brewery, the largest of the whole, will drain into it near Bowlish. The bed of the stream is covered with loose stones lying on rock. In places it is arched over; in some places it is built over; for the most part it is open. It runs on to the village of Croscombe, about two miles further down the valley towards Wells, and from thence there are, of course, constant complaints of the ill odours arising from the stream.

The duchy of Cornwall claims the stream. You see the whole affair is an entanglement, and they will not take a step towards its purification. Surely the duchy, if they will not do it themselves, should insist (if the stream is theirs) upon its being kept free from sewage taint; the vapours and odours from it are fearful, noxious, and nauseating to a degree. An intercepting sewer should be laid at once in the bed of the stream, and conducted to a proper outfall.

If the duchy insisted upon the purity of the stream, the great desideratum of the town would be at once gained,—a local Board of Health possessing greater powers than the turnpike trustees now possess. At this time the streets are pitchy dark, for the lamps are only lighted from Michaelmas to Lady-day, and then for half the night only. For all the parts of this long strag-

gling place, except the turnpike-roads, there is but one scavenger. Sewers are wanted in all parts of the town, and many of the existing old dry stone-wall drains should be destroyed, and proper ones constructed.

We hope we have said enough to draw immediate attention to the sanitary wants of the town of Shepton Mallett: if not we shall recur to the subject. Rao.

FREAKS OF FUNGI.

ALLOW me to add a few words of additional information to "A Church Builder's" lively article, and to explain what the "fine powder-like brickdust" really is, that is at times found on china, &c., near the dry-rot fungus (*Merulius lacrymans*).

This excessively fine red powder is no other than uncountable myriads of the reproductive spores or seeds of the fungus; they are red in colour, and are produced on the surface of the fungus in millions. Certain privileged cells on the face of the fungus are furnished each with four minute points at their apex, each four bearing a single brick-red, egg-shaped spore; so that the fruit is spread over the surface of the fungus in groups of fours. To see the form of these spores the highest powers of the microscope are required, and then they can only be viewed as transparent objects. With a microscope I have readily measured them, and the length of each individual spore is "00035" and the breadth "0002" of an inch.

If these excessively minute bodies be allowed to fall on wet flannel, damp blotting-paper, or wet wood, they immediately germinate and proceed to reproduce the parent fungus. The red skin of the spores cracks at both ends, and fine mycelial filaments are sent out: this is the "mould" spawn, or mycelium from which the new fungus will (under favourable conditions of continued moisture) appear.

To see these germinating spores with their cracked skins, the moist blotting-paper, flannel, or wood must be gently pressed on to a piece of thin glass (so that some of the bodies are transferred to the glass); then viewed with a microscopic power enlarging at least some 800 diameters. FUNGUS-EATER.

THE ORNAMENTAL ROCKS OF CORNWALL.

THE employment of the granite and porphyritic rocks of Cornwall ornamentally, is of very recent date. Indeed, it has been said now that, as Sir H. De la Beche said thirty years ago, they have been much neglected. Their variety is almost infinite. There are first the ordinary gray or bluish gray even-grained granites of the Cheesewring, Par, or Penryn, and the porphyritic granite of Lamorna Cove, with its large crystals of felspar; each and all of which when polished look exceedingly well. It is, however, to the less widely disseminated porphyries and elvans that we must chiefly look. Among these are to be found every variety of combination and tint which the admixture of black, brown, white, red, gray, and purple, in crystals, grains, and specks, can produce. Of the granites and elvans, some are white with black specks; others flesh-colour mottled with white or black; others, again, are a chocolate hue, with gray spots; and some are red and black. Sir H. De la Beche refers to a few of those of Fowey, in his "Report on the Geology of Cornwall, Devon, and West Somerset." He mentions also a light-brown granite from Castle-an-Dinas, near Penzance; a variety with purplish felspar near Gwennap; one with rose-coloured spar at Cligga Point; and a porphyry with felspar crystals of a greenish hue, in a light flesh-coloured base. He speaks likewise of a white granite found near Okehampton, which resembles statuary marble. The extreme hardness of these classes of rocks, though it causes them to keep their polish, is against their very general use; but certainly more might be done with them than at present, if some practical man were to take up the question of their ornamental utilisation from a business point of view, and especially if what is said of the working of hard stones by jets of steam and sand be true.

Beautiful as are the marbles and the granites; they must yield place to the serpentine of the Lizard. Of this, says the *Western Chronicle & Science*, there are two (speaking in an ornamental sense) distinct varieties—the green and

the red. The latter appears to be the most popular; but the former is the most beautiful, particularly in those cases where the olive-green base is traversed by red veins. Yet there are some purposes—such as chimney-pieces—for which the deep, warm tone of the mottled red kind renders it preferable. The principal characteristic of the Lizard serpentine is the richness and body of its coloring. One seems to see beneath the surface. We have classed the serpentine roughly, as green and red; but for those who are not acquainted with this stone, it should be added that the varieties of tint are almost endless. Associated with the serpentine is the diallage rock (small crystals of diallage are disseminated through a good deal of the serpentine) or Crousa Down stone, the principal tints of which are purple and green.

Among matters of minor importance may be mentioned the steatite veins in the serpentine, some of which are large enough to be used for ornamental work; the flints and chalcodites associated with the chalk and greensand in the east of Devon; and a variety of red jasper occurring in large blocks on the north of Brent Tor, Tavistock. Spar, of which the varieties in Cornwall and Devon are almost endless, and some of which are as good as the famous Derbyshire spar, has never been taken in hand, and its capabilities are quite undeveloped, yet it might be used with great advantage and effect in the more delicate kinds of interior decorative work. Rock crystals have occasionally been employed for these purposes, but (in former days) more frequently for jewelry, under the name of Cornish diamonds.

THE SHEFFIELD SAW MANUFACTURE.

FIRST, the saw is cut out of the sheet. If a heavy or large saw it is next toothed, while soft. The third stage is that of hardening. Placed in a structure like a baker's oven, and floored like a baker's oven with brick, the saws are left there to harden, and when they come out they are, when cooled, brittle as glass. To abate this brittleness they are put into a composition, where they lie for a time in a sort of oil bath. This makes the fourth stage. After this they are tempered over a coke fire, watched by men who, guided by their experience of colour, take them out when they have acquired the tint which will leave them with a bluish hue that indicates to his practised eye the amount of elasticity in them. At this point you may bend them like whalebone from heel to point, so elastic have they become. This makes the fifth stage. The tempering warps them, and they now require to be flattened. The flattening is the work of the "smiths," who hammer and beat them into an attitude of precision. This makes the sixth stage. Now the blades have to be ground and glazed. This makes the seventh stage. The saws being now flat and bright have their teeth "set," by the laying over of the teeth alternately, and with the setting the sharpening is associated. This makes the eighth stage. At this point it is necessary to restore to the saw-blade the measure of elasticity which has been taken from it by the processes of rubbing and glazing; so it is put to heat in the oven, for the mere rubbing or glazing of the saws does somehow or other extract from them a large amount of the elasticity imparted to them by the tempering process, and for this reason they are heated to restore to them their lost suppleness. This makes the ninth stage. When they come out of the oven, they have on them a sort of straw-tinted bronzing, which has to be removed. To remove it they are placed in a bath, which immediately takes it off. This makes the tenth stage. The saw has now to be etched. This is the eleventh process. If a hand-saw, it now needs the hold for the hand or handle to be put on, and this is done with remarkable dexterity, and when done the twelfth stage is completed. Nothing remains now but to have the saws examined. Messrs. Spear & Jackson, of Sheffield, make circular saws of from 1 in. to 10 in. in diameter. These miniature circulars are exquisite specimens of the saw-maker's art, and are chiefly destined for Paris, there to be employed by silversmiths and others in the production of those beautiful and ornamental articles for which Paris stands unrivalled. They also make saws on models which it is proved are from two to three thousand years old. These are for the Hindoos, and have the teeth set towards the handle, so as to cut by the up-stroke instead of the down.

Saws are of an almost infinite variety—some narrow as lengths of steel tape, some round and broad as a cart-wheel or the top of a large loathable. Some have beautifully small teeth, others have teeth larger than those of a horse. Some are destined for the most delicate operations of fancy cabinet work, and some are to be employed in sawing Bessemer steel rails by steam, at the rate of 800 revolutions per minute, while others are framed to spin along with a rasping sound all day long, cutting their way through the largest logs of timber in the naval dockyards.

The saw trade is a very ancient one, for the saw itself is figured on the ancient monuments of Egypt and Babylon. The cutting out of the edge in the form of teeth is done by machines, and where the teeth are small it is done at the rate of 400 per minute. The usual way to set the teeth is alternately to the right and to the left before completing the saw; but in the East, where ancient usages are preserved, the teeth of the large saws are bent aside in groups of perhaps a dozen each. The sharpening and setting of a saw require considerable skill of hand and accuracy of eye; for if any one of the teeth projects either edgewise or sideways beyond the true line, it renders the sawing harsh and difficult. When the teeth of a hand-saw become blunted by use, they are sharpened again by means of a three-square file; but previously to this comes a necessity for turning the saw to the fire, where it is heated.

THE WATER SUPPLY OF CROYDON AND OTHER TOWNS.*

THE waterworks at Croydon were designed to furnish a supply at the rate of 2,500,000 gallons per day. The supply at present furnished to the district often exceeds the volume the works were originally estimated to furnish. On the 14th September, 1869, I reported to you for the week ending the 13th of that month that 17,883,633 gallons, or 2,544,765 gallons per day were supplied. The average daily quantity of water supplied to the town for August and September, 1869, was 2,528,160 gallons. The average daily consumption of water in this year 1871 for January, February, and March, was at the rate of 2,534,954 gallons per day for the town supply, and 118,829 gallons for the public baths, making the total quantity of water taken from the wells 2,653,783 gallons per day.

The population of the water district has increased from 26,669, in 1864, to about 50,000 at the present time. The progressive rate of increase may be arrived at from the following figures:—

In 1861 we supplied in the district 408,805,000 gallons; in 1865, 399,800,000 gallons; 1866, 411,276,000 gallons; 1867, 504,000,000 gallons; 1868, 745,400,000 gallons; 1869, 845,100,000 gallons; 1870, 771,300,000 gallons.

In four months of this last year a diminished supply of water was given, as the large engine was in the hands of the contractor. During three months of the present year we have supplied 230,680,810 gallons.

In 1867 the supply (to 4,614 houses) was distributed by 7,062 taps, 6,136 water-closets, 196 baths, and 22 fountains. In May, 1868, there were 7,032 houses supplied by 8,765 taps, 7,573 water-closets, 208 baths, and 26 fountains. In 1869 there were 7,697 houses supplied by 11,005 taps, 9,416 water-closets, 284 baths, and 27 fountains. At the present time we have about 57 miles of public water mains, and there are about 8,440 houses supplied with water, containing a population of about 50,000.

The following estimate shows the quantity of water used in various ways, and also the probable quantity of water wasted in an ordinary day's supply, at the rate of 2½ million gallons per day:—

	Galls.
Legitimate domestic supply	1,000,000
Fishing sewers	8,500
Water-carts	100,000
Public Urinals	5,000
Drinking fountains	4,000
Lost and wasted	1,382,500
	2,500,000

N.B.—The public baths are not included in this estimate, as the principal water supply is taken direct from the wells, without passing the town.

* From Report on the Water Supply of Croydon, &c. By Mr. Baldwin Latham, O.E. (to Local Board of Health). Croydon: Ward, Printer. 1871.

With regard to the durability of various kinds of pipes, I have made experiments with lead, tin-lined lead, composition, block-tin, plain iron, Lavenant enamelled iron tube, enamelled iron, and galvanised iron tubes. For the purpose of these experiments a portion of soil was taken from a district in Croydon known to have an effect upon pipes when laid in it. A small quantity of the earth was placed in an earthenware jar, and two short lengths of pipes were buried in it, the action taking place in the soil through a long period being artificially produced by distilled water, containing a small percentage of nitric acid. After forty days' standing, the order in which the pipes stood the test was as follows:—Block-tin, lead, enamelled iron tube (Imperial Tube Co.'s, Birmingham), tin-lined lead, composition, Lavenant enamelled iron tube, plain iron tube, galvanised iron tube. The following table shows the loss of weight of each specimen during the period of trial:—

TABLE,
Showing the Durability of various Kinds of Pipe in prepared Earth.

Description.	Weight of Specimen before Treatment.	Weight of Specimen after Treatment.	Loss in Grains.	Duration of Experiment.
Block Tin Pipe	944	944	NIL	40
Block Tin Pipe	1,412	1,412	NIL	40
Lead Pipe	1,425	1,425	NIL	40
Lead Pipe	7,038	7,038	NIL	40
Enamelled Iron Pipe	2,499	2,499	NIL	40
Enamelled Iron Pipe (Imperial Tube Co., Birmingham)	3,305	3,305	NIL	40
Tinned-lined Lead Pipe	2,913	2,913	NIL	40
Tinned-lined Lead Pipe	3,778	3,777	1	40
Composition Pipe ...	1,062	1,061	1	40
Composition Pipe ...	2,434	2,437	4	40
Lavenant Enamelled Iron Pipe	2,190	2,194	2	40
Lavenant Enamelled Iron Pipe	3,092	3,091	1	40
Galvanised Iron Pipe	2,017	2,012	5	40
Galvanised Iron Pipe	3,425	3,421	4	40
Plain Iron Pipe	2,436	2,331	105	40
Plain Iron Pipe	3,261	3,257	4	40

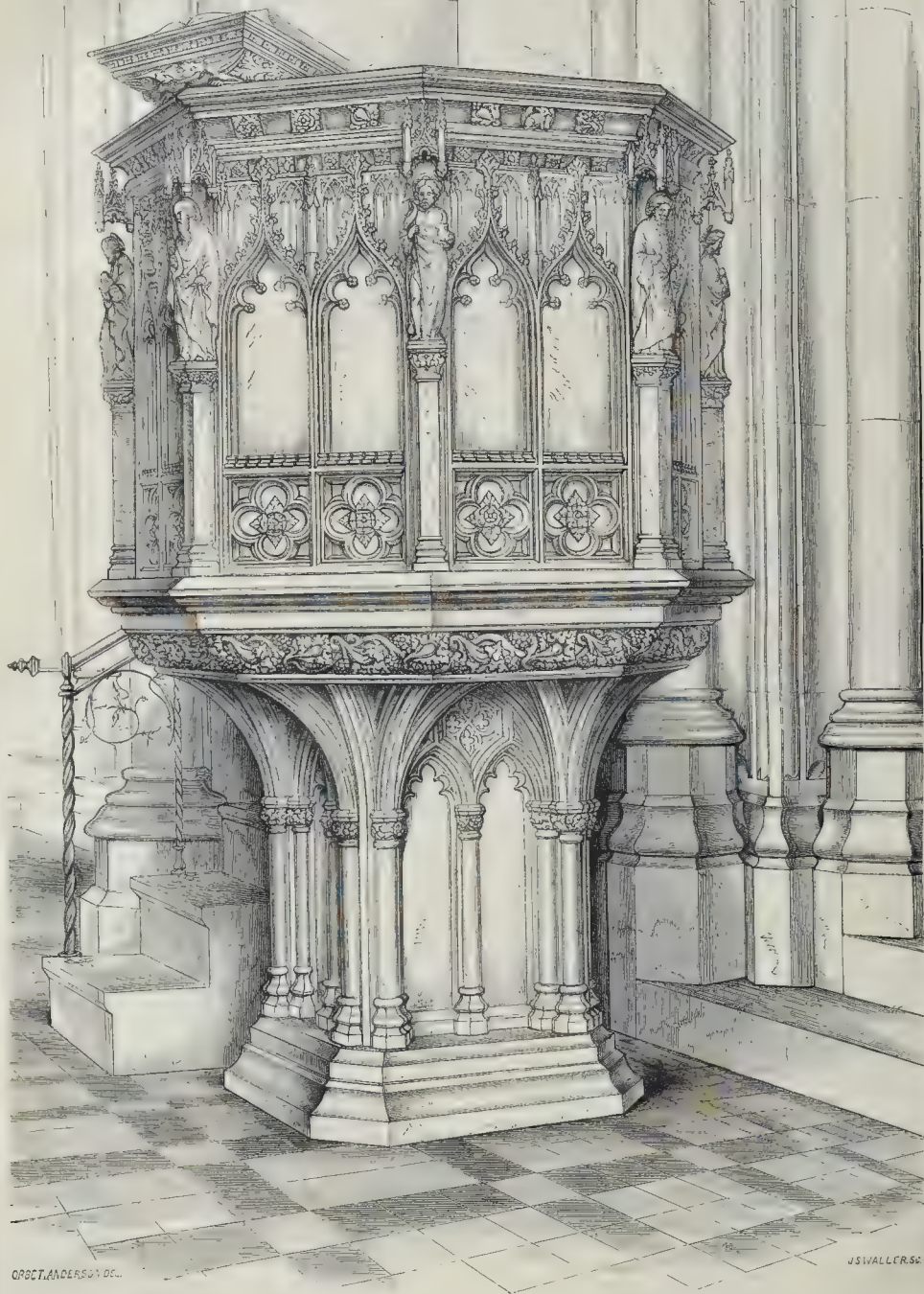
From this table it will be seen that block-tin is the best material that can be used, but its great expense would preclude its general use; next in order stands lead; third, thickly enamelled iron tube; and last in the order of merit stand iron and galvanised iron tubes. The pipes were also submitted to further tests by being allowed to remain in prepared water for forty days, when the result was conclusively shown that the materials now used in Croydon,—viz., plain and galvanised iron tubes,—are the most destructible materials that can be used for the purpose. Under some circumstances strong objection may be raised to the use of lead pipes, on account of their being liable to lead to the poisoning of water. In my report of September 14th, 1869, I pointed out to you that lead, in the case of Croydon, was not liable to decay or to suffer from the action of the water.

The total expenditure up to the present time on the works amounts to about 75,000l. It will be seen from the following table that the water-works of Croydon, so far as the item of capital expended is concerned, will bear very favourable comparison with those of any other district having works of a similar character.

TABLE,
Showing the Cost of Water Works in thirty-five Towns, principally supplied from Wells by pumping, for each 1,000 Gallons of Water daily supplied.

No.	Town.	£	No.	Town.	£
1.	Rye	169	19.	Bradford	48
2.	Wolverhampton ..	145	20.	Stourbridge	48
3.	Liverpool	121	21.	Lincoln	47
4.	Tatridge Wells	120	22.	Chelmsford	46
5.	Tynemouth	118	23.	Exeter	45
6.	Gosport	94	24.	Enfield	42
7.	Uxbridge	91	25.	St. Helen's	41
8.	Goldford	90	26.	Leicester	40
9.	Hastings	89	27.	Orkney	40
10.	Rotherham	80	28.	Saffron Walden ..	40
11.	Deal	71	29.	Coventry	38
12.	New River, London ..	71	30.	Hartlepool	37
13.	Cambridge	62	31.	Margate	34
14.	Staffordshire Pot-teries	62	32.	Hull	30
15.	Brighton	61	33.	Exeter, St. Thomas	27
16.	Colchester	60	34.	Croydon	27
17.	Wallasey	55	35.	Salisbury	25
18.	Vestnor	53			
				Average cost....	£36 6s

From an examination of this table it will be seen that with but one exception Croydon has had its water-works constructed at a less cost than any other works of a similar character.



ORRICK ANDERSON, DEL.

J. S. WALLER, SC.

ST. JOHN'S, CROYDON: THE PULPIT.



LONDON STREET ARCHITECTURE: HOUSE IN ST. PAUL'S CHURCHYARD.—MR. HENRY S. LEGG, ARCHITECT.

LONDON STREET ARCHITECTURE: HOUSE IN ST. PAUL'S CHURCHYARD.

Our engraving represents the building now nearly completed on the piece of land that has, for some few years past, been boarded in at the corner of St. Paul's Churchyard and Ludgate-hill, and which no doubt many have thought was never to be built upon, but thrown into the public way as a public improvement. The great value of the land, however, which contains only about 812 ft. superficial, has no doubt influenced the City authorities, who have preferred to let it on a long lease for building rather than consult the general desire of keeping open the view of the noble west front of St. Paul's Cathedral, already too little seen from the only existing point of view, Ludgate-hill.

The site, which has the greater part of the front curved on plan, admits of one room only on each floor, with a staircase throughout. The ground and first floors are intended for shop and show-room, and hence the large quantity of plate-glass in those two floors.

The elevation is of Portland and Bath stone and white Suffolk bricks; the caps of piers and string-courses, also the whole of the upper cornice from the level of the top of the third-floor windows, being of stone, the rest of brick. The ground-floor front is to be of Spanish mahogany and ebony woods combined.

The building has a frontage of 35 ft. 6 in., with a depth of 12 ft. 6 in., and is carried up to a height of about 68 ft.

It is asserted that the original house on this site was Number One, London, the houses in former times having been numbered from this corner.

The architect is Mr. Henry S. Legg, and the work is being well carried out under his superintendence by Mr. Elkington, of Kingsland, builder.

THEATRES AND MUSIC-ROOMS.

SIR,—As supplementary to my remarks on the proper shape for music-rooms or lecture-rooms, allow me to suggest not only should they be constructed in the proper shape, but also as much as possible with materials of equal densities, in order that the air-waves may be reflected with equal velocities. It must be borne in mind that the reflection of the sound must interfere with the legitimate notes produced. Thus, suppose one sound to be carried along until it meets the walls of the room: it then is reflected back, and in a split second, and will in some measure affect and alter the sound or note which is following after it. This may be proved by singing close to a wall, and repeating the same notes close to an open window, when it will be found that the latter are much sweeter in tone than the former. This being the case, our object must be to ensure their reflection with equal velocities, and from equal distances, which can only be obtained by having the sound-emitting station in the middle of the hall, and the materials of that hall of equal densities. I should, therefore, construct the roof and floor of the same materials as the walls, and fill up the window or skylight openings with thick plate-glass or iron grating, enclosing small sheets of glass. Whether the Medieval architects formed their roofs of stone, and filled up their windows with small pieces of glass enclosed in lead for the sake of getting a good and equal reflection for the notes of the choir, and the ease of the preacher in their churches, cannot, I suppose, be distinctly known; but any one who has visited a cathedral in the time during which service was being celebrated, cannot but have noticed that, whether sought after or not, this result has been obtained. The benches should be massive, or of stone or iron. I am also of opinion that the audience should be placed at some distance from the sound-emitting station point, so as to secure a surface on which the air-waves could impinge without obstruction. I should also leave a space between the audience and the walls, in order that the conduct of the outgoing and reflected waves of air should not be close to the ears. The plan of the building would thus resolve itself into an inner circle (or over) which the orchestra or orchestra or rostrum would be placed; and then concentric ranges of seats for the audience, by which arrangement no one would face their neighbour as is now sometimes awkwardly the case; and beyond the seats and all round next the wall would be an open passage. It will be observed that this would also be the best plan

for providing a free and equal egress for the audience in case a panic seized them, as there could be many doors, all of which would be equidistant from the benches. If desired a distinct entrance for the performers or lecturer, could be obtained by a passage under the hall, with staircase rising therefrom to the platform for their use.

ED. F. HUTCHINS.

The Prince's Theatre, Manchester.—Following closely in the steps of the late Mr. Charles Kean, even to the character of the "bill" and the publication of an annotated book, Mr. Charles Calvert has produced "The Merchant of Venice," with all the architectural, artistic, and antiquarian aid that he could make available, and, according to all accounts, has produced a remarkable picture of Venice in the sixteenth century. Mr. Rawdon Brown, Mr. Alfred Thompson, and Mr. Arthur Sullivan have co-operated; and Mr. Telbin, Mr. Telbin, jun., Mr. Hawes Craven, Mr. Hann, and others, have painted the scenery. *Shylock* is played by Mr. Calvert himself. The house has been improved under the direction of Mr. Alfred Darbyshire, architect, and decorated by Mr. Geo. Gordon. We shall be tempted to make a descent on Manchester.

Theatrical Machinery.—The *Gazette des Architectes* (No. 19, seventh year), just now published, contains the conclusion of an elaborate essay on "Theatrical Machinery, with reference to the New Opera House," by M. Quénel, engineer.

Belfast.—On Monday night last the New Theatre Royal, Belfast, which has been erected at a cost of upwards of 13,000*l.*, was opened. At the conclusion of the comedy, "Time works Wonders," Mr. J. F. Warden, who, on appearing before the curtain, was loudly cheered, delivered the opening address. Mr. McKeown, the contractor, was then called for, and loudly cheered.

Hydraulic Machinery for the Stage.—We are informed by *Engineering* of the successful application of hydraulic machinery to all the purposes of the theatrical stage. M. Quénel has recently established his apparatus at the Grand Théâtre, Paris. The water is taken from the City mains, under a pressure of three atmospheres. The accumulator is formed by the barrel of an hydraulic pump. The piston speed is a little more than 3 ft. per second. This power is transmitted to the objects to be moved by four-fold tackle, which reduces the power to one-fourth, while quadrupling the speed. By this means a large power, with a velocity of 13 ft. per second, is obtained, transferable by pulleys to all parts of the stage where it may be useful. A single attendant can regulate the machinery, move the scenes, raise or lower the curtain, or move carriages or other objects on the stage.

The Pavilion Theatre, Whitechapel, has been altered and decorated so as to be nearly a new house, under the direction of Mr. J. T. Robinson, architect. Messrs. Pashley, Newton, & Co., executed the decorations, and Mr. J. H. Watson built the new stage.

STRIKES.

SURELY the disastrous contest in Newcastle has now taken such a shape that the workmen should arrange to settle it. The difference is very small, and the masters have yielded much more than the men are asked to yield. Sir William Armstrong says:—

"The only effect of the reduction of hours at Sunderland has been to cause the higher rate for overtime to commence one hour earlier than before, and the actual duration of each day's work remains at least as great as ever. As a comment upon this statement it has been said that the practical result of conceding the nine hours at Sunderland proves that the apprehension of the masters in regard to their plant being laid idle for an hour in the day is visionary. In reply, I say that, if the League are contending merely for higher wages in the form of longer overtime, why did they not shape their claim accordingly? Their doing so would have removed much difficulty. The actual form of their demand justifies us in assuming that they have the ulterior design of calling upon the men to refuse overtime, which would have the effect of paralysing the capital of the employer during the periods of enforced idleness.

Let it be recollected, he continues, that the masters have already conceded two-fifths of the full demand made by the men for reduction of time, and that the question is now narrowed to three hours instead of five per week. Would it not be

more rational and business-like on the part of the men if, instead of abusing the employers for resisting coercion, and resorting to the only expedient open to them for carrying on their trade, they were to accept the concession which has been made of nearly half their demand in time, and seek an arrangement in wages as an equivalent for the remainder?"

Enormous mischief is being done by the continuance of the struggle. Who shall tell the amount of privation and demoralisation it is producing? And we must confess we regard with deep sorrow the introduction of large bodies of foreign workmen to supersede our own people. Still, we cannot blame the masters, in the face of the unyielding determination to have their way in their own way that has been shown by the men.

The works, it is stated, are half-full already. The new hands are bound for six months, so that if the old workmen were even willing to return now, the services of all could not be accepted. 6,595 lads and men originally struck; 3,116 are now in the shops.

Many of the old hands have found work elsewhere. The number of men to be relieved is 1,986, and number of children 2,534.

Both sides might now well agree to leave the question to the unconditional arbitration of some well-known public man.

Mr. John S. Storr, writing on "Work and Wages," in the *Beehive*, says,—"It is exceptional now-a-days to meet with either a master or a workman who throws into his labour a true artistic spirit and feeling, without which work is mere slop mechanism—uninteresting to the man who toils, worthless to him who buys the product of the toil. I speak not of the building trades alone; half a dozen other trades, with the details of which I am even better acquainted, are in the same unhealthy state. No pains are taken with the technical education of apprentices; the old hands set a bad example; the effort is neither to do as much work as possible in the hour, nor to do it with the best finish possible, but the reverse. 'Let us get to the day's end with as little effort and perspiration as we can, and let us slouch through the work anyhow.' I say, this is sad, and can lead, in the long run, to nothing but destruction—a destruction extending from the work to the worker, and undermining the whole moral nature of our people. It was in a far other spirit that Cimabue, and Giotto, and Raffaello painted their immortal works; that Benvenuto Cellini and Michelangelo made cold marble and cold metals breathe with life; that Paul probosc and Arnold (of Rugby) taught; that Wellington and Nelson pondered, and then went forth to do their duty.

This contamination of spirit and deterioration of work, though very widespread, have hitherto affected the operatives of the north of Europe far less than those of our own countrymen. I have, within the last week, compared the joiners' work on a large building here,—erected by a first-class London firm of builders, under an experienced architect's supervision, and paid for at full rates in ready money,—with some Swedish work of the same class; if any of your readers wish it, they shall see both on applying to me, and make their report to you; the difference is as great as between an old Gillow or Chippendale sideboard and one met with in the New-cut. The London architect, builder, and joiner would, if judged by court-martial, be sentenced to I know not how many lashes each, and they would richly deserve all they got."

THE CITY PAROCHIAL ENDOWMENTS.

THE new Educational law is naturally turning attention to the way in which more or less ancient educational endowments are managed, and the funds disposed of; and it is to be hoped that the issue will be a decided amendment in many respects. Even the vast revenues of Christ's Hospital may have an overhauling. It was founded by King Edward VI. in 1553, "for the education and maintenance of fatherless and helpless children."

An important paper was read not long ago by Sir Charles Trevelyan at the Social Science Association, "On the City Parochial Endowments," and it appears in a printed form in the Sessional Proceedings of the Association, dated July 13th. In the course of the paper Sir Charles says:—

"I will not repeat the painful story of the manner in which these important public revenues

are muddled away. The rich ecclesiastical endowments in the City are positively damaging to religion, because they are bestowed upon shepherds without flocks, and the House of God is turned into a Temple of Mammon, where a weekly mockery of spiritual teaching is gone through for the sake of the emoluments. The least objectionable appropriation of the civil endowments is in paying the church and poor-rates (including the police and other cesses) of the richest class of proprietors in England, the owners of the City counting-houses and warehouses. A great deal goes in feasting and holiday-making under pretence of 'audit dinners' and 'inspections' of the different properties by large numbers of persons, and a great deal more in the luxurious adornment of churches from which the congregations have disappeared."

"The surplus of the Charitable Trusts Fund was to be applied 'to the extension and improvement of education within the metropolis, and to the promotion, by such means as the Commissioners may judge best, of the well-being of the poorer inhabitants of the metropolis.' . . . It is neither reasonable nor just that the present generation, which has so many claims upon it, should be harassed by repeated appeals to give to objects which have been already amply provided for by the piety of their ancestors. While, notwithstanding the most strenuous efforts, only 389,000*l.* of the million required to relieve the spiritual destitution of the outer circles of the metropolis have been raised, at least two millions are lying at waste and abuse to the scandal of the Church in her ancient stronghold of the inner circle of the City of London. The case is equally clear in regard to the lay endowments. It is preposterous that additional taxes should be levied from ratepayers, many of whom have a hard struggle to maintain their independence, while ample funds already exist for the selfsame objects, which were provided by the benevolent foresight of our ancestors, but are withheld for various interested purposes by persons who have neither inherited nor earned them."

"Of all the modes by which the lower population of London can be elevated and improved, the first and most essential is education, and this lever has now been applied in a systematic and efficient manner through the medium of the Elementary Education Act and the London School Board. The 'City of London Charitable Trusts Fund' would apply the weight required to set this lever in motion. Its distinguishing feature is that it represents a great mass of dormant capital; and it would, therefore, be in an especial manner applicable to the outfit of our London educational system. Schools will have to be erected on a scale suited to the comprehensive plan of the School Board, with masters' and mistresses' houses and play and drill grounds annexed, and one of the greatest difficulties is the excessive cost of sites in London. Then the keystone of the system will be wanting if secondary schools are not established in suitable situations, throughout London and its environs, for the education of the lower middle class, as well as of scholars of more than average merit from the elementary schools; and technical instruction worthy of a country which claims the foremost place in mercantile and manufacturing industry, ought to be provided in these schools."

In conclusion, Sir Charles says:—"If we desire to strengthen the foundations of our existing state of society, no surer way is open to us than by sale of the lands, houses, &c., of these endowments, and investiture of the proceeds in the funds, to convert corporate into private property; and, of all the various classes of corporate property, none is better calculated to take a firm hold upon the masses than these City parochial endowments, because they represent every variety of holding, such as houses, cottages, stables, gardens, workshops, warehouses, wharfs, and country farms, which, separately sold, would pass into a multitude of hands, and tens of thousands of our people, belonging to various social grades, would share in the interests and feelings of proprietors."

New Tunnel Project.—Mr. Charles Richardson, C.E., of Bristol, has laid before the Cardiff Chamber of Commerce a scheme for shortening the railway communication between South Wales and London by tunnelling the Severn near Portskewitt, and joining the Piling Station to the Bristol side of the river. The cost of the tunnel is estimated at \$35,560*l.*, and it is calculated to take five years in construction.

A WORKMAN'S MUSINGS ON THE NINE HOURS STRIKE.*

SIR,—For the last three or four years many people in this country have been blessing themselves with the idea that industrial strife had ceased, and that from henceforth industry had, in arbitration boards, found a better plan to settle its differences than by going to war. Now that delusion is vanished, and one sees and hears nothing else but wars and rumours of war. Any one who is in the habit of preserving, or, as it is called, filing the newspapers, and sometimes, for amusement or instruction, turning them over, must be surprised at the extraordinary things they unfold. Strikes and lock-outs seem to be of the nature of epidemics, and appear to follow or precede them with great regularity. Any one turning over, for example, the pages of the *Builder* for 1865-6, will find precautions to be taken against the cholera, and in the labour column an account of the advance of wages movement. The country was at that time agitated from "Land's End to John o' Groats," and the workmen, as a rule, obtained a large advance on previous rates. Everything went on swimmingly for a time; the tide was smooth, and scarcely a wave rippled the industrial ocean. Men built on the prosperity, as though the foundations were solidly laid. But in a very short time the storm came and shattered their hopes, and it was soon found the workmen had built upon the sand, and a very small storm knocked down such fragile buildings. Before the crash the workmen's friends and advisers were exultingly jovial. Figures were week by week put forth to show the cost of the strikes to the workmen and the gains that would result to them by their successes. Since that time the working men's friends and confidential advisers have had to raise another cry, and the trade society funds told a tale quite the opposite to the one they had previously sung. The Engineers' Society's funds were reduced 100,000*l.*, and the Ironfounders' Society told the same tale, until it began to be the talk that the society would have to dissolve. Charges of mismanagement were made against the officers, and the society was saved by the men in work increasing their subscriptions.

Instead of advance of wages, the cry was,—Depression of trade, want of employment, emigration, reciprocity, and protection. And in spite of all the bombast of the workmen's leaders, it was found they were powerless, and could not bring about a revival of either home or foreign trade. Both in and out of Parliament the cry was increase of pauperism,—Government employment. Every nostrum-monger ventilated his hobby. Government aid was sought to remove the people to other countries; and the Executive, or managing part of the nation, was soundly rated for the small interest shown in the continued distresses of the people.

During the past twelve months trade has been reviving; employment, if not plentiful, has been very near sufficient to employ the people. The emigration cry is grown less and less, and now is almost forgotten; and once more the papers are teeming with reports of workmen's agitations. And because the employers have not in every case given what the workmen required, they are, according to working-class papers, a greedy, selfish, tyrannical lot of capitalist despots; while, on the other hand, the workmen's leaders' demands are always right and just. The true state of the case is rarely, if ever, put before the working classes in the papers they read. The ignorant and the foolish are led astray by the mis-statements and false light in which the case is put, and in nine cases out of ten the workmen find out when it is too late the false path in which they have been dragged.

Strange it is, the great injury which trade societies inflict upon the workmen is, that they keep trade in a continual agitation. It appears that the officials think there is no peace but in war. If an employer was allowed to carry on his business for several years without their interference, they would require a premium for their lenity. What use are trade societies, if they have funds lying useless, and cannot be applied to the purposes of war? It is obvious that the English trade cannot be continually at war without damaging the belligerents; and it is evident that if England, and England's workmen, are to continue to trade with the whole world, the aggressiveness must cease;

* It is desirable it should be understood that this heading is strictly correct.—Ed.

for what can be more injurious to an employer than to be always in fear of a stoppage of his business? He cannot with any certainty enter into engagements. It is like a bankruptcy always staring him in the face, and is damaging the interests of both parties. There is not the least doubt but that the doctrine of political economy has, on the whole, been most injurious to both employer and employed. Men talk of it as though they understood its every part. Of course, there is in the works of Adam Smith, and in all the writings of the economical school, much that is correct and applicable to commerce and society; but it is evident to any one who has studied these writings that they will never regenerate society. The fallacies in them are so apparent to the most casual observer, that they only want showing to be patent to the many, and that the sciences so-called has its limits, or, at least, many modifications. For a long time the workmen were told there was so much capital applicable to the wages fund, and that the price of labour was regulated by the supply and demand. The principal object of the trade societies is to regulate the hours of labour, and get an advance of wages. The leaders of these societies have made the doctrine of "supply and demand; buy in the cheapest, sell in the dearest, market." Their capital, their fertile brains, are always in action. Of course, it is for the benefit of the working classes, or, at least, that section which they chance to represent. Business is business; and, of course, the unionist leaders, like all other business men, must try and keep their projects prosperous. They forget that every class advance is paid for by the general public. It is not the rich who buy all the produce of the labour of the working classes. Every advance of the necessities of life affects all classes; and if the engine or any other section get more than their share, it is a tax upon the other workmen, and the agitation is carried on until all get an advance; and when that is done, of what benefit is it to the whole? Everything is higher in price, and the people get no more of the productive share than they did before. The cost of production is increased, and a larger opening is made for the foreign employer to compete with the labour of this country.—"Buy in the cheapest, sell in the dearest market;" and that the price of labour is regulated by the supply and demand, is the doctrine which has for a long time injured the trade and general interests of this country. It has supplied the trade-union leaders with the materials to carry on their agitation. If it was true, the wages of workmen ought to have been largely reduced during the late depression of trade, as there were thousands of unemployed; but the workmen's wages remained the same. And so it was with the engineers, the ironfounders, and in fact with all trades. The wages of the labourer are not regulated by the plentifulness of the workmen, but by the price the article they produce will fetch in the market. It being so, the supply and demand idea relative to labour wants to be got rid of, and a sounder and more practical issue put in its place. One thing is certain, that gold, of the same purity, is all over the world of the same value. Now if a given number of ounces of gold be required to produce an engine; and if, when finished, that engine cost so much more than one of the same quality made in another country, the workmen of this country ought to make an inquiry into the cause. As a large part of the productions of this country has to be exported, it is obvious that workmen of this country must produce a cheaper and better article than can be produced in other countries.

Workmen and their leaders ought by this time to know, that in the industrial race the manufacturers are already closely run. In iron and cotton producing countries, the people are beginning to work the raw material. Any reader of the *Times* or the statistical abstract can see for himself the steady advance in exports which a few years ago were peculiar to England. Writers in the so-called "people's paper" may ridicule the idea that other countries are making any advance in competition with England. But it is a fact which no one can deny, that some engines and other goods have been imported into this country at a much cheaper rate than English manufacturers can produce them.

As but few manufacturers export the goods they produce, the commercial part of the trade is carried on by other parties called merchants. They are, in the strictest sense, internationalists. It matters none to them whose goods they sell

so as they make a profit; and, if they can buy goods in a foreign country cheaper than the English employer can supply the same quality goods, the merchant buys: he has no sentimental ideas about patriotism, or paying a higher price for the articles because his country produces them. This country labours under many disadvantages in comparison with other countries—high taxation, high wages, drinking customs; and, to hear men talk, it would appear that the employers lived in clover, had no thoughts or cares, and had nothing to do but run and win.

Our leaders say that, in spite of all difficulties, employers make large profits, and amass large fortunes. To some extent that is true; but the annals of the Bankruptcy Court show that many employers do not amass, but, after sometimes paying millions of pounds in wages, die poor. During the week, a noted leader of the working men—or, at least, some portion of them—a shoe-seller—once a shoemaker—now an agitator—has been talking to a number of workmen about the large profits and fortunes employers make. Any one taking the census-table for a basis will find there is a large number of employers in this country who only employ a man and a boy: no one ever heard of such employers leaving a large fortune. There are many small shoe-sellers. Suppose a shoe-salesman sell during the year 999 pairs of shoes at a profit of 9d. per pair; that would give an income of 37l. 9s. 3d. At that rate of sale and profit, the aggrieved shoe-seller would not amass a very great fortune. I suspect the shoe-seller buys his shoes in the cheapest places, without asking whether the workmen are ill or well paid. He, as a trader, is obliged to sell as cheap as his fellow tradesmen, or it is certain the public will not buy his shoes.

If the trader could enlarge his business so that he could sell 999 pairs of shoes in the day, and reckon 312 working days in the year, he would make a profit of 11,594l. 14s. Out of that amount he would probably save 2,000l. a year; and if he happened to do that for thirty years, he would, with the interest, have accumulated 100,000l. No doubt the speaker thought he had made a great point when he alluded to the employer worth 7,000,000l. It appears to me if there is one thing more than another that Englishmen ought to be proud of, it is, that one of the great employers, or shall we say generals of labour, accumulated that large sum.

In St. Paul's Cathedral and Westminster Abbey are many monuments to kings, statesmen, and generals, some of whom received enormous sums from the national exchequer. But the labours of the great general of industry, the pioneer of a higher civilisation, the benefactor of nations, received no national recognition, and no national award.

What a noise has been made about the sham battles which have lately been held. By the reports in the papers some would have supposed the country was at war. What a fuss was made of the moving and exercising 30,000 men; and yet at one time it is said that the general of labour employed 50,000 men. If the weekly wages for that number averaged 1l. per man per week it would have been 50,000l., and the sum paid for wages alone during the year would have been 2,600,000l. If the plant and materials required to keep that number employed amounted to another 1,500,000l., it would have required a capital of 4,100,000l. If that sum had been put out at 5 per cent. interest, it would, without any risk or trouble, have realised the enormous sum of 205,000l. per annum. If the employer of 50,000 men received a shilling per week for the management of a workman, it would amount to 130,000l. per annum. As no employer undertakes the management of men at that price, the above sum might be put at double that amount, and then be below the mark. And without any wonderment or remarks, it must be evident that great generals of labour, by the magnitude of their undertakings, may accumulate, if wise, large fortunes. It requires an immense fortune to carry their work on. Were all employers in this country like the one with a man and a boy, nobody would accumulate large sums, no capital would be created. Yet competition would be more severe than it now is, and the labourers would be most miserable. The large employers of labour receive no more profit than they are entitled to. In my opinion, they are an honour to their country, and an advantage to the whole community. If working-class leaders cannot find better reasons for their agitations, it may well be said of them, "Ne sutor ultra crepidam."

The engineering trade, although well organised, is not one of the very great industries of the country. The number of engine and machine makers, and dealers, was 60,812, according to the census returns for 1861. But, as a rule, they work in large establishments. The 6,595 men that struck work at Newcastle worked fifty-nine hours per week. That, in the aggregate, would be 389,105 hours per week; that, at 7d. per hour, would amount to 11,338l. 17s. 11d.; reduce the working hours to fifty-four per week; it reduces the working time to 356,140; and to turn out the same amount of work, it requires the employment of 641 extra men, and adds 914l. 7s. 11d. to the employers' funds for wages, and for the year an additional outlay for the same amount of work of 47,848l. 16s., which, with the extra machinery and work-room required, brings the cost to nearly 100,000l. If the whole number of workers in the engineering trade is 58,000, leaving the 2,862 for casualties and want of employment, and, as there appear to be variations in the time they work, fifty-seven hours per week per man may be taken as the working time,—that will give 3,306,000 hours as the aggregate for the week; at 7d. per hour, the sum paid for wages will be 99,300l., and for the year a sum of 5,178,000l.; reduce the working hours to fifty-two, which will be the number if the nine-hour movement is successful, it reduces the working time to 3,016,000, and requires the engineering employers to add 3,881 men to do the same work as before, at an additional outlay of 845l. 8s. per week, and for the year a sum of 439,716l.: that, with the cost of extras, will amount to nearly a million.

In the reports of the Paris International Exhibition it states that if the foreign trade in machinery were closed, many of the employers would have to close their yards; and it is probable that if the cost of production be raised a million a year that will happen, and instead of all hours per day it will in many cases be none at all.

The action of the men who guide the working classes, who manipulate their movements, who lead the thoughtless astray to their own and the nation's loss, is pernicious in the extreme. Some other teachers are wanted to place the truth before them,—to show both sides,—and until that is done these movements, so fatal to national well-being, will continue. English working-men are placed in a false position before the world, and are driving from themselves their daily bread. There are many other points I intended to touch upon, but I find I have not space, and will, with your permission, do it in another letter.

JACK PLANE.

PLANNING AND FITTING UP SCHOOLS.

THE Committee of Council on Education have made a number of rules to be observed in planning and fitting up schools, which have been recently issued by the Queen's printers, preceded with some remarks on the subject. The document contains a number of rules, and the plans of the schools are exhibited. In the preliminary remarks it is stated:—"Before a school-room is planned—and the observation applies equally to alterations in the internal fittings of an existing school-room—the number of children who are likely to occupy it, the number of classes into which they ought to be grouped, whether the school should be 'mixed,' or the boys and girls taught in different rooms, are points that require to be carefully considered and determined in order that the arrangements of the school may be designed accordingly. Every class when in operation requires a separate teacher, he only a monitor acting for the hour. Without some such provision it is impossible to keep all the children in a school actively employed in the same time. The apprenticeship of pupil teachers, therefore, is merely an improved method of meeting what is, under any circumstances, a necessity of the case; and where such assistants are maintained at the public expense, it becomes of increased importance to furnish them with all the mechanical appliances that have been found by experience to be best calculated to give effect to their services." After stating that the common schoolroom should be planned and fitted to realise the combined advantages of isolation and superintendence without destroying its use for such purposes as may require a large apartment, the Committee of Council do not recommend that the benches and desks should be immovably fixed to the floor of any school, but be so constructed as to be easily removed and not to be easily pushed out of place by accident or by the movements of children.

The master of a school should never be allowed to organise it so as to provide for carrying out the entire business of instruction without his own direct intervention in giving lessons. "He must, indeed, at times leave himself at liberty to observe the manner in which his assistants or apprentices teach, and to watch the collective working of his school." The remarks the Committee consider will explain the plans as regards the arrangement of the buildings, and the internal fittings of schools and class-rooms.

SANITARY PROGRESS.

NOTWITHSTANDING all the bad names Truro and Falmouth gave "Pro," we notice that from the time his paper appeared in the *Builder*, progress has been made in sanitary matters in those towns.

In Falmouth the sewerage of the town is in progress. In Truro, from a paragraph in the *Royal Cornwall Gazette*, we see the "Town Council is spending about 20l. a week in cleansing the Truro river," while other sanitary matters are receiving much attention. We are very glad our papers have, after all, been taken in good part.

And in Glastonbury, sewerage the neglected parts of the town is in progress; and a Local Board of Health has been established. Though appointing officers at ridiculously small salaries we esteem bad policy, yet we cannot expect everything all at once. With experience, we trust the Local Board at Glastonbury will see its faults.

INCOMPLETE LIST OF TENDERS.

SIR,—May I so far intrude upon your valuable space as to beg the insertion of the following facts? In your last week's copy you gave the names of and the amounts given by five contracting engineers, who estimated and sent in their tenders for the works at the "Holborn Union, St. Luke's Workhouse," and I note that in doing this the two highest estimates have been omitted. There were, in fact, seven tenders opened, and the firm which in the published list was the highest is really the third. In my opinion, no details of these matters should be given unless they are given correctly. No doubt there will be at times omissions and errors; but in justice to the professions and trades concerned, these should be explained and corrected.

The published list of competitors was as follows:—

Jenkes & Co.	21,028	3	3
Elliot	990	0	0
Benham & Son	910	0	0
Potter	740	0	0
May	690	0	0

The true list of competitors is as follows:—

Hart & Co.	21,365	13	0
Morland & Son	1,331	0	0
Jenkes & Co.	1,028	3	3
Elliot	990	0	0
Benham & Son	910	0	0
Potter	740	0	0
May	690	0	0

ESTIMATING CLERK.

* The list published by us was official.

INSURANCE FOR THE CLERGY.

THE Rev. Jas. Lupton writes:—

You have admitted into your columns letters relative to ecclesiastical dissipation, but one thought seems to have escaped the writers,—viz., whether the Bounty Board should not at once take up the business of fire insurance, so far as the clergy are concerned. I am, and I make no doubt my clerical brethren are also, deluged with prospectuses of fire insurance companies. These companies are putting forward their separate claims, all, no doubt, expecting to receive some profit. The insurance is to be effected, not only in the name of the incumbent, but in that of the governors of the Bounty also. Indeed, the governors are mixed up with this business in various ways. Why not at once constitute the Bounty Board into a fire insurance office, so that whatever gain may accrue it may go to the augmentation of small benefices?

HOW WE SPELL POMPEI.

SIR,—Will you be good enough to say in a little note that wherever Pompei, with two i's; may be the orthodox orthography of the press, it is not my orthography. The Italians write the word with one i, and so do I invariably. Two i's seem to me to be pedantic.

H. C. BARLOW.

VENTILATION OF COAL MINES.

SIR,—Soon after the explosion at the Wigan collieries, I went to the Royal Geological Museum, Jernyn-street, to see the newest method and appliances used to ventilate coal mines. I was pleased to observe the rotary blast fan is used at two collieries (I hope at many others also); but the air requires concentrating and conveying through gutters or metallic pipes to the far-off workings, with stop cocks midway, to rush and flush sidings, &c., when needed.

The immense power of these fans can be seen at all smelting works. Mines could be freed from explosive gases by an unlimited force of air night and day. Its return through the mine to the shaft would clear the pit of gas.

..... If there's a will,

There are men and material for every ill.

B. T.

UTILISATION OF SEWAGE.

The West Ham Local Board of Health have just completed an arrangement to purchase, subject to the sanction of the local Government Board, four contiguous farms, containing 750 acres, in the parishes of Barking and Dagenham, adjoining the river Thames, for the purpose of utilising the sewage of the West Ham district. The sewage will be delivered by steam power through about six miles of main culvert. The arrangements and works are under the direction of Mr. Lewis Angell, the engineer to the West Ham Board.

THE DUCHESS OF SUTHERLAND'S MONUMENT.

Sir,—I do not like to see fine quotations marred and spoiled, especially when indelibly engraved on brass or marble in such a noble and well-deserved monument as that to the late Duchess of Sutherland, on the panels of which, you state, are certain texts; amongst others, the following misquoted one:—

"And there shall be no more death, neither sorrow nor crying, neither shall there be any more pain; and sorrow and sighing shall flee away."

The words in italics are interpolated, and meaningless tautology, both words and sentiment having been used before. The writer certainly was not inspired, like St. John, whose text is as follows (Rev. xxi.) :—

"And God shall wipe away all tears from their eyes; and there shall be no more death, neither sorrow, nor crying, neither shall there be any more pain: for the former things are passed away."

How simple and grand is the true text, and how obvious the meaning of the last expression.

HENRY BAKER.

ROADS IN PARIS.

We are informed that some of the Paris roads are being broken up, and that the authorities are about to revert to paving-stones, as of old. The cost of keeping up what our informant terms "Macadam," but by which we suppose he means the asphaltic concrete with which the principal roads there are laid, is given as the reason for the change.

MANSION HOUSE BUILDINGS.

Sir,—Owing to absence from town, we did not observe a letter in your issue of the 16th inst., wherein your correspondent takes exception to the shop-fronts at the above new buildings. "S. F." is mistaken in supposing that these shop-fronts, of which he most justly complains, were designed by us, although the "description" of the building to which he refers would alone warrant such a conclusion; for we are confident that such "incongruous" work, and such bad detail, could not be attributed to an architect, but only to shop-front fitters!

J. & J. BELCHER.

P.S.—Mr. Deroy's front, which was excepted by "S. F." was carried out from our designs and under our superintendence.

THE TRADES MOVEMENT.

Nottingham.—The operative joiners have held a meeting. It appears that they had bound themselves, having accepted certain conditions, to the masters for a certain time, as to the prices to be given for their labour. The result was a great influx of labour from other towns. The workmen not only felt themselves aggrieved by this influx, but, still wishing honourably to abide by their agreement, they found it impracticable, notwithstanding the requirements of the trade, under the circumstances, to ask for an advance of wages. The great demand being at present for house work, a higher rate of remuneration was felt to be due to the operative joiners; and the present conference was held to discuss their position with reference to the whole matter. After a long deliberation, it was resolved to leave the matter open pending the decision of the court of arbitration.

Manchester.—Some 640 masons are employed in the building of the Manchester Townhall. An under-foreman having discharged one of the masons for insubordination, the other men at once waited upon the head-foreman, and demanded the discharge of the under-foreman. The head-foreman requested time to inquire into

the facts of the case; and, as he would not give a decision at once, the men struck, and the whole 640 left the place, but they have returned to their work without any concession having been made to them. The reason of their return is supposed to be that their own society would not recognise their strike.

Barnsley.—A conference of master builders and the representatives of the bricklayers on strike has been held at the Coach and Horses Hotel. Nearly all the firms in the town were represented. After some discussion, the masters informed the delegates present that they could not accept less than three months' notice, and that any change in the working hours, &c., must take place from the 1st of May, according to an agreement entered into some time ago. The strike has had the effect of stopping the erection of the new Lancashire and Yorkshire railway station, and other buildings.

Glasgow.—At a meeting of the Clyde Engineers' Association, held at Glasgow, it has been resolved, taking into consideration that the carpenters' strike continued in the Glasgow district, notwithstanding the advance of wages offered at Greenock and other places at which they work, "That a lock-out of all the carpenters of the Clyde should take place unless the strike was brought to an end."

TILE MANUFACTURERS.

Sir,—We are much surprised to observe, from your issue of the 16th inst., that you describe certain matters of tiling as having been carried out by a firm of "Minton, Taylor, & Co." As Sir R. Malins remarked, in a recent trial before him in Chancery, such a title is most certainly calculated to lead the public to suppose that the above is a firm of Minton & Co., whereas, that to which it alludes really is simply and honestly Messrs. Taylor & Challinor.

The order which Sir R. Malins made, however, was, that this new firm should trade exclusively under the title of Mr. Taylor's own name:—"Robert Minton Taylor, Tile Works, Fenton, near Stoke-upon-Trent."

We must request, therefore, to be informed how such an error occurred in your paper; and we further beg to intimate that, in the event of such mis-statements appearing in future, we really shall be compelled to take proceedings against you.

MINTON, HOLLINS, & CO.

P.S.—We send you a circular per this post in reference to the Chancery trial to which we allude above.

* * * In our last issue we printed a communication from the firm referred to, setting the matter right, and, to make the point clearer, we willingly insert Messrs. Minton & Co.'s letter, notwithstanding the nonsensical threat to take proceedings against us if the comma too much should be inserted. The legitimate representatives of our old acquaintance and an eminent man, the late Herbert Minton, it is not likely they will be willingly damaged by us. They must remember, however, that the world is not so fully taken up with the doings of themselves and their competitors as to remember precisely how the names stand; and if they wish others to be particular, as very rightly they do, they must be particular themselves. To illustrate what we mean,—if it had not been for a printed heading to the letter from them we have inserted, we must have printed the signature Minton Hollins & Co., with the belief that Minton was the Christian name, the two names being joined one to the other without the slightest mark to show that they represent more than one person.

THE PERILS OF RAILWAY PLATFORMS.

DR. LANKESTER has held an inquest at the University Hospital, Gower-street, respecting the death of Geo. William Lane. Deceased was in a train on the Midland Railway: at the Kentish-town Station the train stopped, and Lane opened the door and got out, when the train started again and then stopped, throwing Lane out and under the carriage, where he was fatally injured. The coroner, after evidence had been led, said it was a question for the Government to consider whether the railway platforms of this country should not be of one uniform height, and the step of one pattern, or whether twenty or thirty people should be sacrificed annually. Platform accidents were of frequent occurrence. The railway companies set the example. The manner in which the guards jumped into the breaks on the Metropolitan Railway made him tremble. It

was a most reprehensible practice, as it induced young men and others to follow the example set them on this railway. He thought, there should be one universal law for the height of platforms, and that they should be under the carriages. A short time ago he was present at the opening of a line in Jersey. The platforms were uniform, and the steps of the carriages projected over the platforms, rendering an accident almost impossible. A short clause in an Act of Parliament would manage this. True it would cost the railway companies 100,000*l.*, but it would be the means of saving hundreds of valuable lives. The inquiry was adjourned for additional evidence. This question of the platforms we brought under notice not long ago. With reference to the Metropolitan, the corner's reflections, we think, must have occurred to many. Let us add, that since the Metropolitan District was opened, the line seems to have received an access of bumping engines, riotous carriages, or careless engine-drivers, that are quite a novelty on the Metropolitan. Let some one in authority take a day's holiday and spend it in running to and fro on the line, and he will be certain to discover them if he desire to look into the matter.

CHURCH-BUILDING NEWS.

Bangor.—A new district church, dedicated to St. Elizabeth, and situate at Glasynfryn, a hamlet of the parish of Bangor, Carnarvonshire, and some three or four miles distant from that town,—bordering in fact upon the Snowdonian line of mountains,—has been opened for divine service. The site of the church, as well as of a school which adjoins it, was given by Lord Penrhyn, who also contributed 200*l.* to the erection fund. The total cost of the church and school was about 800*l.* The church is in the Early English style, and was designed by Mr. Gilbert Scott, architect, who presented the plans.

Notgrove.—The chancel of the little church, near Northleach, is being restored by Mr. J. Edward K. Cutts, of London, architect. It is a structure of the latter part of the fourteenth century, lighted by two square-headed windows on the south side. There is no east window—an arrangement common to several churches in the neighbourhood; but outside, in the east wall, about 4 ft. 9 in. from the ground, a crucifix under a canopied arch, with pinnacles on each side, is carved in low relief. Under the chancel arch were two low walls which formed part of the very small old Norman arch, the upper part of which had been taken out, probably at the time the present chancel was built, to insert a larger (but still small) arch, which was put in quite out of the centre of the nave and chancel. The whole wall was in such a ruinous condition, however, that it was found necessary to take it down, and in the rebuilding a larger arch has been inserted. The sanctus bell-cot has been replaced on the new gable. There are monumental effigies of the Whittington family on the south side, and a female figure in the sacrum on the north side. The chief point of interest is the discovery of nearly the whole scheme of the original sculptured and coloured decorations of the chancel. Some other minor discoveries were a square opening under the westernmost window in the south wall, which had evidently been fitted with a shutter; two coins, one of William Rufus, were pulled out with the piscina; another, of Edward I., was found in the soil at the foundation of the south wall; and some wood (?) charcoal was found in a rough cavity of the wall into which the piscina discharged. The restoration comprises the re-building of the south wall, with a new roof, seats, and desk in stained deal; new communion-table, railing, and lectern, in oak; new tile paving; and stained glass by Messrs. Clayton & Bell.

Dorking.—The plans for the erection of a new church, in place of St. Martin's present building, have been on view in the upper room of the local Institute. The architect is Mr. Woodyer. The building will be in unison with the existing chancel.

Southill.—The ancient church at Southill, Cornwall, has been re-opened. The church is one of the oldest in Cornwall. While a part of the foundation was being removed during the restoration, a quantity of Norman work was found. A Norman building at one time occupied the site of the present church, which, according to the *Cornish Telegraph*, was erected in the fourteenth century. The tower has not been

touching by the restorers, but the other parts of the church have more or less undergone alteration. The seats, which are open, will hold about 400 persons. The cost will amount to 1,200l., a considerable portion of which has to be subscribed.

Worcestershire.—At Welland, the parish church (a dilapidated building, erected in the last century) is to be abandoned, the population having much increased, and the crowded state of the churchyard imperatively demanding that additional accommodation shall be provided. A site in a more central part of the parish has been given by Mr. A. Watkins, and plans for a new church have been prepared by Mr. Hingall, of Oxford, at an estimated cost of 2,000l.; the church to hold 400 persons. It is also said that a new church for part of the parish of Hanley Castle is likely to be founded; that Sir E. Lechmere has given a site on the side of the road leading from Hanley Swan to Malvern Wells; that Mr. Gilbert Scott is the architect; and that Mr. S. Martin, of Hanley Castle, has promised to defray the cost of the building.

Bristol.—The new chancel of the church of the Holy Nativity, Knowle, has been opened. It is of the Byzantine school of architecture, and is the only one of the kind in Bristol. The apse is semicircular with a domed roof, 30 ft. in diameter, of cement concrete. At present this dome is painted blue, but eventually it will be painted, the subject being the Ascension. The altar is of plain wood, and over it is a canopy of alabaster and marble, surmounted with carved figures, the whole supported by pillars of marble and alabaster, the capitals of which will be carved. The panels round the chancel are to be filled in with paintings, and "the stations of the cross" will be carved in bas-reliefs around the church. The floors are laid with encaustic tiles. The cost has been about 2,600l. It is hoped soon to remove the present temporary wooden nave, and complete the building. A lady of Clifton has promised a tower and peal of bells at her own expense when the remainder of the work is completed.

Eastbourne.—The alterations in the chancel of St. Saviour's Church are now completed. It appears that the area of the chancel did not afford requisite accommodation for the choir and officiating clergyman. This difficulty has now been overcome by making the choir extend westward of the chancel arch into the nave. The space thus appropriated has been raised to the level of the existing chancel, and paved with similar tiles, and a low wall or screen has been erected to form the boundary towards the nave. The base of this wall or screen is of black Isle of Man granite, surmounted by veined Derbyshire alabaster, and having one horizontal band of Devonshire marble. The cornice has a moulding with broad carved leaves at intervals. The work has cost something over 150l. The tower of the church is making progress, and has already attained a considerable altitude.

Folkstone.—The old Parish Church is to be fitted with new low, open seats, in place of the present ones, which, though comparatively new, are too high and badly arranged; and the lighting of the nave and transepts is to be completely rearranged. The plans have been prepared by Mr. S. Slingsby Stallwood, architect.

Harrogate.—The chancel and temporary nave of the church for the newly-formed parish of St. Peter's, Harrogate, has been opened for divine worship. For a considerable period the requirements of the newly-formed parish have been met by such accommodation as could be provided in the schools immediately contiguous to the new church; and as this became inadequate for the increasing numbers who attended for public worship the building committee resorted on the somewhat novel expedient of pressing forward with the utmost despatch the completion of the chancel and the easternmost part of the new church; to which by adding a temporary erection, occupying the greater part of the space constituting the centre aisle of the permanent church, they have secured for immediate requirements a place for public worship. St. Peter's Church is situated near Prospect Hotel. The site of the church, together with the contiguous parsonage, and land for the schools, was given by the late Mrs. Felde, who also contributed 3,000l. towards a fund for the endowment. In the erection of the schools, and upon the church, to the present time, a sum of nearly 5,000l. has been expended, contributed by residents and those immediately identified with the district. The church has been erected from plans by Mr. J. H. Hirst, architect, Bristol; the

builder being Mr. Ridal, of Wadsley, near Sheffield. The building is in the Early Decorated style, and will hold, when completed, 1,100 persons. The chancel, temporary nave, &c., now available, will seat 450. The temporary nave has been so constructed that there will be no interruption during the completion of the edifice. The architect has presented the marble screen; the Misses Carter 400l. for an organ; the contractor (Mr. Ridal) the carving of the capitals in the chancel arch and the angels supporting the same; and the whole of the serpentine columns of the chancel were presented, one by each member of the building committee, at a cost of 8 guineas per column. The interior walls of the chancel and apse are of white Bath-stone ashlar, raised from the quarries at Corsham Down. The whole of the carving is in the same material. The carved work of the chancel arch and the upper cornice and the arch-moulds of the windows are enriched by the dog-tooth ornament, similar to the early types found in the cathedrals of York and Ripon. The capitals and corbels are carved, the treatment being of a conventional nature, in accordance with the general architectural features of the church. A cornice runs round the apse immediately beneath the windows. This is now in the artist's hands. Each of the capitals in the angles will be carved as representing foliage of a Scriptural nature,—the vine, wheat, passion-flower, lily, pomegranate, myrtle, with angels chiselled under each, some with musical instruments, and some in the attitude of adoration. The clustered capitals have yet to be carved, and the high blocks beneath the chancel arch, and immediately over the pulpit and reading-desk, have to be hewn into shape. These are to represent groups of angels. The execution of the sculpture and of the carving is in the hands of Mr. Harry Hems, of Exeter.

March.—The foundation-stone of a new church of St. John, the first of four to be erected under the Doddington Rectory Division Act, in this town, has been laid by the bishop of the diocese. Mr. Wyatt is the architect.

Adderbury.—The parish church is undergoing some interior alterations and improvements. The first thing provided for is to warm the church by means of hot-water pipes throughout the building, and Mr. J. P. Barford, of this town, has undertaken the contract for this part of the work. Another portion of the work has been undertaken by Messrs. J. & T. Davis, of Banbury, builders. Messrs. Davis's contract includes the removal of the gallery at the west end, and which has for a long time disfigured the church and blocked up an arch, and they have also to open this arch, so as to have the principal entrance from the western tower, as it should be. This tower is to have a new oak floor overhead, a new stone floor underneath, and a window over the door. The taking down of the gallery has necessitated the removal of the organ down into the chancel, where it is temporarily placed, the instrument being found to be unsuited for its proper position on the chancel-screen, according to the plans of Mr. Scott, the architect, who advised its being placed there.

DISSENTING CHURCH BUILDING NEWS.

Brighton.—The new Congregational Church, erected at the junction of Clifton-road and Dyke-road, has been formally opened for public worship. The new church is of a Romanesque type, modified in places as circumstances dictated. The form of the edifice—that of a horse-shoe, was determined by the shape of the ground. The general design of the church originated with a gentleman of the committee; and to its conspicuous feature, the tower, which is 20 ft. square and 130 ft. high, the public are indebted for a convenience in the shape of a clock which has been erected in the tower, at the cost of gentlemen in the neighbourhood, by Mr. H. Pratt. The cost of the building will, it is estimated, be between 8,000l. and 9,000l., and it will seat a congregation of 850, besides providing a vestry and committee-rooms, with school-room (under the church), for 450 children, class-rooms, &c. There are two entrances to the church in the tower: one from the Dyke-road and the other from the Clifton-road. Attention has been paid to the ventilation of the building and to its warming, in winter, by hot-water pipes, this work being done by Messrs. Reed & Co., of Brighton. The building is lighted, in the day-time, by seventeen triple windows in the upper story, and ten large

double windows in the front story, and at night by a gas sun-light in the centre of the ceiling. The pews, of the open kind, with sloped seats, has been executed by Mr. S. Ireland; and an organ is now being put up by Mr. Pickett, of Lewes. The drawings for the plans and details generally were prepared by Mr. T. Simpson, of Brighton, architect to the committee.

Melton Mowbray.—The new Wesleyan chapel at this place has been opened for public worship. The building is of brickwork, with Bath stone dressings. The architect has, however, relied chiefly upon an arrangement of moulded brickwork for effect, rather than upon the stonework, so that it may be regarded as essentially a brick building. The style chosen is Early Decorated, freely treated. The front is flanked on each side by two towers, the upper portions of which are lighted by three-light windows, above which is a brick cornice and high-pitched roof, each surmounted with an iron terminal. These towers inclose the staircases to galleries, and also to schoolroom below. The centre doorway leads into a lobby, from which the body of the chapel and gallery staircase may be entered. Above the doorway is a large wheel-window in a recess, which occupies nearly all the gable end. The ground floor of the chapel is divided into centre aisles and side aisles, or passages, and convenience of access to all the sittings has been especially studied. At the eastern end of the chapel are transepts extending some distance back, which provide for a good number of sittings in a good situation. The gallery plan is large, extending over the lobbies below. At the east end is a recess, in which the organ is placed and choir accommodated, in front of which is the pulpit, which is approached by a staircase leading direct from the minister's vestry. There is a general vestry beneath the organ-chamber, and a lobby beyond, with staircase for choir. On the basement is a schoolroom, 11 ft. high, the whole size of the chapel; attached to which are two class-rooms and a kitchen. The schoolroom has a boarded floor, and wainscoting 3 ft. high all round. The fittings of the chapel are of picked red deal, stained and varnished. The roof is an open one, the principals being supported on stone corbels, carved. The roofs are covered with Bangor slates, and have open perforated red ridge tiles. The chapel is built to accommodate 600, and has cost over 2,000l. The contractors were Messrs. Winkles & Kellett, of Leicester. The plumbing work has been executed by Mr. Widdowson, of Leicester; Mr. Pegy, of the same place, supplying the ironwork. The front fence, which has been specially designed, has been supplied by Mr. Sharman, of Melton. The organ, which has been refixed in a new case, designed to accord with the building, has been put in order by Mr. Valentine, of Melton, organ builder. The whole of the works have been carried out from the designs and under the superintendence of Mr. R. W. Johnson, of Melton Mowbray, architect.

Oswestry.—The memorial stone of the new Congregational church, on the site of the old borough gaol, has been laid. The building is already in an advanced state. The plan of the chapel consists of nave, transepts, and side-aisles, the extreme dimensions being 57 ft. by 72 ft. The tower, a conspicuous feature of the design, terminates the south-west aisle, and forms an entrance. It is surmounted by a spire, rising to a height of 103 ft. above the level of Arthur-street. The platform on which the pulpit is put is partly recessed by the formation of an apse. A gallery is placed over the main entrance, and extends to the commencement of the aisles: the approach to this is by a staircase in the tower. Staircases built out at the back of the chapel lead to the class-rooms, vestry, heating-chamber, &c., which are under the main building. The front elevation on the ground level is divided into five bays by an arcade supported by engaged shafts, with foliated caps, the main entrance-doors occupying two of these bays, the remaining three having circular cusped openings disposed in them, which light the interior of the lobby and chapel. Over this arcade is placed a five-light window, the head of which is filled with geometric tracery. The style adopted may be called Early Decorated. Accommodation is provided for 800 persons when the building is completed, and the class-rooms for about 220 children. The building will be pitched faced with Cefn stone, from Messrs. Dennis & Co.'s quarries; the mullions, tracery, and facings will also be supplied by that firm. The benches and other interior fittings will be of deal, stained and var-

nished. The contract for the work has been taken by Messrs. Morris & Chaplin, for the sum of 3,500*l.*, exclusive of lighting and heating, and will be executed from the designs and under the superintendence of Mr. W. H. Spaul, architect, Oswestry.

Belper.—The memorial-stone of the new Congregational Church at Belper has been laid. The church, which is now in course of erection, is from the designs of Mr. George Woodhouse, architect, Bolton; the contractors being Messrs. Walker & Sons, joiners, Duffield. The style is Decorated. The edifice will seat 550, and galleries may be added to afford accommodation for 200 more, if desired. The entire cost (including the expense of adapting a portion of the chapel taken down last year for Sunday-school purposes, &c.) is estimated at about 1,100*l.*, a considerable portion of which has already been contributed.

Derby.—Bourne Memorial Chapel, Kedleston-street, Derby, has been opened for divine service. The plan of the edifice is nearly square, the internal dimensions being 60 ft. by 55 ft. and 33 ft. in height. The sittings on the ground floor are arranged in a circular form round the rostrum and communion enclosure, with a sloping floor. The gallery is also circular on plan, with ornamental iron scroll-work to the front. Accommodation is provided for about 1,000 adults. The rostrum is approached by stairs on each side, with ornamental balusters, and mahogany moulded rail, continued round both rostrum and communion below. Two entrances are formed at the front, with space for a vestry between them. There are also two side entrances. The woodwork inside is stained and varnished. The windows have ground glass, with light amber-colored margins, while the walls are light grey, and the ironwork is to be white, relieved with gilding. The ceiling is panelled, with beams, and moulded. The Derwent Foundry Company supplied the warming apparatus. The chapel is lighted at night by chandeliers, and several ornamental brackets, supplied by Mrs. Woolhouse. The exterior is built in Derby white bricks, relieved with red bricks, in patterns, to the arches and bands, and encaustic-tile panels. Stone dressings are introduced, with moulded and carved impostas, cornices, and columns. The roof is of single span, with ornamental gable in the front, forming a pediment, flanked by two towers, containing the staircases to galleries, and finished with spires covered with slates in coloured bands and iron terminals. The front has iron palisading and gates to match, on stone base; and broad flight of stone steps to the entrance. The cost of the work is about 3,000*l.* The works have been executed by Mr. E. Dunsant, from designs and under the superintendence of Messrs. Giles & Brookhouse, of this town, architects. The style of architecture is Lombardic.

Mirfield.—The corner stone of a new Baptist Chapel has been laid on the site of the old one, at Knowle, Mirfield. The new building will be in the Romanesque style of architecture, liberally treated. It will seat 630 persons, and the estimated cost is 3,000*l.*

Great Totham.—The new Congregational Chapel at Totham has been completed and opened for divine service. The new building, which adjoins the old chapel, and stands at right angles with it, in a portion of the burial-ground, is designed to accommodate 320 persons,—viz., 230 on the ground-floor and 90 in a gallery at the end. The walls are of red brick of the neighbourhood, relieved with white arches, bands, and patterns. Stained deal benches are provided throughout the edifice. The estimated cost of the works, when begun, was 600*l.*, and the architect has completed the structure for 650*l.* Mr. King, jun., of Halstead, was the contractor, and has carried out the works under the direction of Mr. Charles Portwee, of Chelmsford, architect. The painting, decorating, &c., of the new building have been done by Mr. Wilder, of Halstead. The following shows the details of the cost:—Builder's contract for chapel, 505*l.*; cost of new front to school-room, 83*l.*; extra outlay in the chapel, furnishing both the chapel and school, and providing new harmonium, 90*l.*; making a total expenditure of 678*l.*

Ovenden.—The chief stone of a new General Baptist Chapel for Ovenden has been laid. The site on which the building is being erected is on an elevated piece of ground situated at the top of Lee Bank. The dimensions of the building will be 77 ft. by 45 ft., and the design is Gothic,

with pitch-faced gabled front and two slightly-projecting porches, by Mr. T. Horsfield, Halifax, architect. Over the porches will be large central rose windows, and smaller ones on each side, with ashlar quoins and labial moulds and strings. The side elevation has six two-light windows and buttresses. Internally, classrooms will be at each end, over which will be the lecture-room and galleries. A cottage will be provided in the basement for the chapel-keeper, and the total cost is estimated at 1,500*l.*, towards which about 400*l.* have been already subscribed or promised.

SCHOOL-BUILDING NEWS.

Lower Slaughter (Gloucestershire).—An infant school and class-room with boys' and girls' porches, have just been completed at Lower Slaughter. The dimensions of the school are 25 ft. by 16 ft., with class-room, 12 ft. by 10 ft. The walls are built of the Weal rough warm-colored stone, with dressings of the Farmington freestone. A somewhat unusual and picturesque feature in school buildings has been introduced (by Mr. Whitmore's suggestion), in the shape of a bay window to the gable end next the high-road, the object being both to emphasise this part and to give additional space inside the room. The windows have stone mullions and transoms, and there are stone copings to the gables. The roofs are substantially constructed with open timbers, boarded at the back of the rafters, and varnished (without any staining). A bell-turret, with spirelet, covered with oak shingle, rises from the main roof (the latter covered with stone slates). The whole expense of the work (upwards of 500*l.*) has been defrayed by Mr. Charles S. Whitmore, Q.C., the rector of Gloucester. The same gentleman also rebuilt, at his own cost, some five years since, the parish church of Lower Slaughter, from the designs of Mr. Ferrey, F.S.A. The architect to the school buildings recently completed was Mr. Edmund B. Ferrey. It may be remarked, that the village is of remarkably picturesque architecture, nearly all the cottages, &c., being in character, with gables having stone copings, mullioned and transomed windows, with labels over. Mr. Albert Estcourt, of Gloucester, was the contractor for the works.

Minard.—The new school erected at Achagail by Mr. John Fender, of Minard Castle, for the benefit of those resident on his estate and others, has been opened under auspicious circumstances, says the *Northern Echo*. The building, which includes a house for the master, is of the domestic Gothic style of architecture, built of black whinstone, quarried on the estate, and was designed and erected by Mr. William McKenzie, the carpenter on the property. The school-room is 35 ft. by 18 ft., and 15 ft. high; class-room, 14 ft. by 12 ft., and 12 ft. high; entrance lobby, 12 ft. by 10 ft.; and the dwelling-house contains five rooms. The ceiling is Gothic, diagonally lined with varnished pine, having four ornamental couples resting on ornamental corbels. The spandrels are relieved with a decoration of fret-work. The walls are lined round with pine to the height of 4 ft., and the plaster work is painted. The situation is on a knoll overlooking the road which runs along the shore of Lochfyne, between Lochgilphead and Inverary.

Castle Fields, Shrewsbury.—The chief corner stone of the proposed schools for the district of All Saints was laid on Tuesday, the 19th inst. The building will consist of boys', girls', and infants' schools; the total provision, with the class-rooms, being for 260 children. The walls will be built of red brick, relieved with bands, &c., of white and blue brick. Mr. E. Haycock is the architect, and the contract has been taken by Messrs. Bowdler & Darlington for 852*l.*

STAINED GLASS.

Winkleigh Church, North Devon.—The south window of the chancel has just been filled with painted glass by Mr. W. C. L. Floyd, to the memory of his wife and infant son. The east light represents a female figure of Faith, bearing a cross. There is a palm-tree in the background, and above is an angel holding a scroll. The west light contains a figure of Hope and her anchor, and above is an angel with scroll. The ornamental filling of each light consists chiefly of passion flowers. The small top light contains a Cherub. The artists were Messrs. Ward & Hughes, of London.

St. Martin's, Scarborough.—Four new windows

have been placed in the chancel of this church. They are by Messrs. Morris & Co., of London. The subject is the four living beings described in the fourth chapter of the Revelation, and the seventh verse. It is well known that these have been in old days taken as symbols of the four Evangelists, or rather of their Gospels. In the new windows the idea of these symbols is preserved, and each evangelist's name is placed on a scroll in the window. These windows are the gift of Miss Mary Craven, and are intended by her to be associated with the names of some who have worked in connexion with St. Martin's. Two will be thank-offerings for the recovery from severe illness of Mr. Bodley, the architect of St. Martin's, and Mr. Parr, its first vicar; the other two are Miss Craven's tribute of respect for the labours of Mr. Lister, the present curate and preceptor, and Dr. Sloman, its organist.

Redenhall Church.—A stained-glass window has been recently placed in the south aisle of this church, to the memory of the late Mrs. Ormerod, wife of the rector, the Ven. Archdeacon Ormerod, at the cost of her six children. The window has three lights, representing the Resurrection of our Lord. The central light contains a figure of the Saviour, while beneath it is the sitting figure of the angel who watched by the tomb. In the eastern side-light are given the three women who went early to the sepulchre on the Resurrection morning, and in the third light appear St. Peter and St. John. Both the side-lights have in the upper compartment an angel bearing a scroll, and in the lower an angel adoring. The foot of the central light has the *Agnus Dei*. The top of the window is filled up with the family arms. Messrs. Heston, Butler, & Bayne, of London, were the artists.

St. James's, Brighouse.—The east window of this church has been recently filled with painted glass by Mr. Frederick Craven, of Kersal, Manchester, in memory of a son. It is of three lights, with tracery above. The central light contains one subject only; the outer ones are divided each into three compartments. The central subject is the Crucifixion of our Lord. In the central compartment of the first light that is, to the right of the Saviour, are the three Maries. In the corresponding compartment of the third light, that is, to the left of the Saviour, are John, the beloved disciple, with, on his right, Joseph of Arimathea, and on his left Nicodemus. Above each of these compartments, separate from them by fringes of cloud, are six angels, three on each side. In the lowest compartment of the first light is Christ blessing little children. The Calling of Samuel occupies the corresponding compartment of the third light. The treatment of the Crucifixion is not historical, as usual, but mystical. The angel in the tracery over the three Maries was designed by Dante Gabriel Rossetti; the Calling of Samuel, by Madox Browne; and the rest of the window by E. Burne Jones; the general execution of the whole being by Messrs. Morris & Co., of Bloomsbury.

Dunbar Church.—The introduction of stained glass into the parish church of Dunbar, in Scotland, was commenced in 1865 by the erection of the memorial window upon the one side of the pulpit, presented by Captain Hay, of Bolton; and the window upon the opposite side of the pulpit has just been filled in a similar manner, by Mr. A. Drysdale, of Castellon House. There are six large compartments in the Drysdale window, each containing a Scriptural subject. In the three upper compartments are illustrations of "Suffer little children to come unto Me," "The Sermon on the Mount," and "Christ washing His disciples' feet;" and in the under compartments, "Christ bearing His Cross," "His Entombment," and "His appearance to Mary in the garden." The artists were Messrs. James Ballantine & Son, of Edinburgh.

FROM AUSTRALIA.

Melbourne.—The block of ground at the corner of William and Latrobe streets, then occupied by the old Exhibition building, having been selected as the site for the Victoria Mint, instructions were issued by the Government to have plans and specifications prepared forthwith by Mr. S. H. Merrett, of the Public Works Department. In due course the design was approved and the tender of Messrs. Murray & Beauchamp to erect the operating departments of the Mint for a sum of 22,000*l.* was accepted. This day the work was at once commenced, and the buildings soon began to assume a substantial

forwardness which enabled some idea of their magnitude to be formed. The area of ground which will be occupied by the buildings is the entire block bounded by William-street, Latrobe-street, and Lonsdale-street, or, in other words, a frontage of 313 ft. to William-street, by the same depth towards Queen-street. The frontage towards the main street will be occupied by the administrative offices, while in the rear the operating departments will form three sides of a quadrangle, the entire block of buildings occupying an exact square. The present contract in course of progress only includes the operative branch, the tenders for the erection of the main buildings not yet having been called for; nor indeed has the design for this part of the structure been finally determined upon.

Richmond.—The town of Richmond has now a town-hall and municipal buildings, quite in unison with the steady and permanent advancement of this important suburb. The pile of building, having a frontage of about 180 ft. to the Bridge-road, is thus appropriated:—The central portion contains the municipal offices—mayor's room, town clerk's room, committee room, treasurer's room, &c., with a public library on the second floor, about 50 ft. by 23 ft. In the centre rises the tower to an altitude of 130 ft., and containing provision for clock and bells, the lower portion of the tower being used for munition-rooms. The west wing comprises the police-court, magistrates' rooms, &c.; and the east the post-office, telegraph office, and savings bank. At the rear, partially concealed by the buildings in front, is the townhall, measuring 75 ft. in length by 45 ft. in width, the height being 33 ft. Attached to this room are retiring, refreshment, and ante rooms. The design for this building was selected from many others, and we are informed, would be completed within the amount originally contemplated to be expended. The architect was Mr. Charles Wickers, of Melbourne; Mr. S. L. Carroll the contractor; and Mr. Ryton Oldham the clerk of works.

Books Received.

The Proposed England and India Railway: a Letter to the Right Hon. W. Gladstone, M.P. By WILLIAM LOW & GEORGE THOMAS, Civil Engineers, Cardiff. London: Savill, Edwards, & Co., printers, Covent Garden. 1871.
 "To India in five days:" that is the purport of this pamphlet;—but say seven days. And after the wonders (in a rougher and cheaper way certainly) already accomplished in America, from east to west, as well as from north to south, impossible is not a word to be for a moment entertained. The whole journey just now takes, nominally, twenty days, but often actually a good deal more. The proposal of Messrs. Low and Thomas is to make use of existing lines of railway and of the Mont Cenis Tunnel, to Trieste, and thence to construct a railroad through Austria, European and Asiatic Turkey, Persia, and Beloochistan, to Kurrachee, and onwards to Bombay. On leaving Trieste, the projected line would pass by Fiume to the eastern shore of the Adriatic, and run southwards along this shore to a point nearly opposite Brindisi. Thence it would turn directly eastward, across Turkey, and to the north of the Archipelago, and the sea of Marmora, to Constantinople. Crossing the Bosphorus, it would turn southward at Sontari, and reach the Mediterranean at Adalia. From Adalia to Alexandretta it would skirt the coast, and from Alexandretta would pursue a south-easterly course to the western extremity of the Persian Gulf. From this point it would follow the shore of the Gulf and of the Arabian Sea to Kurrachee. The authors include in the plan a branch from near Antioch to Jerusalem, and a branch to join the Smyrna and Aidin Railway. Without considering these branches, the total distance from London to Kurrachee would be 5,311 miles by rail, and 25 miles (the Straits of Dover) by sea. At a uniform rate of 10½ miles an hour by water and 40 miles an hour by land, the journey from end to end would be accomplished in 5 days, 16 hours, 45 minutes. Calculating the railway travelling at 30 miles an hour the time would be 7 days, 13 hours, 22 minutes; and at 50 miles an hour, 4 days, 10 hours, and 13 minutes. Of the total length of line required nearly one-fourth (1,170 miles) is already constructed. The highest estimated cost of the whole undertaking is, in round numbers, 41 millions sterling, and the estimated cost per mile ranges

from 8,000l. to 17,000l. in different localities. Under a second proposal, the total cost would only be 24,279,000l. The authors suggest that the cost of construction should be borne, not by one nation only, but by all through which the line would pass.

VARIORUM.

"THE Annual Report of the Medical Officer of Health for the parish of St. George the Martyr, Southwark." This report by Dr. Bateson sums up, to a certain extent, the results of the duties and responsibilities which vestrymen undertook in 1856, after the passing of the Metropolis Management Act.—"Open Spaces Within and Around the Metropolis." By M. Corner, M.D., Coningham, Limehouse." Dr. Corner is a medical officer of health, and his brief remarks here relate to the necessity for the creation and preservation of open spaces,—a subject which we completely agree, and on which we have often dilated.—"Rules for the Promotion of Health." By William Whitelaw, M.D., Kirkcaldy. In a condensed form, and on the face of a sheet of paper, Dr. Whitelaw here gives many useful hints as to cleanliness, of premises and person, food, light, exercise, precautionary measures, &c. They deserve to be widely distributed.—In a kindred spirit, with more especial reference to cholera and diarrhoea, a little tractate by M. A. B., on "Some Simple Sanitary Precautions against Cholera and Diarrhoea," has been published by Lewis, 136, Gower-street. It contains useful suggestions concerning dietetic treatment, especially with regard to infants. As this is a fitting season, the autumn, when diarrhoea is apt to prevail, and as medical men advise immediate attention to its symptoms, especially when there is any fear of virulent cholera, we may here repeat a hint we have heretofore given, that a penny-worth of camphor dissolved in a penny-worth of clove oil, and a few drops taken at a time for a dose, will often remove diarrhoeal symptoms. Where these still resist the drops, a penny-worth of landanum added to the mixture, and shaken up with it when dropped out for use, will strengthen the effect.—"Papers on the Cause of Rain, Storms, Aurora, and Terrestrial Magnetism." By G. A. Rowell, Williams & Norgate, Covent Garden." This is a reprint from the *Edinburgh New Philosophical Journal*, &c., of papers intended as an appeal on behalf of a thoughtful theory advanced by the author, who is an honorary member of the Ashmolean Society, and assistant in the Oxford Museum. Mr. Rowell's opinion, based upon certain facts, is that electricity is the principal agent in evaporation, and that the fall or not of ordinary rains depends chiefly on the damp or dry state of the air, i.e., its conducting or non-conducting condition for the electricity of the clouds. This theory as to evaporation, &c., would account for the curious phenomenon of lakes, ponds, and moist earth smoking on certain cold mornings, when assuredly heat does not do it.—"Palestine Exploration Fund: Quarterly Statement: New Series: No. 3, August, 1871. Office of the Society, 9, Pall-mall East." The number contains a variety of interesting matter, on the Discovery of a Tablet from King Herod's Temple, by M. Clermont Ganneau; on a Greek Inscription from Smyrna; on the Moabite stone, by Herr H. Paternan; on Gold in Syria; on the Haram es Sheriff; and others. The next expedition leaves this autumn, and an appeal to enable the Society to carry out the interesting enterprise is made in the preface.—The October part of *Cassell's Magazine* contains the commencement of a new story, by Mr. Wilkie Collins, called "Poor Miss Finch," which promises to be very interesting. Curiosity is already aroused, and we wait impatiently for the next number.—What have we here? "Magi i Ddala Haul-Belydryn. Gan Awdares yr Hou Jolliffe, &c." Is it Hungarian? That can scarcely be, for it is published by Philip Williams, of Aberystwyth. No, it is nothing less than the well-known charming little story, "A Trap to Catch a Sunbeam" (written by Mrs. Henry Mackarness in the earlier part of her life), translated into Welsh, and issued for the benefit of the rising generation of the Principality, though it is quite true that they were all made able to read it in English. The progressive popularity of this story is very remarkable; at least forty editions of it have been published, and it has been translated into many languages, including, we believe, some of the Indian dialects. It is so good of its kind, that we rejoice

in its success.—"Woman's Work; with special reference to Industrial Employment." By Emily Faithfull. London: Victoria Press, Prince's-street, Hanover-square, W." This able paper was read at the meeting of the Society of Arts on March 29th, 1871. Miss Faithfull, as she states, does "not for one moment seek to remove women from those household duties which seem so naturally to come within their special sphere." As it is a subject, however, to which she has given some years' reflection, she thought the result might elicit a discussion which would tend to throw some new light upon a very difficult and perplexing problem.

Miscellaneous.

The East London Tabernacle.—The largest building for religious purposes in the East of London has been opened for the use of the Baptist congregation, under the pastorate of the Rev. A. G. Brown. The new East London Tabernacle, which will provide sitting accommodation for about 3,000 persons, has been erected in Burdett-road, Bow, at a cost of about 12,000l. The frontage is nearly 1¼ ft. in length; the height 60 ft., with a turret at either end; and the depth 83 ft. The basement contains a school or lecture-hall, 92 ft. by 64 ft., with class-rooms, and ample lavatorial accommodation, with hot-water apparatus. With the exception of the platform, which is 20 ft. square, and which is situated immediately over the baptistery, the ground-floor is entirely occupied by sittings. The gallery, which has a minimum width of 16 ft., is approached by four stone staircases, and the floors and gallery are sustained by iron columns. The span of the roof which is of the ordinary fir-framed construction, is upwards of 64 ft. in the clear. Externally, the frontage towards the Burdett-road has a double range of windows, lighting the school-room and the main building; and at about 10 ft. from the base there is a string course, from which rises a colonnade of ten Corinthian pilasters in Bath stone, of which material the dressings and cornices are also constructed.

Farringdon Market.—A meeting of the salesmen in Farringdon Market has been held to consider some proposed alterations in connexion with the market. It had been called by the Trade Association. Mr. Phillips proposed a resolution in favour of a change of site by which a suggestion of the *Times*, that "if a railway could not be brought to a market, the market ought to be taken to the railway," might be carried out. He said the failure of the present market was entirely due to its bad position. The proposed new site in Farringdon-road was a capital one, and it would have the advantage of securing to the salesmen for the carriage of their goods direct railway communication with all parts of the kingdom. The market would do honour to the corporation if they could be induced to construct it, and would meet with the approval of the public. It would, on the other hand, be merely wasting public money to reconstruct the present market. The meeting passed a resolution authorising the association to confer with a committee in the ward.

Another New Bank for Middlesbrough. Scarcely have the National and Provincial Banking Company commenced building operations, than we learn that Messrs. J. Backhouse & Co. have decided upon erecting new banking premises on a corner site facing the railway and Exchange. Like most of the old-established branches of this firm, the one at Middlesbrough has become inconveniently small for the transaction of business. The architect for the new erection, Mr. G. G. Hoskins, of Darlington, has lately erected structures for the same firm at Sunderland and Bishop Auckland.

Vandalism at Stonehenge.—The proprietor of Stonehenge writes to say that the remains are much less damaged than recent statements had led people to think; and, considering the number of persons who visit them, he regards the fact as very creditable to the public. When mischief was done, it was not usually by the operative class.

Technical Education.—As our advertising columns have shown, the classes of the Birkbeck Institution are announced to commence on October 2nd. Instruction will be provided in all branches of science and art, in addition to the large number of other subjects set forth in the announcement.

The New Law for Threats and Molestations.—The Act passed in the recent session relating to violence, threats, and molestations under which persons on strike at Newcastle have been imprisoned, should be generally known. Any person is now liable to an imprisonment, with or without hard labour, for a period not exceeding three months, who uses violence to any person or property, who threatens or intimidates any persons in such a manner as would justify a justice of the peace on complaint made to him, to bind him over to keep the peace; who molests or obstructs any person, as defined by the Act with a view to coerce him—that is, being master, to dismiss or to cease to employ any workman; or, being a workman, to quit any employment or to return work before it is finished; being a master not to offer, or being a workman not to accept any employment or work; being a master or workman to belong or not to belong to any temporary or permanent association or combination; being a master or workman to pay any fine or penalty imposed by any temporary or permanent association or combination; being a master to alter the mode of carrying on his business, or the number or description of any persons employed by him.

A Runaway Steam Roller.—An exciting occurrence took place the other day in Pall-mall and Cockspur-street, Charing-cross, which might have been attended with loss of life, several persons being injured, and others having a narrow escape from death. A large steam-roller was left standing without any attendance, at the engine-man's dinner-hour, near the statue in front of the Pall-mall Restaurant. A mischievous boy jumped on the engine and started it. The locomotive, to the dismay of the spectators, commenced to move ahead. At first it appeared inclined to demolish the statue referred to, for it darted straight for it, but turned round and went across the street, over the pavement, and into premises in Cockspur-street, breaking down the stonework under the window, the window itself being completely demolished. Mr. Oswald Allen, connected with the Grecian Theatre, fell in front of the engine, but was rescued. He sustained, however, a fracture of the left leg. Several other persons were also injured. As soon as the engine came to a stand, the boy who occasioned all the mischief jumped off and got clear away. The engine was not moved off the pavement till the driver returned from his dinner. It is to be hoped no such carelessness will be shown in London again.

The Vienna International Exhibition in 1873.—The Emperor of Austria has sanctioned the project of holding this Exhibition, and has appointed an Imperial Commission to carry out the project. The Commission, which is composed after the model of the English and French Commissions, consists of the Emperor's brother, Archduke Charles Louis, who has been nominated patron of the Exhibition; Archduke Rainer, president; Count Von Benet, and others, vice-presidents. The Commission also includes the presidents of the chief artistic, commercial, and scientific societies, and other gentlemen distinguished in science, art, and industry. The Commission held its inaugural meeting on Sunday, the 17th inst., and issued its programme. It is in contemplation to combine with the exhibition courses of lectures in connexion with the objects exhibited, and to arrange international congresses of learned men, artists, architects, engineers, and others. The Emperor has granted the use of the Prater for the site of the Exhibition, which is described as the Windsor Park of Vienna by Mr. Scott-Russell, who is at present at Vienna consulting with Baron von Schwarz as to the design for the building. It is intended to be very comprehensive.

North Bridge, Halifax.—The work upon this new bridge is progressing rapidly towards completion; the whole of the iron roadway is laid, and the dress bedding for the setting is nearly completed. It was at one time contemplated to lay the whole roadway in asphalt, but it has since been found that this cannot be done, and it has therefore been decided to asphalt the footway only, and lay the central roadway with ordinary setts. They will not much add to the adornment of the bridge. It was fairly tested when the immense boiler for Messrs. Salt's works, at Saltaire, passed over that portion already completed. This mass of metal weighed, with its conveyance, between 30 and 40 tons. The deflection was very slight.

An alleged Nuisance in Westminster.—Mr. Lot Brass, owner of extensive foundry and smelting works in Eccleston-street East, Pimlico, was summoned by Dr. Aldis, the medical officer of health of St. George's, Hanover-square, in consequence of his workshop not being ventilated in such a manner as to render harmless, as far as practicable, any gas, vapours, dust, or other impurities generated in the course of the work carried on therein, so as to be a nuisance under the Act of 1865. Dr. Aldis gave evidence to the effect that the process of smelting iron was carried on in these premises, and the coke, as well as iron, emitted sulphurous and other noxious vapours of a deadly character. In the smelting of bronze,—the defendant having the contract to do the Wellington statue in St. Paul's,—the vapours were not so bad, but they were still injurious to health. The defendant called the chairman of the Board that voted the issuing of the present summons, and that gentleman denied that he smelt anything bad when the work was going on. The summons was adjourned for twelve weeks, to enable a new shaft to be completed.

The Hotel de Ville.—The Prefect of the Seine recently instituted a committee, presided over by himself, and composed of members of the municipal council, artists, sculptors, architects, archaeologists, &c., to decide on the question of rebuilding the Hôtel de Ville. A preliminary report on the subject had already been drawn up by M. Duc, representing the committee of architects of the municipality. The document showed that two proposals were in presence; one to reproduce the building as it existed before the fire, and the other to erect it as previously to the alterations made by Conde de Rambuteau. According to the *Morning Post*, MM. Perrin & Charles Blanc criticised the additions made under the Government of July, and brought forward a third proposal, which was to rebuild the small facade of the old Hôtel de Ville, and to erect at the sides and in the rear low buildings for offices, which, having no pretension to match the other, would leave the original work of Boissard to stand alone in its former beauty. A sub-committee, consisting of the two authors of the project, and MM. Vandoeyer, Duc, and Labrousse, was appointed to consider this new plan and report on it.

The Huddersfield New Waterworks.—A visit has been paid by the members of the Huddersfield Town Council and others to the new waterworks, now in course of construction, at Blackmoor Foot and Deerhill. The party, who were joined by the mayor and Mr. Hawley, C.E., made an inspection of the works, and expressed their satisfaction with the progress made in the preliminary operations. During the afternoon the mayor laid the foundation-stone of the shaft and culvert of the Deerhill Reservoir. Mr. Hawley stated that the whole of the new and the existing works combined would afford to the town of Huddersfield, in the most droughty seasons, from 4,000,000 to 4,500,000 galls. per diem. It was a fact that it was scarcely anywhere possible to secure 1,000,000 galls. per day, over and above compensation to millowners, at an expense of less than 120,000l. to 150,000l., but in the case of Huddersfield there would, he believed, be no such expense incurred. It might reasonably be expected that within the next few years an income of 18,000l. a year would be realised from these works.

Open Spaces.—Two Acts were passed in the recent session (34 & 35 Vict., cap. 181 and cap. 204), for vesting the management of the open spaces known as Wandsworth Common and Wimbledon and Putney Commons in a body of conservators, with a view to the preservation of the same. There are 73 sections in one Act and 110 in the other. As to Wandsworth Common, Earl Spencer is to have a perpetual annuity of 250l., to be levied by the rates, and 1,200l. in respect of Wimbledon and Putney Commons. It is recited in the Acts that it would be of great local and public advantage if the commons were always kept uninclosed and unbuilt on, their natural aspect and state being, as far as may be, preserved.

Society of Engineers.—The first meeting of the Society for the new session will be held in the Society's Hall, Westminster Palace Hotel, on Monday, the 2nd of October, 1871, when a paper will be read on "Recent Improvements in Explosive Compounds," by Mr. Perry E. Nursey. The other meetings for this year will be held on November 6th and December 4th, and the annual meeting on December 11th.

Essays by Workmen.—The Working Men's Club and Institute Union have determined to invite the members of their affiliated institutions to record their ideas on sundry important questions which deeply affect the welfare of the people at large. They believe that much good may be effected by inducing intelligent workmen to write papers on subjects which lie within the scope of their own personal experience, and by making other classes acquainted with their opinions and suggestions. Prizes have accordingly been offered for the best essay on the following subject, and others will shortly be announced:—"The causes of the alleged absence of thrift and saving habits among a considerable portion of the industrious classes of this country, as compared with the same classes in other countries, and the remedies for this state of things." The union will be very glad to receive aid and suggestions in carrying out this useful work.

Ecclesiastical Dilapidations.—Mr. Thomas Morris suggests, in the *Times*, that it is desirable to combine with the merely possible contingency of fire the ultimate destruction by time, which is certain. "On an occasion where a seven years' insurance had been effected in a mutual office, and the premium paid down, the whole sum was restored at the end of the term, as the losses and charges of every kind had been met by the usufruct of the money alone. Assuming the duration of a building to be a century, a single pound a year at 3 per cent. compound interest would exceed 600l. in the time, and at 4 per cent. it would be over 1,200l. A small yearly sum would, therefore, certainly suffice for the twofold object, and might be readily adjusted to all degrees of stability."

New Gas Works.—The foundation-stone of gas-works has been laid at Holt, in Denbighshire, North Wales. Mr. S. Harrison, of Ebenezer Cottage, performed the ceremony, and said he was pleased to have the honour of laying the foundation-stone of the first public works that had as yet been erected in the ancient town. Who among the inhabitants, twelve months ago, he said, would have thought seriously of gas works for Holt. There was also some talk about waterworks, but what was most wanted to make Holt a prosperous place was a railway. The people of Holt were great producers. The system of cultivation was greatly improved, and where only potatoes, plums, and cucumbers had been grown years ago, they had now turned their attention to the cultivation of more costly vegetables and fruits, which found ready sale in the Liverpool and Manchester markets.

Carnarvon Castle.—Mr. Llewelyn Turner, deputy constable of Carnarvon Castle, writes in the *Times* stating that after the dismantling of the castle a cottage was erected in the lower end of the moat, which was suffered to remain long enough to bar the rights of the Crown, and that he had endeavoured to purchase the place. The price demanded was 400l. (three times the value of the site), and on tendering that he was met by a demand for 450l., which he also offered, but the demand increased 50l. a day. The Carnarvon Harbour Trust did all they could to prevent such an act of vandalism; but the Corporation of Carnarvon, he adds, have actually waived the requirements of their by-laws, enable three unhealthy houses to be built in the moat.

Newington Church and the Widening of Newington Butts.—In consequence of an action which is now being taken by the local authorities, it is highly probable that Newington Church will shortly be taken down, in order to admit of the proposed widening of Newington Butts. At their meeting held this week, the Lambeth vestry agreed to present a memorial to the Metropolitan Board of Works requesting them to take steps for the removal of the church. The Newington vestry had already pursued a similar course.

The New Billingsgate Market Act.—Certain improvements are to be effected under an Act recently passed to enlarge the site of Billingsgate Market. The Corporation of London has the power for the compulsory purchase of lands for three years, and Nicholson's Wharf is not to be taken without the consent of the owner.

Rotherhithe Workhouse.—The St. Olave's Board of Guardians have been instructed by the Local Government Board to pay Mr. Hunt a sum of 157l. 10s. for valuing the Rotherhithe Workhouse.

The Builder.

VOL. XXIX.—No. 1496.



*Railway Development,
English & Foreign.*

E have arrived at a period of crisis in railway development. It is not that any new impulse has been given either to our mechanical skill or to our commercial prosperity. It is not such a start as was due to the first triumph of the genius of Stephenson, or

to the first practical outcome of the business capacity of George Hudson. It is due to no single event of magnitude; although the successful accomplishment of some of the greatest feats of engineering have recently been commemorated. But the general result of the engineering of the last forty years, when undisturbed by the avidity of speculators, is such as to indicate further progress. From all parts of the world the same signs are manifested. The Alps no longer exist as a mountain barrier necessary to be crossed in the route from Paris to Brindisi. The Isthmus of Suez no longer forms a material bar, compelling our ships to double the Cape of Good Hope. The eastern and western shores of the great American Continent are linked together with an iron band. And projects for a direct line of communication from our old *tête de pont*, Calais, to the capitals of our Indian Empire, are assuming more than a visionary probability.

Connected with, or at all events most significantly contemporary with, these wide-spread fruits of the skill and patience of the civil engineer, is the march of a movement in our railway economies at home which has been long urged by one or two farseeing men. Two of our largest railway companies, one of them the father of all our iron lines (for it has absorbed its own parent, the Liverpool and Manchester), the annual income of which amounts to a seventh part of that of the State itself, have agreed to make common cause, and to share a common purse. The example set by the London and North Western and Lancashire and Yorkshire railways cannot fail to be widely followed. It has, of late, become pretty clear that the main enemies to railway dividends have been railway directors. The spirit of actual hostility, the desire to injure a rival undertaking, at whatever cost, has been, perhaps not extinguished, but rendered practically powerless, by the absolute necessity to stop reckless outlay, and to close capital account. This was the first victory gained by the shareholders over the boards of management. But with new lines abandoned, and parliamentary contests suspended from pure inanition, the individualising spirit still ruled the several Boards. The wholesome, practical, eminently paying idea of a great railway federation was scouted. It may be extremely unjust to attribute to railway directors, as a body, any but the best and purest motives. Still, human nature is human nature; and any steps that

might tend to destroy the power, patronage, and position enjoyed by the chairmen and leading members of the various boards of directors could not fail to excite an instinctive repugnance on their part. Thus the period of actual waste, of flinging away money by handfuls in the construction of unnecessary lines, has been succeeded by a period of passive waste. Attention has been given, indeed, with more or less wisdom, to the development of the resources of individual lines. But the immense advantage to be obtained by a common adjustment of all the details of the traffic of the country, by a system of through tickets, by the abandonment of duplicate trains and of the general ignoring, by one line or set of lines, of the existence of their neighbours, has been hitherto obstinately neglected.

How great an immediate return to the shareholder is to be secured by a wise and practical federation it is not easy to tell. In the case of virtually rival lines, such as those which have so long wasted the great resources of the south-eastern district, the result would probably be the most immediate. Where there are two or three routes available between the same termini, the arrangement of the trains on the several lines so as to quarter the day is a duty of the most obvious nature. It is one that has been almost invariably neglected. Yet the saving in the unnecessary trackage miles run that could thus be effected, without any loss of total revenue, would form a very appreciable item in the half-yearly accounts. Thus far the mere common sense idea of self-protection at which our coach-owners, after a good bout at competition, usually arrived, might have been thought enough to render Bradshaw a volume of much greater unity of purpose than is actually the case. But then, it is true, the competition for the best time of the day,—for the nine o'clock morning train, for instance,—might require some mode of arbitration. Everything, therefore, points in the direction of what our French neighbours would call syndicating the earnings of the lines. A common purse, to the common advantage of all, will lead to unity or community of management. That, before very long, some organised federation of our immense traffic companies will be carried out there is every reason to believe.

While the actual saving thus to be effected is large, it is nothing as compared to the stimulus that will be given to our internal traffic by the removal of the present petty and unnecessary obstacles. The politico-economical theory of supply and demand may be said to be inverted in the history of our English railways. It has not so much been the case, that the need of men to travel has led other men to supply improved means for so doing, as that the supply of accommodation, far more extensive and available than its projectors originally contemplated, has developed an enormous capacity for internal circulation, both of passengers and of goods. Every railway journey taken by any individual may be thought to lead to other journeys by other individuals, and to a corresponding increase of activity in postal, telegraphic, and mercantile interchange. Whatever may be the limit to this self-augmenting activity, there are no signs that we have attained or even approached it. When we see what has been effected by every instance of well-planned junction, and judiciously extended accommodation, we cannot doubt, that if the union of design and aim, for which the physical means for the most part already exist, be adopted by our leading companies, a great and rapid increase in traffic of all kinds will be the immediate result.

This result will, in the first instance, benefit those who may be thought most entitled to the advantage,—the holders of the ordinary stock and original shares of the railway companies. For the improvement which has followed a few years of failure in the railway system has been

such as to lead us to this point. Preferential charges are now, as a rule, fully discharged out of profits. Debentures, debenture stock, and preferential shares of all kinds are already satisfied. The surplus profit belongs to the original shares; and as the proportion of capital over which every rudiment of new profit has to be spread is so much less than the gross capital by aid of which the earnings are effected, the rise of dividend will be very appreciable. The last half-year has shown this to be the case. The summer dividend of 1872, if the one-purse system shall have been extensively adopted by that time, may recall the golden days of 1845.

Our internal communications, within the memory of not more than two generations, have experienced three great eras of improvement. We anticipate the arrival of a fourth. The first of these was the great change wrought in our highways by the adoption of the simple, common-sense plan which Macadam first induced the Bristol Road Trust to introduce, although in the Plains of Apulia it had been in practice from the time of Trajan. As far as the employment of horse-power, for speed and for luxury of travelling (though not for the conveyance of heavy weight), could be available, the Shrewsbury and Devonport mails and fast coaches may be said to have attained the best conceivable results. We had then a lull in the improvement of traffic. For some years we were content to maintain a rate of excellence that was nowhere to be met with out of England. Then came the unexpected triumph of "Puffing Billy" and his friends. Not knowing what to do with the waste high-pressure steam, the engineer turned it up the chimney, and found that, in its hasty escape, it afforded him the means of flying a mile in a minute. Steam volunteered to do more, after its actual calculated task was done, than had been asked from it in the first instance. The power of producing motion by pressure had been matter of calculation, the power of generating heat by rapid blast was an unexpected godsend. This blast was the very life of the railway.

Intermediate, to some extent, between the latest improvement of the highways and the substitution of iron tracks for the main through roads of the country, was the introduction of water-carriage for heavy merchandise. We are not among those who consider that we have heard the last word as to canals. In the first place, long lines of this nature exist, well laid out in many cases, and have to be kept up, or to be destroyed at a considerable expense. Thus the actual cost of water carriage is the lowest required by any mode of transport. The point where the canal is at a disadvantage is speed. So long as we stick to the towing-path the rate of transit is necessarily slow. But an age which has seen the application of steam-power to an object so refractory as that of breaking up the earth over a large area,—a duty that might well have been thought beyond the function of machinery,—is not likely to fail in the endeavour satisfactorily to apply steam power to canal towage, when once it appears likely to pay. In fact, the plan of what was called, many years since, the "messenger propelling engine," seems likely to meet every requirement. In any case the improvements of the past twenty years have been such as to lead to the anticipation that the application of steam or other mechanically-produced power to machinery of all kinds is yet only in its infancy, and that what we can now do by mechanism is but a very small part of that which mechanism is destined to effect. At present, however, we can only speak of canal transport as among the abandoned improvements of the past,—one of the three great stops made by our engineers in the conduct of internal traffic,—viz., good roads and good coaches, good water-carriage, and main trunk railways.

The stimulus that will be given to the railway

system by linking the networks of the various great companies together in one organic whole must cause, not only the great increase of traffic due to this facilitation, but the prosecution of what may be called the Secondary Railway System. Isolated attempts at this development have been made for some years past, with more or less success. We have had reports of the cheap construction and economical working of light railways in India, Norway, and elsewhere, that are perfectly conclusive in the opinion of engineers. We are witnessing the attempt to introduce tramways into London, with, apparently satisfactory results in a commercial point of view, although the questions of the interference with ordinary road traffic and of the effect likely to be produced on the rental value of the principal thoroughfares cannot be regarded as decided. But what is desirable, and will, no doubt, follow, is, that the service of those parts of the country which are as yet only very partially benefited by the railway system shall be regarded as a serious national object. Call them light railways, tramways, or what we like, we must have the means of reducing the running friction which forms so large a portion of the expense of land carriage placed at the disposal of the country. The important point is, that the method of effecting this object should be so decided by the best professional experience, that, when the wind of public favour sets in that direction, we should not have a reputation of the madness of 1845,—every man's hand against his neighbour,—for the construction of his own speculative tramway. A well-constituted railway federation, giving the weight of its sanction to the most available lines of subsidiary railway, in the first instance, may save us from this disaster. At all events, it is not easy to see what other check will be available, as Parliamentary legislation hitherto has only intensified the evils of competition.

The question naturally arises, can the control of the internal traffic of the country, if centralised, be safely entrusted to any other hands than those of the State. Out of England, the answer would be simple. Roads and highways have always been regarded as the special charge of the administrative powers. Postal and military exigencies alone require the unfettered action of the Executive; and for the Postmaster-General or the Minister of War to have to apply to the Railway Director-in-Chief for the means of sending despatches, or moving troops, could never for a moment be tolerated in a duly-organised State. But it would be unsafe to make any prophecies as to England, however probable it may appear that railways will be dealt with by-and-by as telegraphs are now being dealt with. A country that allowed a mighty Continental empire to remain for a series of years under the rule of a trading company may well allow any commercial interest to grow, bit by bit, to Imperial proportions. Again, much of the battle as to the conveyance of mails and troops has been already fought out in detail, and in the application to the Legislature for powers to render the proposed federation not only legal but binding, opportunities would be afforded for the protection of the public interest. With the impression, then, that the ultimate form to be assumed by our railway management will be that of a department of the Government, we think there is no such certainty in the matter as to allow of any very practical inferences being drawn on the subject.

There is, however, a point of view of no small importance which is not only national, but international. Our insular position prevents us from being bound in the chain of that common interest which unites, or ought to unite, the railways of the Continent. But our interest in the proper development and management of those railways is scarcely inferior to that of the States through which they pass. Considering our connexion with India, the state of the line over which the Indian mail is transmitted to Brindisi is hardly less a matter of English interest, than the condition of the Holyhead route itself. Now there has long been a determination evinced by the directors of the French railways to throw every possible obstacle in the way of a route which shortens our journey by sixty hours, but which avoids Marseilles. The opening of the Mont Cenis tunnel brings this matter to a crisis. The Italians have their thirty miles of railway up to the tunnel complete; the French ten miles are all in disorder. Only an omnibus train, stopping so often and so long as to weary the patience of Job himself (if the much-enduring patriarch had taken a ticket) is allowed to crawl

towards the perforated barrier of the Alps. The tunnel is complete; but, if French policy can avail, it will be rendered no thoroughfare.

We require a body of men, or a duly authorised individual, to deal authoritatively with this, and with similar questions, on the part of the commercial interests of this country. If left to diplomacy to settle, the dispute will unavoidably drag on for years. It is not by way of flinging a stone at our noble and patriotic representative in France that we say so; but a minister has his hands very closely fettered when he is called upon to advocate any commercial interest, and especially when, as in the present case, peremptory settlement of the matter must be demanded, on pain of making immediate arrangements (which are perfectly feasible) to avoid France altogether for the route of the Indian mail. That despatch must and will take place from the proper point of the South-Eastern Continental system of railways, namely, from the old Roman port of Brindisi. Our shortest way to this point is through the Mont Cenis tunnel. But other routes are open to us, and the day of Marseilles, as the sailing port for India, is over. If the French will not see this,—which is not unlikely,—we do; and we require machinery to act nationally, in consequence. It is now possible to effect a great saving in the transit of the Indian mail, and it concerns us deeply that this should be at once carried out.

There is one question which we are much surprised to find still not only unanswered, but even unasked. It is a question not, perhaps, of any great commercial importance, but of deep interest to the scientific world, and to the profession of the civil engineer. How did the two lines of the Tunnel meet? We all know that the junction was happily effected, and that the line is now complete and in working order, through the bowels of the Alps. We offer our most sincere and hearty congratulations to our Italian *confères*, the engineers Grattoni and Grandis; and only regret that Sommerler died just too early to witness the triumph. But we must be excused for asking for details. What was the actual measurement,—decimals, inches, feet, or yards,—by which the two centre lines, started eight miles apart, were found to differ from absolute coincidence when they met? What was this divergence in azimuth, and what was the difference in level? The more or less can hardly affect the well-earned fame of the successful engineers. But the gratitude due to their skill and tact will be increased if they will furnish an accurate reply to a question which, though exclusively technical, has a deep and lively interest for the profession in this country, and will furnish a piece of valuable information in the history of the important public works of the present century.

THE SOCIAL SCIENCE CONGRESS, LEEDS.

THE Congress has begun its work. The Right Hon. Sir John Pakington, as president of the Association, delivered the inaugural address, in the Theatre of the Mechanics' Institute, on Wednesday evening. We confine ourselves to that portion of it which relates to Technical Education:—

I must now, said the President, ask your permission to advert for a short time to a branch of this great subject which has hitherto received little—I may almost say no—attention from either Parliament or the public; which nearly affects the welfare and prosperity of our skilled artisans, who are conscious of their own disadvantages in this respect, and anxious for their correction; and which touches no less directly the manufacturing and commercial interests of the country. I allude to technical education.

We cannot wonder, when we remember through what a length of time the elementary education of the people has been left to chance and charity, and what was and is a national duty has been treated as an individual hobby, as part of the pastoral duties of benevolent ministers of religion, and supported in a great degree at their own expense, from their own narrow means. We cannot wonder, I say, when such has been the treatment of indispensable elementary education by this great and enlightened country, as we consider ourselves to be, that the scientific training of boys, to fit them for those occupations and trades by which they were to live and prosper and gain reputation for themselves and their country, has been almost wholly neglected.

We must take care that we do not before long suffer very seriously for this neglect, and without stopping to consider where the blame should rest, let us rather look to the future, and remember that "it is never too late to mend."

There are consequences of this neglect easily to be seen, and which we cannot afford to disregard. "We must take blame to ourselves for having allowed many branches of trade, skill, and commerce, which yielded to England the greatest remuneration, brought to her commerce the greatest reputation, and afforded to her people the highest wages and best work, to pass away into the hands of better educated people, in foreign lands, guided by wiser heads." These last words are a quotation from Mr. Scott Russell's able work upon "Technical Education," a work which I wish was in the hands of all who feel interest in either the national manufactures or our national education.

In England, technical education may be said to be provided for some of the higher classes of professions in our universities, and in other bodies, such as medical and engineers' colleges; and something has been done in Royal Schools by the Government. I have myself taken a humble but zealous part in the establishment of the Royal School of Naval Architecture, which is flourishing and doing good service under most able management, at South Kensington. There is also the School of Mines in Jermyn-street. There is the College of Chemistry, the Agricultural College at Cirencester, and some others; but, in the sense in which I am now speaking, I agree with Mr. Scott Russell that, "as a rule, technical education does not exist."

The question of technical instruction of the people is one which cannot wait. This is not a time for the Minister of Education to be negotiating foreign treaties, or helping to steer a difficult party Bills through the rocks and quicksands of the House of Commons. The enemy is at the gate, not in the shape of fleets or armies, but in the shape of a rivalry in manufactures and trade, in which, if we fail to maintain the position we have hitherto held, our national prosperity will be undermined, and England's wealth, and power, and greatness will be a story of the past. Let us, then, be wise ere it is too late. The train is behind time, and if the guard cannot recover his lost ground, there will be a collision, in comparison with which the late prostration of unhappy France will be as nothing. The depression of France will be ephemeral—the ruin of England would be enduring.

But, important as I consider this subject of technical education to be (and I earnestly hope that the views I have so strongly expressed will go forth as sanctioned and approved by this Association), we should bear in mind that there are other respects in which the skilled workmen of this country consider their position to be unsatisfactory, and especially when they compare their position with that of men of the same class in other parts of Europe. This is a delicate and difficult subject, especially at the present time, when we are daily disturbed by rumours of international organisations for political purposes, and when we know too well that there are not wanting men who devote themselves to attempting to inspire the minds of our working classes with feelings of discontent and disaffection, and so to make them instruments for the accomplishment of revolutionary objects.

I hope it will be the opinion of this Association that I am now touching on a subject immediately within our proper sphere of action; that it is a subject from the discussion of which honest politicians ought not to shrink; and that it is a subject with which our Government and Parliament ought promptly to grapple in a bold and conciliatory spirit. It is not easy to imagine any object more noble in itself, or more worthy of the highest ambition of a patriotic statesman, than to avert discontent and disloyalty amongst the industrious masses of our countrymen, by the timely concession of moderate and reasonable requirements. On the other hand, it is not easy to imagine any conduct more wicked, more to be condemned by every honest mind, than that attempt to sow discord and disunion between class and class, by exaggerated statements and mischievous representation, which can only end in bitter disappointment to the man and serious injury to the State. What, then, are the principal requirements now felt and urged by working men?

I have already referred to their great need of technical education, and this, if we value the prosperity of England, must be given, and on

fair terms; but the object which stands at the head of their requirements is—"To rescue the families of workmen from the dismal lanes, crowded alleys, and unwholesome dwellings of our towns, and plant them out in the clear."...

The state of village and town education in Switzerland is such, that the workmen's children receive an education that fits them for practical life; and those meant to be skilled workmen get drawing, geometry, physics, mechanics, taught at a cost nearly nominal, and which, in case of need, becomes gratuitous. This description applies equally, or almost equally, to the valley of the Rhine, and other parts of Germany. But such comparisons ought rather to stimulate our Government than to depress our people. Let the English workman bear in mind that as regards Germany and Switzerland, when compared with England, the social, political, and physical differences between the countries are such as to make fair comparison almost impossible. Let him bear in mind the points, and they are not a few, in which his position is as superior to that of the Swiss as in others the Swiss is superior to him. Let him reflect on the advantage which, beyond almost every people in Europe, he possesses, in the vigor, the energy, and the aptitude of his national character; and above all let him remember that it is in the power of the Government and Parliament of his country to remove, or at least to modify, those disadvantages by which he feels himself overweighed in the great race of competition.

In Mr. Sammelson's report to the Government on the rapid progress of the manufacturing establishments of France, Switzerland, Germany, and Belgium, he says, "Meanwhile, we know that our manufacturing artisans are imperfectly taught, and our agricultural labourers illiterate; neither one nor the other can put forth with effect the splendid qualities with which Providence has endowed our people." This is confirmation, and from a very competent quarter, of Mr. Mundella's opinion that, with proper culture, "England would possess the most intelligent and inventive artisans in the world."

What, then, is to be done? I submit that the people,—for this is not a question interesting to the working man alone,—have a right to appeal to the Government for active aid in this pressing matter. I agree with a distinguished friend of mine, who was one of my predecessors in this chair, that we should "impress earnestly upon our countrymen the incalculable value of self-reliance and self-help," and that in the domestic affairs of the country, we should seek the aid of Government only in the last resort; but the reforms for which our working classes ask, are on too large a scale to be entrusted solely to the self-reliance and self-help of the people themselves. The establishment of a system of technical training could not possibly be accomplished by the people. With all the aid that might derive from the governments of Holland, Berlin, Stuttgart, Austria, Hanover, Carlsruhe, and Zurich, the task is one which would now, in England, require all the energy and power of an able minister, supported by a consenting Parliament.

At the conclusion of the address, which occupied an hour and twenty minutes in delivery, a vote of thanks was passed to Sir John Pakington, on the motion of the Mayor, seconded by the Dean of Durham.

CONDITION OF LEICESTER.

THE PHOSPHATE SEWAGE PROCESS.

It is now something like two-and-twenty years since Thomas Wicksteed first introduced, at Leicester, his well-known process for the treatment of sewage, which is a slight modification of the late Dr. Clark's ingenious mode of softening water by means of hydrate of lime.

During all these years the scheme has held its sway on and off, omitting intervals of experimental trials by other modes of treatment, such as the ferric chloride, various descriptions of lime (those now in use are the Cricht and Batterley mountain lime), mixed with other ingredients; the much talked about A B C method of Messrs. Siller & Wyner (alum, blood, and clay), together with others.

Notwithstanding these fears of experiment and re-experiment, the river Soar remains in a shockingly filthy state—the water of a muddy consistency and bluish black color, here and there tinged grey from precipitating lime, and smelling very badly. The surface is covered in

places with a frothy, milky scum, whilst at intervals huge bubbles of gas ascend to the face of the water, and burst, filling the air with a noisome, foul odour, painfully discernible at considerable distances from the river margin, and the effluvia is augmented by innumerable little gaseous bubbles, always on the rise, giving to the surface of the water the appearance presented by falling rain-drops.

This fact points to the extreme putridity of the sedimentary river bottom, now rapidly silting up below the sewage outfall, notwithstanding repeated attempts at dredging. But none of the schemes yearly tried bring relief, even aided by an enormous outlay of 1,500*l.* per annum paid from the rates, and the nuisance continues and increases until at last the outraged residents upon the river banks, after long threatening action for pollution of the running stream, are at last about appealing to the Court of Chancery for redress; and there can be no question, judging on the spot and viewing the river's condition, it will be speedily granted.

At this pass the Phosphate Sewage Company step in with Forbes's aluminic phosphate process of deodorisation with precipitation, and this has been adopted during the past six or eight weeks. The company is in negotiation with the Town Council for a continuance of their process.

It is many years since it was set forth that the town of Leicester required the following objects in carrying out a system of sewerage and precipitating works, which the lime process was to fulfill. We cannot do better than repeat them in the present day:—

"1. The division of all sewage, dye, and scouring waters, from the river Soar and Leicester canal, and their removal as speedily as possible from under and near the town of Leicester, so as to relieve the town from all noxious exhalations and to restore the river to the salubrious state in which it was before it was made the common sewer of the town.

"2. The removal of this sewage to such a point in the river below that the process of collecting and disinfecting may be carried on without injury or annoyance either to the inhabitants of the town itself, or to those of the adjacent villages; and that the process to be adopted in its disinfection be such that the water before it is returned into the river Soar (below the town), shall be in a state of at least as great purity as it was as the river above the town before any sewage or dyo waters had contaminated it.

"3. That the fall in each sewer shall be sufficiently great to produce a velocity that will not only carry off rapidly the liquid filth poured into it (so as not to allow of stagnation or of time for decomposition), but also to produce a sufficient scouring power to prevent the accumulation of debris or heavy deposits of road dirt."

Exceedingly laudable and proper objects of attainment, no doubt. Let us see how far the promises have been realised.

1st. This has been to some extent carried out. The sewage is certainly diverted from the river near the town and removed to a point distant a mile or so from it, entering the river in much about the same condition as it leaves the sewers. Sewage, however, yet remains under the town, cloying the ground and polluting the wells.

2nd. As stated above, the bulk of the sewage is removed to a point in the river below the town sufficiently remote not to be a nuisance to its inhabitants; but there is little or no disinfection, although there is great injury and annoyance to the inhabitants of adjacent villages. Moreover, no process of disinfection hitherto has been adopted such that the water before returning to the river is in a state of at least as great purity as it was in the river above the town; on the contrary, the whole river below the outfall is of the appearance of a huge open sewer, of the filthiest description, and for miles along its course not a trace of Letheby's aquatic plants remains, although above the sewage works aqueous vegetation is abundant and healthy, for there the water is pellucid and crystalline.

3rd. The fall in each sewer is not sufficiently great to carry off rapidly the liquid filth poured into it; but the dead level of some, the actual reverse fall of others, with the imperfect workmanship of the majority, do allow of and produce much stagnation, with attendant decomposition of solid sewage. Positively completely choked sewers may be counted by the dozen; whilst there is no adequate provision for the ventilation and riddance of the generated gases within them, for many districts are entirely without a single venting. Such are marked, and may be known by the prevalence of typhoid and other fevers; and these evils, coupled with a sewage-tainted water-supply, account for heavy annual epidemical losses by fevers and diarrhoea, from which latter disease Leicester suffers more than any town in Great Britain,—indeed, if not even in Europe and in India.

Writing of the condition of the sewers, we have one in memory at the moment which begins at one end of a certain street actually terminating at the other end in a large cesspit sunk into porous gravel, whereby the well-waters are heavily polluted; and owing to no proper exit for the sewage, the house-drains rapidly clog with solid matter from the closets; so that hereabouts sickness is the rule and health the exception. The street has been in this condition for some years, and the evils are aggravated by the facts being well known to the Health authorities.

Therefore we see that the promises of twenty-two years ago of sanitary reform have not been fulfilled. Such gross neglect and utter apathy surely call for rebuke from the central authority. Leicester presents the anomaly of holding up her head, and crying, "I am the cleanest of the clean; my sewers are ample and efficient; their ventilation is perfect; and my water supply is good and wholesome;" yet having the highest death-rate of any town in the kingdom,—a mortality from one disease alone higher than that of Bombay from every cause whatsoever!

A town that is *perfect* must needs find some excuse for its notoriety, and we are told that the high death-rate is due to "simple heat!!!" We give the full amount of admiration.

Perhaps in the next instance we shall be told that the temperature at Leicester, like its mortality, exceeds that of Bombay and Calcutta!

To return to the phosphate process of treatment. Several visits made to the sewage works during the experiments showed there was certainly an improvement, inasmuch as there was little of that noxious smell about the works characteristic of the lime process. The *modus operandi* consists, in the first place, of treating the powdered native aluminic phosphate obtained from the company's deposits in the island of Alto Vela, in the republic of San Domingo, with crude unadulterated sulphuric acid.

On solution, and after thorough agitation, performed by the aid of a portable engine, close at hand, the solution is run into the main trunk-sewer of the town, immediately above the works, and in the proportion of 1 of phosphate to 2,500 of sewage. The mixed sewage and phosphate is now pumped into the large depositing tanks attached to the works, but, before entering them, is further treated with cream of lime, in the ratio of 1 to 5,000, and the whole mass thoroughly agitated with appropriate machinery, driven by steam power. The hydrated aluminic phosphate is set free by the addition of the calcic hydrate, and precipitated in gelatinous flakes, presenting an immense surface, so that the sedimentary matters of the sewage are held in a net, as it were, and carried to the bottom of the tanks by the superior gravity of the alumina compound.

The chief features of this process are the manufacture of phosphated manure of any strength, suited to the requirements of purchasers; the combination with irrigation, after clarification of the sewage,—for the scheme admits of either the precipitation of the whole of the phosphated manure, or merely of the sedimentary matters contained in the sewage, together with a small portion of the added phosphate only, the deodorised fluid retaining the valuable ingredients,—such as the phosphate and the ammonia,—and in a form readily available for irrigation. Moreover, the effluent water is clear and colorless, thus removing the main objections against irrigation, *per se*. This elasticity of the phosphate mode is of considerable practical value, because two distinct methods are available, at the discretion of the operators, or the exigencies of the particular period of the year, and can be worked alternately.

As regards the value of the new process as a defecating agent, Dr. Voelcker, who has watched it at Tottenham, says, "Any person who has once seen the extremely rapid and simple process by which foul raw sewage is defecated and clarified by this plan cannot but be struck with the rapidity and efficient manner in which raw sewage is rendered almost as clear and inodorous as ordinary water. I therefore have no hesitation in saying that effluent sewage as thoroughly purified as I saw it done at the time of my visit may be safely discharged into a water-course without fear of causing a nuisance." The value of the precipitated manure Professor Voelcker estimates as from 2*l.* 10*s.* to 7*l.* 7*s.* a ton, depending upon the quantity of phosphate employed as a precipitating agent.

At the Leicester works we saw two tanks in operation; through one defecated sewage flowed at a rate, as stated, of 3,000 gallons per minute.

This water was deodorised, but far from clarified, because, as the agent stated, the flow was much too rapid and the tanks were too small to admit of proper precipitation; but we take leave to mention another more potent cause.

One defect requiring mechanical remedy is this. When the flocculent hydrated aluminic phosphate forms, the sediment settles with it in the tanks, and the sewage is both deodorised and clarified. But as this highly-organic precipitate is allowed to accumulate at the base of the tanks for weeks and months, secondary decomposition sets in. The generated gases rising to the surface counteract the good effects of the superior gravity of the precipitant, resulting in the supernatant water becoming charged with foul matter that passes off with the effluent water, contaminating it with what is in point of fact anterior sewage. We know this on reasoning by analogy, and proof lies in the large patches of black organic matter always on the ascendant within the tanks, and passing the overflow to the river.

OPENING OF THE ROCHDALE TOWN-HALL.

The town-hall of Rochdale, the foundation-stone of which was laid by Mr. John Bright in March, 1866, has been formally opened with a grand banquet in the hall of the new building. The occasion was observed as a general holiday.

We gave a view and plan, with particulars of the edifice, in our volume for 1866 (p. 869), but we may here state that the style is Decorated Gothic of the fourteenth century. The building is 230 ft. long by 90 ft. at its greatest width. There are three floors at each end, the large hall occupying the entire centre position. At the north-east angle there rises a tower 140 ft. in height, surmounted by a spire, which brings up the entire height of the tower to 240 ft., and the spire terminates with a finial representing St. George and the Dragon. Over the entrance to the tower are thirteen empty niches, which it is intended to fill with statues. The spire is profusely gilded. The exchange has an extreme length of 72 ft. by 39 ft. wide, and the walls and roof are decorated. The grand staircase leads directly to the large hall, which is profusely embellished. Its extreme length, exclusive of the orchestra, is 30 yards by 20 yards wide, and 63 ft. in height from floor to apex. It is calculated to accommodate 1,200 persons, and will be used for public meetings, concerts, &c. The council-room extends the whole width of the building, and is

60 ft. long by 24 ft. wide. The decorations in this room are elaborate. The borough court-room is 51 ft. by 34 ft.

The entire cost of the town-hall, which is situated in the centre of the town, will be 100,000*l*. That sum includes the purchase-money of twenty acres of ground, which adjoin the hall, and which have been laid out as a public recreation ground. The architect is Mr. W. H. Crossland, of London; and the contractors, Messrs. Warburton, Brothers, of Manchester.

The contractors, on the opening, gave a supper to their workmen, and other contractors for works connected with the Town-hall: about 150 persons were present.

DIRECT TRACTION PLOUGHING.

The question of steam cultivation is certainly uppermost in the agricultural world at present, and the ponderous and primitive apparatus still in use is likely to be superseded by more simple and slightly implements. At all events, promising efforts are already being made to that effect.

As a step in this direction, Messrs. Robey & Co., of Lincoln, have been carrying out a series of experiments, and perfecting an apparatus which appears to promise the desideratum so much hoped for.

The principle aimed at is to adapt the Thomson's road-steamer with indiarubber tires, to ploughing by direct traction. In a trial at Lincoln, the little traction-engine has responded cheerfully and successfully, it is said, to this new demand made upon it.

The steamer was nominally of 8-horse power, with double cylinders; its total length was 13 ft., and its extreme width 6½ ft.; its weight, ready for work, 6 tons; its capacities of speed from 2½ to 6 miles per hour; and with a guaranteed capability of traction-power to haul on an average road 12 tons up an incline of 1 in 12, or 18 tons up inclines not exceeding 1 in 30. The plough was manufactured by Robey & Co., and specially designed for adoption with the road-steamer. Bearing in mind the fearful and cumbersome balance-ploughs of ordinary steam cultivation, this contrasts favourably by its compactness and simplicity. It is in appearance something like an enlarged Pirie's double furrow plough, as made by Fowler & Co., of Leeds. It is capable of ploughing four furrows 9 in. wide and from 6 in. to 8 in. deep, or three furrows 12 in. wide by the same depth. Its most noticeable feature is a patented arrangement

for turning, at the headlands. So soon as the road-steamer reaches the headland and begins to turn, the plough is gradually raised out of the ground, and the ploughman has only to secure a lever in its catch; on reaching the next land the ploughman disengages the lever, and the plough at once commences the new furrows. The steering of the plough is very simple, and it is mounted on four wheels for travelling on the roads.

It is urged in favour of this mode of steam ploughing, that there is "simplicity with direct traction, no power lost, comparatively nothing to get out of order, wear and tear reduced to a minimum, and three men manage the whole apparatus." The work, it is said, was beautifully done; and as to results, the speed in ploughing was about three miles an hour, and the ground turned over by the plough one yard wide. It will plough a few perches short of nine acres per day. The net cost is about half the price of similar ploughing by horses. The road-steamer can be applied to nearly all farming work,—thrashing, grinding, and hauling produce, as well as cultivating the land.

ST. MICHAEL'S SCHOOLS, SYDENHAM.

On the 28th of September was laid, by Mr. Charles Henry Mills, M.P. for West Kent, a chief stone of new schools for St. Michael's district, Sydenham. A service was held in the church close by, the Dean of Rochester preaching an eloquent and faithful sermon upon the education of the young, after which the clergy and congregation proceeded to the school site, where prayers were offered by the vicar, the Hon. and Rev. Augustus Legge; and then Mr. Mills performed the mason's office, concluding with an appropriate speech upon the effort that is being made for education. The buildings are to provide for 380 scholars, boys, girls, and infants, in three distinct schools, with their requisite class-rooms and offices, and there are to be two houses for the teachers, the whole being in a simple style with high roofs, and the effect produced by grouping, as designed by the architect, Mr. Edwin Nash, of London. The expenditure will be about 3,500*l*., raised chiefly by local subscription, but aided by liberal grants from the Privy Council and from the Diocesan and National Societies.

The contractor for executing the work is Mr. James Hollidge, of South Norwood.

A view of the schools accompanies this notice.



ST. MICHAEL'S SCHOOLS, SYDENHAM.

EXETER SEWAGE UTILISATION WORKS.

A COMPANY, with a capital of 40,000*l.*, having for its object the interception and utilisation of the city sewage, has been for some time past in process of formation in Exeter. Within the last few weeks a lease, which concedes the sewage of the city to the company for a term of twenty-five years, has been signed and sealed by the Town Council and the Company, under which the company undertakes to construct between three and four miles of intercepting and outfall sewer, pumping station, and all other necessary works, according to plans and specifications prepared by Mr. Charles E. Ware, C.E., city surveyor, who in May, 1870, presented a comprehensive report on this subject to the Town Council, on which the present works are based. The sewage is then to be pumped and applied by irrigation to land, none of which is to be within two miles of the Guildhall (centre of the city), and in connexion with this irrigation the company proposes to pass the sewage through filters, so as to remove the grosser portion for conversion into portable manure. For this purpose, an extensive pumping-station and manufacturing-house have been designed, provided with duplicate engines and filters, so as to insure, in combination with the irrigation, which forms the chief feature of the scheme, the perfect purification of the sewage under all conditions, even in the event of accidents to engine and cleansing of filter. An extra purifying conduit for storm or excess sewage is also provided. Mr. Hope, whose farm at Romford is so well known, will give the Company the benefit of his special experience in cropping, &c.

The whole of the constructive works have been let to a London contractor, who has already commenced their execution, under the supervision of the city surveyor.

WINDOWS.

"Since light so necessary is to life"

to adopt the reflection of Milton's "Samson") it is a natural consequence that, next to the provision in a building of the means of ingress and egress, the admission of light to the interior should have been one of the earliest and most important desiderata which architecture was required to take into account. We name advisedly "the admission of light" as the first office of the window; for that of providing outlook, or prospect is, so far as we may judge from the architectural remains existing on the earth, in the main a requirement of a later civilisation than that to which we owe the greatest architectural monuments of antiquity. Had we more data as to the domestic architecture of the Egyptians and Greeks, we might possibly find reason to modify this conclusion. But, so far as their sole existing witnesses, their temples, bear evidence, the window appears solely as the means for the admission of as much light as was considered necessary; and not only is the provision for view from the interior completely ignored, but the window itself as an external feature is practically non-existent. This fact, contrasted with the important part played by the window in modern, and especially domestic, architecture, is not insignificant. We perceive, on a due consideration of the subject, that in proportion to the importance and grandeur of the internal architecture of an edifice do windows for outlook from it become unnecessary and impertinent. In such cases, the building itself is supposed to be sufficient, in itself, for our interest and admiration, when we are once fairly inside it; to provide means for carrying the vision thence to the outer landscape would be to weaken the effect of the internal architecture by distracting our attention, perhaps also to destroy or impair its scale by comparison with outer and more familiar objects. And when the building has been erected for the celebration of any mysterious and solemn worship, then is this exclusion from the outer world the more sought and insisted upon, and even the necessary light is admitted reluctantly and by stealth, lest it dissipate the repose and mystery of the interior, and awaken hints of the lights and shadows of the outer world. In such an edifice we are to be content with the building itself as our world for the time being; to have no thoughts, no longings beyond its over-vaunted gloom: we are closed in an inner world where the outer one is forgotten and ignored. Of what may be called the "sublime of lighting" with this object, probably no building ever furnished a grander

example than must have been presented by the interior of the Temple of Karnak, with its slanting rays admitted through the low apertures over the larger central columns, half showing and half concealing and exaggerating the extent of the forest of columns on either hand of the central avenue. According to recent theories and investigations, the lighting of the Parthenon and other Grecian temples must have been on a somewhat similar plan, though, we can hardly doubt, with a larger proportion of light and less of gloomy and mystical effect, which indeed could scarcely have been aimed at or obtained in buildings of such comparatively small dimensions. Then we have another type in the Pantheon, symbolical, with its full flood of light descending from the centre of the dome, of the cheerful, practical Roman mind, which was very little concerned with mystery of any kind. But all these typical modes of lighting, thus illustrated in the temples of bygone rituals, have this in common, that their window-space, whether abundant or the reverse, is solely for access of light, taking no account of the window itself as an element of external design, still less as a means of prospect from within.

In short, it may be said, that the window, properly so called, is one of the principal means of embodying what has been termed "courtesy," or "politeness," in architectural expression; that it is in proportion as society emerges from the dominion of the supernatural, becomes less ecclesiastical (using the term in a comprehensive sense), and more civil and social in its view of life, that the window comes into use as an external feature, and a means of architectural expression, instead of being a mere aperture to let in light in a more or less effective manner. And, going a step further, in proportion as we go from civic and political to domestic life, in that proportion does the window assume importance in its third aspect, as a means of looking out from the interior, as well as giving expression to the exterior. The gradation is a natural and obvious one. In our churches we want no outlook, and we still seek for a certain dim effect through the medium of coloured glazing, while the windows are certainly designed on the whole more for interior than exterior effect. In our council chambers, our halls for public business or festivities, we desiderate large windows, and an ample supply of light, but outlook is a very secondary consideration in such cases: what is going on within the building monopolises attention for the time. But in our dwelling-houses, where our daily life is passed, and in all rooms the uses of which partake of a domestic or home character, we no longer wish to concentrate our attention within doors; rather we would diversify and render more cheerful our existence by looking on our neighbours, on the flowers, the fields, and the clouds; we have no such weighty business that we need close our eyes and mind to the outer world, and our window is transformed from a mere means for the admission of light, into a look-out post, a place of contemplation, a means for connecting our life and interests with the world without.

And so, just as "light so necessary is to life" indoors, we find conversely how necessary are lights or windows to the life and expression of the building outside. We have recognised this, and have borrowed from the Latin a long word, "fenestration," what the Germans would call "window-work" (*fenster-werk*), to express the part played by the windows in the external design. The word seems, however, to be used somewhat indiscriminately, to express either the manner of disposing and arranging the windows in the external design, or their decorative treatment. But wherever the latter meaning is predominant,—where the attention is directed to the decorative adjuncts of the windows rather than to their grouping and arrangement,—we may suspect the presence of a certain degree of sham design in the architecture, and that the power of what may be truly called *artistic building* has not been present. A great deal may be done to make what is called a "handsome" building by decking the windows with pediments, and pilasters, and consoles, and such other orthodox decorations; but it is in grouping, proportion, situation, that the real effect of window treatment resides, in aiding and emphasising expression. In the case of a large palatial apartment, for instance, intended specially for festive or State ceremonials, a dignified and suitable expression is best given by completely symmetrical fenestration. In some cases, especially where the range of windows is long, and affords room for a good perspective effect, the

end may be attained by the very simple arrangement of a row of similar windows equidistant and precisely repeating each other. This, however, especially when the edifice is not large enough for real grandeur, is apt to be very monotonous; and it is better in many such cases to combine symmetry with variety by the repetition of groups of windows, or the alternation of two groups slightly varied in disposition.

Where windows are required to be symmetrically placed, but at intervals, an effect at once rich and piquant may be obtained by repeating in the intermediate piers the design of the window, or part of it, as a wall-arcade or panelling. In windows with mullions and transoms, for instance, the repetition in this way of one of the small sections of the window in a series of blank panels continuing the line of the lights, may be made with admirable effect. Both these methods of treatment combined may be seen in the simple and beautiful external clearstory of Lincoln Cathedral, where, in the nave, the lancet windows are arranged in groups of three, the middle one slightly wider than the two others, and each group is separated by three narrow blank arches of the same design ranging with them. In the choir the windows are also in threes, but the two side-lights much narrower than the centre—mere slits almost; the groups divided in this case by two wall-arches the same width as the centre window. There can scarcely be a more pleasing example of combined simplicity and picturesque character. But such symmetrical dispositions, however varied in grouping, are suitable rather to large apartments or very symmetrically planned buildings than to houses divided into numerous unequal-sized compartments, as most English houses are. In this latter case, an attempt at complete symmetry and regularity in the windows is a falsity, and deprives a dwelling-house of its most characteristic expression. Not, however, would we advocate a studied irregularity, or altogether ignore a conventional symmetry in the external design, even where this does not exist inside. A certain degree of symmetrical spacing is especially suitable in that aspect of the house which is most exposed to public view and comment; for, as it has been observed elsewhere, a certain effort at external symmetry in such a case constitutes a part of the "courtesy" of domestic architecture, a kind of testimony to the spectators that they, who only see the outside of the house, are not forgotten; and that provision is made to satisfy their eyes by an external *rhythm*, even at the cost of a little trouble and contrivance. Those aspects of the house which are mostly seen by the inhabitants and their guests only, may suitably and picturesquely assume a greater licence of irregularity, conforming easily to the internal plan, and thus presenting on their "family" side a more homely and domestic expression, and a pleasant and characteristic contrast to that of the front. Browning has happily indicated this kind of contrast between the outer and the domestic aspect of a dwelling, in his poem entitled, "In a Gondola":—

"How home? Must we row home? Full surely
Know I where its front's demurely
O'er the Ginevra pier;
Window just with window mating,
Door on door exactly waiting,
All's the staid face of a child;
But behind it, where's a trace
Of the staidness and reserve
And formal lines without a curve,
In the same child's playing face?
No two windows look one way
O'er the small sea-water thread
Below them."

Such irregularity, however, is only interesting, only truly picturesque, when it is evidently the natural result of the interior disposition of the building; nothing is more impertinent than a studied and intentional jumble of windows of various shapes and sizes, without any regard to meaning or utility. It is this kind of trick in design (for it is nothing more) which has drawn down on the talented author of the proposed Law Courts design a good deal of criticism; and it is well for young architects, who are tempted to distinguish themselves by an affected eccentricity, to bear in mind that this kind of falsity of design is more quickly seen through by the non-professional public than almost any other. But within proper limits, the whole arrangement of a plan may be made the basis for appropriate variations in the fenestration; a long passage suggesting a row of small lights,—a staircase, a large and lofty window; and so on in almost endless ways which will present themselves to a designer with an eye for the picturesque of architectural expression.

Indeed, it is when we come to domestic architecture that we find most scope for a varied and original treatment of the window; regarding it in this case as an internal as much as an external feature. As the central source of the light in a room, as well as the medium through which the outer landscape is viewed, the treatment of the window affords the character and general look of the room more than anything else. And here we must enter a protest against the formal, bare, prosaic treatment which this important feature so often receives in modern dwellings. The spirit of show and ostentation which gave rise to the preposterous plate-glass fronts of our shops, has infected even the dwellings of the country gentlemen. Huge, tall plate-glass sashes, bare and unexpressive, letting in an unnecessary glare of light, are now the rage; and convey an appearance of vulgarity even to what is otherwise a quiet and unpretentious dwelling. Plate-glass is a useful and fine material in its way, and has besides the practical advantage of superseding in a great measure the necessity for shutters, so far as security is concerned; but there is no reason why it should be used in as large squares as can possibly be made, and the windows made twice as large as necessary, in order to display the regulation expanse of glass. These large windows both destroy the architectural appearance of a house from the outside, cutting up the walls into great square holes, and destroy the repose and homeliness of the rooms inside. How far more picturesque, how much more pleasant to look through, how much more constructively satisfactory, are some long low mullioned windows to be met with in old-fashioned houses, through which the sunlight falls upon the walls in a pleasant lattice-work of light and shade, and further tempered perhaps by a fringe of ivy or jasmine overhanging the glass, instead of being poured into the room in one blinding flood. Because there is a beautiful view outside, we do not need to cheat our eyes into the belief that there is nothing interposed between them and it, or to provide for exhibiting it to a crowd of spectators. On the contrary, we venture to say that no landscape looks pleasanter, if it be pleasant at all, than when viewed through the mullions or shafts of a divided window; these architectural features close to the eye give additional value to the distance, conveying to the inmate, too, a certain feeling of repose and security, of being shut up and protected from the intrusion of the outer world: all which picturesque and pleasant association are demolished by the over-large modern plate-glass window. Where a certain degree of window-space is necessary, it can mostly be much more pleasantly and effectively provided, both in regard to external and internal design, by two or three moderate-sized windows than by one large gaping aperture. Windows down to the floors are very common in "entertaining rooms" now, but this is generally throwing away light where it is not wanted; and bringing the light more to the bottom than the top of an apartment is just the reverse of the natural and picturesque way of introducing it. For sitting-rooms the moderately low window, with that good old institution the "window-seat," is the best arrangement, the window-seat being the pleasantest possible place for an idle read or chat, looking out on a summer landscape, and giving in winter and on dull days an opportunity of taking the book or the work-basket "to the light" in the readiest and most convenient manner. Bay-windows form a very useful feature in the external design; in small houses often furnishing almost the only opportunity for a little bit of picturesque breaking up of the plan. They may be treated structurally either as an integral part of the building, and carried out entirely in brick or stone; or as a mere projected window-frame of carpentry. The nature of the site and the character aimed at in the house will decide this. For interior effect, a bay can hardly be ill-placed, and nearly always improves a room. In a dining-room it is best square on plan, and at the end of the room, furnishing opportunity thus for a practical lengthening of the room when a very long "table" is to be provided for. In a drawing-room, a semicircular or semi-octagon plan is more suitable for it, as a place of family and friendly conferences and conclaves on a small scale. In either case the ceiling of the bay should be separate from and lower than the main ceiling of the room, so that it appears as a window and not as part of the room. The octagon plan is best with the front or outer side nearly double the width of the oblique sides, the latter

being at an angle of 45°;—a form of bay not infrequent in some old-fashioned houses, where the outer side is the same width, or even narrower, than the oblique sides, and the latter forming a much more acute angle, is very awkward-looking, and by no means to be imitated. In street houses, side-lights in bays are altogether a mistake, destroying privacy. In some of the small houses in the suburban streets of our towns the bay windows may be seen through to an indefinite extent each way by an inmate standing in one of them. Small bays at angles, on the upper floors especially, are very suitable appendages to town houses so situated as to admit of them, giving a view in two or three directions, and breaking up the angle of the street into a picturesque outline when seen from the exterior,—that is to say, they will do all this if Building Acts will permit them; but towns which are blessed with that legal weapon for squeezing all life and expression out of their street architecture (though necessary in our respects) will probably find themselves debarred from this source of effect.

The method of hanging the windows has no little influence on their general effect as well as their construction. The old casement window opening on hinges had been up to a recent period completely abandoned in favour of the sliding sash and weights. As a matter of fact, we believe that practical advantages as well as appearance are mainly on the side of the casement. The sight of a whole cartload of "weights" discharging, for the windows of a large dwelling-house, certainly does not suggest the idea of economy of construction, especially when we take into account the time lost in weighing and fitting the sashes, the certainty of periodical breakage of sash-cords,* &c. &c. But in addition to this, the sash-window involves "boxings, casings," and all that flimsy cradelike work in which the modern joiner especially delights; whereas a casement can be hung in a solid frame, without any patching-up of glue or nails and is, of course, infinitely more durable. The fitting of sliding sashes to mullioned windows is always a failure, in point of appearance; the paraphernalia of boring and casing forming a mass of material behind each mullion which causes the whole to look preposterously heavy, besides interfering with the light. The prevailing objection to casements is that they are not watertight, which is simply because they are not properly made. A casement window requires a groove or upright throating on the mullion as well as on the sill, and then with proper fastenings it may be as weather-tight as any lifting-sash. If a lifting-sash be fixed without any throating at the sill (as it often is in cheap jerry-built houses), it will let in rain through the bottom just as surely as a casement without a groove on the mullion will let it in at the side. So that, in the interests of solid durable construction and joinery, we may wish that casements should be more used than they are.

The outward aspect of a building owes more than is sometimes suspected to the lights and reflections from the glass with which the windows are filled. A house before the windows are glazed looks blind, so to speak. Draftsmen are well aware of the importance of the windows in getting up an effective perspective view, and very numerous are the dodges and experiments tried to ensure a bright sparkle from the windows in a competition drawing. In the actual building, the window, reflecting in part the sky tints and gleams of sunlight, seems to connect the edifice with the life and change and movement of the landscape. Tennyson has happily hit this in one of the few picturesque lines of a small poem written for Mr. Sullivan's music; where the lover, looking across the country on a fitful autumn day, sees in the distance the chamber window of his mistress, as, lighted by flying gleams of sunshine—

"It brightens and darkens and brightens like my hope."

* The inconsistency of going to all this trouble of lifting sashes "contrary to the laws of gravitation" was commented on in an otherwise not very sound letter about the blunders of modern house-building, addressed, a short time since, to a well-known daily paper, by Mr. Chas. Reade, the novelist. In this point Mr. Reade was right; though so ill-informed was he, that he did not even know the name of the window he was denouncing, and spoke throughout of "casements" where he meant sashes. Much of the letter was of a piece with this; but in England it is established that a successful novelist has the right, *ipso facto*, to talk any nonsense he likes about architecture or any other art, and the more dogmatic he is the more ready are his readers to take it all for gospel.

And so far as this outer expression given to the building is concerned, the quality and treatment of the glass is not of very much consequence, except that (to repeat what we have already urged) it is nearly always detrimental to the near view of a building to glaze it with large unbroken sheets of "plate." Much more might be done in the way of ornamental arrangement of the glass frames, either in wood or in lead, than is usually attempted in dwelling houses, with very little extra expense; indeed, setting against this the high prices which have to be paid for large sheets of plate-glass, we might say at less expense; and by this means a scale is given to the building, and the windows are made to assist instead of diminishing its apparent size, while presenting at the same time an opportunity for a simple ornamental treatment, equally satisfactory from within and from without. Internally, a main question is, are the windows for prospect, or merely for light? Where the former is sought, of course, the clearer the glass the better; where prospect is of less importance, the glass itself may be made an object of interest and a medium of decorative treatment. A very picturesque effect may be obtained by having a small portion of a window filled with stained glass (not too strong in tone); in a lofty mullioned window, for instance, a double transom, with small square stained glass lights between the upper and lower lights, may contribute very much to the warmth and colour of an apartment, without interfering with light and prospect. Where stained glass cannot be afforded, variety of surface and texture may be given to ordinary plate-glass by an "embossed" diaper pattern on the plain glass. It is common to emboss on glass, the intermediate portions of which are subsequently ground, so as to obscure them; but the mere embossing on the clear glass has a very pleasing and delicate effect, when treated with a small and stiff conventional design: the embossing only showing fully at a certain angle seems to appear and disappear as the spectator changes his position, like the reflective lights on shot-silk. As to stained glass on an extensive scale, and of a high class, that of course is a separate art in itself, to be considered apart from mere window design.

We might say much more on the subject of windows, in reference to their accessories,—blinds, curtains, and other things, which are part of their furniture. We remember, however, one other use to which windows may be put. In one of Lord Lytton's novels ("My Novel," *par excellence*), an Italian refugee in England is visited by the parish parson, accompanied by some bulky theological volumes, for the purpose of converting him to the Protestant faith. The result is very succinctly told. "Dr. Riccabocca opened the window, and jumped out of it." No wishing to be left in the position of the parson, we close our windows and our discourse on them before (we hope) our readers are tempted to follow Dr. Riccabocca's example.

THIS AND NEXT YEAR'S EXHIBITION.

EXHIBITIONS have now become such permanent institutions, and apparently so necessary as visible landmarks of the progress of trade and manufacture, and we wish we could say fine art, that no amount of care and thoughtfulness would seem to be too much in the future to make of them, not only records of what is doing, but promising indications of what ought to be done. No one will dispute that whatever may be the merits of the present year's Exhibition, at South Kensington, it is in many respects imperfect, and that the mere tradesman and maker of business have had in it the best of it, and that the artist and the artist-workman, who help mainly to produce it, have had but a very second-rate place indeed in it and its glories. But the very express object of the whole idea of these Exhibitions is to show to the world what it is that the artist,—the thinking and designing artist and the working artist,—can accomplish with the raw materials provided by nature. This, as it seems to us, is an important consideration, and should in the future determine the kind and character of these now-looked annual shows. If the whole business of these exhibitions is to be but a mere art of selecting from the shop-windows the most showy and attractive and telling things, but without regard to the real artistic,—we repeat the word artistic,—value then, as it seems to us, little real benefit can come of them. It is simply an advertisement on

large and conspicuous scale, and to be obtained for the mere placing of goods in a large shop-window without rent. But if, on the contrary, the art and fine art of the country is to be encouraged, and the artist who produces it is to be aided in a way which he cannot get for himself, then is it one of the best, if not the greatest helps that can engage the attention of those who have it in their power to help the world. Let us begin by reminding the reader of a matter or two in the now closing Exhibition. There can be no doubt that this is the age of machinery and mechanical inventions; so much so, indeed, that it would almost seem as though machinery was made for its own sake, and not for the re-creating power, or for the work it has to do. No one can have visited the late Exhibition without being struck with the wonderful powers of the moving machinery in it, and at the almost infinite energies which it manifested. We would remind the reader, by way of illustration, of but one or two things in it, and as they bore more immediately on art matters. Everything in these days is driven by steam power, so that there is not, as in old days, any manual moving force. We would especially point to the "carpet-making machine," where was an ordinary drawing-room carpet in course of being brought into existence as if by magic, and without the help of human agency. Coloured reels of worsted, from which the carpet is made, and no end of wheels and pinions by which the work was done. There is simply, and it is significant of the whole modern shop, a man standing by it to mend the threads as they accidentally break; were it not for this the machine might be started at six in the morning, and go on, without dinner-hour, to six in the evening, or all night as well as all day, in a locked-up room, so completely and perfectly does it act for itself and do without human agency. Here the wonder ceases, for the machine cannot think out the pattern, or select the colours; and it must strike every one as a somewhat strange thing that some little taste, to say the least of it, was not shown in the selection of colours and patterns. Why not a pattern special for the place and occasion,—something different from the ordinary shop show-window display to be seen everywhere and in every street fashionable enough to support a carpet shop? We should then have seen what the Government Art Schools are doing, and what they can produce, and by suspending close at hand a piece of carpet of ten-years-ago manufacture, we should see practically and tangibly what progress in carpet making and designing and manufacturing has been made since, and what hope there is for the future, and what the public purse is drawn upon for. We would suggest this for consideration to the Exhibition authorities and the Royal Commissioners. After looking with amazement at this poor bit of bright modern carpet in course of creation under our eye, let us go into the "Ceramic" department or passage, and have a long stare at some flaky-looking specimen of hand made carpet from the loom of some ignorant and utterly untrained weaver from the interior parts of India, or Tanis, or Turkey,—from any place, indeed, where there is not machinery for doing everything, and where it is absolutely necessary for the workman to think a little of what is going on before his very eyes. It will be seen by a long and steady look that you cannot altogether leave even a carpet to a machine of wheels and spindles driven by a steam-engine.

We mention this first because machinery is the groundwork of this Exhibition, and the prime thing in modern advancement and progress, and to show that it is powerless really in art, and that a help, and not as here a master. This machinery, therefore, it is that should first be looked at and examined, not only for its own sake, but as the moving, and we had almost said it, the inventing power of modern days, and that which is gradually saving the labour of not only the hand of man, but of his head and his heart, too. The result of this machinery is modern art, and it has well nigh taken the place of the old art. It is the power of art-manufacture,—the destroyer of art! Machinery, and the false art produced by machinery, being then the main product, speaking generally, of this Exhibition, it may be asked, perhaps, whether there is or was anywhere in the whole collection anything (excluding for the present all notes of the pictures) which is really the product of the mind and hand of the artist himself. Is there, indeed, a work of real and *bona fide* individual art in the whole place from end to end? Well, there are a few bits scattered here and there in obscure

corners, and in out-of-the-way places, almost out of sight and notice, and looking very much as if they had got in by stealth. It is not a little singular that some of them had no number even attached to them. "Art-manufacture" has certainly triumphed at South Kensington: no one can dispute it. We hardly know what to direct the reader's attention to, or rather remind him of; but a little beyond the armour-room there are on a table a few fragments of modelling in terra-cotta of a head and some details, of course all done by hand,—they are all in a very much broken and fragmentary state, but they ought to be studied as they evidence what an art result is, and how wide apart it is from mere machine and manufactured work, and because these few dingy fragments contrast with another section of this show, viz. that of the vast collection from the warehouses and wharfs of some of the large pottery firms.

Passing these by, however, there is one thing in the "machinery" department connected with the potter's art which must not be overlooked. Carpet-making is but poor work to it. We refer to the machine and potter's wheel at work, and driven by a steam-engine, in one of the machinery outhouses. A man is at work, assisted by a boy and a steam-engine, in the manufacture of articles of pottery, with plenty of clay, water, tools, and everything that is handy and needful; and one would have supposed, considering the place he is in, and surrounded as he is by the highest and most learned of art influences, and examples, and help, that something at least suggestive of novelty would be forthcoming, and that man, and boy, and wheel, steam-engine, clay, water, tools, and altogether, and surrounded too, by "precedent," would produce something better than a "blackening" bottle. May we hope for something else another year; may we therefore suggest for next year's Exhibition a few changes and some additions and omissions. First, that the general idea of the Exhibition should be that the objects exhibited are to be considered as the results of the action of the artistic mind and hand on the rough and unformed materials provided by nature; that machinery is a help and not a master; and that it is only as a saving of mere labour power that it finds admission into art at all. This great principle, if true, of course makes the executive artist himself a something; and the public would then naturally ask for his personal and individualised recognition. Whose work is it? would be the constant question. The who exhibits it?—doubtless important and necessary, but a strictly subordinate and secondary one. Then we would propose that a broad and quite distinct line should be drawn between the works of pure manufacture and the works of genuine artistic production, between the products of the man as a machine, or men as machines, and that wherein the mind and hand of the individual artist have been at work as in a drawing or picture. And then, perhaps, more than all—for it is the great art secret of the future—a special encouragement should, as we think, be held out to the producers of art objects in material, such as objects in metal, wood, and stone, the working artist, the "Cellinis" of modern days, if there be any. Such should be sought out, and specially recognised, and invited to contribute proof of their individual skill; for "Art" in the future, irrespective of "Style," will consist simply in the joint mind and hand productions of the artist workman in whatever material he may work.

ADVANTAGES OF IMPERMEABLE ROADWAYS.

We have received from Mr. Edwin Chadwick some interesting observations on the condition of the street surfaces of towns, and the means of improving them, and in which the writer expresses a strong opinion in favour of the Val de Travers asphalt. We have space for only a portion of the communication:—

I certainly expect that the saving of horse power, from the paving with the new material, of peculiar hardness, as yet unsurpassed, and, as far as I have seen, unequalled, by anything of the kind—the Val de Travers asphalt—will be more than one-half of that power, and consequently of more than half the dirt and dung in the streets, and that this pavement will nearly equal the tramways in this respect for public vehicles, whilst it will exceed tramways in general convenience, especially for all sorts of private carriages. Sir Joseph Whitworth, who has studied street economy and the means of

street cleansing, and who is much struck with the new material, tells me that he anticipates that when extensively adopted, it will make way for the hot-air engine, with india-rubber tyres. A colleague of mine, of the Institute of France, who for the last ten years has ridden over a street paved with the Val de Travers asphalt in Paris, speaks of the great comfort in riding over it. The horses, on becoming accustomed to the tread, he says, do not certainly slip more, nor so much, and when they fall do not tear their knees as on the old pavements.

One advantage of gravel soils is the rapid discharge of surface water, and dryness after rainfalls. This advantage is possessed in a high degree by the impervious and even asphaltic surface.

There is one peculiar evil attendant on the old system, which is the noise, the rattle, and the vibration of the traffic over them, to which strong people become accustomed, and do not mind, but weakly and ailing people suffer very much from it, and are sometimes obliged to leave town to avoid it. The removal of the sick over these paved roads is often attended with considerable danger from the rolling and shaking. At our General Board of Health, it was strongly represented that great injury, often fatal, was inflicted by the removal of some large classes of sick in common cabs, or in other common conveyances, over paved roads. Exhortations were prepared for popular circulation, that, on the occurrence of accidents in the streets, attended by the fracture of limbs, it is of the greatest importance that the patients should not be put into any common conveyance for their removal, but should be allowed to remain where they fall until a surgeon can be brought to direct special and safe means of removal by stretchers. In relation to the action of granite pavements on healthy persons, a professional friend declares that the loss of what he calls "brain force," from the vibration and disturbance of the nervous system in much riding over the old carriage pavements, is far greater than would be imagined. We know that for ladies of the well-to-do class it is found necessary at times to spread straw over the street, to prevent the vibration, and deaden the sound of carriages. With a pavement of this very remarkable new substance, which gives, with great tenacity, a sort of elastic surface, hard and inodorous alike in summer and winter, it is very much as if tan were always laid down before all the hooves of a whole line of street. Tradesmen in Cheapside testify, as one characteristic of it, that, without shutting their shop-doors, they can now hear their customers, and can make themselves heard by them without shouting, as heretofore, to overcome the noise of the carriages over the granite pavement. Those living in such streets can now keep their windows open with little annoyance, either from noise or dust.

The macadam roads, in cities of great traffic, may be said to be huge stone mills for grinding granite dust. Some notion of the extent of the work done in this way in the metropolis may be formed from the fact that there are annually imported, and used there, 650,000 tons of granite, of which it is estimated that about 100 tons are imported in cubes, and that the rest is used as macadam. In addition to this material, large quantities of flint, and also other stones imported as ballast, are used. In Birmingham 50,000 tons of granite are put on the roads every year. Every year, therefore, so many tons of granite are ground in dry weather into dust with dung, which the winds carry about, and in wet weather into mud. The wear of the macadam roads is from 1 in. to 4 in. or more of granite annually. Westminster Bridge, it is stated, requires annually a coating of at least 5½ in. of the very best granite that can be got. The wear of any smooth road, by reason of the very smoothness, is comparatively considerable, an example of which, I am informed, may be given, though of a street of secondary traffic, compared with our chief thoroughfares, the Rue Bergère, in Paris, where the result was observed. The street was laid with 2 in. of Val de Travers asphalt in 1854, which was lifted in 1869, when it was found to be reduced to 1½ in., but chiefly by compression, for it had, during the fifteen years lost only five per cent. in weight.

We found that these granite pavements very injuriously affected the working of the sewers. When the granite-dust is washed by rain into the sewers, it often forms an indurated surface, only to be loosened by the pick, and to be removed at much trouble and expense. This

sometimes occurred, even with tubular glazed pipe-sewers. To obviate this evil, we had traps carefully constructed at the mouths of the gully-shoots to arrest the granite detritus, for which, however, in times of storm or heavy rain they proved to be insufficient.

When the new granite or flint material for macadam is first laid down, it is a cruelty to horses, and a barbarism as respects carriages and carts, to impose upon them the labour of crushing it. The steam-roller is a relief to them, and an economy in getting a somewhat better surface, though still, to some extent, a permeable one for dung. But this implement aggravates waste and evil of another sort, produced by the vibration from heavy traffic. One great inconvenience in those streets is the frequent breaking-up of the pavement for the repair of gas and water pipes. I found in my own inquiries that the leakage of those pipes was very much proportioned to the heaviness of traffic, and was inconsiderable in the bye-streets and districts of little traffic, the vibration of the heavy traffic perpetually shaking the lines of pipes and loosening their joints. The escape of gas, besides being a waste, which in some districts was stated to amount to as much as 30 per cent., was attended by sanitary evil in the pollution of the air, and even in some cases of the drinking-water. So great in some districts was the saturation of the subsoil with gas, that, where the water-supply is on the intermittent system, and the pipes are alternately full and empty, the water-pipes were often filled with gas sucked in from the substratum through the loosened joints when the water was drawn out of the pipes. Mr. Milne, the engineer of the New River Company, to demonstrate this condition to me, and to show that to the water were frequently ascribed impurities which did not belong to its original and proper quality, took me early in the morning to the New Road, and applied a match to the tops of water-plugs, and lighted the gas that escaped from them. Instances were stated of people, on going with candles to the taps in houses to draw water, being surprised by a blaze of gas from them. The operation of the new steam-rollers, whilst it relieves horses, carriages, and ordinary vehicles from the labour of crushing and forcing down granite, and is in other respects economical for the macadam roads, is productive of injury and waste by a yet more powerful vibrating action than the ordinary traffic, and greater disturbance and rupture of the system of pipes beneath the surface. Some of these rollers weigh as much as thirty tons each. I am informed that the gas and water companies in London and in the provincial cities have had serious cause to complain of the use of these rollers, which bring to bear the weight of some twenty or thirty one-horse loads upon one fulcrum, and have fractured large pipes deeply laid, and have also injured the house connexions.

BIRKENHEAD NEW SCHOOL OF ART.

MR. JOHN LAIRD, M.P., has publicly handed over to trustees the new school of art which has been erected at his sole expense at the entrance to Birkenhead Park, and close to the hospital which Mr. Laird presented to the borough a few years ago. The ceremony of handing over the new school took place in the large upper room of the building, in the presence of a numerous and fashionable assembly, including the Earl of Derby, who gave an address on scientific education. The entrance to the park is one of the most central sites in Birkenhead, equally convenient for the outlying districts of Rock Ferry, Traslers, Holt-hill, Oxton, Cloughton, and the various manufacturing and industrial establishments along the margin of the docks, Wallasey, Liscard, and Senacombe. The building is plain and simple in style, three stories high, constructed of brickwork, with a freestone cornice and parapet, over the centre of which is a small segmental pediment for a clock. The front stands some 30 ft. back from the main thoroughfare, and the whole is surrounded by a wrought-iron railing, with the space within the rails levelled, sloped, and laid down in grass. The circular tympana over the six principal windows to the front are filled in with sculpture, *in alto relievo*, representing Mechanics, Ship-building, Painting, Sculpture, Navigation, and Architecture. A projecting portico occupies the centre of the façade, approached by a wide flight of steps, and flanked by two caryatid figures in

York stone supporting the entablature, and emblematic of Painting and Sculpture. The portico opens with a wide corridor traversing the principal floor to the staircase at the back, communicating with the basement floor below and the large room above. The basement floor is on a level with the natural surface of the land, and is laid throughout with a floor of cement. It is 10 ft. high in the clear, and contains a keeper's room and kitchen, chamber for heating apparatus, lavatory, and class-rooms. The principal floor is 13 ft. 6 in. clear height, and contains on one side a room for the life class 30 ft. square, capable of sub-division by curtains, and lighted by a sunlight in the ceiling; on the other side, rooms facing the north for the head-master, with a library and lavatory facing the south. The upper floor contains one large room, 70 ft. by 30 ft., and 20 ft. high to the ceiling, to be set apart for the elementary class. One end of this apartment will be partitioned off for a painting-room by wooden screens, movable at pleasure, such as are in use at South Kensington. The whole of this floor is lighted exclusively from the north with upright double-hung windows and corresponding skylights. At night the painting-room will be lighted by a sunlight, and the large elementary room by standard lights fixed to the tables and desks. The building will accommodate about 200 students at one time. The large upper rooms and staircase are provided with syphon ventilators; all the rest of the apartments are provided with upright shafts and louvred casements, according to a plan carried out by the architects in concert with Dr. Baylis, the medical officer of Birkenhead, and it is expected the ventilation in every part of the building will be perfect. All the windows and skylights to the north are provided with sliding shutters to admit or exclude the light above, below, or in the middle, at pleasure. A light cast-iron staircase is constructed from the head-master's room to the floor above, so as to facilitate control and supervision. The whole of the building is heated by means of hot water in metal pipes, with the addition of open fireplaces in the keeper's apartments and one or two others. There is ample space on the land given by Mr. Laird—some 1,400 square yards—to the rear of the building for the erection of a commodious lecture-room and laboratory entering from the main landing of the staircase, and additional class-rooms may also be obtained by extension on the east and west sides.

The work has been executed by Mr. Alexander Blakley, from designs and under the superintendence of Messrs. W. & J. Hay, architects. The iron railing and lamps were executed by Mr. Henson, the hot-water apparatus by Messrs. Harrison, and the carving by Mr. Rogerson.

The cost of the whole, inclusive of the land, will be upwards of 4,000l.

SOMEBODY WRONG AGAIN.

THE following is a list of the tenders delivered for re-building houses (Nos. 22 to 27), in Prince-street; also at the rear in Bell-court, Mile-end New Town. Mr. G. H. Simmonds, architect:—

Bracher & Son	£3,500 0 0
Harrison & Son	2,850 0 0
Durnford & Laugham	2,779 0 0
Pink	2,662 0 0
Brown	2,640 12 8
Wood, F. & F.J.	2,633 0 0
Joselyne	2,581 0 0
Read & Son	2,589 0 0
Upson & Davey	2,368 10 0
Palmer	2,355 18 6
Morter	2,243 0 0
Farrill	2,231 0 0
Howard	2,221 0 0
Crook & Wall	2,150 0 0
Hughesden	2,175 0 0
Eggs	2,171 0 0
Wright	2,160 0 0
Leatherdale & Son	1,995 0 0
Merton	1,985 0 0
Water	1,935 0 0
Robins & Co.	1,890 0 0
Brugger	1,843 0 0
Grooms	1,700 0 0

PLYMOUTH GUILDHALL AND COURTS.

THE buildings illustrated in our present number are being erected on an excellent site in the heart of the town, which site was early secured for this purpose. So long ago as 1851, a new Guildhall, in place of the present small and inelegant structure (erected in 1802), was contemplated, but a competition then advertised was set aside through the action of some of the town-council of that period.

In 1869, however, architects were formally invited to submit designs for the new buildings, and between twenty and thirty gentlemen responded. On the recommendation of Mr. Waterhouse, as professional referee, the design now being carried out was accepted by the corporation of Plymouth.

The buildings are in two blocks, by which arrangement the old and incongruous houses on either side are shut out from view. On the north side will be the municipal offices, and on the south the Guildhall and Courts, shown in the perspective view, and of which we give a plan. Between the two blocks will be a public place, averaging about 100 ft. in width. At the east end is the fine old fifteenth-century tower of St. Andrew's Church, and at the other end is Westwell-street, a new and important thoroughfare of the town.

The new buildings are intended to harmonise in some general characteristics with the massive tower of St. Andrew's, the wings being treated in broad and simple masses, leading up to central features of appropriate richness and dignity. The local materials, of which the exterior will be chiefly constructed,—viz., granite and limestone,—rendering such treatment desirable, as general elaboration could only be obtained at very great cost.

The large hall, which is intended to seat 2,600 persons, will occupy the centre of the façade on the south side, with the proposed law courts at the Westwell-street end, and the police-court and station-house at the eastern end. The great hall will be entered immediately from the public place through a deeply-recessed central double doorway and side porches, and will have a nave 53 ft. wide, with narrow aisles on either side, the extreme length being 136 ft. The aisles will open into the body of the hall, with two arcades of seven arches each, the pillars supporting which will be of polished grey granite, 2 ft. 9 in. in diameter.

The traceried windows of each clearstory will follow the number of the arches below. There will be seven separate doorways for ingress and egress. At the west end will be an orchestra, in connexion with which will be a suite of ante-rooms, available for performers and others; and at the east end will be a gallery for the public, to seat about 300. The hall will have a semi-circular boarded roof.

The internal dimensions of the police-court will be 46 ft. by 38 ft., and adjoining will be rooms for the magistrates, magistrates' clerk, attorneys, and witnesses; and in the rear will be the station-house, police muster-room, reading-room, &c.

Each of the courts at the Westwell-street end will be 49 ft. long by 38 ft. wide, and will have separate entrances and rooms for barristers, attorneys, and witnesses, with distinct accommodation for the public in galleries at the ends of the courts, approached by a stone staircase in an octagonal angle tower.

An important feature of this pile of buildings will be the tower at the south-west corner of the group, which will be nearly 200 ft. high to the vane.

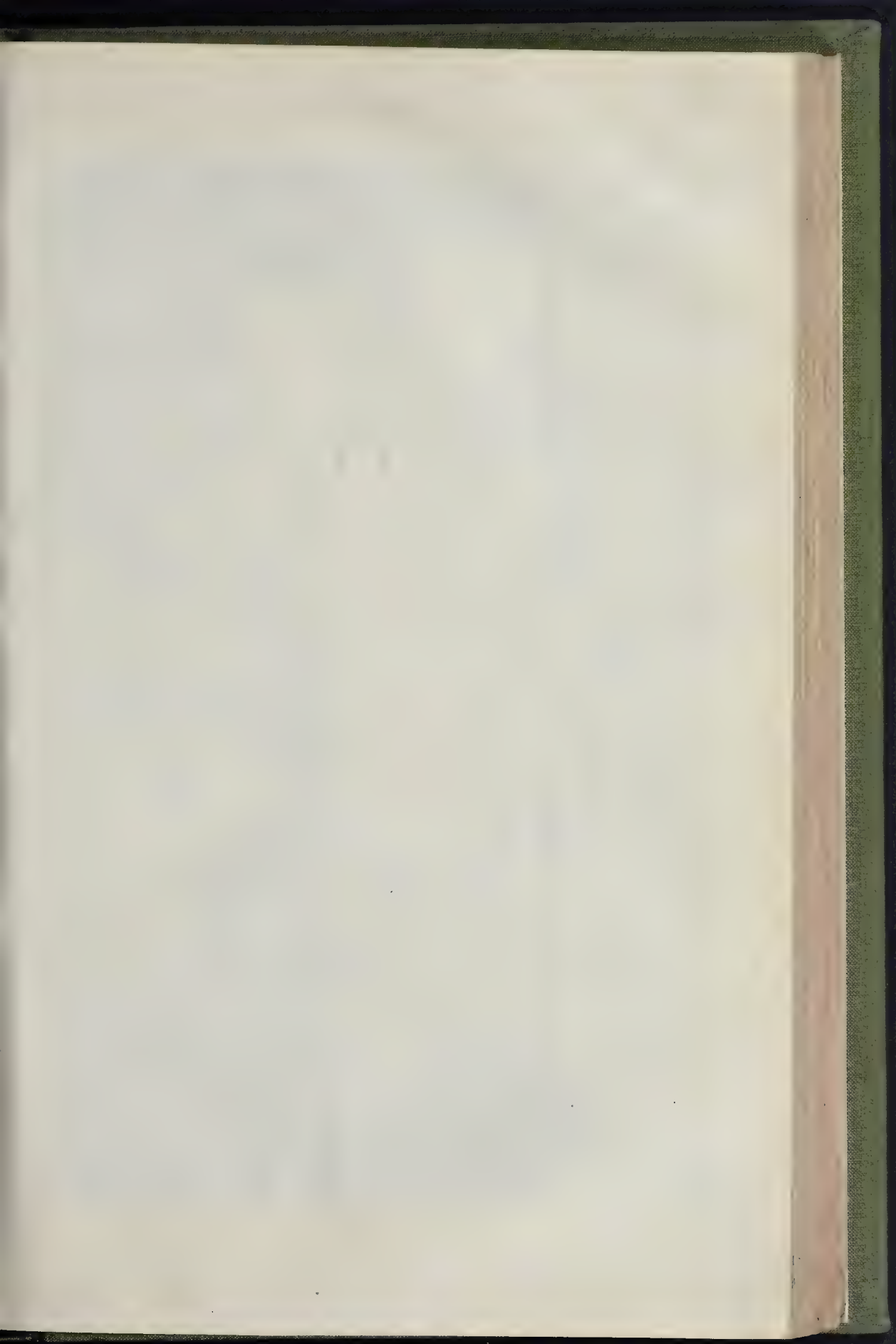
The council-chamber and municipal offices (now in a comparatively forward state) occupy a portion of the northern side of the public place, a space at the Westwell-street end of this side having been preserved for future public use. This municipal structure is for the most part two-storied, the council-chamber forming the central feature, and corresponding in detail somewhat with the great hall on the opposite side. The accommodation of the north block will include offices for the town clerk, chamberlain, surveyor, school board, &c., with strong rooms, store-rooms, and a large vaulted muniment-room.

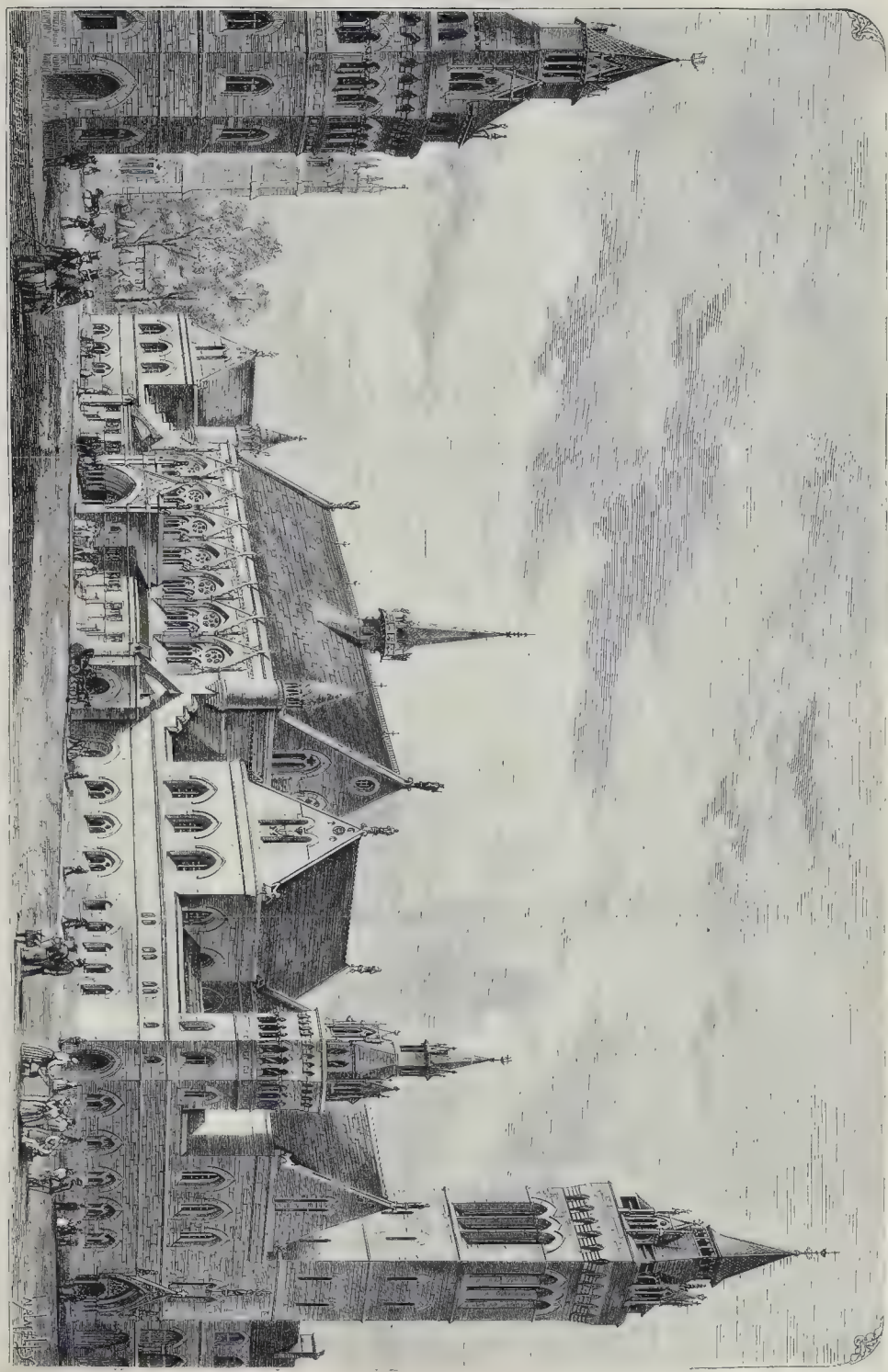
Gothic, of the Early French type, is the style which has been adopted, and the details are bolder rather than elaborate. The plain surfaces, as before stated, are being executed in Cornish granite (from Messrs. Freeman's quarries) and local limestone; the moulded and enriched portions being in Portland and Mansfield stone.

The entire works are being carried out from the designs and under the direction of Messrs. Alfred Norman & James Hine, architects, Plymouth; Mr. E. W. Godwin being their consulting architect.

Mr. Fethick, of Plymouth, is the contractor, and the contract amount is 32,475l.

The buildings were commenced in June last year, and will probably be completed in the summer of 1873.





PLYMOUTH GUILDHALL AND COURTS.—Messrs. Alfred Norman & James Hine, Architects.

ARCHITECTURAL AND ARCHEOLOGICAL
LITERATURE IN IRELAND.

IRELAND, though rich in archeological and antiquarian literature and writers, has made but poor progress during the nineteenth century in the literature of architecture. Her round towers have provoked more controversy than the authenticity of the letters of Junius or the poems of Ossian. Her yet living language is still exciting an interest which appears to be growing deeper, even outside her own shores, and for German philologists, as well as for British, it is an enticing and entrancing field of inquiry. Numerous and many-sided have been the works on Irish history published, and more numerous still are the materials of this history still existing in MSS. in British and Continental libraries, and scarcely less plentiful are those reported to be missing or lost. Englishmen, led by choice, accident, or public appointments to Ireland, have been many for some centuries back, and a fair quota of these have been irresistibly drawn to the study of Irish archeology, philology, and antiquarian matters. Yet in the superabundance of these inquirers, Saxon and Celtic, the progress or growth of an Irish literature of architecture proper has been small indeed. Very few Irish architects have shown any energy in aiding the study of their own profession, in the sense of contributing to the literature of its varied branches. Odd and intermittent papers have been read in public institutions from time to time, interesting in their way, but these contributions go a very short way in the formation of a literature of architecture the emanation of Irish intellect.

Valiancy, though not a native, was a naturalised writer on Irish themes. He was a military engineer, originally of the army, but he became by location and association in Ireland, an archeologist and antiquary, and even a philologist. His works were not of an architectural character, save so far as archeology is connected with it. He wrote, however, a small work entitled "Field Engineering," and a Treatise on Stonecutting. Ledwich was a historian and antiquarian writer, and a native; Sylvester O'Halloran, Taffe, Leland, Beauford, Plowden, Baker, O'Connor, Keating, MacGeoghegan, Kelly, Moore, Curry, Lawless, O'Sullivan, and others, were historians. In more recent times we have another class of historical and antiquarian writers, whose works are very interesting, John O'Donovan, and Eugene O'Curry (the great Celtic scholar), Sir W. Bentham (Ulster King of Arms), John D'Alton, the Rev. Cosmas Ouseley, Sir William Wilde, Richard Brash, John Windole, J. B. O'Flanagan, Francis Wakeman, Boche, George Petrie, Graves, Todd, and some few others whose names do not immediately occur to our mind, but whose works are of a similar useful cast. All these latter writers, with a quota of other local historians, confided their labours to archeological, historical, and antiquarian studies. None of them, that we are aware, were architects by profession, nor have they written on architecture proper, or in elucidation of Irish architecture, save in the descriptive manner of historians and antiquarian observers.

From the days of Giraldus Cambrensis, otherwise Gerald Barry, who accompanied Henry II. to Ireland, in the twelfth century, down to the days of Sir James Ware and his contemporaries, Irish history, language, manners, institutions, and ecclesiastical remains, formed the chief fields for study in Ireland. The Ogham character, the Ossianic tale, the Brehon edict, and the Round Tower mystery, and other cognate subjects, were taken up by turns, and formed a continuous body of writers, until the present hour. Architecture proper was left out in the cold as an uninteresting subject. A few professional men, however, with others allied by tastes to architectural pursuits, look now and then to the subject. There is a manuscript work in the British Museum, by an Irish architect, John Abernethy, entitled, "A General Treatise on Architecture, divided into Five Books." It consists of 176 folio pages, with this epigraph: "This work was written and drawn with pen and ink, and finished by the 13th of April, A.D. 1751, by John Abernethy." The history of this writer is unknown. George Semple, an architect who flourished in Dublin between 1750 and 1780, wrote a work on "Building in Water," and a Diary of his Re-building of Essex Bridge in that city. This book was illustrated with many copper plates. It was published in 1776, and is well known. James Murphy, an architect, wrote on "The Principles of Gothic Architecture," a book in

which he advanced some curious theories about the origin of the pointed arch. James Gandon, an Englishman by birth, but a celebrated Irish architect, during the Irish Parliamentary period in Dublin, wrote some papers on "The Progress of Architecture in Ireland." Francis Grose (the Captain), who published the Antiquities of England and Wales and Scotland, also commenced a work on the "Antiquities of Ireland," illustrated by his own sketches; but dying in Dublin in 1791, his work was continued by his nephew, Daniel Grose, and Edward Ledwich, the Irish historian. It may be mentioned here that James Gandon, the great Anglo-Irish architect, and Grose, were bosom friends, and they both sleep in the one grave in Drumcondon churchyard, near Dublin. Two works of an illustrated architectural nature appeared in Dublin in the latter end of the last century, entitled Malton's "Views of Dublin;" the other, "Poole and Cash's Views." These two books had some letter-press, and the plates were well engraved. They are very scarce now. A description of "Gentleman's and Builder's Price-book," the first of its kind, we believe, printed in Ireland, was written by William Smith, and published in Dublin early in the present century. Some of the old race of Irish builders were wont to calculate their estimates by this book down almost to the present day. A Dr. John Rutty, in a work published in Dublin in 1772, an "Essay towards a Natural History of Dublin," gives some very useful information on the building stone of that county, the different quarries, painting earths, minerals, and petrefactions. This old work will be found useful to Irish architects and builders, and others connected with the building profession even in the present day. John Morrison, an Irish architect, wrote a little on architectural and building matter, in the latter part of the last century. His son Sir Richard Morrison, contributed some papers to the literature of architecture; he also published a work early in his career entitled "Useful and Ornamental Designs in Architecture, &c.," prefixed to which was a narrative of the rise, progress, and extent of architecture; but we are not aware that the son of the latter, who was a good Tudor Gothic architect, contributed anything to the literature. The Morrisons for generations were architects. William Vitruvius Morrison, the younger member of the above family, died young, on his road to fame. Thomas Bell wrote a "Treatise on the Gothic Ecclesiastical Architecture of Ireland," for which he received a prize from the Royal Irish Academy. This work was more historical than technical. Henry O'Brien wrote an "Essay on the Origin of the Round Towers of Ireland," for which he received a prize from the same body. This work was an historical one also. George Petrie wrote a work also on "The Origin of the Round Towers of Ireland." He received a prize, too. Neither Petrie nor O'Brien was a professional man; but Petrie was not ignorant of architectural details. He also wrote several antiquarian sketches for Irish journals, and a sketch of the Rise of the Fine Arts in Ireland. Henry O'Neill wrote on the "Ancient Crosses of Ireland."

The "Life of James Gandon, the Architect," written by the late T. J. Mulvany, R.H.A., appeared about 1846. It was an interesting volume as far as it went, but it was chiefly confined to an account of the architect's career in Ireland, and the public works on which he was engaged. Mulvany was an artist, and not an architect.

In the periodical literature of Ireland for the last eighty years, various minor writers have contributed on archeological and antiquarian subjects.

William Beauford was acquainted with architectural detail as well as antiquarian subjects. He contributed papers on "The Civil, Military, and Ecclesiastical Architecture of Ireland," and on "The Theory of Columns," and on "Gothic Roofs" (their pitches), in the "Anthologia Hibernica," 1793-4. In the *Dublin Penny Journal* of 1832-6, the *Irish Penny Magazine* of 1832, and in the *Irish Penny Journal* of 1840-1, various antiquarian articles appeared, some from the pens of writers we have already mentioned, and from unknown hands.

A schoolmaster, of the name of Armstrong, and Samuel McSkimmin, a local historian of Carrickfergus, contributed several interesting articles, of an antiquarian and historical character.

Neither Cooley nor Ivory, though good architects practising in Dublin in the latter part of the last century, contributed aught to the litera-

ture of architecture. Nor are we aware that Francis Johnston, who founded the Royal Hibernian Academy of Painting, Sculpture, and Architecture, ever contributed with his pen to the literature of his profession. He was an excellent architect, and many of his public buildings still attest thorough acquaintance with his art.

Of latter-day architects in Ireland during the last quarter of a century very little can be said in the way of literature,—the literature of their profession. With the exception of occasional papers read at their Institute, they publish little.

Some Dublin, Belfast, and South of Ireland architects have given proof that they could do useful work in this way; but whether it is from want of time or reluctance, or other causes, Irish architects in general of the present day are doing but little with the pen for their special guild. In our brief review of this subject we have omitted some names that might have been mentioned, but none that would materially change the aspect of the case.

A few words by way of *finis*. In a back volume of the *Builder*, some scattered notices of the lives of a few previously overlooked Irish and foreign architects and engineers of note will be found. Some of these notices might be summarised, and included in the new Architectural Dictionary. If they cannot be given in alphabetical order, owing to the advanced state of that work, they could be included in an appendix to the volume, with the particulars of other unnoticed architects, "waifs and strays" which may turn up before the completion of the work.

As we write, an announcement appears in a contemporary of a promised volume, "The Lives of Irish Architects," to comprise also foreign ones of note once practising in Ireland, with a sketch of the rise and progress of architecture in that island. Such a volume ought to be made as complete as possible, and the members of the profession in Ireland who may have materials or who may know in what quarters such may exist might do well in assisting such a publication.

THE VENTILATION OF SEWERS AND
HOUSE DRAINS.

THE volume of air in sewers varies continually by reason of the varying quantities of water poured into them from time to time. It is well known to those who have had to do with sewers that the volume of sewage varies from hour to hour of the day. Repeated gaugings of the flow of sewage in dry weather, when the quantity of sewage, therefore, is not influenced by the rainfall, but is the quantity used in the houses, have shown that the maximum flow during some one hour of the day is nearly three times the minimum flow during some other hour of the same day, meaning by day twenty-four consecutive hours; and so variable is the flow that one half of the sewage due to the whole twenty-four hours will often pass off in six hours, or thereabouts; and it is usual to calculate the requisite size of any given sewer, so far as respects sewage independently of the rainfall, on the condition that it shall be capable of carrying off one half of the flow of a whole period of twenty-four hours in from six to eight hours. This fluctuation is caused by the varying quantity of water used in houses at different times of the day. It was stated to the Board of Health by Mr. Henry Marton, the engineer of the Wolverhampton Waterworks, that in that town about three-fourths of the daily supply of water were given between the hours of eight in the morning and eight in the evening. Mr. Hawksley found at Salford, in the year 1862, according to his evidence in Parliament on the Salford Improvement Bill, that the draught of water between eight a.m. and noon was from two to two and a half times the average quantity of the whole day, and that in the night it was not more than one-fourth of the average quantity.

These observations on the varying hourly flow of sewage and on the varying hourly quantity of water used in houses, show that the fluctuation of the volume of liquid in a sewer varies very much during the day.

Another cause of fluctuation is the rainfall. Everybody knows that immediately after a shower of rain "the drains smell." The foul gases of the drains are, in fact, at those times being forced out of the drains by the influx of water. When the water in a sewer is rising it compresses the air above it, when it is confined,

and, reacting, as all elastic bodies do, with an equal force to that which has been applied to them, the air forces its way into the houses through kitchen sinks, traps, and water-closets. No trap can prevent this action. Traps will not of themselves prevent the escape of sewer air into houses; indeed, traps are very deceitful things. The old "bell trap," the very worst form of trap we know, is very properly going out of use; but even the best kinds contain no more than about 2 in. depth of water to resist the expansive action of the air within the drains; and it must be remembered that this compression and subsequent expansion of the sewer air, caused by the rise of water, are frequent, and daily, and therefore that the ventilation of sewers and drains is an absolute necessity; or, if it seem that these reasons do not actually prove the case, there are others which we shall mention further on which will do so.

When this necessity is admitted, the next practical consideration is the best manner of ventilating the sewers and drains; but before we proceed further, we will say that we think whenever the ventilation of sewers is considered, it should be considered in connexion with the ventilation of house drains. The conditions of all towns are not alike, and the system of ventilation good for, say, London, Liverpool, or Manchester, will probably not be the best for smaller towns; and, in taking a general view of the subject, it ought to embrace all conditions of various towns. Where the sewers are comparatively large, which is the case where they carry off the whole rainfall of the area of the town in addition to the sewage, the house-drains enter the sewers at a level above the surface of the ordinary flow of the sewage; and in that case, if you ventilate the house-drains, you ventilate the sewers at the same time; whilst, where the sewers are comparatively small,—that is, where they do not carry off the whole rainfall, but where there are storm-overflows, or where old surface-drains are made to take away the rainfall direct to its outlet,—then an influx of water soon raises the sewage above the mouths of the drains, and then the sewers need a separate system of ventilation; and this has been done by compelling the sewage-gases, on their escape into the atmosphere, to pass over and amongst the pores of charcoal. Mr. Latham has arranged the charcoal in a spiral form. He had, we think, previously arranged the trap horizontally, with openings alternately at the right and left side, so that the gases should pass from side to side in their ascent; and this spiral form seems to be a modification of that form, and offers less obstruction to the current of air. Mr. Jacob has an arrangement by which he brings a large surface of charcoal into contact with the escaping gases, consisting of one deep box, instead of several shallow trays. Mr. Robt. Rawlinson first applied charcoal to the deodorisation of sewage-gases in 1856, if we remember, and placed the charcoal-basket vertically in the wall of a man-hole, and made a separate outlet adjoining it, thus combining the manhole and ventilating-shaft in one structure, and protecting the charcoal from being wetted. His system was early described and illustrated in our pages. It is important that the charcoal be kept dry, although, such is its power of self-renovation, in some experiments made by Dr. W. A. Miller under the direction of the Metropolitan Board of Works in 1866, he found that the substance was still effective, after having been in the sewer for six months; and, when dried, 100 parts of it gave off 19·7 parts of water.

Dr. Alfred Carpenter read a paper in June, 1869, "On the Influence of Sewer Gas on the Public Health," and after saying that the general adoption of water-closets and the consequent introduction of drains into houses often brought sewage gas into them, said that the mischief had arisen from the neglect of a natural law, viz., not providing for exits as well as entrances; and as to trapping without providing an exit for the sewer gas to some place where it is harmless, said that merely trapping one place or one town, and driving the gas elsewhere, was a selfish kind of way, and that the public suffered by it. Seeing the evils of this system, he said, the Croydon Local Board determined to adopt the principle of opening the extremity of every sewer and every branch or house drain in connexion with the sewer, and make every house ventilate its own house-drain; and that by this means, and by making frequent openings into the sewers so as to allow a constant and continuous current of air, the effects of sewer gas had been entirely obviated, and the consequences removed, in those portions of the district

to which the law was made to apply. Dr. Carpenter stated that the nature of sewer gas had been well pointed out by various chemists and medical authorities, and that all concur in the belief that dilution destroys it; and said that a most perfect circulation of air had been effected in his district by compelling every new house to have ventilation for itself, whereby the current of air is inwards at the ground level, and outwards at the top of the ventilating pipe into the atmosphere above the roofs of the houses. "The soil-pipe is continued upwards, in a straight line above the level of the pan, between the trap and the sewer; and it is made to terminate by an open extremity above the eaves of the house, away from the window, and not close to or level with the chimney. Every connexion with a sewer requiring a trap has that trap guarded from the consequences of pressure by a ventilator, similar to the soil-pipe, being placed as close to the trap as possible." The result of making these numerous openings at the higher points is to promote a rapid circulation through the sewer, by which all gas is removed as quickly as it is formed, and is diluted and oxidised, and no concentration can take place. "Differences of temperature, density, and moisture, will always be sufficient to determine a circulation, provided entrances exist for fresh air, as well as exits for that which has passed through the sewer. The principle to be obviated is stagnation, whether of solid, of liquid, or gas: deposit must not be allowed: fluid must always run off: let there be also innumerable openings near the tops of the houses, and it may be safely assumed that no stagnation will exist in the sewers themselves."

Towns vary in the manner in which the houses are built, but probably we are not far wrong in stating that the great majority of towns are so built as to allow of such pipes as we have mentioned, viz., special ventilation pipes at the heads of house-drains, being carried up to some few feet above the roof,—say 3 ft. or 4 ft.,—and away from bedroom windows. Some people have supposed that the ordinary rainwater pipes might be advantageously used for this purpose, but they very often terminate in close proximity to bedroom windows, and always below attic windows; and, besides, when they are most wanted to perform the office of ventilating the drains, their throats are choked with rainwater.

If such a system as that described by Dr. Carpenter were to be generally established in all towns, we should go a long way towards getting rid of this part of the sewage difficulty; but to accomplish it further direct legislation is necessary; and we think it is a pity, as we said in our first notice of the Royal Sanitary Commissioners' Report, that they did not make some suggestion of direct legislation on this subject; and as they have not done so, we have undertaken to offer some remarks for consideration.

SILCHESTER.

In the north of Hampshire, on the border of Berkshire, in a somewhat secluded district in which woodland is a prominent feature, stands Silchester, or *Selchester*,* as pronounced by the peasantry. It is the site of the Roman town Calvea or Calveba of the Itinerary of Antoninus, and of the list of places in Britain given by the Geographer of Ravenna. Its extent may be conceived when it is stated that the circumference of the walls yet standing in a fair state of preservation measures nearly two miles. It has of course from time to time attracted the attention of antiquaries, and it has been occasionally visited by the more adventurous sight-seer, but until the present day the extensive area within the walls has remained, as it has existed from probably two or three centuries after the departure of the Romans, in cultivation as farm land. Thanks to the Duke of Wellington, we are now relieved from speculation, and can understand something of the town itself and of its arrangements and general character. Under his grace's countenance and wishes, a few years since the Rev. J. G. Joyce commenced excavations, which are now proceeding, and are luminously reported on, up to 1866, in the "Archæologia," vol. x.†

The first question that arises in the mind of every one who visits a place of such extent and importance, is what was its ancient name, and what remains of its history. Of the name there

should be no doubt, for it is obviously, as before stated, the *Calvea* or *Calveba* of the Itinerary of Antoninus rendered more marked by the annexed appellation of *Attrebatum*, both in the Itinerary and in the Ravenna list. Of its history absolutely nothing is known. Three inscriptions have been found, one of which gives the name of Hercules of the Segontiaci, to whom an altar was set up by one T. Tammunius. The Segontiaci are mentioned by Caesar, and their territories joined those of the Attrebatos; so the inscription is just such as might have been expected from the locality. Mr. Joyce is daily adding something to our hopes that there may yet be found inscriptions that will remove the obscurity in which this important place is shrouded. Fragments of lettered stones are turned up by the excavators from time to time, which, from the bold and well-out letters, seem to indicate dedications of a public character; and in the *Forum* recently laid open, is a large square stone, from which, at some remote period, was abstracted a bronze plate which had been riveted with lead. Without doubt it bore a public inscription of consequence.

It is rather remarkable that Silchester should ever have been deprived of its right to represent the ancient *Calvea*. Yet old writers, from Camden downwards, transposed it with *Vindomis*, a *mansio*, or *mutatio*, between *Calvea* and *Sorbiodunum*, Old Sarum. This would never have been the case had they considered that the places which commence and terminate the *itineraria* were invariably of importance; they were, in fact, towns and walled. The intermediate stations were usually establishments, more or less extensive, to supply horses and carriages for the public service, to rest the soldiers on their march, and for the general purposes of traffic. Remains, therefore, will always yet be found of the former; and it is essential they should be apparent, as at Silchester, which thus stands obviously prominent. The placing *Calvea* at such places as Henley and Wallingford denotes as much want of care and judgment in studying the system on which the *itineraria* of Antoninus are founded as making *Calvea* and *Vindomis* change places. The importance of the place is evidenced by its heading two *itineraria*, and closing two others; while in yet another, that from *Begnum* to *Londinium*, it is placed midway, immediately after *Venta Belgarum*, *Vindomis* being naturally omitted, as lying out of the direct road. Hobsley, with his usual sagacity, detected the error of his predecessors, and clearly exposed it; but his work, the "Britannia Romana," was probably not available to those who subsequently adopted the old mistake.

Of the three inscriptions recorded as found in past times, one is funeral; the other, as observed, to Hercules of the Segontiaci; and the third is to Julia Domna, the wife of Severus. Among the fragments recently excavated by Mr. Joyce are the letters *CIVIL*, probably for *CIVITAS*. In another, the word *XIVS* (*ejus*) is alone eligible, but in both the letters are extremely well cut, and of a rather early form. It is reasonable to expect that others may be brought to light, as only a small portion of the extensive area is as yet laid open; and the site of the cemetery, which, of course, is outside of the walls, has not yet, I believe, been discovered. From the cemetery, wherever it may be, came, no doubt, the sepulchral inscription given by Camden and Horsley.

To the streets and dwelling-houses described and illustrated most faithfully by Mr. Joyce, it now to be added the *Forum*, the foundations of which, completely cleared, extend perhaps 150 ft. in length by about 30 ft. in width. It was surrounded by colonnades and appendages, which bespeak considerable grandeur of design; and though the agents of destruction have been unusually industrious in their abstractions of the building materials, enough remains to reveal the extent and magnitude of *Calvea*, and to warrant the Duke of Wellington in prosecuting the researches which have hitherto been so successful.

Mr. Joyce has not yet fully examined the walls and gateways; but he has succeeded in correcting all who have gone before him in respect to the principal vic which passed through the town; and he has discovered that what was supposed to be a gap broken in through the wall near the amphitheatre was really the north-east entrance from *Londinium* to *Aquæ Solis* by *Vindomis* and *Sorbiodunum*.

Too much praise cannot be given to the Duke of Wellington for his liberality and excellent

* It is so spelt in Baxter's "Glossary." Camden says the word signifies a great city.

† An account of a visit to Silchester has been given in the *Builder*,—Ed.

feeling in thus instituting and prosecuting researches necessarily tedious and expensive, and he will receive the sincere thanks of all who can appreciate our ancient national monuments, and estimate their historical, artistic, and general scientific value.

Simultaneously with the excavations made at Silchester may be noticed the investigations being made by Dr. Stevens at Finkley, between St. Mary Bourne and Andover, where Sir R. C. Hoare was, I think, the first to place the site of Windomis. The Rev. E. Kell and Mr. C. Lockhart, a few years since, discovered the foundations of buildings; and Dr. Stevens is now adding to the revelation of remains which justify us in being quite satisfied upon this site stood the *mansio* or *metatio* which, at this very distance, under the name of Windomis, comes next to Calleva.

C. ROACH SMITH.

"WHERE IS THE PIMLICO CLUB?"

SIR.—In your issue of June 10th (four months ago), Mr. Hodgson Pratt, in answer to the above question, said,—“The plans are now being prepared, and measures taken to commence the work.”

Surely he cannot accuse us of impatience in putting the question again,—more especially when the fact is mentioned, that, in the meantime a large building, intended for schools, has been erected upon the site originally intended for the “Club” in Ebury-street.

We earnestly hope Mr. Hodgson Pratt has not been again compelled to resort to the “slow, laborious, and disagreeable process of begging.”

However desirous we may be, with Mr. Pratt, to see the institution a “model one of its kind,” sorry should we be, in such a case, to try to divert the stream of charity from its legitimate channel.

The 2,000*l.* so generously given—without begging—viz., 1,000*l.* from the late noble Marquis, and 1,000*l.* from the equally noble and generous “Anonymus,” is a “good round sum,” which might be erected a spacious building.

Then, having something to look at, and an assurance that the “Club” would be conducted upon “popular principles,” the working men and other inhabitants of the locality, might be induced to put their mites towards it, and their “shoulders to the wheel” in right earnest.

GEORGE WYTHE,

One of the Local Committees who are “out in the Cold.”

NOT TOO LATE YET.

SIR.—The process of demolition is going on very slowly at the bottom of St. Martin's-lane. Do give the Metropolitan Board of Works a brush-up; and now that they are refreshed by their holiday, and elated by the success of their chairman in another walk of life, urge them seriously and rapidly to entertain the once-rejected idea of setting back the lane front of the new Provident Institution Building to the line of the houses above the throat of the Lane. The other two houses will follow in due time; but the square unrounded corners of St. Martin's-lane with Chandos-street and Hemming's-row, and the narrow pavement, are a constant and ever-recurring source of personal concussion and vehicular danger.

It is stated that Mr. Valliancy is alive to the value of the improvement. A little pressure from without will doubtless be of material assistance to him if he will put his convictions before the Board before it is too late.

W.

PROGRESS IN PORTLAND ISLAND.

PORTLAND ISLAND has many peculiarities, which are not likely soon to die out. Although our medical officers would seem to be sufficient to represent the little local Board of that rocky eminence on the coast of Dorset, it has now, as the natural result of divided councils, obtained the representation of two, though it will hardly venture on consulting more than one of its doctors. It is a pity that Portland cannot proceed with her sanitary works without developing into undue prominence the physical paucity of certain members of her local Board. Last week the plans and estimates were brought up for consideration, relative to supplying Portland with water, and for necessary drainage works. The following tenders were read:—“Thorough,” 2,345*l.* 16*s.* 3*d.* for drainage, and

3,887*l.* 1*s.* 11*d.* for water supply; “Sanitas,” 1,090*l.* for drainage, and 3,006*l.* 16*s.* 10*d.* for water supply; “Experience,” 2,600*l.* for drainage, and 8,500*l.* for water supply; “Faire Mon Devoir,” 6,116*l.* 9*s.* for drainage, and 5,542*l.* 7*s.* 6*d.* for water; “Sanitas” (No. 2), 12,542*l.* for drainage, and 11,200*l.* for water. The above estimates show a wide difference, certainly, and it is to be hoped that the successful competitor, whoever he may be, will have reason to rejoice in the accuracy of his estimate, in view of his personal salvation.

Mr. Andrews was asked to examine the estimates, with a view to advising the Board how best they could proceed. The Board, however, did not adjourn until it became the scene of a conflict.

One member proposed, while another seconded, a resolution dismissing Dr. Carruthers, for allowing a man suffering from small-pox to be brought ashore on the island. The resolution was carried on Monday, but at the request of five members another meeting was acceded to, for Wednesday, to reconsider the dismissal. At this last meeting a most violent passage at arms took place, the result being that the former resolution was rescinded. Having in the meantime appointed Dr. McLean, Portland Island Local Board is now blessed with the collective wisdom of two medical officers. The result may prove satisfactory if the two gentlemen will agree to work in harmony in the interest of the public health, however they may be personally disposed to differ otherwise.

PEDESTAL FOR AN EQUESTRIAN STATUE IN THE CITY.

SIR.—Praise ought to be meted where it is due, and this ought to be bestowed when one reads of 2,000*l.* being voted for a suitable pedestal for an equestrian statue, and a move in the right direction, when it is taken into consideration how much we lack such an appendage either to an equestrian or standing statue. Here there appears to be a fair opportunity for the architect and sculptor to act in unison in producing a work of art which may at length be creditable to the country as a work of taste and talent.

W.

WHO IS HE?

SIR.—Pray who is “Mr. Buckmaster?” Pardon the abruptness of the question, but we people in the provinces are anxious to know. Some little time previously to the opening of the “International,” we saw daily paragraphs in the morning papers notifying that “Mr. Buckmaster” had lectured at this and that place upon the advantages and objects of the coming Exhibition; indeed, so rapid were his transitions from one place to another on this high mission, that he appeared almost to be omnipresent. Since that time we have discovered that he possesses another attribute of deity—*that of omniscience*—for during the Exhibition it appears that this same mysterious personage has periodically lectured upon nearly every subject under the sun, or, at least, under the roof of the International Exhibition; art, science, manufactures, seem all to come alike to him. The newspapers tell us nothing; they name “Mr. Buckmaster” in the most matter-of-fact way, as if there were nothing astonishing in it; yet surely, sir, if this gentleman understands half the subjects he has been lecturing about, he must be one of the most remarkable men in England, and one whom we ought to know more about, if only to do him honour due. And again I ask, who is he? A PUZZLED RUSKIE.

TILE MANUFACTURERS.

SIR.—We notice in the *Builder* of September 30th, a letter from Messrs. Minton, Hollins, & Co. relative to some slight mistake in the designation of Mr. Robert Minton Taylor's firm.

We have no desire to enter into any controversy between the two houses, as we have not the slightest pecuniary interest in either. A dissolution of partnership took place in 1868, when Mr. Colin Minton Campbell took the china, earthenware, and enamelled tile trade, under the style of “Minton & Co.” Mr. Michael Denny Hollins, the encaustic and other tile trade, under the style of “Minton, Hollins, & Co.” and Mr. Robert Minton Taylor commenced business in encaustic and other tiles on his own account.

We should not have troubled you with any correspondence, except to correct the clerical error which occurs in your remarks upon the letter, of quoting “Minton & Co.” instead of “Minton, Hollins, & Co.” We by no means wish it to be understood that “Minton & Co.” the representatives of your old acquaintance, the late Herbert Minton, had written such a letter as the one to which you refer. We are not so fond of “taking proceedings,” and fully recognise the justness of your remark,—“That the world is not so fully taken up with the doings of themselves and their competitors, as to remember precisely how the names stand.” MINTON & CO.
Stoke-upon-Trent, and Walbrook, London.

SIR.—Under the above heading, in your last week's issue, appears a letter alluding to my firm so pointedly that it may be well for me “honestly and fairly” to make the following remarks.

“Honestly and fairly,” in conjunction with my partner,

I started business under the style of “R. Minton Taylor & Co.” (“R. Minton Taylor” always having been my signature); and, during my suit with Mr. Michael Hollins, I offered to carry on business in my own name,—“Robert Minton Taylor.” This offer, I admit, was pooh-poohed by Mr. Hollins's counsel; but Vice-Chancellor Malins remarked, “He could not see what more was required,” and honestly and fairly I have carried on business under the style of “Robert Minton Taylor,” as my letter published in your issue of the 23rd ult. will demonstrate. Again, although your last week's correspondent is singularly silent on the point, I am a nephew (by consanguinity, not mere affinity) and godson of the late Mr. Herbert Minton; and though I have sedulously avoided what I may call a pompous flourish of this fact in my business announcements, I have endeavored, by following in my late uncle's footsteps, “honestly and fairly” to make a good article, and with some little success, as the Exhibition of 1871 will show.

As for you, Mr. Editor, I feel very sorry for you after the awful threat you have received; but if you will “honestly and fairly” insert this letter in your valued publication, I promise not to write to you about the matter again.

ROBERT MINTON TAYLOR.

London, near Stoke-upon-Trent.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—The compromise suggested by Mr. Mandella, M.P., for settling the Newcastle engineers' strike, has been refused by the masters. They say that their object in terminating the strike would be to get back their best workmen, but that they would fail to do this if they acceded to the terms which have been approved by the men. They offer once more the compromise already suggested by Sir W. Armstrong, and are ready to have the dispute referred for arbitration to a national congress of employers and workmen engineers.

Sheffield.—The joiners and carpenters of Sheffield have issued a circular to their employers to the effect that as they have failed to obtain a meeting with the masters' association on the matters which have been in dispute since May, 1869, they intend to press the demands upon each employer separately. They ask for the nine-hours system and a code of rules.

Alnwick.—The journeyman slaters of Alnwick have struck for an advance of wages, after giving their employers a week's notice to that effect. Heretofore they have been paid at the rate of 2*s.* per week, but they now demand 2*s.* 6*d.*, a rise of 4*s.* per week. So far the masters have declined to accede, as they say they are unable to comply with the request of the men.

Barnsley.—The strike of bricklayers and labourers still continues, and there are no signs of a settlement. The masters express their determination not to give way, and are taking steps to supply the places of the men on strike. They state that they will find new hands constant work, and will protect them from all molestation. The men, on the other hand, are taking steps to prevent new hands being employed, and have pickets at the station and on the road leading into the town. The strike is causing considerable inconvenience, as nearly the whole of the work is standing.

Glasgow.—The whole of the shipwrights on the Clyde who have been on strike for an advance of wages during the past six weeks have been formally looked out by the masters.

CHURCH-BUILDING NEWS.

Weston.—St. John's Church, Weston, has been re-opened, after enlargement, by the Bishop of Bath and Wells. An apsidal chancel, with five lancet lights in the apse, has been built, which is divided from the nave by a chancel arch, supported by two pillars with carved capitals, the gift of the architect, Mr. Davis. At the south side a transept, capable of accommodating seventy persons, has been erected. This is separated from the body of the church by two arches, springing from a central shaft, and the bordering of the arches, as is also the case with the chancel arch, is coloured alternately with white and light grey. The end of the transept is pierced with a rose-window, below which is an ornamental doorway, and the roof of this and the other new portion of the building is, in accordance with the now prevalent custom in church-building, covered with red tiles, which of course contrast with the slates of which the remainder of the roof is formed. An organ-chamber has been built on the north of the chancel. There is a small vestry at the east side of the transept and at the other end of the building, on the same side, a spacious porch will serve the purpose of the old entrance at the western end. The church has been newly seated throughout, and the seating arranged on a fresh plan. Instead of a large block of seats in the middle, there are two blocks with a passage up

the centre, and the shape of the seats is such as to give greater comfort. Another improvement has been effected in the lowering of the floor and the removal of the low-pitched plaster ceiling. An encaustic floor has been laid in the channel by Maw, of London; but in this portion of the building the work is incomplete, and the walls below the string-course must remain in a rough state in consequence of the enlargement of the church, however, has been raised, but this has only covered the cost of the new seating and the structural work, so that a debt of 350*l.* has been incurred in fittings and other contingencies.

Cornforth.—The first church in the town of Carnforth, near Lancaster, was commenced a short time since. The church will be in style fourteenth-century Gothic, and will consist of nave, 58 ft. by 25 ft.; chancel, 26 ft. by 19 ft., with south aisle and transept, vestry, and organ chamber. Provision is made for a future north aisle and transept. A tower and spire of the height of 110 ft. will be added when funds permit. The church will seat about 340 adults (sittings free). It is to be built of grey grit stone, and white free stone dressings of the neighbourhood. The roofs will be open-timbered and boarded, stained and varnished, and the seats of pitch pine, with carved bench ends. A stone pulpit and font are gifts to the church. The cost, as at present contracted for, is about 1,600*l.*, exclusive of tower and spire. The architects are Messrs. Brade & Smales, of Kendal; Mr. R. Clarkson, Mr. Ed. Parkinson, and Mr. T. Walsley, of Carnforth, are the respective contractors.

SCHOOL-BUILDING NEWS.

Carlisle.—The Roman Catholic new school in Union-street, in this city, has been opened. The new building, which has been in course of erection for some months, has been built by private subscription at a cost of between 800*l.* and 900*l.*, and will accommodate 380 children. It has a high-pitched roof, topped with a bell-spire, and a large porch in front. At the back there is a large class-room, with an independent porch and entrance. There are two large three-light Gothic windows, with circular lights above. The bell is of good tone, and cost about 20*l.* The building is decorated on the outside with wrought-iron crosses,—one on the front porch, one on the class-room porch, one on each of the two gables, and one on the bell-spire. The material used for the edifice has been brick throughout, and the roof is of slate. In the inside the walls are wainscoted up to the window-sills, and above that they will be left bare, without plaster or any other covering. At one end of the room a space is raised above the floor for the master, and at the other is a small gallery. The artificial lighting will be by four circles of gas-jets pendant from the roof, and one or two brackets on the walls. A space behind the school will be set apart for the schoolmaster's garden, and, as soon as the funds will allow, a house will be erected for him on another portion of the site. The large site has been presented to the trustees by the Duke of Devonshire, and it is said to be worth about 500*l.* This is the third school which has been built in Carlisle by the Roman Catholics within the last five years. Messrs. Cory & Ferguson were the architects, Mr. Thomas Mowbray the contractor, and Mr. Musgrave the builder.

FROM IRELAND.

Belfast.—While this city has increased vastly in every direction, its style of architecture has also improved in like proportions. Donegal-place, which a few years ago presented a uniform front of private houses, devoid of any pretensions to beauty or style, is now almost completely occupied by superior buildings. Among the more recent erections are the premises of Messrs. Young & Co., which are just completed and occupied. The front elevation,—a modification of the Venetian style of architecture,—is of cut-stone from the Dungannon quarries, with windows of plate-glass. The building is four stories high, finished with a cut-stone parapet, terminated by large carved urns. The shop-front presents a spacious recessed pair of mahogany folding-doors, with panels of plate-glass set in between a pair of columns of Newry granite, with carved capitals, the window on each side being of a plate of glass, containing 100 superficial feet, in one piece, set in mahogany frame. The front of the first and second ware-room floors is divided into five seg-

mented arched windows, the arches springing from detached columns of polished pink granite, the front of the upper story being divided into seven windows, with semicircular arched heads springing from cut-stone columns and pilasters. The shop-floor is about 34 ft. wide by 80 ft. in depth. The designs for the building and fittings were furnished by Messrs. Thos. Jackson & Son; and the works carried on under their direction by Messrs. J. & J. Guiler. The painting and decorations have been executed by Mr. George Coulter.

MONUMENTAL.

The Derby Memorial at Preston.—The committee have decided that the best available site is in front of the Belvidere, in the Miller Park. Mr. Noble, the sculptor, has fallen in with the views of the committee that the statue should be of bronze rather than of marble, and it will be 10 ft. high at least, instead of 8 ft. 6 in., as originally agreed upon.

Monument to Cardinal Wiseman.—A monument in white marble has been placed over the grave of Cardinal Wiseman in the Roman Catholic Cemetery at Kensal-green. It is covered by a frame of wood and glass, and will, it is said, be placed hereafter in the new Roman Catholic Cathedral of the diocese. The work has been executed by Messrs. Farmer & Brindley, of Westminster-road, from designs by Mr. Pugin. Above the tomb is a recumbent figure of the Cardinal in ecclesiastical vestments, and on the sides are sculptured several scenes in his life.

The Brunel Statue.—The Brunel statue has been temporarily erected on the Victoria Embankment. The decision of the Metropolitan Board of Works with regard to the pedestal and the general mode of its erection, has been requested by Mr. St. George Burke. The subject has been referred to the Works Committee.

Books Received.

THE new number of *Fraser* contains an article "As to the Decoration of St. Paul's Cathedral," by An Architect. Concerning the Iconographic Scheme which has been obtained by the Committee, the writer says,—

"We must be permitted to point out that the committee, in addressing themselves to the general public for aid, are inviting subscriptions for what a large number of those invited will consider a serious anachronism. The scheme of decoration is to include, it seems, a whole cycle of Biblical and ecclesiastical miracles; not to speak of the Six Days Creation, the nine Orders of Angels, Cherubim 'full of eyes,' medieval Saints with their appropriate symbols, and such other standard pieces of ecclesiastical furniture. If the committee have any idea of what is going on in the world, they ought to be aware that the majority of thinking persons among us regard these things as historically false and totally irrelevant to religion, and even to Christianity in its highest aspect. If they look on the Cathedral as the property of Churchmen to do as they please with, that is an intelligible position; but to advertise such a decorative programme as a work recommending itself to no one class or creed is simply ridiculous. They cannot reasonably expect support for such a scheme from any one outside the pale of their own communion, nor from many within it. If the Committee with the decoration of St. Paul's to be taken up as a national work, let them leave illustrating what many regard as mere fables, and turn to the broader and sublimer moral attributes of Christianity, the illustration of which, in various phases and through various actions, might furnish subjects of the highest order to thoughtful and original artists. We have little hope, we admit, that this bill will be acted upon; the ecclesiastical amateurs, we fear, are too stiff in their own views, the ecclesiastical artists too nearly in the position of the silversmiths of Ephesus, to listen to reason on this topic. But if ever the scheme is carried out which is to convert our only Renaissance Cathedral into a great storehouse of ecclesiastical 'properties,' we shall be able to say that in one quarter at least a protest was raised against the proposition to embody, in an imperishable material, histories and theories, the actual truth and moral relevancy of which are at this very time becoming every day more and more widely questioned."

Miscellaneous.

The St. Gothard Railway, with a tunnel about the length of that of the Mont Cenis will, it appears, very soon be commenced. The capital necessary for the tunnel is about 60,000,000 francs, and for the lines to join the Italian and Swiss Railway about 125,000,000 francs. Subsidies to the extent of 85,000,000 francs have been voted by Germany, Italy, and Switzerland, and the remaining 100,000,000 francs will be taken by a syndicate,—65,000,000 francs in bonds, bearing 5 per cent. interest, and 35,000,000 francs in shares. It is estimated that at least seven to eight years will be required for the entire completion of the work.

Harvest Home Church Decorations.

The memorial church of Welshampton, on the harvest-home thanksgiving occasion, when the Rev. Congreve Selwyn and other clergymen conducted the services, was tastefully decorated by Mrs. Selwyn and a number of other ladies. On entering the church, the first thing that arrested the eye was the marble font, with a green moss Maltese cross for the groundwork, upon which was a circle of purple aster blooms, through and under which passed the long Roman cross, in white aster blooms, forming the apex of a fine dome of flowers in the font proper. The first window, on the north side of the church, was decorated with a miniature sheaf of corn, on the inside sill, upon a groundwork of moss, interspersed with dahlia blooms, ferns, geraniums, and calceolarias. The second and third windows bore sheaves of corn, and between the two latter was a blue silk banner, with a white cross in the centre, studded with purple and gold ornaments. The marble pulpit was decorated at the base and centre with fuchsias, asters, moss, ferns, and other choice flowers. On either side of the supporting pillars of the chancel arch was a banner, with gold letters on scarlet ground, the one on the left being "I am the true Vine," and that on the right hand "I am the Bread of Life," with a sheaf of wheat in the centre of the latter, and a bunch of grapes in the former. But the choicest of the decorations culminated in the chancel, and on, around, and above the altar, the floral decorations being profuse.

Westgate-on-Sea.—This new watering-place, destined, apparently, to be the St. Leonard's of Margate, and to which we first drew public attention, is making very satisfactory progress. *Keele's Gazette* (Margate) says,—"There are evident signs that Westgate-on-Sea is destined to become, in a very few years, a watering-place of no inconsiderable size. We see around indications that the estate is managed by a master mind. Thousands of pounds have already been spent in providing a perfect system of drainage and on its magnificent roads. On the sea-wall which skirts the whole of the charming bay a beautiful promenade is constructed for the enjoyment of the visitors. Terraces of houses have already been erected; and we understand such has been the success of Beach House (private hotel) during this season, that an hotel, vieing with some of the largest in the kingdom, will shortly be erected." The site is the promontory between the two bays, and a beautiful situation it is. The London, Chatham, and Dover Railway has opened a station here, and the arrangements are such as to recommend them to the notice of those whose avocations may require their presence in the great metropolis every day. The sea view is unsurpassed, and the level sands admirable for sea bathing. The population is increasing, and the spiritual wants of the locality have not been forgotten. Already, thanks to the energy and consideration of the vicar of St. John's, it has been determined to build one of the churches for which endowment has been given by the Ecclesiastical Commissioners, with a paragon-house, on the site opposite Dent-de-lion Gates, about five minutes' walk from Westgate-on-Sea.

The Flux-Motor.—A "Description of an Improvement made by Ferdinando Tommasi, on his Invention, the Flux-Motor," has been printed at Boulogne-sur-Mer, by Camille le Roy, 51, Grande-rue. In this pamphlet the inventor says he has "found a means of giving to the engines of the Flux-Motors a tension double that which would have been communicated to them by the height of the column of sea-water available. . . . When the tide rises, a part of the compressed air is changed into rarefied air; and when the tide falls, a part of the rarefied air becomes changed into compressed air, and this produces on the working piston a pressure double that which it would have experienced by the simple effect of the weight of a column of sea-water whose height would be equal to half the total height of the tide employed. Hence follows the conviction that by means of the proposed improvement the piston will always be in a position to work as well when the tide is rising as when it is falling, under a pressure equal to the weight represented by a column of sea-water whose height is the same as the total height of the above-mentioned tide. And as tides of 10 metres high (above 30 ft.), which, with the present improvement, represent the tension on one net atmosphere, exist on almost all shores, Flux-Motors can be utilised almost everywhere."

Exeter Cathedral.—At a recent meeting of the Exeter Diocesan Architectural Society held at Exeter, the Earl of Devon presiding, the Rev. J. L. Fulford (hon. secretary) read the report of the committee, which referred chiefly to the work of re-arranging and re-fitting the choir of the cathedral. Since the last meeting, considerable progress had been made in the work of restoration. The modern altar-screen, the modern pavements, and the very late and meagre stall-work had been removed. The removal of the altar-screen had very much improved the interior effect of the building. The removal of the modern pavement had led to the discovery of the old altar foot-paces and steps, and an old tile pavement; and behind the stall-work, on the north and south sides, a modern brick wall, pointed, was found, with a continuous oak bond set therein, evidently for the purpose of attaching to the wall the back of the stall-work just removed. The removal of the return stalls brought to light a very rough unfinished wall on the eastern face of the solid wood screen. The shafts of the western pier north and south of the choir were of Purbeck marble, and were finished like the other piers in the arcade, and they had their bases grille as carefully wrought and moulded. But a wall of rough masonry was worked without care against and around these Purbeck shafts and bases. After some discussion as to the propriety of removing the old high screen, to which Mr. Scott, the architect, had objected, and which the dean and chapter had decided not to do, the report was adopted.

Proposed New North and South Railway in Yorkshire.—An influential meeting of merchants, manufacturers, and others interested in promoting the proposed railway connecting the South Yorkshire coal-fields with Halifax, Huddersfield, and Keighley, and affording a more direct means of communication between those towns and the North and South, has been held in the White Swan Hotel, Halifax. The mayor presided. Mr. Hamilton Fulton, engineer, explained the route of the proposed railway, and pointed out the advantages it would confer upon the town of Halifax and other places on the proposed line. The meeting was enthusiastic and unanimous in favour of endeavouring to secure for the town improved railway facilities, and of having a line independent of the two great companies now proposing amalgamation. Finally, it was unanimously resolved that the requirements of the town of Halifax absolutely needed improved railway communication north and south, and station accommodation in the higher parts of the town; and the meeting appointed a committee to examine the scheme proposed, and report to a future meeting. The committee includes the mayor, and Mr. E. Crossley, Colonel Akroyd, M.P., and other influential gentlemen.

Extensive Sewage Operations.—The most extensive scheme for the irrigation of towns' sewage yet promulgated and in actual progress of development is, perhaps, that which is now being carried into practice by the corporation of Blackburn. During last session this corporation obtained powers to effect large purchases of lands, or to acquire them on lease; and powers were also secured to borrow from 20,000l. and 30,000l. to carry out irrigation works, with liberty to spread the repayment of loans employed in purchasing lands, over a long term of years. By the Act of last session the corporation have power to acquire 1,000 acres of land for irrigation purposes. An agreement has been entered into between Sir Henry de Houghton and the corporation with reference to the Higher Lower Park farms, which consist of about 180 acres, and possession has been taken by the corporation. Upon these farms it is proposed to utilise part of the sewage, which will be distributed by means of valves and troughs. The land, for the most part, has a wild, moor-like aspect, but the soil, being of a sandy nature, is well suited for receiving a large quantity of sewage.

Slate Ridges for Roofs.—According to the invention of Mr. John Thomas, of Bangor, the slate ridge is constructed in three divisions, consisting of a top roll and two wings, which, when united, form a solid ridge; the wings terminate in flanges, which are placed together within a square slot cut along the under surface of the roll, and are first secured by lateral screws or rivets, and finally by lead, putty, or other suitable adhesive packing, the wings being secured to the ridge-board by vertical screws prior to the application of the top roll.

The Duke of Edinburgh's Residence in Coburg.—Shortly after the death of Prince Albert, the Duke of Edinburgh inherited a large mansion and grounds in Coburg. At that time the mansion-house was in disrepair, and it was allowed to remain in this condition until about two years ago, when workmen from the town of Gotha and neighbourhood were engaged by the duke to put the place into a state of complete repair. The work went slowly on in consequence of the outbreak and continuance of the war between France and Germany. At the close of the war the operations were resumed and carried on with vigour, and it is believed the duke will reside in the mansion-house when he visits Germany. In connexion with the alterations and improvements, the *Dundee Advertiser* says that the paperhanging and many of the other decorations—which are on an extensive and costly scale—have been executed by workmen sent from London by Mr. J. M'Lachlan, St. James's-street, decorator to her Majesty the Queen.

New Railway Station at York.—An extensive station is about being built at York by the North-Eastern Company. In length the station will be a quarter of mile, or 1,320 ft., and in form it will be a crescent. The approaches will have direct reference not only to the convenience of the company, but also to that of the public. The works will be carried out as speedily as possible. Already the company are proceeding with the erection of a new carriage-shed, capable of holding 300 carriages at one time, and fully one-third of a mile in length. It is in contemplation to build a large hotel in connexion with the new station. In front of the hotel, and facing the museum on the other side of the Ouse, will be a series of terrace gardens extending down to the river. The cost of these works will not be much less than a quarter of a million. The Railway Plant Company (Limited), and Messrs. Close, Ayre, & Nicholson, ironfounders, have obtained fourteen acres of ground whereupon to erect works, at which about 1,000 men will be employed.

Discovery in Copford Church.—The church of Copford is a specimen of Norman work, with the east end of a semicircular form. Workmen, while engaged in some much-needed repairs to the east end, and in preparing for a memorial stained window which is to be placed there, discovered beneath the whitewash evidences of colouring. Under the guidance of the architects (Messrs. Slater & Carpenter, of London) and Mr. Joseph Grimes, the whitewash has been removed, showing that the whole of the east end of the church was formerly painted. An artist has examined the paintings, and it is understood that an attempt will be made to restore them. In Wright's "History of Essex" we find the following:—"In 1690, as the workmen were preparing the walls for whitewashing, it was discovered that very good paintings of the Crucifixion, of Peter's mother-in-law lying sick of a fever, of Mary Magdalen, and other subjects, had been covered over with whitening."

Bending Metal Tubes.—In a machine invented by Mr. Charles Höller, of Cincinnati, U.S., the sheet metal pipe or tube is passed by a step-by-step motion over a mandril, at the end of which are two sets of clamps or jaws surrounding the pipe, and so operating in combination with a rocking disc or head situated inside the pipe beyond the end of the mandril, that as the pipe passes over the end of the mandril the one set of clamps or jaws is caused to close down upon the pipe, nipping it upon the end of the mandril, while the other set of clamps closes down and nips the pipe upon the rocking head, which on then being forcibly brought together with the last-named clamps and the portion of the pipe nipped thereby, close up to the end face of the mandril and the first-named clamps, bend up or crimps a portion of the circumference of the pipe situated between the two sets of clamps, and thus by a succession of such crimpings or bendings at short distances apart, the elbow or bend is formed on the pipe.

Proposed New Road from Eaton-square to Brompton-road.—A communication was read at the last meeting of the Metropolitan Board from Messrs. Edwards & Co., requesting on behalf of the Belgrave-road Company that the Board will re-consider the application of the company for a contribution towards the cost of the formation of a new road from Eaton-square to the Brompton-road. The subject was referred to the Works Committee.

Embankment of the Coast.—It is very desirable that Government should without delay proceed to protect the exposed portions of the coast line, commencing a sea-wall at Sheerness, round the Isle of Sheppey, and continuing the embankment or sea-wall to Ramsgate, under-setting or underpinning the chalk cliffs with an inclined brick facing to high-water mark. In many portions grooved cast-iron piles and facing plates backed by a wall of concrete would be found serviceable. Ample provision should be made for the inland drainage, almost as destructive in crumbling away the cliffs in winter as the ocean. The reclaimed land, as the whole coast of England would require more or less this mode of treatment, would be in itself no unimportant feature.—L. S.

Labour and Capital.—In the struggle of labour and capital it strikes a looker-on that the labourer is running his best friend, his only friend—capital—rather hard. The labour of the working man but represents the body,—physical power,—while capital represents the intellect,—mental power. Capital represents accumulations of science in applying them. Labour only represents skilful detail under the direction of science. Which is the higher?—the directing head or the directed hand?—the general who commands or the private soldier who is clever with his Martini? Who wins the battle, the leader who combines or the follower who fires off his rifle? The best friend of labour is capital. It was but a foolish man who killed the geese which laid the golden eggs.—ALPHA.

Presentation to the Borough Surveyor of Reading.—Mr. A. W. Parry, who has been for eight years in the service of the Bradford corporation, and has filled the post of deputy to the borough surveyor, has been presented with a gold watch and chain, and a written testimonial, presented by upwards of 100 subscribers, officers, and workmen of the corporation, on his promotion to the office of Borough Surveyor of Reading. The presentation took place in the committee-room at the Corporation offices. The town clerk, who presided, said he had been requested by the officers and workmen of the corporation to express the regret they felt at parting with him, and the respect and esteem in which he was held.

Dwellings for the Industrial Classes.—Mr. Benjamin Colls, a member of the Court of Common Council, has given notice of his intention to move that the Improvement Committee of the corporation be instructed forthwith to adopt measures for carrying out the provisions of the Holborn Valley Improvement Acts, 1864 and 1867, with respect to labourers' dwellings, as directed by clauses of the said Acts; and further, that a petition be presented to the Court of Chancery for permission to defray the cost of such buildings out of money now in that court belonging to the corporation.

Further Experiments with Asphalt. **Paving in the City.**—An opportunity will shortly be afforded to the public of testing the relative merits of the different kinds of asphalt paving. At the instance of the Commissioners of Sewers, Moorgate-street has just been paved with three kinds of asphalt, the Val de Travers, the Limmer, and Barnett's, for the purpose of ascertaining by public experience which is the best and most durable. The City Sewers Commission have just authorised the further extension of asphalt paving, at a cost of more than 6,000l., at Cornhill, Threadneedle-street, &c.

The Commons Preservation Movement.—An interim injunction has been obtained by the City authorities to restrain parties from ploughing on certain land at Epping Forest until the whole question has been argued, and the City Commissioners of Sewers heard upon it. The solicitor to the Metropolitan Board reports that the matter of Hampstead-heath should, according to the Act, be now completed; but although he had day by day been in communication with the parties, they were not yet quite ready. It is important that there should be no delay.

Royal National Opera, St. James's Theatre.—We heartily wish well to the endeavour which is being made here to establish English opera, and shall find an opportunity to say something on the subject. *The Rose of Castile* and the *Bohemian Girl* have been very fairly presented, but efforts will be needed to achieve success. Miss Rose Hersee sang and acted with great success in both.

Great Explosion in Chelsea.—A destructive explosion of gas, followed by other explosions and fire, took place in the premises of an oil and colourman, 8, Manor-street, King's-road, Chelsea, on Wednesday. Whilst seeking, rashly as usual, for gas leakage with a light, the suspended gas exploded, and set on fire some of the paraffine and colza oil, turpentine, varnish, &c., stored in the cellar. A quantity of gunpowder exploded, blowing up the floors, sending beams, slates, oil cisterns, &c., high in the air, and doing considerable damage to windows. This explosion was followed by a second, which seems to have been caused by another barrel of powder taking fire, and also saltpetre, sulphur, and pitch. Sixteen persons were seriously injured.

The Letter Postage.—The reduction in the postage of letters has come into operation. The half-ounce weight disappears from the postal scales, and the halfpenny stamp comes into use, for letters above an ounce weight. The lowest letter postage will still be a penny; but the penny stamp will cover all letters not exceeding an ounce; while only an additional halfpenny stamp will be required for every additional half-ounce in weight. The other uses of the half-penny stamp do not seem to be affected.

The Tammany Frauds at New York.—A New York correspondent of the *Morning Post* says:—"Last year one of the oldest and best-known merchants in the 'swamp,' wished to have the street in which he lived repaired. The pavement was simply disgraceful. All the houses being freehold, their owners joined in a petition to the municipality to allow them to have it done at their own expense. This was denied them, unless they used a patent which was under contract to pay 20 per cent. out of the profits to the Court of Aldermen. The freeholders declined, and the street remains as before."

The Liverpool Borough Engineer and Borough Surveyor.—The committee interested in the selection of candidates for these important offices have met and selected six gentlemen for the office of borough surveyor, and a similar number for that of borough engineer. For the office of borough engineer the choice will only be difficult from the extreme excellence of the candidates; but the office of borough surveyor is supposed to require great local knowledge, and if scarcely any local surveyors apply for the appointment, the committee will be awkwardly placed.

A District Post-office for Woolwich.—Plans have been prepared and a site selected for the erection of a district post-office for Woolwich, within the Royal Arsenal, but having no communication with that establishment, and open only upon the public road. It is intended to be three stories high, and to accommodate about sixty sorters and clerks, as it is intended to make the office the centre for all the postal and telegraphic business of the surrounding locality as far as Sydenham, the letters and messages within which district have at present all to go through the City.

New Alloy of Copper and Iron.—Dr. Meyer, of California, is said to have invented a new alloy, composed of copper and iron, united in certain proportions, to form a substance which can be tempered to a hardness greater than that of steel, and can be easily worked. It is claimed that it can be used with great advantage for such articles as shoes and dies of stamp-mills, for instance; and, on account of its great hardness, will outlast, by a very considerable length of time, those now made of chilled cast-iron, while they can be manufactured just as cheaply.

A Public Park for Leeds.—The Roundhay Park estate, which is situated two miles from Leeds, has just been sold by auction, and purchased by the corporation of the borough for a public park. Altogether, the estate covers 1,400 acres, the mansion, park, and lakes comprising 600 acres, and the price paid was 107,000*l*. Another lot, which will bring the entrance to the park half a mile nearer the town, was also bought by the corporation for 32,000*l*.

The Dublin Exhibition Building as a Museum.—Sir Arthur Guinness, the principal if not the sole proprietor of the Dublin Exhibition Palace, has resolved to convert it into a public "Museum of Art, Industry, and Manufactures," as closely as possible in imitation of the South Kensington Museum.

An Incendiary at Half-a-crown a Fire. A blacksmith has been brought up at the Thames police-court, charged with wilfully setting fire to some goods on St. George's Sufferance-wharf, Wapping-wall. Within a few months he has announced thirty-six fires at different stations of the brigade, and it is conjectured that he has partly obtained his living by incendiarism, as the authorities allow a gratuity of 2*s*. 6*d*., or 1*s*. to the person who brings the intelligence of a fire to the nearest station. About 100,000*l*. worth of property has been destroyed in these fires!

A Working Men's Hospital.—The Baroness Bardsell Courtis has been invited to lay the foundation-stone of the working men's extension wing of the Queen's Hospital, at Birmingham. It is expected that she will be present, and that the ceremony will take place about the end of this month. A sum of 5,000*l*. has been raised in three years by the periodical contributions of 20,000 workmen in the principal factories of the town. It will be the first hospital in the kingdom erected by the contributions of working men.

Survey and Main Drainage of Heckmondwike.—At a meeting of the Heckmondwike Local Board, held on Monday, the 25th of September, Mr. M. Paterson, C.E., Dewsbury, was unanimously appointed to carry out a complete survey of the district, 10 ft. to the inch, and to design a system of main drainage. Heckmondwike (West Riding), although a manufacturing town of 9,000 or 10,000 inhabitants, and steadily increasing in importance, has been hitherto without any connected system of sewerage.

Proposed Fountain in Hamilton-place and Park-lane.—At the last week's meeting of the Metropolitan Board of Works a letter was read from Mr. Ayrton, as Chief Commissioner of Works, transmitting a drawing of the fountain which Mrs. Brown is desirous of erecting at the junction of Hamilton-place and Park-lane, and trusting it will meet with the Board's approval. The letter was referred to the Works Committee.

Patent Window Blinds.—Mr. J. Kent, the inventor of these blinds (patent dated 7th of March, 1871), attaches a small bracket to the window-frame, carrying a pawl or catch hung loosely therein. A movable sliding rack passes through the bracket, and is held in any position by the pawl. The blind cord is passed round a pulley at the end of the rack. This rack-holder may be used for tightening machine bands and for other purposes.

The Great Exhibition at Vienna.—The erection of the building for the International Exhibition at Vienna has already commenced, and the works are being pushed rapidly forward, in order to get as much done as possible before the winter sets in. It is expected that the whole building will be completed by October, 1872, so as to be ready for the consignments from distant countries which are to arrive about that time for the Exhibition.

National Portrait Gallery.—The collection has been re-arranged by Mr. Scharf with evident advantage. A portrait of Benjamin Franklin is amongst the recent acquisitions. It may be useful to mention that the gallery (at South Kensington) is open to the public on Mondays, Tuesdays, and Saturdays, from ten to six o'clock in summer, and from ten to four in winter. Admission free.

Society of Engineers.—On Monday evening the first meeting of the present session was held at the Westminster Palace Hotel, when Mr. Perry F. Nursey read a paper "On the Recent Improvements in Explosive Compounds." The discussion was long and ample, much interest being manifested in the subject.

Bursting of a Sewer in Hackney.—On Monday night a sewer burst in Mare-street, Hackney, and several cellars were inundated. It is stated that many suffered in health from the sickening odours which were thus spread through their dwellings. It is to be hoped that the cause of this accident will be thoroughly inquired into.

Fine Arts in University College.—The inaugural lecture of the newly-established department of the Fine Arts at the University College has been delivered before a crowded audience, by Mr. E. J. Poynter, A.R.A., the Slade Professor.

The New Cattle Market at Woolwich. Upwards of 500 workmen are engaged in converting her Majesty's Dockyard at Deptford into a new cattle-market for the city of London, according to plans approved by the corporation. Extensive ranges of buildings are being rapidly demolished, and others are being converted into receptacles for cattle.

TENDERS

For premises, Quarry-street, Woolton, near Liverpool. Quantities supplied:—
 Johnson £1,098 0 0
 Walker & Co. 1,68 16 0
 Crowther & Houghton 1,68 0 0
 Oliver 1,68 5 6
 Peters & Ball (accepted) 1,099 0 0
 * All the contractors belong to the neighbourhood with this exception.

For lodge, stables, conservatory, &c., Caterham, Surrey. Mr. R. Martin, architect. Quantities supplied by Mr. F. Sparrow:—

	Lodge, Stables, &c.	Conservatory, &c.
Smethurst	£383	£430
Legg	307	379
Bridgman, Nuthall, & Co.	301	376
Ward	275	339
For the Whole.		
Jarrett	£1,630	0 0

For the foundations to New Crane Wharf, Shadwell, for Mr. W. Rosa. Mr. C. F. Dunch, architect:—
 Browne & Robinson £9,423 0 0
 Runc 8,370 0 0
 Aird & Son 9,970 0 0
 Henshaw & Co. 7,437 0 0
 Hill, Keddell, & Waldram 7,378 0 0
 Brass 5,463 0 0
 Accepted.

For the erection of a new warehouse, St. Bride's Wharf, Wapping, for Messrs. Middleton, Son, & Co. Mr. C. F. Dunch, architect:—
 Ashenden £8,885 0 0
 Pearson 7,917 0 0
 Macey 7,760 0 0
 Ennor 7,763 0 0
 Browne & Robinson 7,360 0 0
 Kilby 7,272 0 0
 Henshaw 7,230 0 0
 Hill, Keddell, & Waldram 7,093 0 0
 Accepted.

For erection of cottage residences for Mr. G. U. Riderstorfer, at Burgess-hill, Sussex. Messrs. Goulty & Gibbins, architects:—
 Hollands (accepted) £260 0 0

For alterations to Apley, the marine residence of Mr. J. N. Clayton, Mr. T. D. Clayton, architect:—
 Langdon £6,008 0 0
 Shibley 4,395 0 0
 Colenetti 3,892 0 0
 Barton (accepted) 3,760 0 0

For additions to 147, Holborn, for Mr. Louis P. Casella. Mr. J. Schofield, architect:—
 A. B.
 Tilley £265 £157 0 0
 Simpson 610 167 0 0
 King & Son 380 188 10 0
 Baugh 554 188 10 0
 Patman & Fotheringham 522 156 0 0

For the Whole.
 Longmire & Budge £667

For additions to house and premises, No. 54, Finebury place, for Messrs. Dashwood, Brothers. Mr. R. Walker, architect:—
 Heaps £1,659 0 0
 Pettigrew & Moys 2,167 0 0
 King & Son 1,195 0 0
 Merritt & Asby 1,150 0 0
 Sewell & Son 1,032 0 0
 Perry, Brothers 1,011 0 0
 Kilby 1,006 0 0

For a factory, City-road, London. Mr. H. Ford, architect:—
 Mayers & Son £4,592 0 0
 Gammon & Son 3,985 0 0
 Nightingale 4,397 0 0
 Stimpson 4,810 0 0
 Mortar 4,360 0 0
 Conder 3,297 0 0
 Browne & Robinson 4,263 0 0
 Williams & Son 4,240 0 0
 Babey & Son 4,207 0 0
 Perry & Co. 4,195 0 0
 Blease 4,158 0 0
 Servier & White 4,173 0 0
 Henshaw 4,125 0 0
 Perry, Brothers 4,077 0 0
 Kilby 3,994 0 0

For rebuilding stores, show-rooms, &c., for Mr. Seaby at the back of the Walls, Southampton. Mr. W. Cole, architect. No quantities:—
 Martin & Son 2,398 0 0
 Stevens 862 0 0
 Gumbrell 386 0 0
 Crook 369 0 0

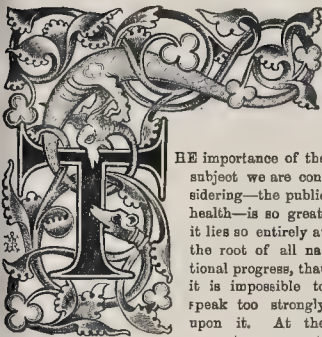
ing a Review of the Defects of existing Houses, and containing
 entered Designs by the Author for Model Houses from which
 ings have been erected; together with Registered Plans for
 Adaptation of existing Dwelling-houses for Letting in Flats.
 London: LONGMANS, GREEN, & CO. Paternoster-row.

EUSTON WORKS, 366 and 368, EUSTON ROAD, N.W. &
BRIDGE WHARF, BISHOP'S ROAD, LONDON, W

The Builder.

VOL. XXIX.—No. 1497.

The Public Health.*



THE importance of the subject we are considering—the public health—is so great, it lies so entirely at the root of all national progress, that it is impossible to speak too strongly upon it. At the present moment, moreover, it is invested with unusually pressing interest. After a terrible visitation which has desolated homes throughout the country,—a visitation which, all evidence shows, was the result of ignorance, carelessness, and wilful avoidance of a known means of prevention, or, at any rate, of amelioration,—we note at no great distance from our shores the presence of a much-dreaded disease; and I should be neglecting a duty if I allowed this opportunity to pass without inviting all who have power to aid in making such preparations as experience shows are calculated, under Providence, to mitigate its severity should it reach us. Should we happily escape its visit, we shall still derive advantage from the steps taken. When there is no immediate prospect of danger the cost of precautions is begrudged. A large class of persons would sooner run the chance of death than incur the certainty of having to pay a pound. We are all of us gamblers, more or less, and like to take our chance.

The most vigorous and intelligent action is required on the part of our health authorities, and their hands should be strengthened by public expressions and outside aid. I am anxious not to be thought an alarmist. There is no occasion whatever for alarm,—it is, indeed, to be strongly deprecated. But it would be suicidal to think, ostrich-like, that if we shut our eyes no one will see us,—that if we say nothing about a possible danger ourselves nothing will be heard of it. The way to defeat it is to meet it well prepared. "It is now known" (says the Registrar-General, in a recent report),† "that where a place is clean, where the waters are pure, where the people are not crowded, where good administrative arrangements are made for the early treatment of attacks in the first stage of diarrhoea, the epidemic is disarmed of nearly all its terrors. But as English towns are still dirty, are dotted over with cesspools or fouled by bad drains, and the waters alike of wells and of rivers, from which towns draw their supplies, are soiled to some extent by sewage, we can at present expect no absolute immunity. Commissions and committees have left our water supply much as it was: the hard waters of the rivers are not purified by Clark's process, nor are the pure, unpolluted streams brought uncontaminated down to the cities in the plains. Still,

much may be done, if cholera pursue its customary course, by commencing at once all useful works of purification, so as to mitigate its virulence." And this is what all, in their several spheres, should aid in doing.

The medical officer of the Privy Council, Mr. Simon, in his instructions on the subject, recently issued, drew attention to which would prove of great value, has dwelt so strongly on the part played by polluted water in propagating the disease as to have led to the expression of fear by an esteemed member of the Association, that the public may be induced in attending to this to neglect other important inquiries. Mr. Simon says:—

"The dangers which have to be guarded against as favouring the spread of cholera-contagium are particularly two. First, and above all, there is the danger of water supplies which are in any (even the slightest) degree tainted by house-refuse or other like kinds of filth; as where there is outflow, leakage, or filtration, from sewers, house-drains, cesspools, foul ditches, or the like, into streams, springs, wells, or reservoirs from which the supply of water is drawn, or into the soil in which the wells are situate; a danger which may exist on a small scale (but, perhaps, often repeated in the same district) at the pump or dip-well of a private house, or on a large and even vast scale in the source of supply of public water-works. And, secondly, there is the danger of breathing air which is foul with effluvia from the same sorts of impurity."

Without here discussing whether the objection taken to the medical officer's expressions be sound or not, the evils resulting from the use of water containing ordinary faecal impurities are well known. Outbreaks of typhoid fever have been traced again and again to this cause. In many cottages in low-lying land, by the side of streamlets which receive the overflow of house-drainage and other refuse, it is never absent, and cripples the working power of the country to a much greater extent than might be supposed. The serious outbreak of typhoid fever at Tarring, in Essex, where, between December 4th, 1867, and January 13th, 1868, 208 persons, out of a population of 900, were attacked, was shown to be connected with the pollution, by sewage, of wells from which the drinking-water was obtained;* and many other similar cases might be adduced, some of which were made public by myself at a time when the evil was scarcely recognised. A Norwich rector has quite recently shown how within eight days, last August, the father of a family, a labouring man, and four of his children, died and were buried, the cause being, as the writer believes, "filth percolating into the well-water." The rector adds:—"I can point to four parsonage-houses around me here where deaths have occurred entirely from this same cause." I have no hesitation in saying with him that the same evil exists in thousands of houses where nothing of the kind is suspected until some severe illness breaks out and carries off its victims,—sometimes not even then. The medical officer of health for Islington, in his last report, gives the particulars of a local outbreak of fever, which serve to show how small a quantity of water so polluted will do mischief. He traced the cause of the outbreak, with much care, to sewage which leaked into an underground tank, whence milk from a dairy was adulterated with water. The dairy-master aided the officer of health by giving him a list of his customers, and it was found not only that the fever was restricted to houses supplied by this dairy, but to individuals in these houses who used that milk, while others who used a richer milk from the same dairy, not diluted with water from the tank in question, were not attacked by the typhoid fever.

London must not comfort itself with the

notion founded on the amount of the recent expenditure on the main drainage, that all its cesspools have vanished, and that its sewers are now good and in a proper state. Many of them are in a dreadful condition, and thousands of old cesspools yet remain. As a rule, wells sunk into town subsoils furnish contaminated water, and should be avoided.

The fine town in which the Association is now assembled suffers greatly from the existence of middens and other dangerous accumulators of refuse. I have on more occasions than one examined Leeds, and have noted these with sorrow in scores of cases. The condition of the river Aire is very unsatisfactory, nor is this to be wondered at by those who know the amount of filth daily thrown into it. Its foul condition is a heavy tax on the cloth-makers, dyers, and other manufacturers of the town. What is the amount of the tax it lays on the health and strength, perhaps life, of the place, I will not here inquire. It is understood that the question how best to utilise the sewage of Leeds has long been under discussion by the Corporation. Let me express an earnest hope that a wise determination will soon be arrived at and acted on, and that the abolition of deadly cesspools and middens will be effected.

A lesser evil here, but one that nevertheless touches the health and pocket, is very distressingly observable to strangers. I mean the enormous amount of unconsumed smoke allowed to escape into the air, and disfigure and damage the town. The appearance of many of the fine buildings, which would otherwise adorn the streets, is miserably changed by it, and the effect produced by the general gloom upon the spirits, and consequently the health of the inhabitants, must be considerable. It is a misfortune, I am satisfied, and not an advantage, that the recent Local Act for the borough contains an exemption as to the consumption of smoke in favour of certain trades carried on here. The Royal Sanitary Commission, in their Second Report, when deprecating this exemption, speak of the manifest injustice thus done to similar works in the adjoining districts, competing in the same market as Leeds, under the more rigorous enactments of the public general statutes. The evil wrought by it in the town will be a stronger argument here, and ought to ensure its early abrogation.

Very large sums have been spent in Leeds on sanitary works, to the great credit of the town; but so much yet remains to be done that the death-rate is painfully high. The use of cellar-dwellings, of back-to-back houses, the middens, and the incompleteness of the sewerage already alluded to, are amongst the most prominent evils calling for remedy.

The death-rate in the Midsummer quarter this year was 23·2 in the 1,000,—very much higher than it should have been,—and yet we are forced to recollect that in parts of the town the rate was probably double that amount, which means that thousands of persons died simply because they were placed under more disorderly circumstances than their neighbours; and this destruction goes on year after year, surely a frightful reflection. It is well to remember that lessening the death-rate in Leeds, say only 2 per 1,000, means saving 520 lives annually.

Disappointment is sometimes felt that after considerable expenditure in a district the death rate is not reduced to the extent expected. Careful inquiry would generally serve to show that the improvement made has been only partial. If the water supply has been attended to the drainage has been neglected, or if deficiencies in this respect have been remedied, the sewers are unventilated, or overcrowding, a deadly evil, has been permitted to an extent that counterbalances the good effects otherwise produced. We may rest assured, however, that every improvement of this kind made does

* The concluding portion of an address delivered at the Leeds Congress of the Social Science Association, by Mr. Godwin, as President of the Health Department, † August, 1871.

* The Builder, vol. xxvi., p. 106.

affect health, morality, happiness, and life, and so be encouraged to fight vigorously in aid of them. The story from Calcutta that, in consequence of the effect produced upon the health of the town by recent improvements in drainage and water supply, the undertakers were applying for compensation for loss of business, if not true, serves to show, what, in public opinion, the result of the work has been.

Many of the subjects relating to public health and social progress still offer problems for solution of extreme difficulty, and much good remains undone for want of its being known how best to do it. In confirmation of this, and for other reasons, I am tempted to mention that I have for some time been authorised by an inhabitant of London to state, that he is willing and ready to appropriate to the improvement of the health and condition of the poorer classes of the metropolis a sum equal to that given by the late George Peabody for a similar purpose—or say half a million of money, when he can see a mode of satisfactorily effecting this without the fear of pauperising the classes he seeks to benefit. Means were taken to make this offer known to a limited extent, and a large number of suggestions have been sent to the proposer, but he is not yet satisfied as to the course that can wisely be taken. We must congratulate the individual on holding in his hand the power to achieve a glorious end, and I would add a hope that he may speedily come to a wise determination. A noble example of what may be done by an employer to improve the condition of those engaged for him, is to be found in this district—I mean, of course, Saltaire, where intelligence and far-sighted benevolence have provided healthful homes, education for the children, innocent enjoyments, and means of culture. The time is coming when the history of the results of that establishment, in a sanitary and social point of view, should be written with a view to the guidance of others.

We lose, on moderate computation, a hundred thousand lives annually by preventable diseases, and millions of money in consequence of these deaths, and of premature disability in cases where death does not ensue. A million paupers receive relief weekly in England and Wales. With complete study of the laws of health, preventive medicine, and improved sanitary arrangements throughout the kingdom, the number of this melancholy army would soon be materially lessened. I have spoken of disability where death does not ensue. With reference to this let me say, we want registration of it. The registration of deaths, which is now enforced, is of the greatest value; but we need beyond that the registration of sickness, which would show the magnitude, not only of the grief and poverty to individuals caused by disease, but of the money-loss to the public. The desirability of this is fully recognised by the Royal Sanitary Commission, so that we may hope for legislation to enforce it before long.

The connexion between bad sanitary arrangements and ill-health is now largely admitted, but not fully, or we should surely not find, in unnumbered places, accumulations of filth violating the air, large populations drinking polluted water and debilitated by unhealthy dwellings, and preventable diseases annually carrying off their thousands, pauperising the families left behind, and injuring the whole community from the highest to the lowest. What is called for is, after all, simple. We want clean air, clean water, clean food,—purity, in fact. As we strive for purity in life, moral purity, so let us strive to obtain for society the advantages of physical purity. "Unto the pure all things are pure," says St. Paul (Titus i. 15), which may be true in conduct, but at present the belief may not be safely acted on with reference to the air we breathe, the water we drink, or the food we eat. Moreover, how is it possible for moral purity to be retained in such dens as those in which multitudes of our fellow-creatures pass their lives? The assertion, "As the home so the people," denounced as almost impious when first written, has come to be pretty generally accepted; but the homes in thousands of cases remain in the most wretched condition, and the natural results continue to follow.

The injury done to our agricultural population by the want of proper dwellings can scarcely be overestimated; in fact, the whole condition of this part of the people is a disgrace to the age. I must restrict myself, however, to the question of health. I have visited hundreds of cottages with rooms scarcely the height of a man, damp, cold, undrained, and overcrowded, with heaps of de-

composing matter around, and where, in short, everything was being done to counterbalance the advantage offered by Nature of a plentiful supply of pure air. In parts of the country where Portland cement and gravel, broken stone, or burnt clay are readily obtainable, a considerable saving in the cost of building may be effected by the use of concrete walls. It is absolutely necessary, however, that the concrete should be properly made and rightly applied; when this is the case, it is an excellent and enduring material; if otherwise, it is worthless rubbish. It may be mentioned, as it will give confidence to those disposed to employ it, that the Metropolitan Board of Works now allow the use of it within their boundaries, and that the Inclosure and Tithe Commissioners permit money lent by them for the improvement of estates, to be expended in the erection of concrete buildings. In both cases, however, the work is required to be done under stringent regulations. It is to be regretted that the number of builders who have applied themselves to the economic execution of such work is very small.

By lessening the cost of erecting cottages something is done towards inducing a proper provision of them. With good plans, wise superintendence, and the choice of proper materials, much may be done in this direction. Non-absorbent walls and floors are amongst the desiderata, and, above all things, such arrangements for the removal of the refuse that it shall not by any possibility contaminate the water supply.

Sound and healthful dwellings are required in towns for a lower class than have been yet thought of,—the multitude who are unable to pay more than, say, a shilling a week as rent. There is a large number of these who require only one room,—a man and his wife, without children, single men and women, and widows. There seems no valid reason why a part of the Peabody fund should not be applied to meet this want, and it is to be hoped the trustees will turn their attention to the subject at once.

The desire to produce cheap houses by speculators has necessarily had real results, that the efforts of the builder are all directed simply to that end, to discovering the means of erecting a dwelling at the least possible cost, not in providing to the utmost extent for the health and the comfort of the occupant. If the wages of a labourer are not sufficient to enable him, by the exercise of due prudence, to pay for a decent habitation, warm, dry, airy, and well drained, calculated therefore not to destroy his health and working power, and to send him to a premature grave, and his widow and children to the union to be maintained at the expense of the ratepayers, it is time they were made so. It is found to be wise and paying policy to provide houses with good stables, and pigs with healthful styes. Surely it ought to be thought necessary to do as much for the men who drive and feed them. Among minor evils, ill-ordered dust-bins should be mentioned as the fruitful source of sickness; decomposing matter, under present arrangements, being allowed to remain in them for weeks, sometimes months, to pollute the air. Better supervision is needed. If the occupants of houses were to see that all consumable matter was burnt, the danger would be lessened, and the quantity would be so much reduced that arrangements might be made for its removal day by day.

A vast deal of ill-health, to say nothing worse, results from the too early occupation of newly-built houses. In the suburban districts of London, and of many of our large towns, small houses by the thousand are planted on the ground, often on heaps of unwholesome deposits placed there to fill up hollows whence brick earth or sand may have been removed, are finished with painless rapidity, and, all reeking as they are, receive a family, often before the workmen have left. The danger involved was recognised long ago. An ancient foreign proverb says, as to a new house, "The first year for my enemy, the second for my friend, the third for myself." The speculative builder of to-day too often cares for neither friend nor enemy. The houses, like certain historic razors, are made to sell. To turn a penny is his sole object, and the buyer must look out for himself. Alas! for such a state of feeling. It unfortunately prevails in modern society to a much greater extent than is consistent with the right condition of public health, giving that word its full meaning.

Among the arrangements for furthering the object we have in view, facilities for recreation and amusement must not be forgotten. Amuse-

ment must be had, will be had, and if that which is rational and innocuous is not obtainable, less wholesome excitements will be resorted to. The provision of open and adorned places, picture galleries, social gatherings, flower shows, the practice of window gardening, facilities for obtaining books, for the enjoyment and the study of music, "penny readings," cricket, swimming, archery, drill, are all matters calling for the fostering aid of those who desire to see a good state of health prevailing, and would contribute their share in rendering the world happy, and leading to a higher type of manhood. Popular meetings for recreation have a further value as serving to bring classes together, counteracting the tendency to severance now in operation, and which has aided to produce the great danger that threatens society at this moment.

It is the opinion of some who have inquired, that we are deteriorating physically as a people; that the number of men, for example, rejected on physical grounds from amongst those who offer themselves as soldiers or policemen, is greater proportionately than it was a dozen years ago. I am not disposed to accept this belief in our deterioration without reservation. It may be, and, indeed, unquestionably is true, in the case of thousands of our fellow-creatures pent up in close courts, garrets, and cellars, without pure air and water, or knowledge which would lead to an improvement in their condition, and in the case of the thousands born of this class who go to lie prematurely the hospital and the graveyard. But there are other portions of the population of whom a different story may, it is hoped, be told. Still, the destruction of health and life by preventable causes is enormous, and we are again made to feel, by the belief alluded to, the vital necessity of continuous efforts to bring about a better state of things.

Every one may assist in his particular sphere in disseminating knowledge of the kind required, and building up a proper state of public opinion. By the exercise of this alone may we hope to obtain satisfactory laws, and to see those laws properly acted on. The want of education in what affects the human frame,—the operation of the agents by which it is influenced,—is unfortunately almost universal; if it were not so, laws to enforce sanitary requirements would be much less necessary than they are. Sanitary science should be taught to all from the earliest years in schools of every grade. Until this is more generally done, we shall go on, as now, destroying one another, and blind to the fact, obvious to a Latin poet 1800 years ago, that, "Life is not to live, but to be well." This great question of health calls for the primary and unremitted attention of statesmen and legislators; it is far above party considerations, far superior in importance to the great majority of subjects which monopolise attention. Without education and health no nation can advance and be happy, and to bring about those conditions should be the chief object of all government.

THE PRIMARY DEVELOPMENTS OF ARCHITECTURAL DISTRIBUTION.

By an advance that is easy, if not absolutely the most immediate, from the Primary architectural elements of Use and Construction, in the direction of primary combinations, we come to the Apartment; the form must be accepted here in as distinctly technical a sense as it was previously found convenient to assign to the *Room*. The Apartment, then, taken as the simplest form of architectural arrangement for human haunt or occupation, admits of contrasted forms as Interior or Exterior,—respectively typified by an open platform or a covered chamber. Such a single apartment of either class may constitute a structure in itself; or, with some enhancement of complexity, a structure may be composed, exclusively still, of apartments closed and covered, that have all to be entered as chambers for specific use and enjoyment, or of a set of distributions that quite as exclusively are made up of variously disposed serviceable arrangements, all fully open to the outer and surrounding world.

A public place, esplanade, or piazza, a system of terraces, a ghat,—may exercise the facilities of an architect as seriously as a palace, or a theatre, or a town-hall; and obelisks, monumental columns, ornamental gates, nay, triumphal arches and bridges, may be comprised under the same head of classification. It is not very apparent what more the "lovely-looking Ariadne" could have required for a "chorus"

or dancing-place in "wide-extended Cnossus" beyond a smoothed platform, with some seats, it may be, and, it may be, a podium and ascending steps; yet Homer assigns it to Dædalus, representative of all ingenious artificers, and expresses its formation at first and its imitation by the renowned metal-worker Vulcan on the shield of Achilles, by words peculiarly expressive of care and elaboration. With such a work may be associated, under contrast of the introduction of the vertical element, the Greek Lesche, or lounging-place for the open air, of which the essential characteristic was a wall of such carefully adjusted orientation as to provide a shaded or a sunny side throughout the year, precisely at the times and in due degree when sun or shade were welcome. Further illustrations of this subject will be found in the too short-lived Museum of Classical Antiquities of Edward Falkener. In a Lesche for England, the east wind would probably require to be reckoned with at least as accurately as the sun.

As an illustration of structure of most purely interior distribution, what more is required than the dwelling-house, of which too many examples are around us, without porch, area, verandah, balconies, or even parapet?

Half way between structures, so theoretically single in principle, and those which combine both forms, of interior accommodation and exterior also, are the Apartments that similarly may be called Mixed or Equivocal, as scarcely susceptible of division, but partaking equally or in various but marked proportion, of either characteristic; such are platforms partly covered, or chambers partly open or capable of being opened, or closed at will. This class comprehends unnumbered varieties, and among them many of the most beautiful inventions of the architect,—porches and porticos, arcades and loggias, and balconies and vestibules. It is, indeed, in these combinations that the architecture of apartments as exterior has most frequent if not most important scope. The opportunities for the play of proportion are endless here in the details of such apartments themselves; and still further and more important are the responsibilities of consistency and expression involved in the proportions of such apartments, as adjuncts to the mass and distribution of a main building.

The analogies between artistic structures and natural organisation can never be too steadily borne in mind and kept in view, and here present themselves again, and are to be insisted on with especial force; the combination of closed with open distributions,—apartments as technically defined,—corresponds to the union of the "free appendages" of the physiologists,—the attached limbs and branching members, with the central enclosure of walled cavities that constitute the main trunk of the body. In animal organisation we find every variety of proportion in number and extent between these contrasted elements of composition; and Architecture is bound no less to be as harmonious in result, and to establish a parallel proportion that shall be no less agreeable, than consistent with the characteristic purposes of the structure. The open courts and ranges of porticos that enclosed symmetrically the central sanctuary of the temple of Jerusalem, are to be regarded by the architect as they were by the worshippers, as no less parts of the temple; the courts, indeed, are in one place distinctly referred to by Josephus as the "hypæthral temple." The terraced steps and inclines, and open arcades in front of St. Peter's, at Rome, are open "apartments," by no means too extensive to be out of proportion to the vast structure they lead up to, however lacking the last satisfactoriness of articulation with the adjuncts of the main entrance. And on the other hand, the outer balcony above this, that belongs essentially to the same category, and that should naturally have been pronounced with largeness and dignity to correspond with the purpose of its annual ceremonial occupation, lamentably fails. In our own St. Paul's, the dignity and proportion of lateral and western porticos are admirable in themselves,—on the western front especially so admirable, that it must be noted as one of the most wanton sacrifices of rarely realised architectural beauty in Europe that the effect of the graduated approach is utterly frustrate by the interposed screen of heavy railing. Doubtless, if this were to be removed all round, the detrimental weakening of the general basement by the openings perforated to light the crypt, would be unhappily obtrusive; but on the front, at least, the disadvantage would be more than com-

pensated, as well by the giving freely to the eye the full height of the front and its relative divisions, as more especially by fair exhibition of the features that at once express and soften the sense of a transition, that symbolise the intercourse and intercommunication of whatever should be worthy and sympathetic within the consecrated precinct and without. The atrium of St. Ambrogio, at Milan, is an early and admirable adjustment that is but unsatisfactorily replaced by the secluded and unsymmetrical cloister of later cathedral distribution. This is, indeed, a transposition involving questions, not of the design of a single structure, but of the grouping and association of several. A stately entrance to a close is in like manner no more a portion, or development of a portion, of a cathedral, however advantageous an accessory to its dignity, than the *propylon* of a Greek peribolos is a member of the temple it gives admission to. At Athens it will certainly appear that the position and proportions of this detached open apartment were adjusted with studious and ingenious references to those of the Parthenon; but development proper attaches more closely to its centre.

It has become so habitual, for good reasons, as to seem almost instinctive naturally, for both student and expositor to draw back from the employment of the term Development. It is its lot to share not wholly without cause in the prejudice that attaches to Evolution, so abused of late years as titular of a process that aspires to bring all organic nature forth from whence it assures us at the same time that no germ of organisation ever existed,—to expound the marvel of effects as emergent under no obligation to a cause that is their equivalent, at all. Analysis, however, that aims to be exact, if not exhaustive, must needs be conversant with the process, only more modestly conceived, and may not be quite indulged in a preference for dispensing with the term.

If we commence with the simplest exterior element, a plain platform of whatever dimensions and proportion, it becomes strictly interior only when surrounded by a wall, and covered by a roof: remove a side, and it appears the equivalent of a porch; remove opposite sides, and it presents the aspect of a Roman tablinum; pierce the roof, and we have the Roman atrium, or an hypæthral chamber; change proportions or absolute dimensions, and the same elements are transformed from the type of a saloon to a hall, to a gallery, to a corridor.

The Pyramids apart, and those only reserved under strict qualification, no structures with claims to the highest and noblest artistic expression were ever more simple in their general scheme than the Greek temples; at the same time that none have ever embodied results of profounder study or finer feeling. In its essential elements a Greek temple is an apartment—a cella—for the preservation and exhibition of a single statue of its god, founded on a basement, and covered by a roof,—this and no more.

The apartment, with few exceptions, and these for the most part only apparent, is uniformly an oblong square on plan, having the entrance at one end, and lighted sometimes by the same opening, in other and more important instances from above, by arrangements of which the difficulty and mystery have surely been exaggerated. Such a distribution is obviously most suitable for the display of a statue, but it is too uniformly adhered to not to warrant the conjecture that it had the sanction of primeval traditions; and if so, like the cruciform plan of cathedrals, it can scarcely have been disconnected with symbolical considerations that might yet be plausibly discoverable. It is, then, the essential simplicity of an important building that should consist mainly of a single chamber, and then only of its simplest and most natural adjuncts, while it claimed and commanded the fullest elaboration of refined art, that makes the Greek temple a most appropriate subject by which to exemplify those general principles—that in virtue of generality and very largeness of application, must also be the simplest—of architectural art.

These structures have the further claim to their position, as marking the true starting-point in history of the architecture of progressive civilisation; the lineage of every style of later date that can claim the honours of a style—even of Indian and Arabian—if traced with accuracy upward, ends at last in these, as certainly as the base-mouldings of shafts at Westminster repeat and own relationship to Ionic bases of Attica. After most liberal reservation made for imperfectly measured and recorded works in Egypt,

there remains a gap as marked between what was there done and what in Greece at its very earliest recoverable period, as serious as between Greek poetical mythology and the wearisome Orientalisms which only the antiquarianism of schools, mistaking body for soul, can persuade itself to be not merely earlier, but quite as good,—a chasm as utterly unbridged as between the Fæna of any pair of geological epochs, which it is the tendency of modern science not so much to prove as to induce us to accept, without a particle of substantial proof,—for outgrowths of continuous development.

In the matter of artistic development, the one factor that no analysis can demonstrate to be of necessity, and yet that is all-important, is the manifestation of genius,—the very outbloom of the originating power "of great creative nature,"—in an individual, in a group, in a succession. When this agency has appeared and has done its work, history peers busily and usefully enough into its antecedents and circumstances; yet can it but flounder falsely when it presumes to say, as on a time it will, that not only so it was, but so it must have been. This is the element,—the embodiment in one man consummately of the best ideas and tendencies of the time it may be, which still but for that one man would have remained disembodied, or been speedily dispersed, that has been cast in at every great transition of art,—at the genesis of Gothic no less than of Greek architecture, independent utterly of prevent control or calculation. It was much in this light, to recur to the Philebos, that the critical definition of every noblest art presented itself to Plato,—*"A gift of the gods to men, as is very clear to me, sent down to us from some direction by the gods by intervention of some Prometheus, along with a certain most luminous fire; and the ancients who were our superiors, and dwelt nearer to the gods than we do, handed down the tradition"* (Plato: Philebos. sec. 18).

The primary oblong plan of the naos,—to re-turo,—is the centre of the development, and controls all proceeding developments and outlines; the application of a lateral portico, as in the Erechtheum, is exceptional; I am told, indeed, that the carving of the elaborate architecture of this north door is so inferior to the exquisite work of the other mouldings, however engravings seem to decline to reduce their own importance by betraying the fact, as to indicate a long posterior date. The primary addition to the typical naos is made by extension of the oblong plan to comprise a porch, or vestibule,—a pronaos,—an open apartment in advance of the doorway, supported by *antæ*, or by columns *in antis*. The result is a temple *in antis*. By advancing the plan still further, and supporting the front by free columns, a portico is obtained in addition to, or substitution of the pronaos, and the structure becomes a Prostyle temple. In point of use, the portico might supply shelter and shade for functionaries and votaries, as well as for subsidiary sacrifices, statues, or other dedications; but its essential contribution to the dignity of the structure is that it withdraws the naos from immediate contact with external accidents, and in a manner secludes it from unprepared intrusion. It is the ceremonious intimation of retirement not idly to be disturbed,—of a blending gradation between contrasted moods of mind. A temple of which the oblong plan comprised such a portico at either end, was called *Amphiprostyle*; the title, however, does not define the important differences of extent that might exist between the two porticos, and assist with some other adjustments to render the proper front unequivocal.

The next and a most important development is the extension of the roof, not only endways to shelter a portico, but laterally to cover wings or external ambulatories, between the walls of the cella and a row of columns that return the line of those of the porticos, and so complete a peristyle,—the temple so enhanced acquiring the character and name of *Peripteral*.

Sometimes more rows of columns than one were applied on the flanks, and more than two on the fronts; and in peculiar cases,—a remarkable and important example is among the at present unpublished archives of the Society of Dilettanti,—the plan was spaced as for a double row, but the interior line was omitted on the flanks at least, or entirely.

The little temple of Themis at Rhamnus, in Attica, is a simple oblong nave, extended by a portico, *diatyle in antis*; that is, with a roof supported by two columns, between piers, that terminate the produced lateral walls of the cella.

In the little temple of Artemis Propylæa, at Eleusis, we find the same arrangement, with the addition of a similar portico,—distyle *in antis*, at the rear as well as front of the structure.

In the plan of the Ionic temple on the Ilyseus, free columns take the place of the ante, which are set back behind them, and there results an Amphiprostyle plan.

The plan of the temple of Nemesis at Rhamnus, of that of Theseus at Athens, and of many others, is the plan of the temple of Artemis Propylæa, surrounded by a general peristyle that envelopes it front and flank. In these larger temples, the cella, with its porticoes and proper basement and step, is placed upon a larger general platform or basement, of which the lateral extensions form the stoblate that bears the columns of the peristyle; and cella, porticoes, and peristyle are covered by the general span of one common roof.

The plan of the majestic Parthenon exhibits an Amphiprostyle cella—which, however different in proportions, is still of the same class and nature as that of the temple on the Ilyseus; that is to say,—each portico consists primarily of a row of columns in advance of the ante which have no columns placed between them; the difference in the projection of the ante in the two cases respectively is matter of proportion,—a more essential difference is the division of the cella by a cross partition into two unequal chambers, each with an entrance from its proper portico.

Here, again, the amphiprostyle cella has its proper steps and basement, and stands therewith upon a larger and deeper basement that bears the outer colonnade,—colonnade or peristyle and cella being comprised, as in all instances, under the double slope of one common roof. The scanty remains of the temple of Jupiter Olympius at Athens are sufficient to disclose that here the flank colonnades were double, and that by a still further application of the same rule of distinction there was a descent of a step from the inner to the outer stoblate.

And so the simplest possible fundamental architectural scheme was extended successively by the simplest possible modifications, yet withal the most significant, of rudiments first, and then of members already existing,—their duplication and reduplication. At the same time, the primary generative notion was never confused, covered up, or superseded, any more than in the marvellous development of the spoken language of the architects, was the value of a primary syllable obscured by accretions of syllable on syllable that clustered around it, each contributing a restricted but special significance, each taking its place with pathological sensitiveness of harmonious collocation, and altogether making up at last a fully inflected and expressive word controlled in pronunciation by one dominating accent. The architectural language of the Greek grew under observance of the same laws as his spoken language, and his poetical materials and forms; barbarism and discordance may lie buried at the roots, and ethnologists may dig and find them there, or trace that there they have been, but they were only ever to be found there at all to become rapidly refined almost beyond recognition by industrious and sagacious study, by enthusiasm for Beauty, and reverence for the Truth that lives in the eternity of Nature.

SANITARY PRINCIPLES OF SCHOOL CONSTRUCTION.

Now that new school-boards are preparing for the construction of new school-rooms, it is of importance that they should be apprised of the sanitary defects that require amendment in the greater proportion of those existing for the elementary schools in this country. Medical officers of health have concurred in declaring that the common elementary schools, as now constructed and conducted, are the frequent centres of childhood epidemics. An excess of upwards of 7,000 deaths in the metropolis, and of upwards of 50,000 annually throughout England and Wales, in the school stages of life, were pronounced by them, on the observation of the working of particular schools within their province, to be largely attributable to the structural condition of the school-rooms, and to the modes in which the children are kept in them.

The chief sanitary defects of these schools are, in my view—1. Defective ventilation; 2. Defective warming; 3. Bad drainage and foul latrines; 4. Want of means of enforcing personal cleanliness; 5. Bad lighting; 6. Bad arrangements of

desks and seats; 7. Want of proper means of gymnastic exercises; 8. Insufficient, and ill-paved playgrounds. I would submit that it is important that school-boards should require, in the competition for plans, that these evils should be first specially considered and provided for, and that the architectural designs and elevations be made of secondary consideration.

I will, in the first place, treat of the warming of the schools, as that largely influences their ventilation. To me, it has always been most painful to observe the condition of children in winter-time in the common schools, going there in cold and wet, in driving sleet and snow, frequently ill-shod, and commonly ill-clothed,—kept in the school with feet and hands painfully cold, fingers often so benumbed as to be scarcely able to hold their slates and pencils; the open fires at one end of the school, not freely to be approached, and when approached, the warming or heating on one side, "roasting in front and freezing behind," so as to give inflammations or colds from the disturbed and unequal circulation. The confinement of the children for five or six hours in such conditions, overtasked mentally, and painfully constrained bodily, are surely evil conditions, requiring active intervention for their relief. One consequence of the defective warming is, that doors and windows are shut to keep out the cold. Then comes the pernicious effect of confinement of the children in the atmosphere polluted by their breath and by transpiration from their skins, usually unwashed, or only hands and face washed, and from dirty clothes. As a relief, some of the windows are in part opened, and the cold air is let in for ventilation. The corners where this is done have been called "rheumatism holes." Sometimes, when the windows are kept closed, the confined air is heated to an extent that creates perspiration, even in winter-time. Eruptive diseases are often consequences of precedent functional derangements, and when there are outbursts of epidemics in children's institutions or in large schools, they frequently occur among the children grouped at one end, and the first case observed is a new comer, who has been for a time the centre of the group attacked, the infected breath having been pumped out upon the surrounding children for several days before the eruption has appeared on the new comer. In general hospitals, it is known, that if they are well ventilated, cases of typhus fever may be put in every second or third bed, with an interval of about 4 ft. between each bed. Cases of scarlatina, it is considered as settled, must be placed at wider intervals—as of every seventh bed,—but if the ventilation be defective and confused, a foul atmosphere is created which will endanger the nurses. I submit that the first object is to improve the method of warming as involving the method of ventilation.

Of the modes of warming, those by hot-water pipes and iron surfaces are of inferior, and sometimes, when for high heats, are of pernicious effect, and are very expensive. Besides, they are apt to warm only the sides of rooms, or the upper parts of them, and to leave the feet cold, unless an inconvenient and objectionable degree of heat is created over the whole room.

Observing some ragged boys at night grouped upon a particular street-pavement, and apparently enjoying themselves, in very inclement weather, I found that the pavement on which they were assembled was warmed by a baker's oven beneath. It is observable that market women, with a foot-warmer, sustain very inclement weather. The like facts, which I might multiply, appear to me to lead to the conclusion that there are no means of applying warmth that are so economical as by applying it to the feet. There is extending experience of this in the use of hot-water bottles, and vulcanised-macintosh hot-water bags.

The class of facts on this topic lead me to recommend that we should adopt the practice of two empires, of Rome and of China.

The ancient Roman plans of floor-warming are displayed in the remains of villas found in the chief seats of their occupation in this country. Their hollow floors were mostly made by square slabs of stone, or of large tiles, supported by stone pillars 1 ft. or 8 in. high, or more, set upon a lower stone floor. The upper floors were covered with concrete, and often ornamented by tesserae. Some of their hollow floors in this country were evidently warmed by coal, from the remains of coal scowls in others they were warmed by wood. The fireplace was, from the coal-warmed flooring, mostly a small cylinder of red earthenware, containing a mere hatful of coal, through which

the air was led by a down-draught through the hollow of the floor, the draught being created by an upcast flue on the side of the chamber opposite to the fireplaces, the tall chimney-flue acting as the longer leg of an inverted syphon. In some of the largest Roman constructions of this species, the heat appears to have been led underneath the long, distinct channels. But in some the warming was by the diffusion of heat through the floors, amidst the uprights, which, I conceive, would be done by low heat, led slowly, but long applied.

I have been unable to get any detailed accounts of the Chinese methods of construction for the purpose, but the testimony is strong and decided that the floor-warming there is the most comfortable that has been experienced by Europeans. Marco Polo, the early traveller, notices it as extraordinary. The warming is effected with a comparatively inconsiderable amount of almost any sort of fuel. I am informed that in the barracks in China, constructed on the English principle of the open fire men were frost-bitten, whilst the Chinese, with their mode, were perfectly unharmed. The abuse of the method of warming will obviously be in getting up unduly high heats for the whole of the air of a room. The warmed floor, in its proper use, however, appears to me to have the peculiar advantage of enabling a colder and thence more condensed air, a better quality of air, to be breathed than any heat-expanded air.

To those who have not had occasion to attend to the subject, it may be observed that if a given quantity of air, with a given quantity of oxygen, at a given temperature, be expanded in bulk by heat,—say a fourth,—the inspirations of the lungs must be quickened in proportion, to obtain in the same time the same quantity of oxygen. In newly warming the Palais de Justice, at Paris, a warmed surface was placed for the feet of each judge. If the warmth were applied to the whole body so as to raise it to the same temperature given by the foot-warmer, the air breathed being more expanded would, I consider, be inferior in quality for the health. It is proper to mention, as respects the higher class of female schools, boarding schools, great pain is inflicted, and bodily disorder occasioned, by heads kept heated by unduly protracted mental labour, and feet kept cold by bodily inaction.

Before it became a practice to use foot-warmers in railway-carriages, the passengers were accustomed to close the windows as completely as they could. Since foot-warmers have been introduced windows are allowed to be more widely opened.

The effect of foot-warming is, then, to enable the body to sustain, with less discomfort, the impact of cooler currents of air. Foot-warming will of itself allow of doors and windows to be opened with less annoyance, and of itself will be conducive to freer ventilation. But in addition to the warmed floor I would propose the introduction of open fireplaces, on Captain Galton's principle of warming with air pumped in that is fresh, as well as warm, and the more active removal of vitiated air through the smoke-chimneys. I have long advocated the principle of floor-warming; but I find it expedient to propose particular means for the purpose, as architects will not be at the pains to study the Roman methods of floor-warming.

I will now describe the tiles and the support, with which I propose to effect the object efficiently and economically.

The tile forming the hollow floor may be of concrete, or of earthenware, or of slate, to be tongued or rebated at the sides, so as to fit into each other, and, when cemented, not be easily shifted, or so as to obstruct the passage of highly-warmed air or smoke, if accidentally loosened. The upright supports are made with tongues to lock in at the corners of the tiles.

The tile and the support used as a cross-tile will, I submit, serve for the construction of walls, and attain more perfectly the sanitary ends I proposed for the hollow brick construction of the walls of houses. It may also be used for roofs as well as walls, in which case iron ties are to be used to give it cohesion, and iron uprights for bearing-power, on the Crystal Palace principle. If walls of ordinary construction be made with non-absorbent surfaces, there may be sometimes unpleasant condensation on such surfaces, because they will be sometimes colder than the dew point of the air. If, however, contact of the outer air with the inner part of the wall be prevented by the interposition of a layer of confined air, the inner surface of the wall will never be much colder than the air of

the room, and will not, therefore, condense moisture from it. The inner glass of double-paned windows does not become covered with hoarfrost for the same reason, the inner pane being nearly as warm as the inner air; it remains clear when common panes are obscure.

The tiles for this purpose may be made of earthenware as well as of concrete, but most cheaply of concrete which require no burning, and most readily receive exactitude of form. With about 1-6th or 1-7th of good Portland cement, or with General Scott's new preparation of lime clay and sand, called *colenite*, tiles and the supports may be made stronger than the common building stones. For leading the warmed air in any direction, and better diffusing it on admission, in place of the upright pillars, upright tiles with rebated joints may be used.

In some cases, in the place of tiles with rebated joints, tiles with overlap joints may be found eligible for the application of rapid second mechanical vertical pressure in construction.

The concrete tiles may be moulded in the yard, and kept to harden there, and to be tested there, and then carted to the spot and set up rapidly, without any other mechanical process there. The advantage of the tile construction of walling is, that with the cross-ties included, not above one quarter of the material will suffice to give the requisite strength. Only one quarter of cartage and expense of conveyance is required, and the total expense of the construction, iron supports and cross-ties included, is less than the common cost of construction.

If earthenware tiles are used, they pack closer in the kilns, and closer and lighter for carriage than any solid materials. The form and construction of the tiles gives them the maximum of strength, of density, and non-absorbency or dryness, with the minimum of material and of weight. Some of the advantages of the hollow wall construction of tiles, in respect to non-conductibility of heat, are like those of the double window,—they will be cooler in summer and warmer in winter.

One advantage of the tile construction is, that from the very considerable saving which the plan effects in the material, a proportion may be given to the improvement of the tile. Its flat shape admits of power being applied at a ready and cheap rate by a second pressure when the material is half dried, to give it great density of substance and exactitude of form. With this second pressure they may be made absolutely non-absorbent, and to throw off driving wet as well as ascending wet, and may be made absolutely damp-proof. The inner tiles would be washable on the surface,—in itself an important sanitary quality. They may be coloured of any colour that may be deemed suitable, and that with a great economy over the usually non-washable paper and absorbent plaster. By these means the warming and, indirectly, the ventilation, may be most cheaply and efficiently provided for.

A better conception of the eligibility of the principle of construction proposed will be obtained by examining and considering the specimens of the tiles, rudimentary as the specimens produced yet are. The ends might, and the chief advantages claimed for them may be thus summed up:—Giving maximum of strength of each tile, with the minimum of material; a maximum of defensive power for shelter and durability at a minimum of cost; a cheap and salubrious means of diffusing warmth in winter, and of defence against excessive heat in summer; non-absorbent and washable interior surfaces, defensive against vermin and noxious deposits; means of cheap and permanent washable colouring and ornamentation; facility of transport; rapidity of construction and alteration; cheap, and dry, and smooth surfaces for play-grounds. In the selection of materials for the tiles, those of the greatest non-conducting power are, of course, to be preferred. The common tiles and bricks, being usually absorbent of moisture, are rapid conductors of heat, and when we were consulted at the General Board of Health we advised that they should not be allowed, but only wood for the floors of schools, inasmuch as the common tiles, instead of giving warmth to the feet, aggravated the evil in question by taking warmth from the feet. I take it that the foremost authority on ventilation, from the long and impartial attention he has paid to it, and the trial he has conducted, is my colleague of the Institute, General Mervin, and he has given decided testimony on trials in favour of Captain D. Galton's warming and ventilating chimney. I propose to submit to the General

for his opinion this method of floor-warming, as to the modifications it may require in connexion with that important instrument, the chimney-ventilator, which I have got successfully applied in some model cottages.

There is a very frequent and serious defect in the construction of the common schools which requires to be guarded against,—namely, the bad distribution of light. From a paper transmitted to me by the excellent sanitarian, Dr. Varrentrapp, of Frankfort, it appears that from the insufficiency of light, and from the bad division of light, in the schools in Germany, nearly a third of those who remain in them during and beyond the secondary stages, are subjected to short-sightedness. Professor Leibrich, our most eminent oculist, tells me that the injury is always done by the front light, and that the light should always be got in from the left side, and that in towns where such light cannot be obtained, it should be got, as the next best, from the back of the desk, and never from the front. A great deal of distortions and curved spines are, as Dr. Varrentrapp shows, occasioned by the wrong adjustment of seats,—a topic, as well as others, of the wall colourings and school-fittings, beside my immediate purpose. I consider that schools ought to have more of window-space; of windows made with very thick glass, which is economical as saving heat, and is, moreover, advantageous, as saving the transmission of sound from the streets.

Enough has been stated to show that the school, properly considered as an efficient implement for training the young, is not the mere barn with an architectural elevation, according to the common conception, but, for the avoidance of serious evil, as well as for the attainment of the requisite good, is an implement which must be carefully fashioned by the best practical sanitary science.

EDWIN CHADWICK.

THE IMPROVEMENT AND PROVISION OF HUMAN HABITATIONS.

LEEDS CONGRESS OF THE SOCIAL SCIENCE ASSOCIATION.

In the Health Section, Dr. Acland, of Oxford, read a paper entitled, "The Sanitary Care of Villages and Cottages." In the course of it, he said that, *mutatis mutandis*, the same sanitary care should be bestowed on a cottage in the country as on a house in a town. In the case of a well-ordered town, the community provides water for its members, and removes their refuse for them. Not so in a village. The chances are in many districts that every cottage or every other cottage has its well; and, there being, of course, no sewers, has its own cesspool. The expense and the risk from want of organisation are both multiplied. It may be said that our scattered populations are not worth the care, or that, if worth the care, then the supervision would, in practice, be too costly: so that the care of hamlets and villages is either impracticable or visionary. Issue may be joined on both these objections. The rural populations are becoming nurseries for town populations. They cast into the towns either a strong, decent, manly people, or an enfeebled progeny, brought up unwisely. The rural districts contain no less than 9,803,811 persons, having increased in the last ten years by 668,428. With respect to the purely rural districts, the great powers of the Public Health Acts at present reside with vestries and guardians. In many cases, therefore, they are indirectly in the hands of the very class of persons who require guidance and help. Herein lies a great part of the strength of the Local Government Board. It enlists in the cause of public health, understood in the widest sense, every ratepayer who votes on matters of parish organisation, and the medical men of the poor. Will they not? Will they apprehend their own material interests. We may not doubt that, with the progress of education and self-government, they will. What has to be done in these difficult cases must often, I am convinced, be done by the people, with the aid, but not by the compulsion, of the law. To revert to the specific proposition from which I started,—the cottages in rural districts should be scavenged by the community and not by the occupier.

A second paper on the same subject was read by Mr. P. H. Holland, and a discussion followed, in the course of which

Dr. Stallard objected to the principle of amending private property at the public cost.

He regarded the experiment that has been made at Liverpool as a most lamentable failure. At no time had Liverpool been in a more unhealthy state, and never less free from epidemic diseases than within the last two years, notwithstanding all the money that had been expended. He did not therefore think that the evil should be remedied in that way. A law was already provided for the destruction of houses unfit for habitation. But there were two parts of this problem. The best house might be made unhealthy by the habits of the occupant; and at the same time it must be borne in mind that the very worst roof in the country could be made decent and comfortable by the habits of those occupying it.

Mr. G. W. Hastings commented on one of the topics referred to by Dr. Acland, viz.,—as to who are the persons to be charged in rural districts with the execution of this work. Where he lived he had painful evidence not only of the evils of the present system, but what would be the evils if the system which the Sanitary Commission was attempting to carry into effect were adopted. He pointed out the faults of the present system, and said the only chance they had of an improvement with regard to the sewerage, the supply of water, &c., was by having an authority acting over large areas, and, therefore, not coming into contact with some neighbouring authority.

Mr. Rawlinson, C.B., speaking from a statesman's point of view, said that the question of providing the best form of dwellings for the people had been neglected, so far as his knowledge went, from the earliest dawnings of history. He knew of no nation that had paid attention as it ought to have done to the dwellings of the lower class population. He spoke with a full knowledge of the habitations of this country, and he spoke also with some knowledge of the houses of the labouring classes upon the Continent and even in America and India; and the sum total of the story was one of utter and gross neglect,—one which generates a mass of misery, crime, and disease that was indescribable. That being the case, whether socialism was to come into play, whether the rich were to take something from their wealth to aid the poor, he was not there to tell, or to speak of the form in which the work should be done. He was simply there to say that there was no safety for any State; that there was no safety for any people; and no security for any Government, until statesmen have learned that lesson and worked out the problem how it is to be applied. He would point out what had recently taken place in France. What had impressed upon the people of that country the untruthfulness of character which they possessed? They must attribute it to the gross ignorance in which the people revelled. Statesmen knew they could tell them any number of lies, because they knew no better. But raise that population, give them proper dwellings to live in, educate them, give them freedom, and no statesman would dare to tell them those falsehoods. As to the question of securing the best dwellings from the building point of view, one of the great evils in the construction of houses in this country was, first of all, utter regardlessness of the site, the subsoil, the material, and the mode of management subsequently. Now, if they were going to build a house for themselves, whether a villa, a mansion, or a palace, the first necessity was to have a dry subsoil. If not naturally dry, it must be made so. The second necessity was that the area must be isolated from the subsoil, and the best and cheapest means to accomplish that was to use concrete. Then they ought next to put in a damp-proof course, either made of brick or of stone, which was not costly. If they had a basement story, they ought as much as possible to isolate it from the ground. Make a dwarf wall around it, and keep off the damp from the basement walls. Then the rooms ought to be arranged to secure ventilation. Going afterwards into details, Mr. Rawlinson made some very complimentary remarks with reference to the *Builder*.

In the Economy and Trade Section, on the question, "Is it desirable that the State or Municipality should assist in providing improved dwellings for the lower classes; and if so, to what extent, and in what way?" a paper by Mr. James Hole, was read. At the outset it referred to the great deficiency in the accommodation for the poor, and after commending building societies, which, however, did not meet the deficiency, he referred to the two Acts passed in 1851 and 1866, the one to encourage the establishment of lodging-

houses by the authorities, the other to enable the Public Works Loan Commissioners to lend capital to erect improved dwellings for working men. He approved of the principles of those Acts, but contended that the capital lent by the State should be advanced at a lower rate of interest, and that a much larger proportion of the cost of the improved dwellings should be advanced. He recommended that the scale of repayment should be so constructed as to enable those who wished to become owners of their own dwellings, and illustrated the principle of the experiment made by the Model Cottage Society of Leeds a few years ago.

Mr. T. B. Smithies, the excellent editor of the *British Workman*, read the next paper on this subject, and referred chiefly to the shocking crowded state of the dwellings in London, and the fact that with the carrying out of great railway improvements, masses, equal to the population of large county towns, had been turned out of their dwellings, without any home, in many cases, whither they could go. He stated that Prussia had for years devoted itself to the improvement of the dwellings of the poor, and considered that England should do the same, and see if it was not practicable that the Water-lot and Peabody schemes could be extended in the most populous parts of London, and that if they could not get little cottages with gardens, why could they not adopt the Scottish system of holdings or flats?

Mr. Burnham Safford also read a paper upon this subject. He considered the scheme of preventing typhus spreading by the establishment of wholesome dwellings and the starting of an industrial dwellings company, was creditable to the town of Leeds. If intemperance was the origin of vice, idleness, and crime, so also were, surely, hovels devoid of sanitary and other comforts the origin of intemperance. Physical and spiritual degradation followed one upon another, and consequences unnatural to the ordinary state occurred, and we had the "descent of man backwards." Means for procuring improved dwellings having been provided by the Labouring Classes and Dwellings Act, 1866, it only remained for the Legislature to prevent a good measure from becoming virtually a dead letter.

In the course of the discussion which followed, Mr. Daglish, of Newcastle, said that the Newcastle Improvement of Dwellings Company had declared a dividend of 5 per cent., after putting by a fund equal to 10 per cent. upon the whole capital for depreciation in value. He felt certain 8 per cent. could be realised upon workmen's cottages, and while that could be done there was no need to go to the State for aid. If proper care were exercised, workmen's dwellings could be made to pay. He asserted that the State had already given sufficient and necessary assistance in this respect, and he disapproved their going to the State to borrow money. As to the question of the municipality assisting the erection of such dwellings, he thought they could not well do so, as in many cases members of corporation felt they were coming into competition with private enterprise. This difficulty had been experienced in Newcastle, and the work had been left to private enterprise.

Dr. Gairdner, of Glasgow, said there were, in his mind, great difficulties in the way of the State or the municipality building houses for the working classes in the room of those displaced by improvements. It would, he said, be wrong for the municipality to build a similar class of houses to those displaced. In illustration, he said, in the city of Glasgow there were 100,000 houses, 25,000 of which were occupied by persons at a tenancy below what it was possible to construct or hold an ordinary dwelling. The majority of them were below 5l., some even 4l. 10s. 4d., and even 3l. It was impossible to get any place to accommodate a family with anything like comfort, even if it were only one room, under 5l. Supposing some great commercial operation should displace a number of these houses, was the municipality to replace them with a similar class of houses, a class below the line of sanitary comforts? For if they were not to do so, they could not replace those houses thus removed. The working class of Glasgow had become so debased by the evil influence of miserable dwellings that they could not rise to the idea of proper house accommodation. The remedy for removing the present low class of houses was to let the working classes understand that they must raise their notions of accommodation. If such a class knew that the municipality would provide dwellings for them, there would be no end to it. The duty of the municipi-

ality was, rather than assist in erection, to destroy these dwellings as rapidly as possible. They should remove them as rapidly as possible, but he would recommend a gradual process. Much had been said as to the advantages of the flat system. He admitted there was a great convenience in it, but there was danger in it. The danger was this,—it accommodated a large population upon a small area, and this led to the generation and increase of fever. If they adopted this system, they must do it upon a conditional system. He concluded by repeating that it was the duty of the municipality to pull down the low class of houses as quickly as possible.

Ultimately the following resolution, moved by Mr. John Holmes, Leeds, seconded by the Rev. H. Solly, was passed:—

"That the Section recommends the Council to take into its consideration what legislation can be taken to improve and render more effective the Public Health Acts, giving power to close or remove property found unfit for habitation; and, further, by what means statistical information could be obtained as to the experience of the various companies, societies, or other organisations which are engaged in providing dwellings for the working classes."

THE HEALTH OF OPERATIVES IN FACTORIES AND WORKSHOPS.

In the Health Department at Leeds, on the special question for discussion, "What are the best means of promoting the health of operatives in factories and workshops?" the first paper was read by Dr. J. H. Stallard, who said the chief point was to keep the air-supply pure; and he maintained that the death-rate and the kind of disease existing proved that the air in many cases was impure. A sufficient supply of air was capable of reducing the deaths resulting from pulmonary disease, and this fact he illustrated by a reference to improvements that have taken place in barracks to secure ventilation. He wanted, he said, to establish the principle that factories and workshops should be so constructed as to assimilate the condition as near as possible to that of the open air, with provision only for protection against rain falling and violent draughts. To protect ourselves from draughts and rain was all that we really required. All ventilation proceeded under the supposition that only a certain amount of air was required, whereas the true air-supply we needed was only to be obtained by living in the air. He exhibited a diagram of an improved method of ventilating hospitals, public buildings, and dwelling-houses, and in speaking of it said that if we wanted to place our workshops in free contact with the open air, we should be compelled to adopt the principle of numerous small openings, and must rely upon the laws of diffusion and connexion for a sufficient and complete interchange. That was, we must protect our apartments from the direct pressure of the wind, and yet provide a large surface with which the communication with the outer air should be free. Laws of diffusion and connexion were sufficient to insure interchange even in the stillest atmosphere, if only we gave them sufficient opportunity for acting; and the problem was thus reduced to the question as to the largest surface of our room sides, which might be perforated by innumerable small openings, so placed as to be free from any outside pressure of the wind. Of course we could not perforate any of the sides, and we had only the top and the bottom. It would be expensive and difficult and needless to perforate the floor, and thus we were driven to the alternative of perforating the ceiling. If we protected this perforated ceiling from rain, and exposed it nowhere to the direct pressure of the wind, we had succeeded in placing the workroom in free, complete, and immediate contact with the outside air, and we should have given the principle of slow diffusion full play. No great volume of cold air could possibly be driven down on any side of the apartment, whilst the front exit was provided for the warm and vitiated exhalations from the lungs and body, and for any unwholesome products of the manufacture carried on. There was no disturbance in the atmosphere of the room sufficient to interfere with the natural rising of the vitiated products to the ceiling, and in the plan he had proposed there was nothing to prevent the escape of those products into the air chamber, from which they were at once carried away by the horizontal current passing through. The arrangement was simple. Every room should be provided with a double ceiling, the space between being in free communication with the outer air on all sides. The top ceiling was either the floor of the room above, or the

roof—the lower ceiling was made of finely perforated zinc, or oiled paper. The air chamber should be large enough to admit of being swept out from time to time, and the sides might be made of perforated bricks of various colours and shapes. This plan did not interfere with the employment of opposite windows and ordinary means of warming rooms. The sole object was to maintain the principle of living in the open air, under all conditions, whether in winter or summer, day or night. It was beyond the control of any one to cut off the wholesome and necessary connexion. It was a principle which, in his judgment, was as necessary in a bedroom as in a drawing-room, and as necessary in a factory as in a hospital. It was a principle which had been ignored by architects since the Roman era, but he would observe that the courts of the Pompeian house were but a more open arrangement than the one proposed. He believed that the best means of improving the health of operatives in factories and workshops would be to place them in direct communication with the open air by the plan proposed.

In discussion, Mr. Leighton (Liverpool) said, the simplest and most effective system of heating and ventilating he had ever seen was in a schoolroom at Glasgow. The whole of the exhausted air was taken away by the draught caused by a fire on the lower floor, the school being on the second floor, and the air being conveyed to the lower room in a tube from the ceiling. The supply of fresh air was by means of a perforated pipe, which pipe conveyed the air to a boiler heated by the fire, and there the air was warmed and conveyed back to the school-room.

Mr. Rawlinson recommended the suggestions of Dr. Stallard to the serious consideration of all persons having anything to do with men crowded either into workshops or into houses. There was no artificial remedy, there was no fine-drawn remedy of fines or valves or other means of that class that would give fresh air in the abundance that appeared to be necessary for health.

THE AUTOBIOGRAPHY OF MR. RUSKIN.

MR. RUSKIN has made public the following autobiographical notes:—

"You perhaps have been provoked in the course of these letters by not being able to make out what I was. It is time you should know, and I will tell you plainly. I am, and my father was before me, a violent Tory of the old school (Walter Scott's school, that is to say, and Homer's). I name these two out of the numberless great Tory writers, because they were my own two masters. I had Walter Scott's novels and the *Iliad* (Pope's translation) for my only reading when I was a child, on week days: on Sundays their effect was tempered by 'Robinson Crusoe' and the 'Pilgrim's Progress,' my mother having it deeply in her heart to make an evangelical clergyman of me. Fortunately, I had an aunt more evangelical than my mother, and my aunt gave me cold mutton for Sunday's dinner, which, as I much preferred it hot, greatly diminished the influence of the 'Pilgrim's Progress,' and the end of the matter was, that I got all the noble imaginative teaching of Deane and Bunyan, and yet—am not an evangelical clergyman.

I had, however, still better teaching than theirs, and that compulsorily, and every day of the week. (Have patience with me in this egotism; it is necessary for many reasons that you should know what influences have brought me into the temper in which I write to you.)

Walter Scott and Pope's 'Homer' were reading of my own election, but my mother forced me, by steady daily toil, to learn long chapters of the Bible by heart; as well as to read every syllable through, aloud, hard names and all, from Genesis to the Apocalypse, about once a year, and to that discipline—patient, accurate, and resolute—I owe not only a knowledge of the book, which I find occasionally serviceable, but much of my general power of taking pains, and the best part of my taste in literature. From Walter Scott's novels I might easily, as I grew older, have fallen to other people's novels; and Pope might, perhaps, have led me to take Johnson's English, or Gibbon's, as types of language; but once knowing the 32nd of Deuteronomy, the 119th Psalm, the 15th of 1st of Corinthians, the Sermon on the Mount, and most of the Apocalypse, every syllable by heart, and having always a way of thinking with myself what words meant, it was not possible for me, even in

the foolishness of youth, to write entirely in verse, to form like English, and the affectation of trying to write like Homer and George Herbert was the most innocent I could have fallen into.

From my own masters, then, Scott and Homer, I learned the Torquism which my best after-thought has only served to confirm.

That is to say, a most sincere love of kings, and dislike of everybody who attempted to disobey them. Only, both by Homer and Scott, I was taught strange ideas about kings, which I find, for the present, most obsolete; for I perceived that both the author of the 'Iliad' and the author of 'Waverley' made their kings, or king-loving persons, do harder work than anybody else. Tydides or Idomeneus always killed twenty Trojans to other people's one, and Red-giantlet speared more salmon than any of the Solway fishermen, and—which was particularly a subject of admiration to me—I observed that they not only did more, but, in proportion to their doings, got less than other people,—nay, that the best of them were even ready to govern for nothing, and let their followers divide any quantity of spoil or profit. Of late it has seemed to me that the idea of a king has become exactly the contrary of this, and that it has been supposed the duty of superior persons generally to do less, and to get more, than anybody else; so that it was, perhaps, quite as well that in those early days my contemplation of existent kingship was a very distant one, and my childish eye wholly unacquainted with the splendour of courts.

The aunt who gave me cold mutton on Sundays was my father's sister; she lived at Bridge End, in the town of Perth, and had a garden full of gooseberry-bushes, sloping down to the Tay, with a door opening to the water, which ran past it clear-brown over the pebbles three or four feet deep: an infinite thing for a child to look down into.

My father began business as a wine merchant, with no capital, and a considerable amount of debts bequeathed him by my grandfather. He accepted the bequest, and paid them all before he began to lay by anything for himself, for which his best friends called him a fool, and I, without expressing any opinion as to his wisdom, which I knew in such matters to be at least equal to mine, have written on the granite slab over his grave that he was 'an entirely honest merchant.' As days went on, he was able to take a house in Hunter-street, Brunswick-square, No. 54 (the windows, of it, fortunately for me, commanded a view of a marvellous iron post, out of which the water-carts were filled through beautiful little trap-doors, by pipes like boa constrictors); and I was never weary of contemplating that mystery, and the delicious dripping consequent; and as years went on, and I came to be four years old, he could command a post-chaise and pair for two months in the summer, by help of which, with my mother and me, he went the round of his country customers (who liked to see the principal of the house his own traveller); so that, at a jog-trot pace, and through the panoramic opening of the four windows of a post-chaise, made more panoramic still to me because my seat was a little bracket in front (for we used to hire the chaise regularly for two months out of Long Acre, and so could have it bracketed and pocketed as we liked), I saw all the high-roads, and most of the cross-ones, of England and Wales, and great part of Lowland Scotland, as far as Perth, where, every other year, we spent the whole summer; and I used to read 'The Abbot' at Kinross, and 'The Monastery' in Glen Farg, which I confused with 'Glendearg,' and thought that the *White Lady* had as certainly lived by the streamlet in that glen of the Ochills as the Queen of Scots in the Island of Loch Leven.

It happened also, which was the real cause of the bias of my after-life, that my father had a rare love of pictures. I use the word 'rare' advisedly, having never met with another instance of so innate a faculty for the discernment of true art, up to the point possible without actual practice. Accordingly, wherever there was a gallery to be seen, we stopped at the nearest town for the night; and in reverentest manner I thus saw nearly all the noblemen's houses in England; not, indeed, myself at that age caring for the pictures, but much for castles and ruins, feeling more and more, as I grew older, the healthy delight of uncovetous admiration, and perceiving, as soon as I could perceive any political truth at all, that it was probably much happier to live in a small house, and have Warwick Castle to be astonished at, than to live

in Warwick Castle, and have nothing to be astonished at; but that, at all events, it would not make Brunswick-square in the least more pleasantly habitable to pull Warwick Castle down. And, at this day, though I have had kind invitations enough to visit America, I could not, even for a couple of months, live in a country so miserable as to possess no castles.

Nevertheless, having formed my notion of kinghood chiefly from the Fitz-James of the 'Lady of the Lake,' and of noblesse from the Douglas there and the Douglas in 'Marmion,' a painful wonder soon arose in my child-mind why the castles should now be always empty. Tantalum was there, said the housekeeper and gardeners. Deep yearning took hold of me for a kind of 'Restoration,' which I began slowly to feel that Charles II. had not altogether effected, though I always wore a gilded oak-apple very reverently in my button-hole on the 29th of May. It seemed to me that Charles II.'s Restoration had been, as compared with the Restoration I wanted, much as that gilded oak-apple to a real apple. And as I grew older, the desire for red pippins instead of brown ones, and living kings instead of dead ones, appeared to me rational as well as romantic; and gradually it had become the main purpose of my life to grow pippins, and its chief hope to see kings."

INFORMATION FROM CANADA.

Sir,—I have been five years away from England, and during that time, having travelled nearly the whole of Canada and in the Western States of America, I perhaps may enlighten the "arizans" likely to emigrate as to what they may expect in coming to Canada or America. I will not touch wages in this letter, but speak of the classes most likely to prosper.

1st. Carpenters and joiners are a class most likely to succeed. In the first place, they will have a different kind of work to do than what they have been used to. Throughout Canada, and in most parts of the States (except large cities), the carpenter is the mainstay of building. Nearly every house is executed in framework,—very little brick or stone, and very few hands from England are accustomed to it. Carpenters should thoroughly study theoretically how to frame a building, or else they will find themselves a long way behind the "American" artisan. Let them study by plans, so as to cut up and make everything fit, so that it can be fixed and put together, as it were, like a bedstead. The interior parts of buildings are not so much studied, but a good English workman can go ahead, and when it is to be done will always have the preference of a job. Staircase and handrail hands are at a premium when that kind of work is wanted; and, with architectural and mechanical schools in England, they should be able to get out the lines, and be able to undertake such work. It nearly in every case is done by contract, and pays well.

2nd. Bricklayers, from the shortness of the season, can only depend upon five or six months' full work in the year. Very few follow this trade, but act as masons, laying stone for cellars and kitchens, generally executed as far as the level of the ground-floor: with care and economy, and by going to the right places, they may do very well.

3rd. Slaters are useless; nearly every house is "shingled" or tin-roofed. Slates do not answer, from the severe frosts and heat.

4th. Plumbers used to job work, gas-fitting, &c., may look for work in established cities, where water-works and gas are used, and should be able to do labour at hot-air furnaces for heating buildings, &c.

5th. Painters are not much in request. A good painter takes a contract, and, from the useless or surplus of "no trade" people, manufactures his hands.

6th. Blacksmiths should learn to shoe, and that well, and be able to do the smithwork for wagons, sleighs, cutters, &c. No class of men do as well as good smiths, but keep from crowded cities at first. Start in rising places. The coal used is not what English workmen have in their shops, and therefore they do not get on very well at first.

I would beg of the British workmen to understand that Canada and America are not places for idle hands. Gold is not picked up, but only got hold of by industry and sobriety. Drink is

the curse of an emigrant, and one who is fond of it is not wanted. Drink this side of the ocean will very soon "fetch him," as the Yankees say. Shopmen, clerks, and no-mechanic Londoners, pray stop at home.

And now for my own experience. After an idle life of many weeks, and notwithstanding the many advertisements that a neat expeditious draughtsman may be found, &c., the writer at length obtained a subordinate position under a Government surveyor to lay out "timber limits." So your humble servant bade farewell to Montreal, leaving the Law Courts, with their French and English knots to be solved by one spectator the less, and at once started for Ottawa, the capital of Canada. Ottawa is delightfully situated. Broad streets, but miserably-built houses, no water-works, and were it not for the Parliament buildings, it would hardly come up to the mark of a substantial city. Considering that thirty years ago Ottawa was nothing but forest land, and now, I think, numbers 30,000 inhabitants, defects in architecture must be overlooked. At Hull, adjacent to Ottawa, with the exception of Niagara Falls, is one of the most magnificent rapids and falls ever seen by the writer. The water power is vast, and here have settled Yankee lumbermen, who give work in their mills and in the bush to several thousand hands. From Ottawa commences the first touch of hardships,—travelling in an old stage-coach, modelled after the fashion of the old Lord Mayor's coach (less paint and gilt). The surveying party put up for the night. The second day's journey is something like the first day's journey, only, as my companion remarked, "a little more so." We then arrive at "depôt" (a wooden house, with three rooms, far away from any settlement): after a good night's rest, our party wake up, and prepare for the journey proper. Snow-shoes are then handed over, with two blankets. Moccasins (deer-skin shoes) are then put on, with bags of pork, bisonite, tea, a tomahawk axe,—so we travel. Our party consists of an Indian cook, two Chinamen, who carry pots to cook pork and brew tea, with the "boss" surveyor and the enlightened writer. It will take too much trouble to describe surveying in the bush. Snow, 3 ft. to 6 ft. deep, the lines taken by a prismatic compass, and instead of pickets the trees are blazed; that is to say, a little bark peeled off. The sleeping to a Londoner is truly "primeval": a couple of birch trees chopped down lighted for fire, tamarack branches for a bed, and a cotton tent. Fancy this with 30 degrees below zero. What with the barking of wolves the first night's camping out made your correspondent feel the loss of a chop and his bitter beer.

Four months exploring limits in the rough and tumble way described, only now and then seeing a stray Indian, certainly hardened the constitution of the once feather-bed Londoner, freeing him from all biliousness, but made him comparatively inclined for fresh meat and vegetables.

Having finished the survey, our party broke up camp, and by the aid of birch bark canoes, we made tracks for Ottawa, once more to realize the comfort of a bed, but fully impressed in the writer's opinion, that a French Canadian shanty man could make anything with an axe, auger, and square, except a piano.

Having arrived safely at Ottawa, your correspondent met another victim to advertisements for a neat and expeditious draughtsman, and who had been employed in the "bush": so we did the sights of Ottawa. The Parliament buildings are certainly a fine piece of architecture; the governor-general's establishment is somewhat convenient, but void of decoration in an artistic point of view. With a proper system of drainage, waterworks, and a more abundant supply of gas, Ottawa could be made a splendid city; but, oh! the roads, for mud and slush, would make a London vestryman shudder at his own shadow.

From Ottawa we "switch" off for Prescott, and make our journey west. Prescott is a broken-down town, unworthy of notice; so we start for Kingston, look at the beautiful harbour, and having listened to regrets of trade being dull, make up our minds for Toronto. Railways in Canada are not proverbially noted for speed. What with jolting and jumping on the Grand Trunk Railway, we arrived at Toronto, the "Queen's City," so called. Toronto city, next to Montreal, is the largest in Canada. The city seems to have been laid out on a dead level, good wide streets, handsome shops, and bids fair to grow very much, besides having the germs of

a good business place. It was here, for the first time since leaving England, that your correspondent heard a real genuine "chime" of church-bells, bringing with them thoughts of the happy days gone by, and recollection of those who have gone where the "weary are at rest."

Canada is abundantly supplied with water-power, and has all the facilities for manufacturing; but, though a thoroughly loyal man, I confess there is a lack of enterprise compared with that of the Yankees. If a Canadian makes "a pile," he commences shaving notes or money-lending, taking mortgages; and though the country through the eastern parts suffers from a long, tedious five or six months' real winter, yet hard, there are opportunities, particularly in the west, for capitalists to make money "hand over fist," as they say.

Before closing my letter I must not forget to say, that for loveliness, health, and beauty, some of the Canadian ladies cannot be surpassed, many of whom know how to, and do, milk cows, spin their own wool, cook like a Christian should do, and can play the pianoforte.

QUEBECUS.

PURCHASE OF A PARK FOR LEEDS.

VALUE OF LAND.

The Roundhay Park estate was put up for sale by auction last week, by Messrs. Hepper & Sons, at the Great Northern Railway Station Hotel, Leeds. When Lot 19, consisting of the residential estate of Roundhay Park, together with the Park Farm and Braim Farm, containing an area of 601a. 1r. 12p., was put up, Mr. Hepper said that the apportioned rental of the property was 550l. 8s. 4d. The timber, he stated, which was an important item, would be included in the lot.

The bidding then commenced at 50,000l., and rapidly increased by 10,000l. at a time until it reached 100,000l. The latter sum was bid by the Mayor, and elicited hearty cheers. The bidding having been resumed, it ran up by 1,000l. at a time to 106,000l., the Mayor continuing to bid in competition with other gentlemen, and the last bid being his. At this stage there was a pause, during which Mr. Hepper announced that he would now take 500l. at a time. A gentleman then bid 106,500l., and the Mayor bid 107,000l. against him, at which sum it was knocked down. Mr. Hepper said he was authorised to knock it down to the Mayor for the sum last named, viz., 107,000l. Prolonged and hearty cheering followed, winding up with three cheers for the Mayor.

Hartley's Farm and a number of cottages, the apportioned rental of which is 490l. 14s., was also bought by the Mayor, the amount being 32,000l.

SIR THOMAS DRANE, ARCHITECT.

It is with deep regret that we record the death of Sir Thomas Deane, architect, at his house in Longford-terrace, Monkstown, county Dublin, aged eighty. He was the son of a builder in Cork, and lost his father when a mere youth, but being blessed with a mother of very superior mind, he was enabled, by the energy of his own disposition and her influence, to keep together a very promising business, and to maintain a numerous family of brothers and sisters. He undertook large works as a contractor for public bodies, and realised a handsome fortune; became mayor of Cork, and was knighted during his year of office, in 1830, by the Lord Lieutenant. He then practised as an architect, being employed largely by the municipal authorities, the Government, and by private individuals. At Cork he erected the Old and New Savings Banks, the Bank of Ireland, the commercial buildings, and Court-house, to which he put a classical portico, deservedly praised by Macaulay. He also erected the Queen's College in that town, upon a lofty prominent position, and which for its general arrangement and style of art, is entitled to commendation. He erected the fine Lunatic Asylum, at Killybeg, an imposing mass, well distributed and finely executed in the stone of the country. At Dublin, one of the best buildings is the addition to Trinity College, conceived in the Venetian style, and elegantly carried out in its sculptural details by Irish carvers, whose natural taste he, and his partner, Mr. Woodward, brought out, by inducing them to imitate the foliage of nature, unrestrained by conventionalism. The most noted, perhaps, of the works with which his name is connected, is the

Museum of Oxford, in which he associated his son Thomas, and their talented colleague, Woodward, an old pupil of Sir Thomas, whose career was cut short by illness before he had realised the full honours which his talents gave promise of attaining. Sir Thomas Deane then left the pursuit of the family career to his son Thomas, who, with a talent equal to the occasion, has already erected some striking buildings in Dublin, Oxford, London, and Taun, to the cathedral of which diocese he was architect.

The late Sir Thomas was thrice married, and leaves a widow and several children. He was of a hopeful, cheerful spirit, with a kindness of disposition and happy wit characteristic of his country. He maintained the most honourable character in all his engagements. He befriended many of the young artists of Ireland, who with daring and genius were struggling under difficulties to gain a name, and whose ultimate success proved the judgment with which he seconded their efforts. The careers of Maclise, Foley, and many others bear testimony to his kindly influence.

We must not omit to mention that he was for several years president of the Institute of Irish Architects, and that his eldest son John was the chief director and manager of the Manchester Great International Exhibition, which owed to his energy much of its great success.

REVUE GÉNÉRALE DE L'ARCHITECTURE.

We see with great satisfaction that our accomplished colleague, M. César Daly, is again in the field, and that the *Revue Générale de l'Architecture*, after a suspension of more than a year's duration, has again appeared. Two parts are before us, and we shall take an early opportunity to give some account of them. In the mean time we cordially welcome this admirable publication, and we invite for it new subscribers from amongst our readers.

THE CONTRACTOR FOR THE GLOBE BRIDGE, PECKHAM, AND THE CAMBERWELL VESTRY.

About two months ago Mr. Riley, builder and contractor, entered into a contract with the Camberwell vestry for rebuilding the Globe Bridge, at Peckham, his tender being 1,900l., which at the time caused some surprise, inasmuch as it was so much lower than the rest of the tenders sent in, being only one-half the amount of Messrs. Manley & Rogers's (3,800l.), the highest, and 1,000l. less than that of Messrs. Jukes, Coulson, & Co., which was the next lowest to Mr. Riley's. It now appears that Mr. Riley is unable to ratify the contract, in consequence of one of his sureties having refused to sign the requisite security bond, and the vestry have, therefore, just decided to advertise for fresh tenders.

SELLING OFF THE ARCHIVES.

At the Ossory Diocesan Synod, held a few days since, some extraordinary routine business was transacted, and more extraordinary proposals and resolutions were agreed to. Is it possible that the Cathedral Sustentation Fund is about to be created by the sale of its archives?

The Rev. James Graves, a well-known Irish antiquary, and member of the Irish (late the Kilkenny) Archaeological Society, perhaps can answer us. A Mr. Staples suggested, at the Synod, that the very valuable collection of books left to form a library by two of the former bishops, one of them being Bishop Morris, should be disposed of. In fact, to use his own words, "the collection was going to ruin and decay, the binding was nearly worn away, the backs and covers were falling off; and if something were not done, no books would soon be there. The building was not properly attended to, the books were in a damp place, and he would repeat, that unless some steps were taken, they would soon be beyond repair."

Hear now the remedy that Mr. Staples had, and did propose should be carried out. "He would propose that they should sell the books, and thus raise a sum of money,—perhaps 500l. or 600l.,—get a catalogue of them made out, and send it to some London man who deals in those old books; and they would raise a sum which would be of the greatest use to them." Some other members questioned the legality of such a sale; but Mr. Staples informed the Synod that he had

a copy of Bishop Morris's will in his possession; and there was a clause in it which authorised such a sale for the restoration of the Cathedral.

We trust that the Rev. James Graves will be no party to such a sale; his life, labours, and antiquarian taste would forbid such a supposition. Even should there not be a halfpenny of funds, as the reverend antiquary himself has stated, as a member of the chapter of St. Canice, the books should be kept with loving care, and snatched from the fate that probably awaits them. A collection of books once scattered may never come together again, or be availed of for historical purposes.

The city of Kilkenny ought to feel humbled in the face of such a proposal, if she bears it meekly without protest. It will not tell much in favour of the energy of the whilom Kilkenny Archaeological Society if these books be sold in the manner suggested, no matter what price is obtained for them.

SURVEYORS UNDER THE ECCLESIASTICAL DILAPIDATIONS ACT.

London.—We mention with much satisfaction that Mr. Gordon M. Hills has been elected surveyor for the diocese of London. In face of the remarkable list of testimonials which Mr. Hills submitted, we could not look for any other result.

York.—Mr. G. N. Armfield, Whitby, has been appointed one of the two surveyors under the new Act, for the diocese of York. Mr. C. T. Newstead, of York, is the other.

THE SEWAGE QUESTION AT COVENTRY.

At the recent discussion of plans for using the sewage in irrigation it was stated that the estimated cost of Mr. Hawksley's pumping machinery is 24,000l. Surely something more economical than this could be contrived. If money is to be spent in this way, a fair return can scarcely be looked for.

BUILDING OPERATIONS AT BRADFORD.

Mr. G. Corson, architect, of Leeds, has designed a building for Messrs. Hengh, Danlop, & Co., which presents a contrast to the usual type of Bradford warehouses. The structure, now approaching completion, stands at the corner of Peckover-street and East-parade; it is built externally of stone, and is designed in the Scottish baronial style. There are three frontages. The centre part of the front to Peckover-street is carried up as a tower, slightly projecting from the front, and contains the principal entrance, a simple square-headed doorway, with bold roll mouldings on the jambs. A bay window-corbels out immediately over the door, and the tower is finished at the top with turrets on the angles, and a pavilion roof between.

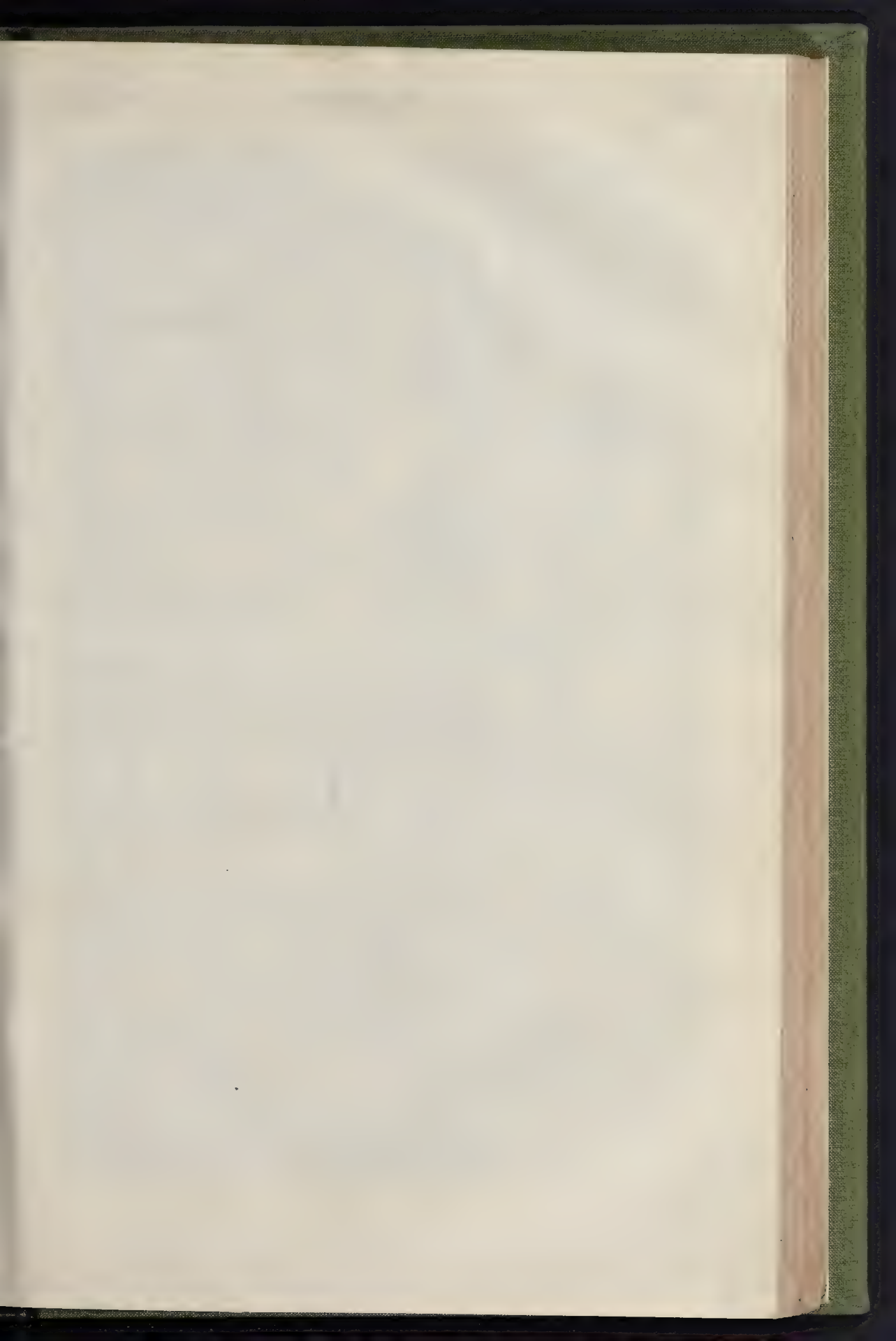
In other parts of the borough building is going on vigorously. A large warehouse is in course of construction adjacent to Peckover House. The third story is being put on the Town-hall, and the London stone-carvers have got to work. The Covered Market progresses slowly. A range of schools for the parish church, in the Bolton-road district, is making satisfactory progress, and schools are also being built in Oley-road, to serve as a place of worship as well. A new church is rising at Ripleyville, another at Great Horton; St. John's Church is to be replaced by a new building in Little Horton-lane; and the Wesleyans of Fryinghall are pushing forward their new Gothic chapel.

GREENHURST, NEAR OCKLEY, SURREY.

This house is being erected for Mr. Thomas Lambert, and is distant from the Ockley Station about a mile. It commands extensive views towards the south and west of Leith Hill and Horsham. The entrance is on the east. The walls are built of red brick from the neighbourhood, with Douling and Bath stone dressings. The roofs are covered with Staffordshire tiles.

The cost will be about 11,000l. for the house, and 2,000l. for the stables, which are situated to the north of the house.

The builder is Mr. W. Shearburn, of Dorking; Mr. J. P. St. Aubyn, of the Temple, being the architect.



SCALE OF FEET
10 5 0 10 20 30 40 50 60 70



GREENHURST, NEAR OKLEY, SURREY.



GREENHURST, NEAR OCKLEY, SURREY.—MR. J. P. ST. Aubin, Architect.

FALL OF A WORSTED MILL AT
GUISELEY, YORKSHIRE.

At Gaisie, on Sunday forenoon a large and newly-erected worsted-mill fell in. So far as we can learn, it appears that Mr. Denoon, a draper at Shipley, had an extensive worsted-mill in course of erection at Gaisie, and was the first mill of that description in that place. The plans, it is alleged, were prepared by Mr. Walsh, plasterer, at Baldon, and the contractor for the work was Mr. Lapiash. The building was four stories high, and was of considerable length. Only about one-half of it had, however, been built, and the roof of that portion was put on last week. The mill appeared to be all safe and sound when the workmen left on Saturday, but on Sunday forenoon, about half-past ten o'clock, the whole erection suddenly collapsed and fell to the ground with a thundering noise, without any warning whatever. The building presented a mere wreck, as scarcely any portions of the walls were standing. The beams and iron girders and pillars which had been used in the construction of the place were broken to pieces. There were many conjectures as to the cause of the accident, and they were so conflicting that it will be better left to the parties concerned in the erection to give an explanation.

DECORATIONS OF ST. PAUL'S
CATHEDRAL.

SIR,—Mr. Shone, in reply to my letter, writes as follows:—

"Sir Christopher Wren's intentions, mode of treatment, and, as far as they can be authenticated, his very designs will be scrupulously kept sacred and followed." He adds: "The leading principle affirmed by all who have been consulted is this,—to make Sir Christopher Wren's intentions the completion and decoration of the cathedral the main text, as it were; and to study to carry out, as implicitly as possible, whatever he may have expressed in drawing, model, or writing; and where these materials for guidance fail, that harmony is to be sought for to the fullest practical extent, with what he has proposed or done."

Mr. Shone gives these words as extracts from the programme set forth by the Embellishment Committee; and if the committee adhered to what they have here set forth, we would not complain; but what have the committee done? and what are they doing?—if it be the committee, and not the architect, who is answerable.

Sir Christopher's last work at the cathedral was the construction of the choir, and he put the organ where it was thought best to be. The whole cathedral was open to his choice. He might have put it,—as was lately done,—in one of the ladies' closets. We are told that it did stand on one side of the choir, in the old cathedral; and had not that situation been condemned, he might have put it there again, or he might have made it clothe the two grand pillars against which it is proposed to place it now. He did neither. To use Mr. Street's words,—

"He acquiesced in Father Smith's determination, that the organ should occupy the place in which beyond all doubt its tones produce the greatest effect; but he limited the size of the instrument most carefully, leaving enough space around and above it, to allow of suggestions, at least of a distant view, and so creating that mystery of things half seen, which all students of Medieval art well know was the secret of its greatest successes."

The width of the choir between the pillars is 40 ft. The organ occupied about 16 ft., leaving 12 ft. open on each side, to allow, as you enter at the west door, the receding vista to be seen,—i.e., arch after arch in the perspective, gradually receding from view; and as to the height of the organ, its shape being rather horizontal than vertical, it left the whole of the roof, or nearly so, to be seen. What was seen gave sufficient suggestions to the imagination to comprehend the whole, and moreover awakened a desire to see what was partially hidden, and thus reserved beauties hereafter to be discovered.

Ah, but, says Mr. Shone, "nothing is more certain than that he (Sir Christopher) made the best of a situation forced upon him." Of course, forced upon him it was. Given the cathedral, and the musical service to be performed in it, where was the organ to be placed? It was to be placed somewhere, and he put it, whatever might be the difficulties of his choice, and however constrained by superior powers, where he thought it could best be. Not in one of the ladies' closets, not reared up in two separate sections, not on the magnificent pillars, and destined to rotate, but in the place where, when Mr. Penrose became architect to the cathedral, he found it.

But further, Sir Christopher not only placed the organ where he did, but he designed the elegant pillars on which it stood. He wished these pillars to be seen in the position in which he placed them.

The placing the organ on these pillars was his last work; and if the committee had done their duty, and acted according to what they profess in their programme, they would have begun where Sir Christopher left off, and not by ruthlessly altering and destroying what he had done.

What is the consequence of their removing the organ? The return-stalls are carried away to the chancel, and the two elegant gates erected there by Sir Christopher Wren removed to make way for them. The beautiful columns are carried away into the north and south transepts, and made to do duty as porches, and these porches are so arranged as to interfere with Sir Christopher's grand intentions.

He made three principal doorways, which, when seen, give a grandeur to the whole building. Would any one think of putting an inner porch to the west door, leaving only the upper half of it to be seen, and thus marring its grand proportions? And it is a similar error to cut the north and south doors in two, and leave only the halves of them to be seen above.

Had the organ not been moved, these pillars would not have been moved, and the desecrations at the north and south doors would not

have been perpetrated; nor would the elegant gates in the chancel have been wrenched from their positions.

I ask Mr. Shone, and through him I beg to ask the committee, whether this is completing what Sir Christopher left undone? Mr. Shone says that the lowering the stall-work was "anonymously" agreed to by the committee; now, it appears, it is to be as unanimously raised up again. I ask, as one of the public—I have a right to ask—what reliance can be placed on such a committee? Can they do and undo, almost in the same breath, and not feel ashamed? To settle such matters by a committee is pretty much the same as asking an assembly of women in Exeter Hall to decide upon some important church doctrine.

There ought to be an architect of a master mind, who shall be able to say to the committee, "Gentlemen, *this is my plan*, and if you insist upon things of which I disapprove, I must make you responsible—not myself." And until such a person is found, St. Paul's will not be properly embellished.

JAMES LUPTON.

JAMES LUPTON,
St. Paul's Cathedral.

TO RENDER SEWERS OF DEPOSIT SELF-
CLEANSING.

WITH this I beg leave to submit a section and specification for making the sewers of deposit in Belgravia, and elsewhere, in the Old Westminster sewer districts, self-cleaning. The cost of the work would be not more than 2s. 6d. per foot run, or 660¢ per mile. I think I may venture to say that no improvement could equal this for simplicity, durability, economy, and efficiency. Permit me to suggest that you should give this section and specification in the *Builder*, in order to show Local Boards and their surveyors "how to do it."

JOHN PHILLIPS.

Specification for Making the Sewers of Deposit in Belgravia and elsewhere, in the Old Westminster Sewer Districts, Self-Cleansing.

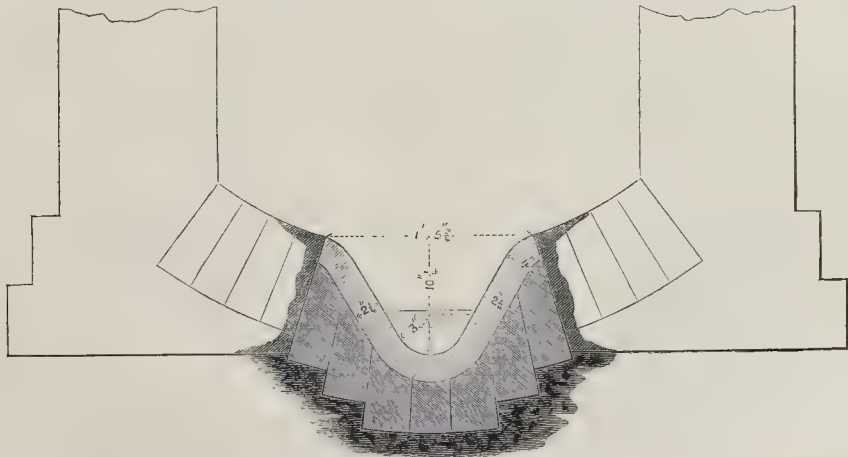
1. Raise the hard deposit in the sewers to the surface, and cart it away; flush away the soft deposit, and thoroughly wash and cleanse the side walls and bottoms, with jets attached to hose carried down into the sewers

2. Take out in lengths of about 6 ft. at a time, seven courses of the brickwork along the centre of the inverts; put small rebated wallings with struts, between the remaining courses at the sides; then excavate the space to the depth shown by the drawing. The soil, rubbish, and earth arising from the work, lift to the surface and cart away.

3. Well wash and clean the bricks taken out of the inverts, then lay them solidly in Portland cement (half cement and half sand) in the excavated space, in accordance with the drawing, and form the upper part to a mould corresponding to the outside of the barrel tile.

4. Remove the strutting, and evenly bed in Portland cement the channel tiles upon the sunk brickwork, as shown by the drawings; then solidly flush up and point the joints of the tiles, as also the joints of the old brickwork in the inverts and side walls, with neat Portland cement, and leave the sewer-bottoms clean and perfect.

6. The channel tiles to be made of stoneware or fire-clay in 2 ft. lengths, $2\frac{1}{2}$ in. thick, perforated longitudinally with cylinders $\frac{1}{2}$ in. in diameter, accurately moulded to the shape according to the drawing, salt-glazed, and burnt to a vitreous substance.



Section showing Self-cleansing Sewer.

ART AND SCIENCE.

Burslem Schools of Art and Science.—The annual meeting of the Wedgwood Institute School of Science and Art has been held in the town-hall, Burslem, under the presidency of Sir Smith Child, bart., M.P. The attendance was numerous. Mr. W. Woodall (chief bailiff) read the report of the committee, which stated, that during the year 168 students had entered the school, besides the ladies' morning class; and at the local examination, in May, 38 students were successful, and 14 Government prizes were awarded. For the national examination 971 works were executed by 126 students. The chemistry classes had been attended by 91 students, of whom 39 were examined, and 28 passed. The committee were, however, surprised at the extraordinary apathy in quarters where ready co-operation might have been looked for; and that in a vast population, pursuing occupations necessarily artistic and scientific in their character, there should be so small a percentage desiring intellectual advancement, and so large a proportion content with an unquestioning and stolid dependence on traditional usage. The committee felt they had some reason to complain of stinted payments by the Department of Science and Art on the results of examinations, as compared with what previous experience had led them to expect. The committee expressed congratulation on the Institute being at last freed from debt, and indulged in confident expectations, as the necessity for technical education becomes increasingly apparent, of a support of the school worthy of the enterprise and public spirit of the district. Mr. G. Theaker, master of the science and art school, and Mr. A. L. Sparkes, master of the chemistry school, read their reports.

Salisbury School of Science and Art.—A building, erected at a cost of 3,000*l.*, for the use of the Salisbury Literary and Scientific Institution and the Salisbury School of Science and Art, in New-street, in that city, with a hall capable of seating 800 persons, has been publicly opened. The Dean of Salisbury has been a liberal subscriber to the building fund, which is to preserve the memory of the late Bishop Hamilton. The new front is designed in the Gothic style, and built of red brick, with coloured brick arches and devices, stone dressings to the doors and windows, Mansfield stone shafts and carved caps. The building comprises, on the ground floor, a reading-room, and on each side of it a wide entrance-passage to the lecture-hall and staircases. On the first floor are the library, class, and committee rooms; and above it is the School of Art, which is 34 ft. by 23 ft., and 17 ft. high. The lecture-hall is at the back of this building, and was formerly the Salisbury Theatre. The old stage, galleries, boxes, &c., have been swept away, and thus a room obtained which is nearly 70 ft. long by 33 ft. wide. The walls have been raised about 6 ft., a new roof put to the building, and windows inserted. A large gallery, supported upon iron pillars, has been erected, and fitted up with stalls, the hall and gallery affording accommodation for about 800 persons. A broad staircase, which is double above the first flight, gives access to each side of the gallery, as well as to the upper part of the front building. The interior of the hall is decorated, and lighted by means of star-jets from the ceiling and walls. Mr. John Harding was the architect, F. Hale the builder, and Abley foreman. The decorations were executed by Mr. Neal, under the direction of Mr. Toomer; and the stonework carving was done by Mr. A. C. Kenn.

Closing of the Norwich Industrial and Fine Art Exhibition.—After having been open for a period of two months, the Exhibition of the Norwich and Eastern Counties Industrial and Fine Arts Association has been closed. The ceremony took place in the presence of a large number of persons, but the exhibition was not actually closed till ten o'clock in the evening, to enable those who could not obtain admission on the previous evening to pay a final visit. Pecuniarily the results of the exhibition are satisfactory, in so far, at least, that the receipts are amply sufficient to meet all expenses. The performance of a musical programme opened the closing ceremonial. It consisted of an organ selection, played by Dr. Bunnett, and of a variety of pieces by the Norwich Volunteer Artillery band.

Sir John Lubbock, M.P., on Scientific Education. Sir John Lubbock, bart., M.P., addressed a meeting of working men on Saturday night at the Trades Hall, Liverpool. The occasion was that

of the delivery of prizes in connexion with classes of science meeting at the hall, and affiliated with the South Kensington institution; and there were present, amongst other gentlemen who take a warm interest in the elevation of the working classes, Messrs. Jas. Samuelson, F. Archer, J. A. Pictou, Rev. J. Beard, S. G. Rathbone, Dr. Sheldon, Dr. Costine, and Mr. Francis Bonlt. Sir John Lubbock, who was loudly cheered on taking the chair, said that all must rejoice to see how the love of science was spreading in the country. It was one of the most hopeful features of the age. Speaking first of the relations between the Government of the country and the scientific societies, Sir John said that there was no other country in Europe where the Government did so little for such societies. The societies, however, did not wish that this should be altered, and believed that entire freedom of action was the best for the Government, the country, and the societies themselves. True, there was a grant of 12,500*l.* under the head of scientific societies, but 10,000*l.* of this was spent in meteorological observations, and 1,000*l.* given to scientific research. With regard to scientific research, he declared that the Government had never been chary of incurring expense, and the hesitation as to the expedition relative to the last eclipse arose from a misunderstanding, and not from reluctance to spend money. With regard to elementary schools, he could not speak of the Government in such satisfactory terms. The scientific men throughout the country unanimously regretted the manner in which the grants to those schools were distributed. Reading, writing, and arithmetic, although the foundations of education, were not education itself, and the schools would never be placed on a sound and satisfactory basis until they took a wider ground. Sir John quoted in support of this view the resolutions of the British and the Social Science Associations, and the opinions of those practically concerned in education. With regard to schools of science, he pointed with pleasure to the fact that when they commenced in 1860 there were nine schools with sixty students, and that now there were 810 schools with 30,000 students. In conclusion, Sir John, though he criticised the positions taken by Mr. Forster, paid a high tribute to the great services which he had rendered to the cause of national education.

The Leeds School of Art.—The exhibition of the students' works at the Mechanics' Institute closed on Saturday last, on which day 3,259 persons visited it. There are now 300 students. Out of more than 2,600 drawings and paintings produced within the year, 468 works were selected for exhibition, and a large proportion of them were meritorious. Dr. Packett is the head-master.

BOROUGH ENGINEERSHIP OF LIVERPOOL.

The special committee met on Monday last to consider the claims of three selected candidates, viz., Mr. George F. Deacon, of Liverpool; Mr. James Lemon, borough engineer of Southampton; and Mr. Mackinson, town surveyor of Dundee; when, on a division, Mr. Deacon obtained 12 votes; Mr. Lemon, 9; and Mr. Mackinson, 3.

Mr. Deacon was therefore recommended to the borough council for the appointment. Mr. Deacon is in practice in Liverpool, and he is the son of the under-sheriff of the county.

THE GREAT FIRE AT CHICAGO.

The whole business part of Chicago has been destroyed by fire. All the wholesale warehouses, banks, public buildings, theatres, great hotels, six grain elevators, much shipping, and 10,000 houses are burnt, and many persons have lost their lives. 50,000 persons are without shelter, but tents to shelter 75,000 have reached Chicago. The dead found in the ruins already exceed 100, and many are dying from exposure. Special trains with food and clothing are arriving in the city, guarded by military. Forty plunderers and turbulent characters have been shot.

The fire is now stated to have begun in a stable. A boy having, it is said, taken a kerosene lamp into the stable to milk a cow, the animal kicked the lamp over, and set fire to the place. The burning fluid ran to the wooden pavements, and thus the flames were extended, and not through the party-walls, we presume, unless

they were of wood. As the fire progressed people became crazy with excitement, and many were trampled to death and others burnt. 500 persons are believed to have perished. The very waterworks were destroyed, and several square miles of the city are in ashes. The loss is estimated at three hundred millions of dollars.

This city is one of the most marvellous in the history of the United States. Up to 1831 it was only an Indian trading post, and even in 1840 its population did not exceed 5,000. From the latter period, however, it rose rapidly in population and wealth until it attained an importance second, perhaps, to that of no commercial city in the world. It has long been known as the great trading city of the far West. It is there that the grain of the West and other important productions are collected for transport to the seaboard and to Europe. Much as has been said about the rapid development of Liverpool within the last century, it is nothing compared with the marvellous strides made by Chicago. The population in 1850 was 28,269; in 1857, 130,000; and probably at the present time the total is little short of a quarter of a million. Chicago is beautifully situated on an inclined plain extending along the shores of Lake Michigan for many miles.

DRAWINGS AND THE POST-OFFICE.

SIR.—Doubtless many of your readers will have become aware that since the 5th of October an imperial size drawing can no longer be sent as a roll through the post, the limit of length now being 18 in.; and as it is a matter of some importance to me, as I suppose it is to a great number of persons, I feel an exception should be made, such as that packets may be 22 in. long, if not exceeding 5½ in. by 5½ in. in width and thickness.

Unless the Postmaster-General will reconsider his order, and restore to us the privilege of sending drawings by post, one will be forced to resort to the antiquated methods of sending them either by parcels delivery, carrier, or railway, which would involve considerably greater trouble and expense, as well as much annoyance in their not being delivered by the expected time.

LIVERPOOL.

The new County Courts question, the proposal to decorate the council chamber and luncheon-room at the Town-hall, and the exhibition of paintings, were amongst those subjects which were under consideration at the last meeting of the Liverpool Town Council. A letter of the secretary to the Government Commissioners of Works, suggesting that the corporation should provide a site for the proposed County Courts, for which the House of Commons had voted 20,000*l.*, had been replied to by the finance committee, declining to agree to the suggestion, but stating that the committee would recommend to the council that the vacant land behind the municipal offices should not be parted with for twelve months without giving the Commissioners of Works the option of purchasing it on reasonable terms. In reply, the secretary stated that as it was probable the Judicature Commission would in the course of a year have formed some satisfactory scheme to reform the multiplicity of courts of justice now existing in Liverpool, it was useless to discuss the subject at present. The First Commissioner, however, thought it right to observe that by the 13th and 14th Vic., cap. 61, sec. 24, it was provided that the town-hall, court-house, or other public building to any county, city, borough, or town in which a county court was held, might be used for the sittings of that court without payment of rent.

The finance committee recommended the council to vote the sum of 600*l.* to be expended under the direction of that committee, in the decoration of the council chamber and the luncheon-room at the town-hall. Mr. Pictou, in moving the confirmation of the recommendation, said the subject was mooted in the council about six months ago, and a committee was appointed to report on certain designs that were presented to the council. It was then agreed that the subject should be postponed for six months. Mr. Minton moved the following amendment:—"That specimens and tenders be asked for from Liverpool decorators, at a cost not exceeding 600*l.*, for decorating the council-chamber and luncheon-room." Mr. Minton afterwards withdrew his motion, and Mr. Pictou said it would be better to allow the matter to be brought for-

ward at some future time; and meantime the general proceedings were confirmed.

In reference to the exhibition of paintings, Mr. Picton said the exhibition which had been opened in the Free Library and Museum had turned out, so far, to be a great success. Since the exhibition opened, pictures had been sold to the extent of 4,000*l.*, and that would be encouraging to the artists who had sent their pictures. The committee could now see their way clear to the fact that there would be no loss, but some profit.

THE SOIL PIPE AND SANITATION.

Sir,—On perusing the *Builder* of the 7th inst., I find that the soil-pipe has been performing an important part in the sanitation of Croydon, with which the name of a medical gentleman is closely associated.

Will you permit me to state that in the second edition of "A House for the Suburbs," published in 1861, the following passage occurs at page 168:—

"I have found it advantageous in practice to take the soil-pipe quite up to the gutter, letting it serve also as a drain for the water, and when this cannot be done, to lead a small pipe up through the roof, so that the foul air, instead of rushing at every opportunity into the house, may find a ready exit at the top."

THOMAS MORRIS.

THE RIGHT OF WAY.

Sir,—Have you had difficulties in public through making a stand for your right side of the pavement? I admit to many occasions. I fight my way along when I feel strong till I meet a wrong-sided bobby too big for me, I invariably decline contention with women; make a dead set at boys, they are not too old to learn; but, sir, it is not annoying that green policemen should run a muck amidst London pedestrians they are paid to rectify? Official instructions are needed here. Recently, a friend of mine had an obstinate encounter on London Bridge; it was push for push, till an ignorant policeman came up and offered to run them both in. If you had said, the other party often does the same: is it then right to hit out? E. T.

CLEANING TILES.

Sir,—Will some correspondent kindly inform me of the best method of cleaning white tiles? The joints become incrustated with hard carbon, and the edges of the tiles for a considerable width are black. The hardest brush and water with soda will not remove the marks. I should also thank any of your correspondents if they could inform me of the best mode of firing these tiles with cement. I have used various cements, but the tiles come off in frosty or very hot weather. A. DAVIS.

INVITATIONS TO TENDER.

Sir,—I accepted an invitation last August to tender for the completion of four houses in Cedars-road, Clapham, from Messrs. Mayhew, Salmon, & Whiting.—Mr. J. Thomas, architect. I tendered agreeably to their request, was lowest, and was rejected. Will you kindly inform me whether I have any remedy for this? I had to verify the quantities by measuring up the work to be done, as the bills were not explicit, and as a return have my name published before the party chosen to do the job, which is, of course, calculated to do me an injury. I should feel greatly obliged by your informing me what remedy I have, if any. Yours, Old Stronachian.

* I would probably depend on the terms of the invitation. Most certainly if a builder be invited to tender, and is lowest in amount, he ought to be employed.

THE NEW MORGUE, DUBLIN.

THE Corporation of Dublin has at last established a necessary sanitary requisite long called for in Dublin.

A square block of granite-faced buildings, originally constructed for a savings-bank, in Marlborough-street, has been transformed into a gloomy morgue. The history of the old structure is as melancholy as the purposes for which it is now used. Nothing ever seemed to thrive under its roof from its first foundation.

Idle for years, and again occupied at long intervals as a meeting-house, emigration office, reading-room, soup-kitchen, registry office, shipping office, and as the "head centre" of the National and Fontan Brothers, it has reached its sepulchral climax by being dedicated to King Death as a dead-house. The building, as to locality, is very well situated, being a few yards from the river side. It is two stories high, and well lighted above. The ground floor is converted into the morgue proper; it is divided into three compartments, the chamber for the corpses, a dissecting-room, and a waiting-room.

All post-mortem examinations will, of course, take place in the dissecting-room, for which necessary fittings are provided. The morgue is fitted with marble slabs, on an inclined plane, on which the bodies will lie, over whom a stream of water will constantly flow (it is hoped). The upper story contains the corner's court and waiting-room for the jury. The former is somewhat spacious, being about 40 ft. by 30 ft. The story is also fitted up with the necessary accom-

modation for coroner, advocates, jury, witnesses, and the press. The morgue was not long opened when it received its first melancholy baptism in the person of a male infant who was probably strangled or mismanaged at birth, and was left exposed in a public hall.

DAVENTRY ASSEMBLY HALL.

THE New Assembly Hall was opened last week. The building, the property of a company, stands fronting Foundry-place, and runs parallel with New-street. There are four entrances, two from Foundry-place, one of which is private, and two at the opposite end, communicating with New-street by a long vestibule. The hall is 50 ft. long, 37 ft. wide, and 34 ft. high to the boarding at the top. The stage or platform at the western end is 20 ft. long by 15 ft. deep, and is fitted up with foot-lights and two bracket-lights. Underneath and on the sides of the stage are three rooms, exceedingly handy for entertainments or public meetings. The auditorium is intended to accommodate 600 people, but about 700 were present at the opening. There is no attempt at display in the frontage, owing to its retired position, but the elevation is neat and simple. The main feature of the interior is the roof, which is constructed with eight principals, the ribs of which are elliptical in form. The thrust of the roof is counteracted by tie-rods. There is a boarded cove on either side, having moulded ribs starting from pendants at the foot of the queen-posts. These are stopped by a plaster cornice running round the room, 14 ft. from the floor line.

The room is lighted from the roof by side-lights, in pairs, between the queen-posts and top lights, extending from the matched boarding at the collar-beam down to the top of the side-lights. The roof is a semi-decagon in form, and the lines of the principals, combined with the cove on either side, present the appearance of a trefoil. The gas-pendants brought from the centre of the collar-beams of six of the principals, extend about 7 ft. below the tie-rods.

The building was designed by Messrs. Walford & Hewitt, of London, and the work has been executed by Mr. Gee, builder, Daventry. It may be added that on Wednesday night the acoustic properties of the hall were fully tested, and proved to be all that could be desired.

THE TRADES MOVEMENT.

Settlement of the *Engineers' Strike*.—The great strike of the engineers at Newcastle has happily settled. Sir William Armstrong, Mr. Philipson, Mr. Joseph Cowen, jun., and Mr. Barnett, president of the League, met, and after some discussion, agreed to all the details for carrying into effect an arrangement suggested by Messrs. Philipson and Cowen. After the meeting Sir William Armstrong submitted the details to the associated masters, and Mr. Barnett to the committee of delegates. Both parties agreed to the conditions proposed by their representatives. Mr. Philipson signed the document on behalf of the employers, and Mr. Cowen on behalf of the men, and the negotiations terminated. The result was hailed with great rejoicing all over Tyne-side. Flags were hung out of the windows of the meeting-houses of the engineers, and the people everywhere congratulate themselves and their neighbours at the happy termination of the most prolonged and resolute strike ever known in the north of England. The men were to resume work this Thursday morning.

A lime-light demonstration of the trades and working men of London, was held in Trafalgar-square, for the purpose of congratulating the engineers of Newcastle on the favourable termination of their strike, and to form a "national league for the furtherance of the nine-hour movement."

The compromise which has ended the strike is one with which both parties may be satisfied. In substance it is a victory for both; but the nine hours' day is granted, though not to begin for three months. Meanwhile, the men go on, not on the old terms, but on the terms of the compromise originally offered by Sir W. Armstrong. When the strike began they were working fifty-nine hours a week: ten on each of the first five days, and nine on Saturday. They will now go back to work fifty-seven hours a week; and on the 1st of January they will begin working fifty-four hours a week. The arrangement that overtime shall not count in a man's

pay till he has made his fifty-four hours of regular time is a concession to the masters which enables them to yield with credit. One of Sir W. Armstrong's objections to the nine hours' day was that the men would be tempted to increase their pay by losing time in their regular hours and making it in the hours which are better paid as overtime. A man might thus work only fifty-four hours a week, but might make, say, forty hours at the regular wages, and the other fourteen at overtime wages. It is only fair that extra pay should be reserved, not for certain hours of the twenty-four, but for extra hours of the week. The principle of a nine hours' day, with this necessary safeguard, may now be considered as established.

The precise terms presented to employers and men were said to be the following:—"Supposing the employers to concede the fifty-four hours per week, the men would agree to work overtime, when and to the extent required by the employers. The wages, both as to ordinary wages and overtime to remain the same at the different factories as prior to the strike. The wages to be reckoned by the hour, and quarter-hour, and paid weekly at 12.15 p.m. on Saturday. The agreement to be for twelve months, with power to either party to determine at the end of six months by giving one month's previous notice. The men to go to work on the arrangement now existing in the shops (fifty-seven hours), and the new terms (fifty-four hours) to take date from Jan. 1, 1872."

The proposals were unanimously accepted.

SCHOOL-BOARD DOINGS.

ON the motion of the Rev. J. A. Picton, the London School Board have decided to instruct the School Management Committee to obtain information concerning the Prussian system of class-division; and to report to the Board how far it would be desirable, in determining the plans of new school-buildings, to keep in view the possibility of the adoption of a similar system in London. One would have thought the collective wisdom of the School Board would have been able to devise a system of education without going to Prussia for a model. We do not wonder that a daily contemporary inquires if Englishmen are losing all independence of thought and action.

At the instance of Mr. McGregor, a committee of the London School Board has been appointed to inquire into the extent of the present bathing accommodation in the metropolis, and the best means for its systematic extension, and to report thereon to the Board, so as to allow due time for the provision of cheap and convenient swimming-baths for the next bathing season. It gives us great satisfaction to find that the School Board has taken up this question.

On the motion of Mr. Reed, M.P., the Board has agreed to purchase a site in Whitechapel for a school, at a cost of 9,000*l.*

At the last meeting of the Birmingham School Board it was announced that the Board proposed to apply to the public commissioners for about 20,000*l.*, to be expended in the building of five or six rate-supported schools.

SEWAGE POLLUTION AT KEW.

Sir,—The evils of want of drainage, leaking cesspools, and a sewage-polluted soil, have been often adverted to in your columns, and recently with reference to Ilminster; but there exists at the present moment a glaring example of such a condition of things much nearer home. At the little picturesque village of Kew, close to the National Botanic Gardens, and around the favourite Green to which, in the summer-time, Londoners resort in thousands for the sake of fresh air, the whole system is in full operation.

There is no sewerage at Kew: the houses, about 160 in number, some large and some small,—a royal residence being one of them,—discharge their filth simply into cesspools, and store it by them, or rather it is in their intention so to store it; but a little closer investigation will show that they are very far indeed from succeeding in doing so.

There are extensive market-gardens in the neighbourhood of Kew, where the demand for manure is considerable. The contents of the cesspools, when available, are, therefore, valuable for this purpose, and yet it is not found possible to make them in this way a source of profit to nearly their nominal value, inasmuch as the quantity of fertilising material, in proportion to

the total discharged into them is unduly small, only about one-fourth of that total being reclaimable when the cesspools are emptied.

The rest all goes away. Where? This is not difficult to ascertain. In the case of the houses nearest to the Thames, it goes directly there between each tide; and these houses are, in a sanitary point of view, probably the best off. Elsewhere, and where the distance, as compared with the elevation above low water, is too great to allow of a percolation in the short space of twelve hours, the pollution remains principally in the neighbourhood of the spot where it has entered; the river suffers less, and the subsoil more. Each cesspool forms a centre whence a poisoning influence extends in successive concentric circles, until, by the intersection of these circles, the whole intermediate space is filled up, and alike contaminated.

The purifying properties of earth, especially of a light sandy soil such as here exists, are of course well known, and, were the sources of pollution only few and scattered, or could the polluting liquid be compelled in all cases to filter through a considerable thickness of the soil, their injurious qualities could be to a great extent neutralised, but when the permanently saturated subsoil is within a few feet of the surface there is obviously no room for this. Now at Kew water is always found at about 5 ft. below the ground, and if in the course of building operations an excavation is incautiously made, even to this depth, at the time of a high tide, the foundations are instantly flooded with water. It is needless to say that the water so entering, and which frequently finds its way into the cellars and basement floors of the houses, is a more or less diluted solution of the neighbouring cesspits. In addition to this polluting influence, the fertilising properties of the amount left in the cesspool is weakened by the loss of the most valuable ingredients, viz., those in solution in the escaped more liquid portion.

The question of sewerage is more important now from the fact that a large estate, abutting upon the south-west corner of the Green, and lying between it and the newly-opened Kew Gardens Station, is now being rapidly built upon, apparently without any provision for drainage, but simply causing a multiplication of the already too numerous cesspools, which in a few years' time will, in all probability, be trebled in number.

Surely, with the market gardens requiring manure, and in the face of the awakening interest in and knowledge of the results following such a condition of things, it is not a time to permit it to continue, still less to allow of its extension to what will, I fear, be found, perhaps too late, a very grave conclusion. On the contrary, the present seems the very time to arrange a system of drainage in connexion with which the new houses should be built. W. SCOTT.

FUNERAL OF M. DUBAN.

We understand, and are glad to mention, that on the occasion of the funeral of the distinguished French architect, M. Duban, Professor Donaldson, who was present, pronounced a discourse, which produced considerable effect, and greatly interested his auditors. Three other addresses were delivered.

CHURCH-BUILDING NEWS.

Bingley.—The parish church here has been reopened for divine service, after having been restored, and the interior fittings renewed. The restoration has been carried out from designs prepared by Messrs. T. H. & F. Healey, architects, Bradford. The fabric of the church generally was in a fair state of preservation, taking into account the rough usage it has experienced at various dates. The windows were in part decayed, whilst insertions of heterogeneous style have further tended to weaken the structure. The buttresses with which the building has evidently been furnished have disappeared to make room for interments, and circumstances have prevented the restoration of these and other features. The restoration has comprised the rebuilding in part of the north or Ryshworth chapel, the east gable of the chancel, the south wall of the south or Riddlesden chapel, and the south aisle of the nave. The old porch, of incongruous character, has been replaced by one in keeping with the rest of the church. Several windows have also been renewed, particularly

those of the north chapel and the east or chancel windows, which are wholly of new design, the rest being generally copies of the old work they replace. The west gallery and organ-loft have been removed, and the lower-arch opened to the nave. The flat plaster ceiling, which obscured the old nave-roof, has disappeared, and these changes in themselves have chiefly contributed to the effect of the restoration. The nave-roof has not needed renovation, but has been simply cleaned, plastered between the spars, and an embattled cornice added. The chancel-roof is wholly new, and, with those of the aisles and south chapel, is of oak, with boarded panels and carved cornices. The interior stonework has been redressed, and the clearstory-walls have been stripped of the plaster and roughly chiselled over. The floors have been preserved at their original levels, and the whole area of the church has been covered with a bed of concrete.

In removing the soil for this purpose, several relics were discovered,—notably two or three bases and capitals of Norman pillars, which seem to point conclusively to the fact of a much earlier building having existed on this site or its neighbourhood. These remains have been utilised for the foundation of pillars of the later church. The curious old font-bowl (supposed, however, by a learned professor to be the base of a cross, and subsequently converted from its original purpose) now rests within the church. The seats are open benches raised slightly above the general level of the floor. These and the chancel stalls, screens, &c., are of solid oak. The organ is placed at the eastern end of the south chapel, the remaining portion of the chapel being available for seats. The chancel is divided from the chapels by screens, with carved open tracery-work in the head. That on the north side is of more elaborate character, and is the gift of Mr. J. A. Busfield, who has undertaken the restoration of the north chapel, the design being furnished by Mr. R. N. Shaw, of London. The Ferrard Chapel, an exorcism on the north side of the nave, has not been removed, but permission has been granted to convert the lower story into a vestry, an appendage of which the church was previously destitute. An oak screen now separates it from the nave. Another screen will also divide the tower from the nave. The old grave-stones have been relaid within the church, but it is hoped that ere long tiles may take their place. The heating of the church was a source of difficulty, owing to the torments. It has been, however, solved by placing Haden's hot-air apparatus in an iron chamber beneath the tower. The old organ, which was built by Messrs. Forster & Andrews, of Hull, about twenty-four years ago, has been improved and enlarged by the same firm. The cost of the renovations, including the organ, will be about 3,000l. The contractors were:—Masons, Messrs. Foulds, Bros., Bingley; Messrs. John Ives & Sons, joiners, Shipley; Mr. Dawson, plumber, Bingley; Mr. Thornton, slater, Bingley; Mr. Anderson, plasterer, Bingley.

Duffryn (Neath).—The new church of St. Matthew, Duffryn, has been consecrated by the Bishop of Llandaff. Duffryn is a small hamlet, formerly with a very sparse population, and adjacent on two sides to the parishes of Cadoxton and Skewell, and on the other to Neath. Lately some colliery works have been opened in the neighbourhood. Adjacent to these works stands the residence of Mr. Howel Gwyn. He resolved to build a church for the people of Duffryn, and endow it. The site chosen is one adjoining his lodge. On this a church has been erected by Mr. Gwyn, at a cost of about 3,500l. In addition, Mr. Gwyn endows the church with land to give an annual stipend to the clergyman. The new church is dedicated to St. Matthew, and consists only of nave, chancel, with organ-chamber, vestry, and tower. It was intended to be as purely as possible a type of the Welsh Church of the twelfth century. Mr. Norton, of London, architect, submitted a plan of a church of this description, which met with the approval of Mr. Gwyn, and the work of erecting it was undertaken by Mr. Rees Roderick, of Margam, who has also restored Llantrissant Church. The new church is built with Penant stone, from one of Mr. Gwyn's quarries, with Bath stone dressings. The design is Gothic, and the nave has a somewhat plain appearance, owing to the absence of aisles and a clearstory range. The nave is lighted both north and south with plain single and double lancet windows. The nave alone is 62 ft. long, with a width of 25 ft. in the clear. The chancel is 27 ft., with a

width of 21 ft. On the north side there is an organ-chamber and vestry, and at the south-west end there is a porch, which is surmounted by a square tower, terminating in an open battlement, and in this tower will be placed a peal of six bells. At present the upper portion of it is incomplete. The tower, which below forms the entrance-porch, has a Gothic doorway, and this is surmounted by a carved stone statue of the patron saint. The walls of the interior of the church are stuccoed, and both nave and chancel have timber roofs in panels. The nave is covered with open benches, affording accommodation to 300 persons. The floor is formed with Godwin's tiles. The altar and the dais for the communion-table are formed with Kilkenny marble. At the entrance stands a carved font from the Bridgend stone. The pulpit is formed of the same class of stone carved, and bearing in the panels crosses of alabaster. This, with a bronze lectern, is the gift of the tenants of Mr. Gwyn. The east window is a three-light painted window, with rose beading. It was placed there by Mr. Gwyn, as a memorial of Mr. Matthew Gwyn, his brother. The subjects in the principal divisions illustrate passages in the life of Our Lord. The church is warmed by hot water, and lighted with gas, conveyed to it from Mr. Gwyn's private gasometer. The choir is plain, but in keeping with the seats in the nave. At present the ground is not inclosed in the manner it will be when the church is completed, but a lych-gate,—another feature of the old Welsh church,—has been built. The inclosed ground will be used as a graveyard.

Barrow.—The ancient church of St. Bartholomew at Barrow has been opened, after some necessary repairs and alterations were carried out. Mr. Douglas, of Chester, was the architect employed. He estimated that the expense of re-seating the church with open seats of pitch-pine, and providing a new south door, would be 2800l.; while the vestry could be built, and the chancel re-seated and furnished, for an additional sum of about 2000l. Mr. Jones, builder, of the Kaleyards, carried out the proposed alterations. The square pews have been removed, and open seats of pitch-pine substituted for them,—a change which has had the effect of adding to the accommodation of the church. The gallery, which formerly afforded accommodation for the school children, has been removed, being considered unnecessary, and its former occupants accommodated in the chancel, which was built in 1671 by Bishop Bridgman, formerly a rector of Barrow. The inner arch of the Norman doorway, on the south side of the church, has been restored, but the outer arch has been left untouched until a new porch can be built, while a new oak door has been provided. The four arches separating the nave from the aisle, and supposed to be about 300 years old, have also been restored; while the old stone flagging has been removed, and encaustic tiles substituted. A new roof, new windows (on the south side), and a new porch are still required. The cost of the alterations already made amount to about 4000l.

Burwardsley.—The little church at Burwardsley, after undergoing considerable repairs, has been re-opened for divine service. The edifice was used as a chapel of ease for Banbury prior to 1735. According to the accounts of the parishioners, the floor of the old church was worn into holes, and strewn with rushes, the roof was entirely decayed, and the building was fast becoming a ruin. Now it is different, and when the extension is carried out, as at first contemplated, of adding a chancel with the chancel arch, where the east window is, it will be sufficient for the wants of the neighbourhood. Exterially, the most conspicuous portions of the work done comprise a new battress on the south side, repair of the west window, replacing of the windows with the exception of the east windows, and a new slated roof with a bell-turret and louvres. In the interior, the floor has been furthered up, and the old pew oak has been used for boarding the walls to the height of 3 ft. 9 in., and the walls have been plastered and coloured. The new seats are open, and, like the lectern, are of pitch-pine, stained and varnished. They will accommodate about 180 persons. The pulpit and reading-desk have been restored. The chancel and aisle have been laid with tiles, and some attention has been given to the heating apparatus, the hot air being admitted now at the entrance to the church. The cost of the entire work, done by Mr. Fleet, of Beeston, under the superintendence of Mr. Chatterton, the

architect being Mr. Douglas, of Chester, will be about 270l.

Kirkby.—The new Church of St. Chad, at Kirkby, between Liverpool and St. Helen's, has been consecrated by the Bishop of Chester. The building, which has been erected by Lord Sefton, at his own expense, was designed by Mr. Paley, of the firm of Paley & Austin, architects, Lancaster; and the contractor was Mr. E. Gabbat, builder, Liverpool. The total cost of the building has been about 14,000l. It is calculated to seat 600 persons.

Harwell (Berks).—The church of St. Matthew's Church, Harwell, has been re-opened for public service by the bishop of the diocese; after a restoration by the lay rector, Sir John Chetwode, bart. Sir John has had the floors laid with encaustic tiles, the old altar-rails of oak restored, and removed to their proper place, and the choir benches remodelled. There is also a new altar-table made of oak, by Isaac Hitchman, the village carpenter, and the tiles were laid by Joseph Harris, the village mason. It was the wish of the vicar, and the desire of the meeting at the restoration of the nave in 1867, that a Purbeck marble slab, some 8 ft. long (discovered in the north aisle, and now placed at the entrance of the chancel), should have formed the new altar, but with the advice of the bishop, the intention for the present is abandoned. The original stone altar, bearing five crosses, although broken almost to pieces, has been repaired by Joseph Harris, and forms the base of the new altar-table.

Sheerness.—The foundation-stone of the new church of St. Paul, situated in Terminus-road, has been laid by the Bishop of Dover. The church, which is to be built in the Gothic style, will accommodate 500 persons, and is designed by Mr. R. B. Wheeler, architect, Tunbridge Wells.

DISSIDENT CHURCH BUILDING NEWS.

Stamford Hill.—A Congregational Church, which has just been erected at Stamford Hill, by the Congregationalists of that improving locality and of Hare-court Chapel, Highbury, has been opened for public service. The building, which was designed by Messrs. Tarring & Sons, architects, and built by Messrs. Dove Brothers, is in the ornate style of Gothic, and is constructed of Kentish ragstone, with Bath stone dressings, and with its tower and spire forms a prominent object on the summit of the hill. Its interior dimensions are 118 ft. by 51 ft. 6 in. It consists of a nave, aisles, and galleries. There is a transept extending out at each side, and an apse at the eastern end, and it supplies seat accommodation for 1,380 persons. At the back there are public and other vestries, apartments for the chapel-keeper, a lecture-hall, capable of seating 300 people, a kitchen, and other accessories. The total expenditure for the church has been 13,000l.

Aylestone (near Leicester).—A new Nonconformist Chapel has been opened in this village. It is in the Early Gothic style of architecture, the walling being of Clarkson's patent pressed red bricks, with Derbyshire stone dressings. It will seat about 200 adults, and has cost 500l. The architect was Mr. Tait, of Leicester, and the contractors were Messrs. Glover, of Blaby.

SCHOOL-BUILDING NEWS.

Maidstone.—The St. Faith's School, for girls and infants, one of the series projected a short time since, has been formally opened. The Earl of Romney headed the list. In the new parish of St. Faith two new buildings were contemplated, one for the reception of girls and infants, and to contain 296, which has just been opened; and the other for 125 boys, which will very shortly be taken in hand. A third school is nearly completed in St. Peter's, while two others are in course of erection, for ragged children, in Bonny-yard, and the schools at Tovil have been enlarged. Altogether additional accommodation for 700 children will be provided. The St. Faith's girls' and infants' school, which give accommodation for 296, cost, with land and fittings, about 1,700l. The architect is Mr. Stephens, and the builders are Messrs. Clements & Wallis. The building is a plain one, of brick. It is similar to the All Saints' School, with this exception, that it is built in two stories, the infants being on the ground floor, and the girls above.

Bowling (Bradford).—The new schools which have been recently erected in connexion with

St. John's Church, Bowling, have been opened by Bishop Ryan, vicar of Bradford. The foundation-stone was laid in the summer of last year. The new schools adjoin the old one in Wakefield-road, which for some years has been inadequate to supply the wants of the thriving district in which it is situated. The new buildings overlook the green fields, and they have attached to them spacious playgrounds. They are arranged in the form of the letter H, and consist of a boys' school, 56 ft. by 19 ft.; girls' school, 49 ft. by 19 ft.; and infants' school, 48 ft. by 19 ft.; with two class-rooms. The rooms are ceiled on the level of the collar-beam, about 19 ft. from the floor, and the walls are lined with dressboarding up to the inner side of the window-sills, and plastered above. Ample provision has been made for the ventilation of the rooms, and the warming will be effected by means of a stove in the basement, in addition to which fire-grates are provided. The boys' school is divided from the girls' by a wooden partition, which, being easily removable, allows the two rooms to be used together for large meetings, &c. The seats and desks are of pitch pine, with Sidebottom's patent standard, by which they can be made either into tables with seats or seats with backs. The style of the building is Gothic, and the four main and smaller gables have tracery on the window-heads. The remaining windows have plain ashlar dressings. A bell-gable is formed in the chimney-stack of the infants' school. The contractors were Mr. Samuel Jackson, mason and joiner; Mr. John Schofield, plumber and glazier; Mr. Woodhead, plasterer; Mr. Stoner, slater; and Mr. W. Dawson, painter. The architects were Messrs. Healey, of Bradford. The total cost, including the site, has been about 2,000l.

Milton (Hants).—New national school buildings have been erected here, on a site given by the Right Hon. Sir C. B. Adderley, M.P., in the most prominent and central position in the village. They are in the Gothic style, plain. The accommodation provided is for children in the mixed school, which is 40 ft. by 18 ft.; and for infants in the classroom, which is 14 ft. 3 in. by 13 ft. 6 in.; and for special purposes, such as tea meetings, both rooms can be thrown together by means of a movable partition. Adjoining the school a teacher's residence has been erected. The schoolroom is fitted up with desks, which will also serve as tea-tables, and for seats with inclined backs, as also for forming classes for Sunday-school purposes; and the classroom is fitted up with a gallery. Both the rooms are lofty, well-lighted, and ventilated. The ceiling is at the collar considerably higher than the walls. At the rear of the schools there are playgrounds, which are asphalted and enclosed with walls, and suitable out-offices for each sex, and it is intended to fit up the playgrounds with swings. The front boundary of the site, which is up to the turnpike-road, is inclosed with a brick wall, with open-framed wickets to the several entrances. The materials which have been used are red brick, relieved by bands and vasaire of blue bricks, and all the strings and labels are of moulded blue bricks. The principal elevation, which is to the turnpike-road, shows a gable for the mixed school, which is filled in with three lancet windows and a rose window above, and the gable is surmounted by a bell gable, fitted with a bell and finished with an iron vane. The remainder of this elevation, consisting of the classroom and the principal front of the residence, harmonises with the school. The contract for the building has been executed by Messrs. J. & G. Moss, of Ford Green, from the design and under the superintendence of Mr. George B. Ford, architect, Burslem.

STAINED GLASS.

Upton Church.—The great west window of this church has been filled with stained glass. The window is divided by the stone mullions into three lights, each about 15 ft. high and 3 ft. wide, with the centre light terminating in three tracery openings. The whole window is illustrative of the Crucifixion. In the centre light is our Lord, with the Mother, the Magdalene, and St. John at the foot of the cross. In the side lights on either side are the two thieves. Grouped around the impenitent thief are figures of those who mocked and reviled, while in corner beside the penitent thief are seen one of the Marys, Joseph of Arimathea, and the converted centurion. Towards the upper part of the composition are angels in radiating golden

light hovering over the scene. An enriched floriated panel underneath contains the lamb and passion-flower, and in the tracery openings at top, issuing from palm-branches, is the descending dove, with devotional angels on either side. The window is a presentation from Mr. W. Inman, of Upton Manor. Messrs. Ballantine & Son, of Edinburgh, are the artists of the work, and, we believe, have executed the whole with the approval of Mr. John Cunningham, the architect of the church.

St. Chrysostom's Church, Liverpool.—Two stained-glass windows have been erected in this church, by the same firm, to the memory of the late vicar, the Rev. T. Cowan. These windows have each three upright compartments, and represent the six Christian acts of charity (Matthew xxv. 35, 36). Above these springs stone tracery. The geometric openings therein are filled with glass of floriated design, and the two central shapes contain angels.

FROM AUSTRALIA.

Wangaratta.—The want of a hospital has long been felt in Wangaratta. What may be termed the administrative portion of the new building comprises an operating-room, male and female wards for accidents, board-room, surgeon and matron's rooms, linen-closet, store-room, and servants' rooms. The wards of the hospital proper are connected with the administrative department by paved passages, there being a distance of 12 ft. between each of the wards and it, which arrangement allows a free circulation of air round each ward, leaving no angles in which it can stagnate, and at the same time affording the means of carrying out the principle of subdivision of the sick. The cubical quantity of air allowed to each bed is 1,430 ft. The nurses' rooms are situated at the entrance of the wards. Enclosed at the end of each ward are the lavatories, water-closets, and baths; and attached to each ward is a scullery. The passages and staircases are of stone. Lifts are provided, and every means to economise labour has been studied. The kitchens and other offices are situated in the rear of the administrative department, with which they are connected by a covered way. The building is of ordinary picked red bricks, with patent pressed dark red brick dressings. To ensure ventilation, the introduction into the walls of ventilating flues has been adopted. The dispensary will be separate from the hospital, and will comprise waiting and consulting rooms, laboratory, and dispensing-room. The style of the architecture is modern Tudor. Mr. Leonard Mason is the architect.

Sydney.—The new Town-hall, the chief stone of which was laid by the Duke of Edinburgh, is making progress. The site is part of the cathedral close. The building, of which the *Australian Illustrated News* has given an illustration, has a frontage of 153 ft. east to George-street, the principal business thoroughfare from which alignment it sets back 40 ft., collimating with the east front of the cathedral. A space of about equal width, and 270 ft. in length, has been reserved on either flank of the building for ornamental planting. The building as planned would extend in length 245 ft. west from the frontage. The existing contract, however, comprises only the foundations and basement of what may be termed the business portion, and has a depth of 150 ft., or a superficial area of one half acre nearly. The foundations have been built on the bed rock at a depth of 15 ft. from the natural surface. It is a dense red sandstone, indurated with grit, almost level on the surface, and little inferior in hardness to granite. The ground-floor is elevated 8 ft. above the level of George-street. A flight of steps, 36 ft. in length, leads upon a colonnade, from which the principal entrance conducts to the central hall. At either end of the colonnade or portico, recessed vestibules open on the staircases and corridors; these will be of fire-proof construction, and respectively 8 ft. and 10 ft. in width. The central hall is octagonal in plan, disclosing engaged columns, panelled dado, niches for sculpture, enriched entablature, groined and coffered ceiling, and tessellated pavement. A spacious opening in the hall, and others contiguous to the staircases, give direct access to the vestibule, which in its entire extent is 88 ft. in length and 60 ft. 6 in. in width. Its architectural character assimilates to that of the Venetian cortile, consisting in a continuous arcade over arcade in two orders, the lower supporting a spacious corridor

or gallery, the upper surmounted at a height of 40 ft. by a ribbed and coffered ceiling pierced for direct lighting and ventilation. The corridors enlarding the vestibule communicate with offices for the town clerk and assistants, the city engineer, surveyor and assistants, city treasurer, clerks, city solicitor, health officer, and others. The dimensions of these offices average 20 ft. by 18 ft. 6 in., and have a uniform height of 20 ft. The first floor is appropriated to the council chamber, 42 ft. by 31 ft. 6 in., and 28 ft. in height; mayor's and aldermen's room, respectively 26 ft. by 22 ft.; library and committee-room, 42 ft. by 31 ft. 6 in.; mayor's reception-room and withdrawing-room, of similar dimensions to the council-chamber and library; fire-proof record-room, public gallery, reporters' sitting-room, waiting-room, ante-room, corridor, and balcony. The upper floor provides accommodation for chief draftsman, assistants, contractors, and fire-proof plan and instrument room, lavatories, &c. The town-hall, as designed, has a clear length of 132 ft.; width, 62 ft.; and height, 66 ft. When thrown open en suite with vestibule its dimensions will be:—length, 212 ft. 6 in.; width, 62 ft. It is flanked on three sides by an open colonnade, 12 ft. in width, and a corresponding terrace at a height of 21 ft. from the floor. At either level spacious retiring-rooms are provided. Internally a gallery, 5 ft. in width along the sides and 10 ft. at either end, commands the hall; double orchestras have been arranged, with external means of approach, and ample provision made for the safe and speedy egress of a crowded assembly to the grounds which environ the hall. Wide and covered staircases conduct also from the colonnade to the refreshment-room, situate beneath the hall. Its dimensions are 90 ft. by 60 ft., with a clear height of 18 ft., and in convenient proximity are placed the kitchens, purveyor's-room, serving and waiting rooms, stores, and cellars. The general style of architecture is Italian; the salient faces are enriched by coupled columns, superimposed and detached. These flank spacious circular-headed window openings, deeply recessed and of Venetian character. The tower rises to a height of 180 ft., and terminates in an open campanile; the several floors are available for cloak-room, observatory, telegraph-rooms, &c. The present contract, providing for the excavation and building the foundations and basements of a portion of the building, was to be completed within three months. The plans have been modified to some extent from the original prize design, accredited to Mr. J. H. Wilson, who superintends the erection of the building, by direction of the municipal council. Mr. Thomas Alston performs the duty of foreman of works; the contractors are Messrs. Kelly & McLeod. The new City Bank, Sydney, is in progress. The appearance of Pitt-street North has been completely changed during the last few years; and the low mud hovels which formerly lined the thoroughfare have given place to massive and ornamental buildings, which would do no discredit to any city. The style is Italian, freely treated. The front elevation faces Pitt-street, and has for its central feature a projecting portico, crowned with a cornice and balustrade. The main line of the front recedes about 7 ft. from the line of footpath, the space on either side of the porch being enclosed with a stone wall and balustrade, with iron railing. The windows on either side of the porch have arched heads, supported by small independent columns. The upper windows are of similar form, but with lighter details. The elevation is surmounted by a cornice and balustrade. The building will probably be by this time completed; and its estimated cost is about 17,000l. Mr. George Allen Mansfield is the architect, Mr. Alex. Dean, the contractor; and the masonry has been executed by Messrs. R. & W. McCredie.

FROM SCOTLAND.

Glasgow.—The foundation-stone of a Reformed Presbyterian church has been laid at Rutherglen, near Glasgow. The edifice is in the Early English style of architecture, and built of square-dressed rubble stone-work, with the dressings to the principal entrance door, windows, &c., of freestone. The front elevation will consist of a large gable, with buttresses and moulded stone coping, with carved stone finial; the entrance-door being in the centre, and having moulded jambs and shafts, with bases and capitals supporting a

deeply-moulded pointed arch, with label moulding, and carved bosses. On each side there will be a double-light tracery window, which will afford light to the vestibule above the door. In the centre of the gable will be a large four-light window, with pointed arch, filled with tracery. At the south-west angle of the church, there will be a tower and spire, 115 ft. high. In the lower part of the tower will be the side (south) entrance-door, having deeply-splayed jambs and pointed arch, and on the west a treflow window; the upper part of the tower to be occupied by pointed-arched windows, having moulded jambs, with shafts, bases, and capitals of columns, which give light to the gallery staircase. The belfry windows are two-light, and tracery with a cornice above, from which springs the stone spire, built of coned ashlar work. A staircase in the tower will give access to one of the galleries, and at the corresponding angle of the church there will be a projecting octagonal staircase leading to the other gallery, the lower portion being lighted by a treflow window, similar to that in the tower, and the upper part by double-light cusped windows, surmounted by a conical roof. The church will be lighted by the large window in the west gable; five lancet-shaped windows in each of the side walls, and a rose-window, 14 ft. diameter, in the end gable above the pulpit. All the windows will be glazed with cathedral glass, and have borders of stained glass. The body of the church will be 69 ft. by 50 ft. wide, divided into nave and side aisles by cast-iron columns, with foliated capitals supporting the side galleries, above which there will be another series of columns, also with enriched capitals, from which spring moulded and enriched pointed arches. The ceiling of the nave will be flat, and divided into bays by the tie-beams and hammer-beams of the roofs, which will be exposed to view, and rest upon carved corbels; the height of the side walls will be 25 ft., and the nave 38 ft. The gallery front will be of timber framing, with cusped ornaments; the pulpit of the semi-platform type, upon a slightly raised dais; the pews will be open benches, and for 750 sittings. The cost 3,000l. The architects are Messrs. George P. Kennedy & R. Dalglish, of Glasgow.

PATENTS CONNECTED WITH BUILDING.

SLIDING GAS PENDANTS.—J. Horton. Dated 6th March, 1871.—These improvements in gaseliers consist in combining a central light, capable of being raised and lowered, with a series of two or more fixed lights. The central sliding light is carried by a gas supply-pipe, sliding in the tubular body of the gaselier, and is supported by chains and a balance-weight or weights. An ordinary water-slide or gas-joint or packing is used to prevent the escape of gas. A gas-joint or packing for this purpose is described, consisting of two concentric tubes secured in the tubular body of the gaselier, and two washers or packings fixed by screw caps or plugs in the larger tube; the smaller tube is filled with bees' wax. The gas-pipe of the central light passes through and slides in the chamber containing the bees' wax, and also through holes in the washers and screw caps. This gas-joint or packing is applicable to sliding gas-pendants and sliding gas-brackets.

BRICKMAKING.—J. F. M. Pollock. Dated 9th March, 1871.—In constructing a self-contained machine for making bricks according to this invention, a receiving hopper is combined with a pug-mill, having its shaft and lower portion peculiarly constructed, and provided with a sliding bottom or mould. The pug-mill shaft is composed of a series of knives, each consisting of a boss and one or more blades. The bosses are provided with projections and recesses, taking into one another, so that the bosses themselves form a shaft, the torsional power being transmitted from knife to knife by the projections above mentioned. The bosses are formed with central holes, and are secured vertically by a bar or tie passing through them. Motion is given to the knives by means of a disc arrangement provided for the purpose. The lower portion of the pug-mill feeds the clay to a tapered chamber, assuming at its lower end the form of the article to be moulded. Across this chamber is or are placed a flat bar or bars, whose edges are situated upwards and downwards to insure the delivery of the clay downwards. The pug-mill is furnished with a sliding bottom or mould, which receives motion from a rocking shaft, and suitable gearing or apparatus is specially arranged for giving the requisite motions, removing the

bricks, and so forth. The machine may be constructed so as to mould two or more bricks simultaneously. In some cases a circular table and special gearing are used instead of the sliding bottom and gearing already mentioned. When the table is of the kind described in the specification of the patent No. 2,911, of 1869, the framework is composed of a base plate, bearing side frames or pillars supporting a top frame, and suitable shafting and gearing are provided for giving the various self-acting intermittent and other movements. The two main vertical shafts receive motion from a horizontal shaft carrying worms and wheels, rotating in vessels containing oil or other lubricant. Arrangements are made to preserve the gearing from dust, and drippants are applied for receiving superfluous oil from the bearings. Another part of the invention relates to pressing bricks, whilst confined in moulds, by means of plates of smaller area than the sides of the bricks against which such plates are intended to operate. The various improvements are applicable to machines for making tiles and other articles.

MACHINERY AND TOOLS.—W. Thompson. Dated 17th March, 1871.—This invention consists in, first, forming tools for cutting marble, stone, slate, and other minerals of tubes of steel or other metal; secondly, the general arrangement of machinery for cutting marble, stone, slate, or other minerals.

REGULATING THE SUPPLY OF WATER.—W. Morris and G. Eskholme. Dated 30th January, 1871.—This invention consists—first, in the use of a movable seat in lieu of a fixed seat in the ball-taps employed in connexion with the waste-preventing serving-boxes or water-closets, and other purposes, in order to reduce the liability to injury of the seating of such ball taps. Secondly, in the combination of a sliding discharge-pipe, with a cylinder or water-box containing a movable valve-seat resting on the discharge-pipe, so arranged as that on withdrawing the discharge-pipe from the valve-seat, a given time will elapse before the seat, by its descent, will close the discharge-pipe again, thereby not only preventing continuous waste, but further insuring the delivery of a regulated quantity of water. This is applicable to water-closets, stand-posts, and other like purposes. Thirdly, in the use of a supplementary service-box in water-closets, situate between the supply cock and the basin, for the purpose of insuring the delivery of a proper amount of water into the cistern after the cock has been shut, in order to properly trap the closet.

LOCKS AND LATCHES.—H. C. Harvey and T. Walton. Dated 1st February, 1871.—According to this invention the bolt, which acts both as a lock-bolt and latch-bolt, is provided with a sliding working in a recess across the bolt, the said sliding being moved from side to side of the bolt so as to lock or release the bolt by the action of the key. A slot in the bolt works upon a strong stamp, and a recess in the rear of the slide can be brought or not to coincide with the slot in the bolt. On the slide is a lever, in the gating of which a stump on the slide engages. The key first acts upon the lever to release the slide, and the latter is then removed by the key into such a position that the recess in the slide coincides with the slot in the bolt, when the said bolt can be withdrawn. When the slide is so moved across the bolt that its slot does not coincide with the slot in the bolt, the latter is fixed, and can only be withdrawn by the action of the key upon the lever and slide. The case of the lock is made of sheet metal, and is strengthened, and a guide for fitting on the cover provided by means of raised strips fixed along the inside of the case. The keyhole is double, so that the lock can be used without alteration with any kind of door. The follower of the latch is made to operate upon the bolt by means of a projecting tooth on it engaging in a recess between the teeth in the crank, or the reverse arrangement may be used. Around the follower loose bushes are placed to facilitate its motion and to prevent it becoming fast.

FURNITURE.—J. E. Tysall. Dated 4th February, 1871.—This invention consists in inlaying or ornamenting by the use of different coloured woods substantially in the following manner:—Upon the groundwork of the article to be inlaid or ornamented is secured a layer of dark wood or wood of a colour different from that of which the article is made, and upon this dark coloured wood is secured a thin layer or veneer of the same wood as that of which the groundwork of the article or surface of the article

made. Portions of the upper layer or veneer are cut away in any desired ornamental form, the dark or coloured wood beneath it being exposed at the cut-away parts, so as to give the surface the appearance of ordinary inlaying. The exposed surface of the dark or coloured wood may be carved, or portions may be incised or pierced, so as to expose portions of the wood beneath it. The application of the layers of different-coloured woods may be limited to the part or parts to be ornamented, or a slab may be incised or ornamented and inserted in the groundwork of the article, or the whole of the groundwork of the article may be covered with the layers of different-coloured woods.

IMPROVED APPARATUS FOR PREVENTING EXPLOSIONS IN BATH OR DOMESTIC BOILERS.—W. Randall. Dated 10th January, 1871.—A safety-valve is adapted to the tap, and must be opened every time water is required to be drawn from the boiler.

MACHINES FOR MOULDING AND PRESSING BRICKS.—W. B. Lake. A communication. Dated 11th January, 1871.—A mould-wheel and feeding-screw are arranged upon the same shaft, and the mixing-arms of the pug-mill are on the same shaft as the mould-wheel. The tub-bottom is also arranged around the shaft that bears the mould-wheel and feeding-screw. There is also a follower cam-track around the driving-shaft. The tub-bottom has one side which is provided with a feeding apparatus arranged to fit closely over the mould-wheel, and the other side is raised above the mould-wheel, to allow of the expulsion and removal of the bricks. There is a screw in the lower bearing of the driving-shaft for adjusting the mould-wheel to the tub-bottom. There are lateral flanges on the tub-bottom secured upon the frame by set screws for adjusting the position of the tub-bottom. The frame is composed of two uprights, connected by brace-bars all cast in one piece; one-half or part of the tub is securely fixed, so as to fulfil the additional function of a support to other portions of the machine, and the other part thereof is hinged to the fixed part, so as to swing open. The cam-track has adjustable sections. The moulds are constructed to form the bricks vertically edgewise in the mould-wheel. The brick-moulds are arranged in combination with a traverse belt and carrier belt for automatically removing the bricks from the mould-wheel. An adjustable draught-arm is used in combination with a sweep applied to the driving-shaft.

TILES FOR ROOFS AND OTHER PARTS OF BUILDINGS.—J. A. Wade and J. Cherry. Dated 12th January, 1871.—The walls are built with outer and inner courses, and a space between them, such courses being tied with glazed bricks, ridged or fluted, to prevent the lateral passage of water; also with channelled bricks to act as spouts at the upper part, and similar bricks at the lower part to carry off water through perforated bricks. Glazed bricks set in cement are also used for the "damp courses." The tiles have dovetailed, rabbeted, or undercut flanges, similar to those in patent No. 1173 (1870), but instead of being held together by separate fastening pieces, each tile is formed with such flange on one edge, and a fastening piece of corresponding section on the other edge. Other tiles are made with locking flanges on considerable portions of their upper and lower surfaces, so as to admit of their hanging together on roofs without depending on knobs or nails for support as usual. Such tiles may also be used for sheathing party walls temporarily.

WINDOW BLIND MOUNTINGS.—H. B. Young. Dated 12th January, 1871.—These improvements relate to apparatus by which the level of the blind-roller may be regulated so that the blind may hang perpendicularly, also to the governance of the movement of the roller in being caused to rotate in either direction, or in holding the same stationary. The apparatus may be fitted at the end of the roller, and should principally consist of a reel barrel, a reel and spindle, with spring bearing, a spring acting against the same, and a leather block secured to the bracket of the roller.

WINDOW BLINDS.—W. Farnell. Dated 11th January, 1871.—The feature of novelty of this invention consists in causing a spring roller to press on that part of the cord of a roller window-blind that is in the groove of the pulley employed to revolve the roller for raising and lowering the blind, and by these means to hold the blind firmly at any desired height.

SPINDLES AND THEIR KNOBS OR HANDLES.—S. Wilkes. Dated 26th January, 1871.—These

improvements refer to a spring arrangement applied to the spindle, whereby the knob or handle is secured thereto without screws or other means of connection heretofore adopted. The spindles are adjustable to the varying thicknesses of doors, drawers, and locks, owing to the spring arrangement being capable of being shifted in position.

GAS BURNERS.—G. Haselstine. A communication. Dated 23rd February, 1871.—This invention consists in a peculiar arrangement of two concentric rings of gas jets, and presents several novel characteristics of construction whereby the inventor obtains a uniform and perfect diffusion of the gas. He also secures a perfect control over the gas issuing from the inner concentric ring of jets. Duplicate concentric rings of jets are combined with gas chambers, and the latter are connected with bifurcated sections of a pipe, and respectively supplied with gas through suitable passages. He uses a regulating key with the inner ring of jets in connexion with a passage, which, above the key, is divided into branch passages, and thereby regulate the flow of gas to the inner ring.

COFFER DAMS.—A. M. Clark. A communication. Dated 11th May, 1871.—The inventor constructs a coffer-dam so that it can be easily moved, sunk in place, and removed, the walls being so constructed that after one section of what is to be a continuous wall is built within it the dam can be moved forward in the line of the wall, and by devices be clamped fast to the part completed, and another section be then built and joined on. The invention also includes improvements in the construction of some of the parts of the shell, and in the structure as a whole. Also in the employment within the dam of loose piles to act as girders to the dam in raising and lowering it; and also apparatus for placing and moving the dams.

Miscellaneous.

The Poor Organ-Grinders.—Some disgraceful disclosures are being made in the Clerkenwell Police-court as to the treatment of the organ-men in their crowded and filthy domiciles in the neighbourhood of Holborn. Mr. Barker said he was determined to stop this overcrowding of Italians, who were treated, as far as their lodgings were concerned, far worse than many dogs were. Some time ago the places had been ordered to be repaired and cleansed. On the part of the padrone or master of one of these lodging-houses it was urged that the Common Lodging-house Act, 29th and 30th Vic., cap. 90, sec. 41, did not contemplate overcrowding by members of the same family, or by servants; and here, if the parties in the house were not exactly "members of the same family," they were the servants of the padrones. The defendant brought these organ-grinders from Italy, provided their passports, paid their passage, engaged them for a term (generally of years), and undertook to provide them with food, clothing, washing, board and lodging, and with an organ, receiving as his remuneration half of their earnings, the remaining half being accumulated until the expiration of the term of service, when it was equally shared between the employer and employed, rather too much in favour of the organ-grinder to be true, we fear. If the employed were successful, it was added, the bargain was not disadvantageous to the employer, but otherwise if unsuccessful, as the latter took the sole risk. Some of the cases were adjourned, and others settled by sentences of fine or imprisonment. We described these very places as overcrowded with Italians some years ago.

Mr. Brassey, M.P., on Labour and Capital.—Mr. Thomas Brassey, M.P., has delivered a lecture in the Workmen's Hall, Birkenhead, on the relations of labour and capital. Mr. Edward Mills presided, and the hall was crowded principally by working men. Mr. Brassey's able lecture has been well quoted. It contained much useful advice and information, and advocated, amongst other things, the establishment of Courts of Conciliation, composed of masters and men, the advancement of co-operation, the cultivation of fraternal feeling amongst the workmen in their private affairs, as to early marriages, &c., and the establishment of bonds of sympathy between class and class, by bringing them more together than heretofore; the laws of capital and labour, supply and demand, were also considered.

The Sewage Works at Merthyr Tydvil. The population of this town is 50,000, and the daily dry weather flow of sewage 60,000 gallons, or 12 gallons per head. The method of purification at present employed is that of intermittent downward filtration on a limited area of land, arranged by and carried on under the superintendence of Mr. Bailey Denton, C.E. The area employed for the filtration is twenty acres, and although not yet fully prepared, the whole of the sewage has been passed through it for the last three months. It is intended to be divided into four beds of five acres each, receiving in succession the whole sewage continuously for six hours each per day. Ten acres only, or two beds, are as yet completed, and these now receive, and have been receiving for the last month, the whole sewage for twelve hours each per day. The crops this year were all in a fine healthy condition,—the peas exceptionally so. All the vegetables had been planted since the 14th of June, and the growing crop has been sold, and realised an average of 17l. 15s. per acre. Although the ten acres on which these crops were growing had for the last month received the whole of the Merthyr sewage, yet not the slightest offensive odour was given out, either from the land or the carriers, which, built of brick and cement, were efficiently arranged for the even distribution of the sewage. Mr. Bailey Denton has been requested to furnish a report upon the practicability of applying a similar system for the purification of the sewage of Birmingham.

The Insanitary State of Wolverhampton. In a report to the Town Council, by the Sanitary Committee, based upon an inspection made in August by the committee and other members of the council, they "regret that they have to report that they find a remarkable concurrence of testimony to the fact that nuisances of a dangerous character are almost universally prevalent, and that the town is in a fearfully insanitary condition." Some of "the worst and most offensive of the nuisances" are described under the heads of "privy accommodation," "midden pits," "pigsties," "water supply," and "unpaved yards," with the additional remark "that the numerous other insanitary abominations are described in the reports submitted to your committee, but an enumeration of them would fill a volume." Further on the committee say they are "of opinion that abundant evidence has been placed before them to prove that all the local circumstances which are essential for the propagation of cholera and typhoid fever exist in frightful profusion in all parts of the town," and evidence shows them "that all the elements are present which are requisite for the rapid spread of any contagious disease provided it once gets a start." The remedies proposed by the committee are:—The appointment of a medical officer of health; the removal and disposal of night soil by a separate committee; the whole time of two inspectors to be given to the work of the Sanitary Committee; and the provision of certain structural arrangements for privies and cess-pools, and the removal of night soil.

The Proposed Covered Market for York. The long vexed question of a covered market for York has been decided as far as the special committee appointed is concerned. It is proposed to make a frontage to Parliament-street of 21 ft., the market to extend backwards to the Great Shambles. It will be 194 ft. long, and 60 ft. wide, and will have four entrances, one from Parliament-street, one from High Jubbargate, one from the Little Shambles, and one from the Great Shambles. The internal area will be 2,046 square yards, and the whole area purchased will be 2,888 square yards. Three houses will be taken down on the north-east side of the Shambles, and two houses in Colliergate, thereby insuring a carriage entrance from that street 30 ft. wide. According to the City Surveyor's estimates, the cost will be 18,423l. Adding to this 10 per cent. for contingencies and Parliamentary expenses, the total cost will be 20,529l.

An Analyst of Food desirable.—One of the Lambeth vestrymen, speaking on the necessity of appointing a public analyst for the parish, stated, amongst other things, that a quantity of red lead was found in some cocoa, purchased in the parish, and some butter was found to have contained a quantity of rags. The matter has been referred to a committee. Something more than the mere appointment of an analyst is requisite, as experience has shown.

A Self-taught Mathematician.—Mr. Thomas Barker, a self-taught mathematician and practical engineer, has just ended his days as a "poor brother" in the hospital of the Charterhouse. He was the son of a farmer at Old Park, Durham, and the solution of many of the most difficult problems in the earlier stages of railway surveying and construction was due to his genius. It was he who invented the celebrated method of laying down railway curves, and the *Durham Advertiser* says that he "laid out the Stockton and Darlington Railway, the first line in the kingdom." He also laid out the atmospheric line from Dublin to Kingstown; and in the infancy of the railroad system he was largely engaged in many parts of the kingdom. The last line which he surveyed was that projected by Mr. George Hudson for connecting Lowestoft with London, and for making that town on the eastern coast a second Liverpool,—a project which the ruin of the "Railway King" extinguished. Mr. Barker was the author of several works on mathematics, both theoretical and practical.

The Old Sea-Water Town Pump at Brighton.—The remains of this old pump have been discovered by accident. The original chamber which covered it was come upon when digging out the road for the Aquarium works. It is situated beneath the entrance-gates to the pier, by Batty's toll-house. The Aquarium Company's builder rented the chamber—ignorant of its original purpose,—to store cement in. It is vaulted and about 25 ft. by 15 ft., with a brick-arched passage, about 10 ft. long, leading into it. One of the men, while working there, happening to throw his shovel down somewhat forcibly, was surprised that it made a hole, opening into a hollow beneath. Dropping down a stone, he heard the splash of water. Calling a fellow-workman, they enlarged the hole, and having first let down a candle, they got a ladder and proceeded to explore, when they discovered the gear of the old well. It appears that the gear, when the well was disused, was covered up with oak planking, which had become rotten.

Queen Victoria-street, London.—Several new buildings here are either in course of erection, or about to be commenced, the lower portion to be devoted to shops, and the upper floors to offices. One block, nearly opposite the Church of St. Mary, Aldermanbury, and estimated to cost between 25,000*l.* and 30,000*l.*, will have a frontage of about 120 ft., and a height of 80 ft. The elevation will be Venetian in style, and in Portland stone, with marble pilasters and clustered columns. In another part of Queen Victoria-street a pile in the Italian style in Portland stone is about to be commenced; and close to the Church of St. Mary, Aldermanbury, a block of buildings, 50 ft. high, also in the Italian style, has been contracted for. It will have an elevation of Portland stone, and the pilasters will be of polished granite.

National Education League.—The annual general meeting of this League has been announced to take place at the Masonic Hall Assembly Rooms, Birmingham, on Tuesday and Wednesday, the 17th and 18th of October; and we are informed that many influential names and large deputations from various leading towns in the kingdom will be included in the programme of the proceedings. The chair will be occupied by Mr. George Dixon, M.P.; and papers will be read by Sir Charles Dilke, bart., M.P., Mr. Alfred Blingworth, M.P., Mr. R. W. Dale, M.A., Mr. Jesse Collings, Rev. Sonley Johnstone, Rev. J. W. Caldwell, M.A. (Head Master of the Free Grammar School Bristol), and other gentlemen.

The Promenade Concerts.—We willingly mention that Mr. Edward Murray, long honourably associated as acting manager with the promenade concerts organised by the late Mr. Alfred Mellon, and who has, with equal credit, filled the same position at Covent Garden Theatre during the recent series so successfully conducted by Mr. Rivière, has had the special privilege accorded him of an extra night, which will be identified with his personal interest. This first benefit of Mr. Edward Murray is fixed for Monday, October 16th—a special extra performance.

Hull Dock Company's New Offices.—These buildings in Hull are now finished and occupied. We will give particulars on another occasion.

Norfolk and Norwich Archaeological Society.—The day appointed for the autumn excursion of the Archaeological Society was a very rainy one, but, as all arrangements had been made, the "outing" could not be deferred. About a dozen persons met at the Dunham station of the Great Eastern Railway. Mr. Carthew acted as guide, and the party, which afterwards increased, visited Great Dunham Church, Beeston St. Mary the Virgin, Mileham Church and Castle, and Mitcham Church; then lunched, and proceeded to the churches of East Lexham, Newton, and Sporre.

Dorking Public Hall.—It has been resolved that the building of the new public hall be commenced forthwith. With this view the architect, Mr. C. H. Driver, has been requested to meet the directors, for the purpose of taking the necessary steps for proceeding with the works. A circular is to be issued to the public, setting forth the present prospects of the undertaking, together with a list of shareholders and the number of shares already applied for. It is now considered that the chief obstacles to its realisation are overcome.

Fall of a New Four-Story Building in Dundee.—In Dalfield-walk, the whole of the front wall of a new four-story dwelling-house presently in course of erection has fallen out on the street. A man visited the premises just before the wall fell, for the purpose of expelling a few children who had been playing in the inside. Having done what he intended, he heard something cracking, and, fearing what actually did occur, he made off by the back of the building. Scarcely had he got out when the wall tumbled.

Proposed Widening of Chancery-lane. At the meeting of the Metropolitan Board of Works, the Works Committee presented a report recommending,—“That a communication be addressed to the First Commissioner of her Majesty's Works, &c., representing to him the desirability of clauses being inserted in some Bill to be introduced in the next session, to provide for the widening of Chancery-lane.” After a great deal of discussion the report was referred back to the committee for reconsideration.

Men out of Work.—In a discussion on the Poor Laws at the Leeds Congress, Mr. George Potter stated that in addition to the million of paupers receiving relief, there were in this country “700,000 able-bodied men out of work, and living on the labour and industry of others.” Can this be correct? We can scarcely believe it. Some means should at once be adopted to ascertain the facts.

Working Men's College, 45, Great Ormond-street, W.C.—The Art Classes already founded comprise—Elementary, Pencil and Chalk, Water-colour, Ornament, Architectural Drawing, Antique, Still Life, and Life; the teachers being Mr. W. Cave Thomas, Mr. Henry W. Brewer, and Mr. G. Rosenthal. The lectures on Perspective will commence on the 20th.

St. Paul's, Covent Garden.—Mr. Butterfield has been commissioned to alter and improve the church of St. Paul, Covent Garden. The galleries over the aisles are to be removed; open seats will replace the present pews, and the position of the organ will be altered.

Fire in a Timber Yard.—On Wednesday night, a fire, attended with great destruction of property, broke out in the extensive timber-yards of Mr. Lindsay, East-lane, Lock's-fields, Walworth. The flames spread with alarming rapidity, stack after stack of timber being completely destroyed.

A New Alliance.—We hear of an alliance between a certain number of Conservative peers, members of Parliament, and the working classes, as represented by some of their leaders. It is full of strange import, though, as it seems to us, promising more good than ill, and will call for serious attention.

Prints for the Patients.—The British Hospital for Diseases of the Skin, in Great Marlborough-street and Finsbury-square, has just received a handsome present of framed engravings for the decoration of the waiting-halls, from Mr. Henry Graves, the well-known publisher.

The late Charles Dickens.—A meeting has been held in Portsmouth with the view of raising a national memorial of the late great novelist, Charles Dickens.

TENDERS

For villa residence for Mr. James Wilkes, Chester-road, Kidderminster. Mr. J. T. Meredith, architect. Quantities supplied:—

Thompson	£298 0 0
Hilton	658 0 0
Goodman & Burmore	686 0 0

For extension of spinning-shed for Mr. Thos. Lea, M.P., Kidderminster. Mr. J. T. Meredith, architect. Quantities supplied:—

Hilton	£292 0 0
Binnian & Son	916 0 0
Thompson (accepted)	916 0 0

For coach-house, stable, &c. for Mr. J. Steward, Trimley, near Kidderminster. Mr. J. T. Meredith, architect. Quantities supplied:—

Hilton	£232 0 0
Goodman & Burmore	299 0 0
Binnian & Son	257 0 0

For erection of shed, engine-house, and stack, for Messrs. Lowe, Brothers, Wribbenhall. Quantities supplied:—

Hilton	£469 0 0
Horton	469 0 0
Parton	468 0 0
Binnian & Son	443 0 0
Smith & Sons	390 0 0

For erection of weaving-shed, warehouse, dye-house, engine-house, stoves, drying-shed, and stack, for Messrs. Wainall & Fawcett, Kidderminster. Mr. J. T. Meredith, architect. Quantities supplied:—

Binnian & Son	£3,560 0 0
Thompson	3,500 0 0
Goodman & Burmore	3,409 0 0
Hilton	3,400 0 0

For new premises for the Kidderminster Industrial Co-operative Society, Limited, Worcester-street. Mr. J. T. Meredith, architect. Quantities supplied:—

Goodman & Burmore (accepted)	£1,125 0 0
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For building a house in the Terrace-road, Highbury, for Mr. Richard Bailey, exclusive of painting, glazing, plumbing, and paperhanging. Mr. H. Hackett, architect:—

Davis, Brothers	£715 0 0
Clarke	685 0 0
Orchard, Brothers (accepted)	649 0 0

For conservatory, &c. at Highbury. Mr. Richard Marvin, architect. Quantities supplied, by Mr. Frederick Spang:—

Bridgman, Nuthall, & Co. (accepted)	£250 0 0
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For new coal stores, meat larder, &c. for the Faversham Hospital, Homerton. Mr. Jno. Walker, architect. Quantities by Mr. A. L. Buzard:—

Walton	£1,628 0 0
Crab	1,676 0 0
Blackmore & Morley	1,485 0 0
Nicholls	1,478 0 0
Claridge	1,387 0 0
Vaughan	1,379 0 0
Waterson	1,197 0 0
Front	1,195 0 0
Brown & Sons (accepted)	1,154 0 0
Robins (withdrawn)	868 0 0

For the erection of a workshop at Highbury Coach Factory, for London General Omnibus Company, under the superintendence of Mr. Tosh. Quantities supplied by Mr. A. J. Bolton:—

Dunford & Lagham	£1,475 0 0
Pettigrew & Moyes	1,420 0 0
Pink	1,392 0 0
Farsons, Brothers	1,350 0 0
Cook	1,350 0 0
Randall & Cockle	1,310 0 0
Johnson & Co.	1,267 2 8
Thompson	1,230 0 0
Vaughan	1,224 0 0
Norris	1,217 0 0
Scutt	1,211 10 0
Rooney, Brothers	1,200 0 0
Mitchell	1,198 0 0
Crocker	1,190 0 0
Biesag	1,150 0 0
Ford	1,170 0 0
Goodman	1,133 0 0
Mann	1,111 0 0
Brown & Son	1,110 0 0
High	1,095 0 0
Wright	1,095 0 0
Robins & Co.	1,045 0 0
Atkinson & Walker (accepted)	1,025 0 0

For addition of two new rooms to the Independent Chapel House, Fareham, for repairs to ditto and school room. Mr. J. Rosevear, architect:—

Judd	£215 0 0
Rosevear	99 12 0
Tutte (accepted)	91 0 0

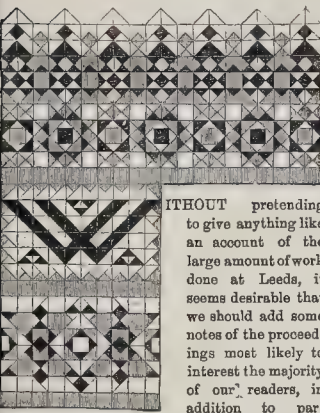
For new school at Stocking Pelham, Herts, for the Rev. C. Hartley and others. Mr. George Perry, architect:—

Gibbons	£219 0 0
215 0 0	
Cornwell	212 0 0
Beggars	212 0 0

The Builder.

VOL. XXIX.—No. 1498.

Social Science: the Leeds Congress.



WITHOUT pretending to give anything like an account of the large amount of work done at Leeds, it seems desirable that we should add some notes of the proceedings most likely to interest the majority of our readers, in addition to particulars already

given. The meeting was unquestionably a success. The Town-hall in its various courts and apartments afforded accommodation under one roof to all the departments, and the usual hospitality of the district was abundantly shown. The Mayor (Alderman Barrau), Dr. Chas. Chadwick, Mr. Ikins, Mr. Fenwick, Mr. William Thomas Jackson (of Headingley), Mr. Milliter, C.E., and others, opened their houses to members of the Association, and entertained many at dinner and luncheon. The presidential addresses by Mr. Hastings, Mr. Vernon Harcourt, M.P., Mr. Baines, M.P., Lord Teignmouth, and others, were full of valuable matter, and the discussions which the arranged questions elicited were practical and useful. We must print a few paragraphs from the presidential address of Mr. Newmarsh, F.R.S., in which he spoke of

Capital and Labour.

The Trades Union Act, the speaker said, concludes the long controversy between the Legislature and the working-classes regarding combinations. Peaceful combinations to procure higher wages, shorter hours, and better conditions generally, are now fully within the law, so long as violence, threats, and molestation are not resorted to. The Legislature, so far as it can, has remedied arrangements between masters and men to the only arbitration which can really settle them—namely, free discussion between the parties. Such arrangements are essentially bargains regulated from time to time by the circumstances of the demand for goods, the supply of labour, and the resources and enterprises of capital; and, without quarrelling or temper, it is the interest and the duty of both sides to discover, by the quiet discussion which takes place in all other commercial dealings, what are the precise and practical terms on which they can buy or sell. A strike is the end of discussion and the beginning of war, and injures both sides. The common-sense course is to set up some middle tribunal composed of representative masters and men, who will meet as people of business, and fix the rate of wages from time to time. It is chiefly abroad that we now hear denunciations of capital as the great enemy of the working-classes. Popular observation among ourselves has advanced far enough to see that, as a general proposition, nothing can be plainer than that the greater the accumulation of capital,—that is to say, houses, shops, ships, railways, manufactures, commodities, animals, tools, and implements,—the better must it be for the

classes who live on wages, and who desire to buy with those wages as many commodities as possible. A cheap country means a country where there is much capital, and much, therefore, to sell; and a prosperous country means a country where the industry of the people produces the largest quantity of useful and desirable things, to be divided among the capitalists and labourers who produce them. The first concern of all societies must be to augment the gross produce of the year, so that after providing for the subsistence and comfort of the members there may be a surplus applicable to the cheapening and enlarging of future production.

The Workmen's Meeting.

The workmen's meeting was held in the Victoria Hall, and was as usual one of the most interesting events of the week. About 4,000 persons were present. The appearance of the hall, densely packed in every part, the central gangway and a few feet at the extreme end of the hall occupied by standing listeners, who thus formed a T-shaped figure in the midst of the sitters, was a sight not soon to be forgotten. The platform was also crowded. The Mayor presided, and showed admirable tact in the conduct of the evening. For obvious reasons we adopt the report made by the *Times*:—

"After an introductory address by the Mayor, and a speech by Sir John Pakington on technical education, Mr. Godwin pursued his customary course of giving a description of the sanitary condition of the locality. He said that he could tell them a great deal of what he had seen in other towns, but perhaps they would rather hear something as to what he had seen in Leeds that morning. He would take Back-house-yard and go into Ebenezer-street, Polard's-court, and other places in that neighbourhood. He found these courts a mixture of humanity and middens. They were filled with children, all sores and sickness. The women said,—and respectable women they were,—'We can do nothing; we have given up attempting to be clean; we abandon ourselves to circumstances, and you see us as we are.' They were wretched, listless. He asked the question, which he had asked five hundred times and oftener, 'How many children have you?' 'Three.' 'How many are dead?' 'Five.' That was the reply of the first woman he met. In the second case, 'How many alive?' 'Two.' 'How many dead?' 'Seven.' As to Back-house-yard, the entrance to it was so narrow that it was quite impossible they could get the coffins out. How it was done he did not know. It was 2 ft. 6 in. wide,—the passage leading to those five houses around the court, with no air, with no single house having a back window, and with a pavement filled with rotting and decomposing matter. There was every circumstance about these courts to induce bad health, and with bad health came listlessness and demoralisation. The whole of these courts were in the same evil condition, and for the honour of Leeds the sooner the whole of them were swept away the better. One of the women said to him most expressively, 'Do go down that court, sir; you will find there smell enough to rise a plague.' And so it was. The place was honeycombed with cesspools and middens and drains without traps, and from these there emanated the foulest gases that human nature could be subjected to. Some persons might fancy he was exaggerating, but he spoke of what he had seen from observation sharpened by a long experience, and from an earnest desire to improve the conditions under which the working classes live. Something might be done and must be done by the authorities; but they could all do much to help themselves. With intelligence, an immense deal might be done to alleviate those objectionable conditions; but the ignorance in all classes,—he did not speak of one class in particular,—the want of knowledge as to the necessity for pure air, fresh water, good food, was lamentably excessive. The moment they got into that fine free-library of which they had heard, let them set themselves to work and acquire the elements of sanitary knowledge. Let their children from the very first obtain this knowledge, and the happiness and comfort of the whole community would be increased with it. Until the importance of sanitary improvement was felt, there would be no earnest endeavour to improve their circumstances, and there would be no willingness to spend money. Money must be spent in this direction, and it

could not be better spent. There should be no questions whatever about money—at any rate, it should be a secondary question,—because the money spent in these sanitary improvements would bring, he was sure, a fourfold return. It was very sad to walk through the large towns of this country and find nothing beautiful,—no pictures, no places laid out with trees and fountains, and things to accustom the eye, and through the eye the mind, to the contemplation of the beautiful, and the rejection of the ugly,—all which very nearly meant the good and the true. It was to be hoped that in all the large towns endeavours would be made on the part of corporations and public men to gather together objects of art which might elevate and adorn. He understood a park was in contemplation in Leeds. Some people said it was a little too far off, but never mind that; if they could not get it near, get it far off. They would build out to it in time, and then they would be glad that, through their mayor and through those far-seeing men who bought the park, they had preserved some lungs in the new parts of Leeds. He should be deeply grateful if what he had said should lead any of them to look into the truths of sanitary science.

Mr. Newmarsh, F.R.S., Mr. E. Holland, and Mr. Mundella, M.P., next addressed the meeting; the last-named gentleman giving an account of his visit to Newcastle as a mediator between the masters and the men on strike. A vote of thanks to the mayor, who presided, brought the proceedings to a close."

It was very satisfactory to hear the mayor say at this meeting, that a motion would speedily be brought before the Council to sweep away the district in connexion with Ebenezer-street in a way which would destroy the fever beds there. With the support of the inhabitants, which he was sure would be given, no effort would be spared so long as he was in the Council to rid the town of everything that was a disgrace. The ringing cheers which greeted the announcement seemed to show that this support would not be denied. We are glad to be able to add, that a resolution to the effect indicated has since been brought before the town council, and, after a very brief discussion, adopted.

We must print a few sentences from Mr. Mundella's address. He said he was not the apologist of strikes. Strikes were in the industrial world what wars were in the political; they were only things of the sternest necessity. They starved the labourer, and diminished the value of capital. There was a good deal of alarm at present in the public mind; the people thought that strikes were becoming more chronic, and that there was little work doing. He, however, took a more hopeful view of the relations of capital and labour in this country. He believed we were coming nearer and nearer the end of our difficulty, and arriving at the best means of settling the question. There never was more work being done than at present; and there was never a better understanding between employer and employed. If masters were wise they would treat their men with the same respect and equality as they did those from whom they bought their cotton, coal, and iron; and if they did so he believed they would see a great deal less of strikes than they did at present. So long as the capitalist supposed that in dealing with labour he was dealing with something of a servile nature—so long as he supposed that the article that he bought was not the full return for the money that he gave—so long should they find those misunderstandings arising which developed themselves into strikes.

A few words as to

The Condition of Leeds

may be added, from a speech by Mr. E. Rawlinson, C.B., at one of the section meetings. He said he had had the opportunity of holding an inquiry in Leeds, and of turning his attention to some of the sanitary defects that existed, and he had pointed out previously what in his opinion would have been a remedy for one of these defects. Again he wished to point that out, and enforce it with all the emphasis he could apply, because it would not cost much. Leeds had already been sewered. He might say there were sewers through the main streets, and some of the tributary streets also, but the system was not complete. The sewers were not ventilated

at this moment. The houses were connected with these unventilated sewers. He could assure them that this was one of the elements causing the excessive mortality of Leeds, and he pleaded with the people of Leeds to make the openings up to the streets as they were made in London, to let the gases come up at as many points as possible, and thus the atmosphere would dilute the gases and render them innocuous. Then some of the streets were paved; others in the suburbs were not paved at all; and Leeds should not permit its population to be dragged down by the miserable condition of any street. Even streets in the heart of the town were in a bad state. For instance, the street in which he was staying was disgraceful. It was a paved street, full of ruts fit to break any springs that might go over them. It was no economy to leave a street in that condition, and he urged that the work of repairing such streets should be commenced at once. If the town had not the money it should be borrowed; if it had not the power to borrow, then, in the name of goodness, let the town go and get power.

We have received a dozen letters inquiring what was decided at the meeting as to

The best Means of Removing and Utilising the Sewage of large Towns.

Mr. C. Rawson, general manager of the Native Guano Company, read a paper in the Health Section, "On the Utilisation and Deodorisation of Sewage by the A B C Process," and made several hazardous assertions, such as, that at least one acre of land was required to utilise the sewage of 100 adults annually. Mr. Rawson said, in conclusion,—

The last argument I have to advance in favour of the "A B C" process is certainly not the least conclusive one. It is successful in a commercial point of view, and pays. Even in the south of England, where coals and chemicals are far more expensive than in the north, our native guano costs us only 30s. to 35s. per ton, leaving a clear profit of 2l. per ton. Now, I will only instance the case of one city, to show what a profit of 2l. per ton really means. The metropolis daily pours into the Thames 100 millions of gallons, or 448,740 tons of sewage. From experiments we have made with this sewage, we estimate that the "A B C" process would convert this into over 1,000 tons of dry manure, worth annually, at 3l. 10s. per ton, the enormous sum, for the metropolis alone, of 1,282,500l. I cannot conclude this paper without mentioning to the section that the authorities of Leeds resolved some months ago to make an experimental trial of our "A B C" process. Their works are hardly yet completed, and certainly not yet in such neat condition as we hope shortly to see them; still, they will afford any gentleman interested in the solution of the great sewage question an opportunity of seeing our process in actual operation. We shall welcome any such visitor, and give fuller explanations than are possible here. I trust that these trial works will be found such a success by the town council that all their daily eleven million gallons of sewage may shortly be treated by "A B C" to their profit and ours. The works are situated at Knostrop, to the south-east of the town, and adjacent to the river Aire. On the left of the entrance is a chimney, 90 ft. high, which takes the products of combustion of two boilers having a nominal power of thirty horses each, and also the steam and gases from four drying-sheds. Each of these sheds has an area of about 1,000 square feet; they are heated by steam, which passes below iron floors, the mud being placed on these in a thick liquid state. Over the surface of these floors a current of hot air is drawn from the boiler-flues, escaping at the further end of each shed by flues leading to the chimney. It will hence be seen that the principle of drying involves the double mode of applying heat both above and below the mud. For the purpose of increasing this upper drying, a cover is placed at a small height above the mud, removable when it is dry, and replaced when fresh mud has been spread on the floor. The effect of the cover is to increase the draught, and, at the same time, it prevents waste of heat. The remainder of the arrangements in regard to machinery, "A B C" pits, and the agitating or

centre pits, &c., are precisely similar to the general plans I have already described. The settling-tank, which is at the south-east of the works, has a length of 170 ft., is 2½ ft. in width, and about 12 ft. in depth; but till we have had some experience in working the Leeds sewage it is impossible to say the exact number of gallons of sewage we shall be able to treat in the twenty-four hours.

Mr. W. T. McGowan, town clerk of Bradford, read a paper entitled "The Sewage of Manufacturing Towns: What shall we do with it?" Having very largely reviewed the question of town sewage, the writer came to the conclusion that although sewage irrigation may be resorted to advantageously in the case of small towns where circumstances admit of the proceeding being successfully and inoffensively carried out, these are sound reasons for holding the system to be impracticable for large manufacturing towns if they are to undertake the whole operation themselves; and that if the sewage of those places is to be applied to the purposes of irrigation, it can only be done in some such way as has been suggested—by the Government making main outfalls to sea sands with a view to their reclamation; and that, meantime, the local authorities would have to direct their attention to the best means of purifying the sewage in the vicinity of the stream to which the water belongs, by mechanical or chemical means, or both.

Various other papers were read. In the discussion which followed,—

Mr. W. H. Michael (London) complained that gentlemen read papers which showed that they were totally unacquainted with the first questions essential to the success of irrigation. The gentleman who read the first paper had said that a sewage irrigation farm was a bog. He could never have been at a good sewage irrigation farm. The same gentleman had said it would be detrimental to health. There, again, he had never been at a sewage irrigation farm properly conducted. The Edinburgh meadows were not a sewage farm; they were managed in total contrariety to the very first principles of the proper sewage irrigation farm. The solid constituents of manure which one gentleman proposed to remove and economise were the worthless part of it, and the first thing in dealing with irrigation was to separate the whole of the solid constituents. The admirable method adopted by Mr. Baldwin Latham in his new machine made this successful. Any process which might be proposed that tended only to separate the solid constituents of sewage must be put aside as utterly worthless. Gentlemen who wanted in the interests of the public health to remove the difficulties in the way of dealing with sewage were not wedded to any one system; but the difficulty was that when the subject was discussed gentlemen got up and advocated their own measures, looking at it as a commercial speculation, as some means of making profitable manure at so much per head of population. That, however, had nothing to do with their question. The value of the whole of the manure, he maintained, lay in the fluid portion, and it was this fluid portion, the soapuds, and slops, and the urine that formed the difficulty to be got rid of, and any system which did not deal with this fluid failed to achieve the primary essential to be adopted in treating sewage. So far as he could see at the present time, irrigation was the only process that answered the necessary conditions, of taking that which it was requisite, should be taken from the excreta, and it could be applied to land without creating the slightest amount of nuisance even to persons living in the immediate vicinity. There was no cause of disease which had been shown to have arisen from sewage irrigation, and the latest experience proved that on sewage irrigation farms so large a per-centage as 10 per cent. could be returned for the money invested by local authorities in the creation of that which relieved them entirely from the nuisance, and which must prove a benefit, in every sense, to the rate-payers.

Mr. Rawlinson said, with regard to the power of manipulation, they were told that dry earth disinfected immediately. Well, if it did, he would say that water stopped putrefaction for a limited time,—for a safe time to enable it to flow beyond the precincts of the town; and if that were so, with a properly-arranged water-closet there was no trouble,—there was simply the pulling of a handle to get the water supply, and the offensive matter passed away. Now, if

there was an earth-closet, there must be separate intervention at least once a week, but, if perfectly clean, at least once a day. If there were two or three earth-closets in a house, how could the servants be expected to manipulate them in a cleanly manner on all occasions. There would be 365 manipulations a year, if they were daily, and if weekly, 52. The value of the manure was called 12s. per head of the population, and he asked if any one would accept that remuneration in respect of the manipulations in his house. The dry-earth system might do for detached dwellings, for large establishments, for gaols, for barracks, for any place where persons were entirely under command, where there was no objection to bear the expense of the separate manipulation, and where the gardeners could be found. He took it for granted that the excreta must be removed, either in the dry state or in the wet state. If in the dry state, it was removed necessarily by mechanical means, or by human agency. If in the wet state, having made sewers and drains under proper conditions, and properly ventilated them, the excreta removed itself to any point that was desirable; and where necessary they might call steam-power into use under such a system. With regard to irrigation, he would not go into the question further than to say that sewage might be applied to land with perfect success without causing the smallest nuisance, and that probably, according to circumstances, there would be a great income. The conclusions that he was brought to were these,—that no human means, so far as we at present know, of treating sewage by chemicals did more than remove one-eighth of the salts of sewage from the effluent water; and that the brightest and best clarified sewage, nearly as bright as the water in the bottle before him, was then in the very best possible condition to be put upon the land for the purposes of irrigation. He could only say that if such manufacturers, by the "A B C" process, could make the manure worth 3l. or 4l., or any higher amount per ton, they would do what all the chemists he had been in contact with told him that it was impossible to do. However, these gentlemen said they got that price for it, and there he must leave the question.

Mr. E. Chadwick, C.B., maintained that the cheapest mode of removal was by water, which arrested decomposition, and carried the sewage away most completely. As to earth-closets in the tropics, he had no experience of India, but as to the West Indies he knew he had been consulted upon the means of providing deodorators to get rid of very troublesome insects. Decomposition began ordinarily in three or four days, and if they attended properly to sewage they would get rid of it in a day. Excreta ought to be in the field, not in mechanical suspension, but in chemical combination. He regretted that in this town of Leeds, for thirty or forty years, the place should have remained in the state it was with a death-rate augmented. There was a very large, pecuniary loss to the town occasioned by lost labour, and the effects of premature debility, owing to ignorance of sanitary science on the part of the town.

Mr. Connellor Marsden said he was very much disappointed with what the Association could do for towns that were anxiously considering their difficulties, if all the benefit to be received was represented by the papers read that morning, there being nothing precise and certain in what was recommended. He advised that a system should be taken into consideration by which the different elements of sewage should be kept and dealt with separately.

Mr. W. Hope, Q.C., gave some most interesting details as to the system of irrigation pursued on his farm of 121 acres at Romford, maintaining that his experience demonstrated irrigation to be a most successful method of utilising sewage. In order to use sewage fully, he should like an acre for every twenty persons, but to purify it a very much smaller area was sufficient. The portion not used became inorganic, and therefore innocuous. The commercial success of his undertaking enabled him to pay 600l. a year to the town of Romford. He ridiculed the theories as to the generation of zoonozes in animals fed on irrigation lands, and said that the horse-pond was the great source of such diseases. The manure obtained by the "A B C" process he pronounced almost valueless.

We adopt the summing up of the President of the Health Department, who, in closing the discussion, said he had been sorry to hear from a member of the Leeds Corporation that he had learned nothing; and he hoped

that when that gentleman reflected upon the subject, he would see that his means for arriving at a conclusion were very much increased by the discussion of that day. At any rate, he would say this, that if the gentlemen then around him knew nothing on the sewage question, there was no person in England that did know anything. He wished, in the interest of the community at large, to urge that irrigation should be employed extensively, and in all places where it could possibly be adopted; and he asserted, moreover, that he had the strongest ground for doing so. What was the use of a Royal Commission, of a Committee of the British Association, and of the Rivers Pollution Commissioners, in all cases coming to a conclusion in favour of irrigation, if persons, who could not possibly go into the subject minutely to the same extent, were not to attend to the recommendations made, and believe that irrigation was, under the greater number of circumstances the best mode to adopt. And he maintained that the evidence from the established farms, from Mr. Blackburn's farm at Aldershot, of which he knew something, and a number of others, as at Crofton, and Mr. Hope's valuable farm at Romford, ought to induce them to say that irrigation was the best means to employ. With regard to the "A B C" process he was anxious, knowing that it was a great interest, not to do anything unfair; but really he was compelled to remark that these gentlemen inferred more than they could possibly prove. They said they got 3l. 10s. per ton for the manure. But could they prove that it was worth 3l. 10s. per ton? Such chemists as he had spoken to said it was not worth the cost of the process which it went through. It was all very well to say that they had sold some many thousand tons, but they had not yet proved the value of it, or that the farmers would continue its use. Then, with regard to the effluent water, which they said they were quite willing the irrigators should have. That did not answer the question at all. Was it true that this effluent water was sufficiently purified? He, however, feared to pursue the subject, and, as the process was now a great commercial speculation, but nothing that the "A B C" advocates had said or done had affected his mind on the subject of irrigation. It had been shown that they must get rid of sewage immediately, that water was the readiest means of transporting it, and that when properly disposed of on land, it really did no damage whatever to surrounding persons; there was China, for example, a country where they had had irrigation at work for 1,000 years, and a great deal longer period by their own records—and all the evidence was, he thought, in favour of irrigation. He hoped the people of Leeds would look into it. They must no longer delay, with a thousand middens; their fearful death-rate told them of the work that had to be done. As to the "A B C" process, they must satisfy themselves either as to its goodness or its badness. If good, let them adopt it entirely; but if bad, then, at once they must set to work to get land and irrigate it with the sewage.

At another meeting of the Health Department, Dr. Fergus, Glasgow, read a paper on the production of disease by air and water pollution. He stated that the reappearance of diphtheria as a disease in this country was probably owing to our own carelessness in the disposal of excreta. Typhoid fever also (killing annually from 15,000 to 18,000) was produced by our trifling with our systems by either contaminated air or water, the results of excremental pollution. He exhibited soil-pipes from water-closet towns, which were corroded by sewer gas, and which had caused typhoid fever. The principal grounds for believing that this state of the pipes arises from sewer gas, he said, were that the perforations were generally in the upper surface of the pipes, and from within; also, that in pipes that are ventilated the corrosive action is much slower than it is in pipes where the gas is not allowed to escape at the top. This state of pipes was not easily detected, as plumbers looked for liquid leakage; and as the perforations were on the upper surface, there could not be any liquid leakage. One specimen he pointed out, where a plumber had renewed the water-closet, but failed to detect the state of the pipes. Typhoid fever being in the house, he (Dr. Fergus) had insisted, from the smell, that the pipes from the closet must be corroded. He showed that cholera and diarrhoea are caused by the same carelessness in the disposal of excreta; that the decomposition of excreta takes place even in the best constructed sewers; and that the result was highly detrimental to health. In large towns

the sewers were a perfect laboratory for the manufacture of sewage gas, and this gas was continually getting into our houses from water-closets and sinks.

Mr. Baldwin Latham, the engineer of the works at Crofton, explained the operations carried on in that town to utilise the sewage. The plan was to remove as far as possible the sewage in its perfectly fresh state, the sewers having the requisite inclination to carry the matter with sufficient rapidity to the outfall, and before six hours were over the water was passed over the land and passed off again perfectly pure. From a sanitary and an economical point of view the experiments at Crofton had established the success of irrigation.

In reply to questions, Mr. Latham said the best plan of dealing with sewage gas was to introduce ventilators, accompanied by charcoal trays. The gases were various, including sulphuretted hydrogen, and they were allowed to escape at the level of the street.

Strikes.

In the Economy and Trade Department, Mr. Frederick Hill read a paper on the question "Whether Strikes are necessary for the Protection of Workmen, or Look-outs for that of Employers." He said it was generally admitted that strikes and look-outs were great evils, but many persons regarded them as unavoidable. The author, however, held a different opinion, believing them to be no more essential to the system established by our benevolent Creator than are wars and pestilences. He pointed out that when wages, as compared with profits, were too low, or the hours of labour too long, then, without any joint action of workmen, some employers, stimulated by a high rate of profit, would speedily try to increase the number of their workmen by offering higher wages, or a reduction in the hours of labour, or both; while competition would soon compel other employers to do the same; and that the converse would be the case when wages were too high or the hours of labour too short. He pointed out, also, that every shilling of wages or profit which, by a cessation of work or the stoppage of machinery, was lost, was so much withdrawn from the fund on which workmen and employers alike depend; and, so far as it goes, must be a subtraction from the general rate of wages and profits. He said that if his reasoning were correct, its practical application would be the abandonment of all attempts artificially to regulate wages and hours of labour, and a willingness to leave the matter to the quiet but certain operation of natural law, affirming that it is good policy, on either side, to pursue this course, even if it should not be adopted by the other. He gave it as his opinion that the wisest action on the part of any employers who might be subjected to a strike was at once to yield to the demand, if such a proceeding would impose a smaller loss than would be caused by a temporary stoppage of their business; while workmen should, under similar circumstances, and with the same reservation, yield to their employers in case of a threatened look-out; since both parties may fully rely for rectification on the power of a law to which both employers and workmen must succumb. He maintained that the interests of workmen and employers, instead of being opposed, were in unison, and this even in the matter of wages; pointing out that if a number of workmen and employers met together to agree upon a scale of wages, they would find that one and the same scale would be best for both parties,—viz., that which was most in accordance with the actual state of the labour-market. For, if the scale were placed too high, a motive would be offered to men to come in from other works, while the employers would have an inducement to transfer part of their capital to other concerns; and if the scale were placed too low the men would straightway have a motive for seeking employment elsewhere. He referred to the beneficial results of bringing employers and workmen into friendly conferences, and to the great good accomplished in this way by Mr. Mundella. If these premises were admitted, both parties in the strike at Newcastle acted unwisely, the men in making the strike, and the employers in resisting it,—except, indeed by argument, as was done, and with success, by Mr. Stephenson. He proceeded to show that it is an error to suppose that a decrease in the quantity of work performed would be followed by an increase in the rate of wages, whether paid by time or by the piece. He expressed also his belief that, for the most part, intelligent workmen have now

discarded the idea that wages depend on the will of the employer, though he pointed to experience as showing that this want of power in the employer is no obstacle to the voluntary performance of those acts of kindness and good offices which the possession of superior means always suggests to a kind heart. The paper then referred with condemnation to the school which maintains that, instead of capital being labour's mainspring, it is its unaided produce, or, as affirmed by some zealots, labour's enemy; and on this point spoke of the document, so replete with ignorance and folly, which has lately been addressed by the International Society to the people of Switzerland, but to which the author trusted the Swiss were too intelligent to give ear.

After the reading of Mr. Frederick Hill's paper—

Mr. George Potter said, in regard to look-outs and strikes being great evils, he went with the author of the paper at once, and admitted them to be so. But he believed from his own experience for the last ten or twelve years they had been necessary, and not only by the action of working men, but generally by the coolness and disinclination shown by employers to workmen, when they asked for what they thought a fair day's wages. It was always said that the men made the demand, and the masters could not afford to give. They had only the masters' word for that. The unions had asked the masters, when they said they could not afford a rise of wages, to submit their books to an impartial arbitrator, and if that arbitrator said the masters were losing, the demands of the men would be immediately withdrawn. This request had never been granted; they had been told that the plan was impracticable. The workmen had always made the demand for higher wages, and had met with refusal; hence strikes. The result of strikes and combinations of workmen was to give the workmen their position, which they would never have obtained otherwise. He looked upon the effects of strikes as not transient, but abiding; and, in conclusion, he appealed to them not to force the cause of every strike and look-out upon the men. The men were quite willing to bear their share of blame for the blunders; they were not perfect; but was it all their blame? Had not capital aggrandised to itself more than its fair and just reward? Was it right that working men should toil from one year's end to another for the lowest rate of wages? It was a question upon which they now met upon different ground. The success of the Newcastle men, the increasing success of working men generally, had brought employers and workmen to look upon each other differently from what they formerly did. Instead of strikes they should have conciliation. He laid much stress upon conciliation; if the employers but met half a dozen of their men when any demand was made, and talked it over in their offices, he took it that in nine cases out of ten it would be harmoniously settled. If there was a difference between men and their employers, let them have arbitration. The men had always, whenever an arbitration had been decided against them, gone and worked under the decision.

Mr. O. Lamport entirely agreed with those who thought that strikes had been necessary, and he said this as an employer of labour. Mr. Hill, speaking from a purely philosophical point of view, said these things would arrange themselves; but when? There were two difficulties in the way of a master showing his books to the men. In the first place, he might be a person who had not the capital to carry on his business, he might be in debt, he might be ruined, and if the books were examined his ruin might come out. He did not say that would not be a good thing, but that they were dealing with human nature. He was free to admit that labour had not had its full share of the amount of profits due to it. But why? The workmen paid a portion of these profits to obtain for themselves the advantage of insurance. The remedy for these things was certainly boards of conciliation. But boards of conciliation acted against the master in many cases in the most important and objectionable way, for this reason. The men went into court, and the masters went into court. The decision was given in favour of the master, and against the men. The men, as a body, most honourably kept their engagement; but what tied the men as individuals to their master? The master was fixed, but the men were not fixed.

Mr. James Wilson thought it was manifestly unjust that the hours of one class of men should

be by combination reduced to a minimum, while the great body of the people of the country, who had an equal interest in producing the wealth of the country, were compelled to work for a much longer time. He took exception to the description of the action of strikes given by Mr. G. Potter. As far as he had known it he had known it as of the most cruel, most unrelenting, and most merciless character. The interests of the employers and the interests of the workmen were one and the same. What they wanted to bring about was mutual understanding and fellow-feeling.

Mr. G. J. Holyoake thought strikes, by the mode in which they had been conducted, were a very blundering process indeed, and he never had any sympathy with that mode of improving the rate of wages. He had always been more inclined to the forming of co-operative manufacture, which placed the workman in a position of power over their own resources, and enabled them the better to effect that improvement which they desired. But he quite believed that if combinations of workmen had done nothing more than put into the power of working men the means of treating upon something like equality with their employers, those combinations would be amply justified. He wished to see the working men in such a good position that they should neither supplicate for the goodwill of others nor be dependent upon it.

Mr. Wallace, Halifax, said that in the district he came from there had been an advance of from 50 to 60 per cent. in wages without the aid of strikes. He knew no tyranny equal to that of trade-unions. By their operation the country was going back to the old system of guilds.

Mr. E. W. Holland thought that with regard to the general aspect of capital and labour and their interests, there was one sense in which the interests of labour and capital were identical, and another, and a very important sense, in which they were always opposed. Their interests were identical in that they were both engaged in producing a certain article; it was sent out to the world, and both gained from the products of the sale. The aspect in which the two were opposed to each other was in the division of the gains from the profits of the sale.

Visits were paid to the sewage works at Knostrop, to the Reformatory at Mirfield, to Temple Newsam, to Kirkstall Abbey, and to the very interesting Norman church at Adel. We can only add that the next Congress will be held in Plymouth in 1872.

LONDON ALOFT.

The roofs of London are rising with portentous celerity. The two square bases which mark the period of extreme depression in the English architectural taste, when the light of heaven was taxed, and people seemed to fear that the air they breathed would be taxed next, are happily disappearing from our streets. In a few years they may be expected to become as rare as their gabled, timber-framed houses, with floor projecting on floor, of which a fine example still marks the site of Staple's Inn. With some features that seem to us inconvenient, or even unsightly, these ancient homes of the citizens combined many elements of comfort. In these up-piled stories they contained accommodation for the lodging of household and visitors, of children and grand-children. The low, squat, two-storied huts, such as line part of Tottenham-court-road, appear, on the other hand, to combine the maximum of structural ugliness with the minimum of economy of area, and to be the most unfit and inconvenient form of dwelling ever yet introduced into a city,—if, at least, that title be denied to a mere collection of wigwams.

Paris used, in the days of the *bourgeois* king, to strike us by the height of the houses, as compared to those of London. A climb *au huitième* was not uncommon. Indeed, when photography was first invented, the lofty perches sought for the convenience of the skylight familiarised us with many a ladder-like stair. Still the successive stories were, for the most part, of low height. The *entresol* would hardly allow a tall man to stand upright. The principal floor, indeed, often contained a suite of rooms of noble proportions; but above this you generally found little more than nests of cupboards. This was before the days of Haussmann, and the systematic regularity of the Rue de Rivoli. But, comparing the habit of rearing *appartements* with that of

renting houses, there is no doubt that the population per acre of Paris was far denser than that of London, speaking of such portions of the two cities as most resembled one another in the character of their inhabitants. The mean density of the population of London is stated by the Registrar-General at 40 to the acre.

A great change, however, is coming over London in this respect. The sanitary importance of giving due height to the rooms in which they pass no inconsiderable portion of their lives, is becoming more thoroughly realised by City men. At the same time the value of land is augmenting, the value of time is increasing, and the importance of having a *piéd à terre* within a certain very limited area is yearly more obvious. Architecture is responding to the commercial requirements of the day—and loftier rooms, and more numerous stories, are raising the newer city houses into veritable towers.

There are extant old engravings representing some of the Italian towns, Lucca, we think, or Pisa, in the fifteenth or sixteenth centuries, which differ very materially from any existing groups of dwelling-houses. Genoa is, perhaps, one of the loftiest of modern Italian cities. The chief characteristic of that stately port is the number of blocks of lofty palaces divided from each other by lanes as narrow as the "rows" of Yarmouth, which have involved the construction of cars of a specially narrow gauge for their service. But the older cities had not the luxury of the modern port. The houses were high—even higher than the present Genoese palazzi, but they were small. They were, in fact, chiefly towers. A collection of edifices resembling these round towers in Ireland that have caused such very long antiquarian discussion as to their origin, was a mediæval Italian town.

In fact, building, like dress, armour, carriages, ships, or any other requisite of civilisation, of which we can trace the histories, has been a faithful reflex of the habits and the requirements of the age. When violence was so ripe that each man found his own arm his most ready protector, and when the most formidable projectile was the cloth-yard shaft, or the bolt of the arbaleste, people naturally built towers. They afforded at once the means of a safe outlook, and a security against escalade. Many a seignorial keep dotted the country in those troublous times. But the existence of towns of towers is a fact that we should not now recognise as having existed, but for rare and curious graphic records. Its cause, however, is perfectly intelligible. With the introduction of gunpowder, a change took place in building as well as in defensive armour. The domestic tower disappeared, and houses gradually shrank down to economic pigeon-holes, that formed the meanest architectural phase of the domestic building of England. Economy was written on every house-front in the plainest text; economy, that is to say, of area and of cubic contents, of bricks, mortar and slates; of light and air, of comfort and of health. How much of the enfeebled health and diminished natural powers of our urban, and indeed of our rustic population, we owe to the pestilent little holes in which it became customary to cram away people for the night, we shall perhaps never fully understand.

A counter movement has, however, set in, and attained a very notable advance. In the country the beehive-like cottage is becoming a thing of the past, and the great landowner is beginning to take a pride in the architectural elegance of the rebuilt villages. In London the movement has assumed more striking proportions. City houses which, when first built, were considered almost too lofty and too aristocratic in their air for the abodes of business,—such as the buildings in Moorgate-street, for example,—are now looked down upon as but little removed from "poking." A lofty office is felt to be a requisite for a man who would be thought to drive a first-class business. In this, no doubt, there may be much foolish ostentation, much reckless following of fashion; but yet good is done, even if not from good motives. Health is greatly promoted by the increased size, especially by the increased height, of rooms. With health comes increased capacity for the good conduct of business. Architecture, pictorially considered, is greatly the gainer; and the honest and praiseworthy industry of the builder, the skill of the architect, the courage and enterprise of the capitalist, all find occupation and reward. Prices are forthcoming, in the way of rent, that more than cover the increased outlay. In one new building that springs

into the air near one of the great wagon-shaped railway roofs that disfigure London, for the ground floor—a single large room, capable of subdivision—a rent of 1,500l. per annum is asked. The first floor is rented at 1,000l.; the second floor is let at 500l. Then there are a third floor and a basement. A large building outlay is justified by the power to earn such rents as these.

On ascending any eminence, either within the precincts of the metropolis, or on one of the ranges of hills which command its area, the eye is arrested by the appearance of lofty structures of very recent date. Of these the most self-arresting are the large piles of the Langham Hotel and the Victoria Hotel, which are conspicuous not as sending up towers or spires to the sky, but as rearing great castellated structures to an unusual height. The new Record Office has recently displayed a very picturesque outline. The lofty clock and Victoria towers of the Westminster Palace, with the spires and pinnacles that adorn the same noble pile, cast the twin towers of the Abbey into shade, and have done more to improve the architectural ensemble of London, when viewed from a distance, than it was possible to anticipate. The Charing-cross and Cannon-street roofs,—frightful mistakes, either in an architectural or an economical point of view,—lose much of their shapeless deformity in a distant view. The roof of St. James's Hall, with its huge wind-cowls, attracts curiosity as well as attention. The somewhat squat bulk of the Royal Albert Hall also afflicts the eye.

It is not, however, in the Albert Hall alone,—a building the large area of which renders necessary a considerable elevation for the structure, whatever be the outline given to that elevation,—that the tendency of the present re-builders of London to mount is apparent. Two large buildings are on the point of completion under the auspices of the authorities at South Kensington. We have before described the new School building which looks down on the Exhibition-road and almost overshadows the Royal Horticultural Gardens. But the mere height of the building deserves note. The accommodation afforded by the structure is large; the view from the balcony or from the roof is superb. When we see, on a valuable site indeed, but one of which the acreage value has not yet reached the ninth part of the price asked in the City, commodious offices thus arranged, floor above floor, in a building which is at once healthy and elegant, we cannot doubt that the example will be rapidly followed. The only drawback to this method of economising building area is the fatigue caused to the occupants of these great palazzi by the height to which they are compelled to climb. But here the rapid development of mechanism comes in aid; and we have no doubt that a manageable and economical arrangement of lifts for ascent and descent will form a prominent feature in the City house-building of the future. The tidal rise of the Thames might be made use of to work these lifts conveniently.

The new rooms of the South Kensington Museum yield another example of rooms of size hitherto rarely paralleled. Two enormous red gables have recently been completed, to the south of the mass of the new buildings of the Museum. The Patent Office looks crunched beneath their shade, and gives the idea that it is only waiting to be crumpled up, and rolled away to some more appropriate locality. In fact, this, which is one of our most important institutions, can no more thrive under the shadow of its more holiday-making neighbour, than corn can grow under the shade of a beech tree. The country owes much to Mr. Bennet Woodcroft, who has not only opened the monopoly of patent knowledge, that is to say, knowledge of what patents exist, and of the contents of their specifications, freely to the public, but has also, by his own personal influence and exertion, rescued from decay some of the most interesting relics of the mechanical art of England, and brought them together for the instruction of our children. A proper home for this collection, and a proper recognition of Mr. Woodcroft's great services, are among the things for which it is disgraceful to have to plead,—things which have been neglected solely from the unobtrusive modesty of a really deserving man. This, however, is by-the-by, although it is a bye that naturally ensues from a visit to the large courts of which we speak.

They form a sort of twin hall, or double apartment, divided by an arcade. The length of each court is 120 ft.; the width, 60 ft.; the

height, about 90 ft. The ceiling is curved and paneled, the panels being filled with ground glass. The purpose of these large rooms is to afford a place for the display of objects too large to be placed under shelter elsewhere. In some of the costly reproductions made for the Museum, such a home is a necessity. Thus the wonderful *portico da Gloria*, casts of which have been procured from Spain, has been made to look little short of ridiculous by being out in two, and the arch stuck on the ground, opposite to the entrance of the Museum. The Sanchi Tope, moreover, has had to lift its head through the floor of the International gallery. These, and similar structures, will be safely fixed, and commodiously viewed in the New Courts. A gallery runs round each hall, at the height of 50 ft. from the ground, from which a sort of bird's-eye view of the entire court can be commanded. There is no doubt that the halls are well adapted to the purposes of the Museum.

One name, amid that of the ten centuries of builders who have made London what she is, impresses itself on the mind of any observer of the lofty towers and of piled roofs that are yearly thickening in the landscape commanded from the hills of Highgate or of Sydenham. One great master-builder foresaw that a great city, cramped in its area, might expand in its vertical structure. Let us raise our warehouses, our offices, our public buildings, to any readily conceivable height. Let us shoot up our mon of business on steam lifts, and double the elevation of the halls and schools of South Kensington.—St. Paul's will still soar above them all, and will the more proudly assert, the more closely modern builders climb after its lofty proportions, the genius of the man who was aptly termed in his epitaph the builder of this fane and of this city.

SOME ARCHITECTURAL (?) ADVERTISEMENTS.

If we were only to credit the assurance of those who advertise themselves as prepared to supply or to manufacture every kind of thing that an architect can possibly require to render his buildings perfect, it should seem that we are totally without excuse if our editors are not overflowing from top to bottom with ornamental work, all "of the best description," and "in all styles," not to speak of the innumerable new patents placed before us for preventing or curing all the practical ills that buildings are heir to. As to these last, indeed, any one unacquainted with the actual shortcomings of defective ventilation, smoky chimneys, &c., which we know too well to deny, might suppose that all such causes of complaint must be for ever at an end, after the perusal of even a comparatively small proportion of the documents which set forth the merits of Smith & Co.'s chimney-tops, Brown's ventilators, and Jones & Robinson's smokeless grates;—all patent and all perfect, all guaranteed for the future, and having received medals in the past. These are practical matters, however, in which one mechanical inventor may be allowed to pit himself against another, seeing that the final test after all is the question, which every practical man can on trial answer for himself, whether these said inventions really accomplish what their patentees or vendors profess they shall accomplish. A large number deserve every consideration; though in many cases, perhaps, the first conviction of the purchaser would be something like that celebrated principle of the Irish Republican,—"One man's as good as another, 'faith, and a great deal better," or a great deal worse, as the case may be. But there are some other advertisements which the reflective architect can hardly contemplate with the same equanimity. These are such as deal not with practical inventions of the above-mentioned type, but which proclaim the readiness of their authors to supply all sorts of ornament and ornamental work *ad libitum*, with a cheapness and despatch never before equalled, &c. Architects, it is true, know how to give their due weight to these attractive proposals; but the less skilled public are apt to be tempted by the bait, and to imagine they have got something worth having, more especially when the advertiser claims to have invented some new species or application of ornamental work; for if a man only praises his own work thoroughly, there are always plenty of people ready to believe him; and the (apparently) inherent disposition of the English public of the present day for cheap showiness in all their surroundings, leads them to offer a ready custom for any new device

which combines these two desired qualities. We leave the application of these remarks to our readers.

Few things are more remarkable in this way than the supremely ugly forms assumed by patent chimney-tops to prevent down-draught, the illustrations of which are accompanied with an assurance that "they are very neat in appearance"; the word *neat* being that upon which your patentee generally falls back when he has invented something which even he cannot venture to describe as ornamental. Why is it that all our "patent" contrivances are so ugly and awkward-looking? Look at the "ventilating globe light," for instance; a very good contrivance for keeping the effluvia of gas out of a room, and preserving the air fresh, but could anything uglier well be conceived? Unhappily, it should seem, the mind of the mechanical inventor is impervious to considerations of fitness and beauty of form; so long as the thing works well, he is satisfied, and expects the public to be so; and most of them, we fear, are satisfied. Not but that some inventors and advertisers soar above these sordid feelings. There was an advertisement-sheet sent round to the profession during the last month or two, concerning some improvement in hot-water coils, we forget of what nature; but one of the advantages set forth was that no grating is required over these coils, as they are "made ornamental," so that they can be openly placed in a hall or vestibule, &c. We certainly enjoyed that phrase, "made ornamental." It speaks volumes, though it scarcely could be properly appreciated except on comparison with the accompanying figure or diagram of this ornamental production; the ornament, as usual, consisting in the imitation in the cast-iron of certain established "architectural" features; in one specimen the pipes (upright) took the form of columns with moulded caps and bases, supporting a top plate which, as the advertiser cunningly hinted, could be used as a table. Ingenious advertiser!

Among illustrated advertisements of what is supposed to be ornamental work none are more remarkable in a way than those which exhibit and recommend chimney-pieces. Remarkable they are for the utter absence of hint at anything thoughtful or original in a class of object which we should have thought peculiarly susceptible of variety and novelty of treatment. But one firm after another advertises its "largest and richest assortment of marble chimney-pieces in the kingdom," with accompanying illustrations showing the same old worn-out forms of conventional Gothic or Classic type, as the case may be. These advertisements are, however, perfectly truthful, for if we go to the repository, we shall find that they do really represent all that the manufacturers have to offer. As to the ornamental metal-workers' advertisements, we do mention them with a certain degree of awe. Every now and then a metal-working firm which thinks a new push requisite, comes out with a fresh pictorial device for attracting public attention. The main object in getting up these seems to be (there are exceptions) to get the maximum amount of twisted "Medieval" leafage into the allotted space, and to render the wording of the address so illegible, through its excessively "decorative" character, as to furnish a puzzle of a minute or two to the reader. It is only justice to say, however, that these are almost the only illustrated advertisements which show something of artistic device. Are they not pictorial too? and do we not all know the figures of the accomplished workmen, monstrosities, and hammer in hand, at work on an altar-standard, and looking as if they thought themselves the most important of all possible members of society? This last trait, we fear, is a little too near the truth. The typical "art-workman" is not a very modest person; he has, perhaps, been spoiled, patted on the back a little too much; but the idea conveyed by his manners too often is, that he would have you know he considers himself a great deal better than most people on God's earth. Some of this self-conceit he will have to unlearn. Nineteen-twentieths of the work he does is, after all, only a more or less clever repetition of the work of another period; and *handwork* is not the only thing in this world, though it has been much talked up in these very practical days.

We noticed how comprehensive are architectural advertisements, providing for "every possible want" of the architect; an expression which would be fully borne out by a study of them; for they even offer to provide him with that first great requisite—"brains." This, we know, was the medium with which a certain

great artist avowed that he mixed his colours; and these are on sale in the advertising mart, along with other requisites of the craft. The number of draughtsmen who are fully competent to make drawings, details, and specifications of all kinds is remarkable. Some only profess church work; others are more general in their qualifications; but it is to be noted that the special statements of knowledge of what is termed "classic" work are rare: it is to be presumed that the market for "this particular variety" is not considered to be brisk at present. Then there are the competition colourists, who give you, with charming *naïveté*, a list of the competitions which have been won under their colours,—a significant indication of the way these things are "managed." There is a gentleman, we see, who undertakes to prepare designs promiscuously for any architect "from rough sketches;" but whether such designs, when done, are to be publicly credited to the advertiser, or to the authors of the "rough sketches," does not appear: the point is not unimportant, though, in its bearings on the working of the profession. These advertisements mostly represent, however, the legitimate endeavors of younger members of an overcrowded profession to find work for themselves in assisting others; as such they must command sympathy, even though we may think that some of the advertisers might be doing more useful work in the world, if they would only think so, than colouring up other people's designs to look finer than they really are. There are less praiseworthy or excusable kinds of advertising, in connexion with the profession, otherwise than through the medium of "columns." What are we to think, for instance, when we hear of architects, well off and in good practice and reputation, sending touts round the provinces (on their own account) to "push" their books of designs, &c.? We have heard of such things. The *modus operandi*, as described to us, is very refined, however. The tout, who lets you know that he is a friend of the distinguished architect whom he represents, of course insinuates that Mr. — has no desire to make money by the beautiful work which he has the privilege to show you; indeed, Mr. — is above the necessity of looking for money, "as you will doubtless be aware, sir: he married a very large fortune," &c. He is only anxious that others should have the benefit of the work, at a cost that may be called quite nominal. "Messrs. Peckaniff & Co., sir, say that this work has been invaluable in giving them ideas in ornamental design;" or, "You will observe this final, sir. Mr. Gargyle said it was the most beautifully drawn ornament of the kind he had ever met with," &c., &c., *usage ad nauseam*. We hardly think that is the way to raise the dignity of the architectural profession.

THE CONDITION OF LONDON SEWERS.

THE metropolis of England is said to be the best sewered city in the world; and this may be true. But is London complete in main sewerage and house-drainage arrangements? A faithful reply to this question is of far more importance than a mere boast. Cities, in ancient times, were sewered and were supplied with water on a grand scale. Public buildings were also erected highly, for grandeur of design, beauty of detail, and power of endurance, put to shame modern efforts.

But to the London sewers: are they perfect? A diagram in the last Number of the *Builder* (October 14th, 1871, p. 809), shows that they are not perfect. There are, in the aggregate, about 1,500 miles in length of tributary sewers in the metropolis, serving to drain about 350,000 houses, and it is probable that 50,000 of these houses have no proper direct connexion, or, at best, have a very lame and imperfect connexion with the adjoining sewer. The whole of the houses are indeed, to a certain extent, imperfectly drained. Many of the house-drains are square on cross section, flat in gradient, and pass from back to front beneath the basement and area floors. Some drains are brick-barrel—that is, circular on cross-section, flat in gradient, and consequently the sewage is sluggish in its flow, or, for the most part, soaks into the sub-soil, or evaporates through any chinks there may be. The old flat-bottomed sewers of deposit, and the large sluggish house-drains also of deposit, are the abodes of rats innumerable. Grit from roads and streets, with gritty refuse sent in from house-sinks and yard-grids, form

banks and shoals, over which the rats walk and scamper at leisure. The house-drains being at higher levels on each side of the main sewers, afford shelter in times of rain-floods. It is said that there are distinctive tribes of rats in the London sewers, gifted with all the noble attributes of human tribes, clans, and factions,—jealous, fond of excitement, revengeful, ending in fighting, bloodshed, and rat-murder; the rat Capulets and Montagues being as proud, as quarrelsome, as vindictive, and as revengeful as the bipeds living and walking above them. A rat Romeo risks his life if he goes courting to a rat Juliet in her noble father's domain. The London sewer-men (rat-catchers), who minister to the aristocratic sport of rat-worrying, know the several tribes of London sewer-rats as well as a Highland shepherd knows his sheep. But to the defects in London sewers, which admit of all these interesting underground phenomena. London has been, and now is, parish governed. It has been said that the government of London is an unbound bundle of parish vestries, of which St. Pancras is a burning and shining example. Well, in the early days of sewerage there was no recognised cross-sectional form for sewers: there was no systematic mode of setting them out so as to secure truth in line and in gradient; but they were constructed by rule of thumb, in short lengths at a time, without any reference to a defined bench-mark, so that in line they are up and down, just as chance determined,—this irregularity being, however, all in favour of the rats. At first, water-closets were not allowed to be connected direct with the sewers; and in many cases house-sinks were not connected directly. The old sewers were made without any side-connection arrangements; so that to connect a drain the brickwork of the old sewer had (and has now) to be broken through. This cost money, and therefore the economical vestries charged for the connexion some two guineas, besides the cost of the drain connected. This breaking through tended to ruin the sides of the old sewers; but it also tended to a worse thing,—that is, to the prevention of any connexion, bad or good, being made with the sewer at all. Thousands of houses in London, old and new, East-end and West-end, have drains unconnected with the street-sewers. Now, is not this "a pretty kettle of fish" for the metropolis of England? But even at this day it is not the business of any official to see that the drains of houses, old or new, are in direct and proper connexion with the street sewer. The Metropolitan Board must confine its attention to the main intercepting sewers. The district surveyors under the Building Act, have nothing to do with it. And it seems not to be the imperative duty of the surveyors to the parishes to see that house-drains are properly and safely connected. Hence the existing muddle. How much of disease and premature death results from this defective state of things, it is impossible to say; but of a truth there is much sickness, lassitude, and suffering, because of sewer gases pervading houses in London. Think of a delicate patient coming from fresh country air to consult a London physician, who has his consulting-room over a colony of rats, and whose house is pervaded with diluted sewer air! When London ceases to be exempted from municipal government, and the St. Pancras vestry has been improved off the face of the earth; when the local government of London has been consolidated, and when the officials have learned their duties, and execute them; then the hundreds of miles of old and defective sewers will be reconstructed or repaired, and the tens of thousands of defectively-drained houses will be put into safe and proper connexion with the renovated main sewers. The accomplishment of this work will, however, be death to the rats, and the interesting natural history phenomenon now going on beneath our feet will cease.

A PEEP AT AN EAST-END CEMETERY.

By common consent the grave, as our last resting-place, is sacred, and all its surroundings, since the first dawn of history, are marked by the respectful attentions and observances of the living. Who amongst us does not experience a revulsion of feeling, and a tingling of shame coursing through his very nature, when beholding an act disrespectful at the grave, or a course of conduct, unhappily not yet rare, in desecration of the dead?

We have been looking at the burial-place of eastern London, called Victoria Park Cemetery.

An inscription over its jejune Gothic-arched gateway tells us the date of its opening, 1845. Who its present owners or directors are we do not care to know, though we believe the ground or cemetery originally belonged to a late deceased M.P. of Hackney. What its profits are we are also unable to learn, though, judging from the number of weekly interments there, they must be something enormous. We are credibly informed by a resident in close proximity to the cemetery, that on one certain day, between the hours of two and five, one hundred funerals arrived. Of course this was an exceptional case; but the same person said, that on an average the burials might be taken throughout the year at from 150 to 200 a week, though 300 have been known to be interred there in one week. The cemetery is not a large one, and the system of interment adopted is such that it could well afford a small outlay, and the employment of a staff to keep it in some sort of proper order. It is, however, no libel to state, and from a personal visit we are enabled to say, that its management and present state are really a disgrace to London. For fifty or more yards ahead of you, as you enter, there is a rough, rugged carriage-way or roadway, which winds round after a short distance, and rises as it winds, decreasing in breadth as it proceeds, and merging in the central part of the graveyard into two collateral footpaths, or semblance of footpaths, leading to the distant corners of the graveyard.

In fact, there are no walks or footpaths, properly speaking, after you pass round a short distance. There is no boundary walk or path around the four walls of the cemetery within: the graves abut right up against the wall in nearly the entire circuit, excepting a space on each side of the entrance not yet opened for graves.

In the centre of the cemetery all is disorder, dirt, long rank grass weeds, and all the unnatural growth that rankness and absolute neglect encourage. But very few graves are dressed, and the majority of the tombstones are crumbling to decay from their friable nature. Nearly all the slabs are of the most rotten description of freestone; and the lettering, which was not sunk in the first instance more or even as much as 1 in. below the surface of the stone, and then painted black to throw out a deep shadow, is in nine cases out of twelve worn off. These are the poor robbed of their money even at the grave by unprincipled mortuary masons, whom they trust with the creation of the slightest tablet. There is no indication of drainage throughout this cemetery, and on a wet day the condition of the only carriage-way in the graveyard is such as to render it nearly impassable from deep sludge. There is no paling, railing, box hedge, or bordering of any kind along the entrance avenue or short sideways, and only the mearest and shabbiest attempt at a garden plot of a few feet wide and long immediately within the entrance-gate. This could only be intended as a mask to hide the defects of the hideous and sewerish wilderness within. All beyond this is ghastly and disgusting. The graveyard within is yearly rising and swelling up far above the level of the surrounding neighbourhood. Tier after tier of corpses is packed in deep and narrow graves ranging from 16 ft. to, perhaps, 20 ft. deep. Children's coffins four abreast,—but we hesitate to give a multiplier for fear our readers might be led to suspect exaggeration. The depth of the coffin once ascertained, the "dead reckoning" may be gauged with a certainty.

Here, grave almost touches upon grave with scarcely a decent partition of clay between, the head of one grave and the foot of another often meeting below the surface, though the coping of clay on the top sends visitor and mourner away with their illusions undisturbed. Here the newly-made graves of the poor run side by side, forming ridge and furrow, each little mound bare and undistinguishable from its neighbour, nor date, nor name, nor index directing. Thousands of graves that once had an elevated mound or coping are trampled level with the earth, and are matted over with living and decayed vegetation, with no stone, no epitaph, no history. All is blank over large spaces.

The spread of the metropolis in the east end of London raises once more the serious question of intramural burials. Independently of the disgraceful condition of Victoria Park Cemetery, the question of the public health must force itself upon the mind of all. The spread of house property and the great increase of population in the vicinity of this graveyard augments the serious consideration whether it will not be soon, if it

is not already, advisable to close up this and similar burial-grounds, which, though outside the town a considerable distance at their first opening, are now so situated as to be productive of danger.

Victoria Park Cemetery is nearly full to overflowing at present,—it is badly kept,—its directory or owners appear to have neither taste, sympathy, nor respect for the living or the dead. Their whole desire seems to be to make as much out of this hideous patch of ground as they possibly can. One thing is, however, certain: if the directory of this cemetery wish to protect or keep in abeyance the anger of the public, they had better at once make some improvement.

ST. MARY'S CHURCH, MIRFIELD, YORKSHIRE.

The new church here was consecrated by the Bishop of Ripon on the 12th inst. It is situated on the west side, and close to the site of the old parish church, and is in the Early English style. The plan consists of nave and aisles, chancel, south porch, tower, and two vestries at the north-east angle, one of which is appropriated to the choir. The tower is at the west end of the nave, and adds considerably to the length of the church internally, its dimensions at the base being 30 ft. square, exclusive of buttresses. It rises 140 ft. from ground to top of the pinnacles, the vanes rising 6 ft. beyond this. It contains a clock and ten bells, cast by Messrs. Taylor, of Loughboro', the tower weighing 30 cwt. 1 qr. 22 lb. The bell-floor is of great strength, and covered with lead, as also is the roof.

The clock is supplied by Messrs. Potts & Sons, of Leeds, and strikes the quarters on two bells. There are three dial incised in the stone work, the hands and figures being gilt. The principal entrance is through the south porch; there is also an entrance from the west end through the tower: this doorway is composed of a recessed and moulded arch, supported by stone bases, with detached stone shafts and moulded capitals, the tympanum being filled in with diaper and carving; also a circle sculptured, representing the Annunciation of St. Mary.

Internally, the nave is 82 ft. long, and divided into five bays; it is 27 ft. wide. The tower is 21 ft. square; the aisles are 13 ft. 6 in. wide; and the chancel, 40 ft. by 27 ft. in clear. The entire length internally is 150 ft. 6 in.; the width in clear, 60 ft. 4 in.; the height from nave floor to ridge, 64 ft. The church is lighted by coupled windows with splayed jambs along the north and south sides, and by three lancet windows in the tower; the west one of which is to be filled in with stained glass by Clayton & Bell, and presented by Mrs. Ingham, of Blake Hall. The east window is a triple lancet, with circular window over, and two coupled side windows to sanctuary. The clearstory is arched both inside and out, with a lancet window pierced through the middle of each bay. The roofs are open, and of pitch pine; the principals of nave, chancel, and aisle roofs spring from stone corbel shafts with moulded capitals, the spandrels being filled in with tracery. The arches of nave arcade are moulded, and supported by stone moulded bases. The pillars are circular, and octagonal alternately, the capitals of the latter being carved.

The tower is vaulted with stone ribs springing from carved corbel shafts at the angles, the cells being filled in with local stone in thin courses. The seats are of oak throughout, the chancel stalls and screens being rich in detail, with the moulded chancel arcade, and fossil marble columns add to the appearance of the whole. The pulpit is of oak, and stands upon Caen stone base with green marble shafts supporting. In the panels are figures carved in oak, representing St. John, St. Paul, and St. Augustine of Canterbury, the divisional triple shafts being in walnut. The pulpit is presented by the parishioners as a testimonial to the late respected vicar, the Rev. R. Maude.

The font is of green marble, the bowl being sunk externally, on each side is a quatrefoil square panel, with carving inserted, representing the four rivers of Paradise, with green marble caps and base, the small columns and centre shaft being Irish red marble. The recesses are profusely enriched with carvings, diaper panels, marble figures, and the caps, bases, and panels being in Derbyshire spar, the divisional clustered shafts in Cornish spar; the arading on either side is executed in Caen stone.

The floors and passages are of stone, laid

diamond-shape, about 12 in. square, the floor of sanctuary being encaustic tiles. The stone used for the exterior is from Mr. J. Walker, St. Michael's Mount Quarries, Barksland, near Halifax; also the dressings of the interior, the walling inside being local stone, rubbed to a smooth surface, the outside being tooled diagonally.

The architect is Mr. G. G. Scott, R.A., under whose direction the work has been carried out by Messrs. W. & J. Milner, of Mirfield, and under the immediate superintendence of Mr. H. Roome, as clerk of works. The carving has been executed by Messrs. Farmer & Brindley, London; the retables by Mr. Earp, pulpit and font by Mr. Phillips, coronas and altar-rail by Messrs. Potter & Son, all of London; chancel stalls and screens by Messrs. Bates & Kett, of Cambridge; seating for nave and aisle by Mr. Thompson, of Peterborough; the roofs, doors, &c., by Messrs. Barker & Plough, of Mirfield. The church is warmed by water, the apparatus being supplied by Mr. J. Brooke, of Huddersfield. The total cost will be about 25,000*l*.

At the luncheon after the service, Mr. Scott proposed the health of the contractors for the work, and the clerk under whose superintendence it had been carried out, and spoke in high terms of the workmanlike manner in which Messrs. Milner had executed their part of the contract.

ECCLIESIASTICAL DILAPIDATIONS ACT.

Norwich.—Mr. B. M. Phipson, of Norwich and Ipswich; Mr. J. H. Brown, of Norwich; and Mr. E. L. Blackburne, F.S.A., of London, have been elected surveyors for the diocese of Norwich, under the new Ecclesiastical Dilapidations Act. There were seventeen candidates.

Hereford.—Mr. Thomas Nicholson, architect, of Hereford, has been appointed Surveyor of Ecclesiastical Dilapidations for the diocese of Hereford, under the new Act.

Lichfield.—This diocese has been separated into three superintendencies;—viz., for the Archdeaconry of Derby, Messrs. Stevens & Robinson, of Derby; an architect at Stoke has the Archdeaconry of Lichfield; and an architect at Shrewsbury has that of Salop.

Canterbury.—Mr. Lucius Spooner has been elected for the eastern division of this diocese.

Ely.—In consequence of the large area of this diocese, it has been decided to divide it into three districts for the purposes of the Act. The three surveyors who have been appointed are, Mr. W. M. Fawcett and Mr. R. E. Rowe, of Cambridge, and Mr. Day, of Bedford.

NOVEL MODE OF UTILISING SEWAGE AT GLASGOW.

ALTHOUGH Glasgow is far behind London in regard to its sewage arrangements, yet it is about to adopt a plan for utilising part of its sewage, which now runs into and pollutes the Clyde, that London might very well follow, if the several municipal Boards were only to take joint action in the matter. A contract has just been entered into between the sanitary committee of the Police Board of Glasgow and a company in that city for utilising the urinals. The Police Board are to collect and supply to the company 5,000 gallons per day for twelve years, for which the company are to pay the Police Board 1,000*l*. per annum. It will be collected in close tanks, and will be removed during the night to the company's works, where it will be resolved by a chemical process into sulphate of ammonia. The contract is to take effect from the beginning of next year.

ARCHITECTURAL ART CLASSES.

ARCHITECTURAL MUSEUM, WESTMINSTER.

A JOINT committee to overlook these classes for the ensuing session has been constituted. The classes will open on Thursday, the 2nd of November, at 7.30 p.m., and will meet on the evenings of Tuesday, Thursday, and Saturday in each week from 7 to 9.30 p.m. during the months of November, December, January, February, March, April, May, and June, excepting during one fortnight for the Easter recess.

The Figure-drawing class, instructor Mr. F. Weekes, is divided into two sections:—1. For the study of the antique; 2. For drawing from the living model and the draped figure. The fee is 7*s*. 6*d*. per month, which it is hoped to diminish as the number of students increases.

The Ornament class is to be under the guidance of a committee of visitors, among whom are Messrs. Waterhouse, Burges, Cockerell, Seddon, E. W. Godwin, Tarver, Florence, and T. H. Watson. The whole contents of the museum are available for this class, which will meet, besides the evening named above, on Tuesday, from three to five p.m., and studies may be made at all times in the daytime when the museum is open. The fee is 2*s*. 6*d*. per month.

Prizes are offered for work done in the various classes, and it is intended to provide a course of lectures upon the contents of the museum, of a character similar to those of last year, which were well attended. Intending students should send in their names at once to Mr. Thomas Henry Watson, the hon. secretary.

MORE DIFFERENCES.

Sir,—Pray have the kindness to insert the following lists of tenders:—

For alterations and repairs to stables, coach-house, and laundry, in rear of 23, Bedford-place, Russell-square. Mr. C. H. Edwards, architect:—

Collins	£136	0	0
Wilson	130	0	0
Travern & Bull	120	0	0
Devonport	108	0	0
Huckle	97	0	0
Wilcocks	75	0	0
Nash	75	0	0
Cater	75	0	0
Beresford	74	0	0
Jones & Wareham	68	0	0
Keyes	68	0	0
Hill	68	0	0
Seed (accepted)	48	0	0

For repairs to 29, Bedford-place, Russell-square. Mr. C. H. Edwards, architect:—

Hill	£181	0	0
Cater	135	0	0
Keyes	127	0	0
Wilson	118	0	0
Collins	117	0	0
Huckle	116	0	0
Moss	112	0	0
Seed	83	0	0
Beresford	68	0	0
Devonport	63	0	0
Jones & Wareham (accepted)	55	0	0

Here is a difference of opinion which could be explained in ten minutes' conversation.

J. W.

INTERMITTENT FILTRATION WORKS.

Sir,—In the observations contained in your last number, on the Intermittent Filtration Works, conducted by Mr. Bailey Denton, under an order of the Lords Justices, for the disposal of the sewage of Merthyr Tydfil, a printer's error states the daily dry-weather flow of sewage to be 5,000 gallons. The quantity should have been 50,000 gallons, the water supply being 12 gallons per head on 50,000 people.

The success that has hitherto attended the works has been remarkable, because 60,000 gallons of sewage have been daily applied for a month together to 10 acres of land only. It would, of course, have been much less remarkable had the quantity been limited to 50,000 gallons.

BAILEY DENTON, SON, & NORTH.

SUBTERRANEAN TREASURES.*

MARBLE, ALABASTER, AND SLATE; PETROLEUM, ASPHALTE, AND JET.

"NATURE," says Dr. Hartwig, "displays her wonders not only in the starry heavens or in the boundless variety of animal and vegetable life on the surface of our earth. In the dark regions underground she likewise shows us much that is remarkable or beautiful, or carries on gigantic operations, which are sometimes beneficent and sometimes disastrous to mankind. There lie concealed the mysterious laboratories of fire, which reveal to us their existence in earthquakes and volcanic explosions. There, in successive strata, repose the remains of extinct animals and plants. There many a wonderful cavern may be seen, with its fantastic stalactites, its rushing waters, and its noble halls. There have been deposited the rich stores of mineral wealth—the metals, the coals, the salt, the sulphur, &c.,—without whose aid man would never have been more than a savage."

An elaborate and interesting work in which are well described the wonders of this hidden world in their various relations to man, now raising him to wealth and now dooming him to destruction, has been written by Dr. Hartwig, the author of "The Sea and its Living Wonders," "The Harmonies of Nature," and other kindred works.

From this work we propose to condense a few of the exceedingly varied contents in order to show its scope and nature. It treats of geological revolutions, fossils, subterranean heat, upheavals

and depressions, waters and wells, volcanoes, earthquakes, landslips, caves and the life and relics in them, tunnels, mines, metals, coal, bituminous deposits, salt, sulphur, amber and precious stones, quarries, rock temples, churches, and dwellings, tombs, and catacombs,—a goodly list of miscellaneous information, all well told and full of interest and value.

Basides metals, and the various minerals mentioned in the special chapters, the solid earth-kind, as the author remarks, furnishes an inexhaustible supply of marbles, slates, and stones for building or paving; and their extraction occupies a vast number of industrious hands. To these we shall first refer.

In a popular work on geology, published some years ago, Mr. Burat informs us that about 70,000 persons were employed in the 18,000 more or less important quarries at that time worked in France, and that the produce of their labour amounted to a value of more than 2,000,000*l*.

There can be no doubt that the quarries of England or Germany are at least equally productive, and thus a very moderate estimate leads us to the conclusion that the quarries of Europe, from those which furnish the costliest marble to those which yield the commonest building-stone, employ at least half a million of workmen, and produce an annual value of no less than 12,000,000*l*, a sum which is probably doubled or trebled before the heavy materials can be placed in the hands of the consumer. A land ribbed with stone, like England, has therefore a considerable advantage over a flat alluvial plain, like Holland, as it possesses in its rocky foundations a source of wealth which nature has denied to the latter.

Though several other stones, such as granite and porphyry, are susceptible of a fine polished surface, and serve for the decoration of palaces and churches, yet marble or pure compact limestone is chiefly used for ornamental purposes, both on account of its beautifully variegated tints, and its inferior hardness, which allows it to be more easily worked. Our Derbyshire and Devonshire quarries supply a great variety of richly coloured marbles; but the best material for the sculpture is supplied by the limestone mountains of Carrara, which furnish a homogeneous marble of the purest white, with a fine granular texture, resembling that of loaf sugar. These far-famed quarries, which were worked by the ancients, having been opened in the time of Julius Cæsar, are situated between Spezzia and Lucca, in the Alpe Apuana, a small mountain-group no less remarkable for its bold and sharp outlines than for its almost total isolation from the monotonous chain of the Apennines, from which it is separated by a wide semicircular plain. Where the Alpe Apuana faces the sea, it is chiefly formed of magnesium and glimmer slate, in which large masses of limestone are imbedded; but the more inland part of the group belongs entirely to the limestone formation, and abounds in romantic scenery and noble peaks towering to a height of 6,000 ft. above the level of the sea. Towards its north-western extremity rises Monte Sacro (5,200 ft. in height), the famous marble mountain in whose slopes are scattered the quarries to which the small town of Carrara owes its ancient and world-wide celebrity.

The quarries themselves by no means afford an imposing sight, as they are mostly small, and very badly worked; but it is interesting to watch the transport of the huge blocks of superb material from the various glens in which the quarries are situated, while the numerous water-mills for cutting or polishing the marble enliven the whole neighbourhood.

In the town of Carrara numerous sculptors are constantly employed in rough-hewing the marble into various forms, such as capitals, friezes, busts, &c., in order to diminish the cost of transport, or to discover faults in the stone before it is shipped. There are also shops where marble trinkets or ornaments are exposed for sale; but Florence, Leghorn, and Genoa are the chief depôts of ready-made marble articles, such as vases, urns, sculptured chimney-pieces, and copies of renowned statues. Different kinds of fruit are also executed in marble, and with the aid of colour made to imitate nature so closely as to deceive the eye.

In Carrara the inferior qualities of marble are used for building and paving, as it is here the cheapest material. The window and door frames, the flooring and the chimney slabs, in even the meanest houses, are made of marble, and form a striking contrast to the squalid poverty of the remainder of the furniture.

* The Subterranean World. By Dr. George Hartwig. London: Longmans, Green, & Co. 1871.

The quarries which furnished the material for the finest works of the Grecian chisel partake of the interest which attaches to every vestige of ancient art.

About eight miles to the north of Athens rises the Pentelikon, or Mount Pentelios, from whose flanks was excavated the marble that served for the construction of the Parthenon, of the Temple of the Olympian Zeus, and of the other matchless edifices of the Athenian Acropolis. No other quarries in the world can boast of their material having undergone a more beautiful transformation, for never has marble been more highly ennobled than by the genius of Phidias! The ancient roads ascending from the foot of the mountain to the quarries still show the traces of the sledges on which were transported the huge blocks of more than twenty tons in weight that now lie scattered among the ruins of the Acropolis.

Gypsum, or sulphate of lime, and the peculiar form of that mineral called alabaster, are substances of considerable importance in the arts. Rendered more valuable by a slight admixture of carbonate of lime, the gypsum of Montmartre, near Paris, has long been celebrated for its excellence as a cement or stucco. It is found resting on a limestone of marine origin, and in some places appears immediately beneath the vegetable soil, so that it can be readily and conveniently worked without having recourse to subterranean excavation. These quarries furnish the whole of northern France with the well-known plaster of Paris, and the value of their annual produce amounts to not less than 100,000l.

When sulphate of lime or gypsum assumes the opaque, consistent, and semi-transparent form of alabaster, it is worked like marble. The pure white and harder varieties are usually employed for the sculpture of statues and busts; while the softer kinds are cut into vases, boxes, lamps, and other ornamental objects. The alabaster quarries in the neighbourhood of the ancient Etruscan town of Volterra are the most famous in Europe, and have afforded employment for many centuries to her industrious population. Volterra exports her beautiful produce to all parts of the world, even as far as the interior of China. Beggary is here unknown (a rare case in Italy), for even women and children are all employed in cutting, sawing, rasping, or filing alabaster. In the remotest antiquity, when the city was still called Volathri or Volaterra, this industry was practised within her walls, and a collection of sepulchral urns and other works of Etruscan art contained in the town-hall bears testimony to her ancient skill. Now, however, art seems to have degenerated into mere manufacturing ability; the statues and other objects are almost always repetitions of the same models, and but very rarely some speculative person introduces a novelty, for the purpose of obtaining a somewhat higher price for his wares.

Great Britain possesses apparently inexhaustible quantities of alabaster in the red marl formation in the neighbourhood of Derby, where it has been worked for many centuries. The great bulk of it is used for making plaster of Paris, and as a manure, or as the basis of many kinds of cements. For these common industrial purposes it is worked by mining underground, and the stone is blasted by gunpowder; but this shakes it so much as to render it unfit for works of ornament, to procure blocks for which it is necessary to have an open quarry. By removing the superincumbent marl, and laying bare a large surface of the rock, the alabaster, being very irregular in form, and jutting out in several parts, can be seen out in blocks of a considerable size and comparatively sound. This stone, when preserved from the action of water, which soon decomposes it, is extremely durable, as may be seen in churches all over this country, where monumental edifices many centuries old are still as perfect as when they proceeded from the sculptor's chisel. The Derbyshire alabaster, commonly called Derbyshire spar, gives employment to a good many hands in forming it into useful and ornamental articles. Another kind of alabaster also found in Derbyshire is crystallised in long needle-like silky fibres, which, being susceptible of a high polish and quite lustrous, is used for making necklaces, bracelets, brooches, and other small articles.

Besides her inexhaustible coal, iron, and lead mines, Wales possesses in her slate quarries a great source of mineral wealth. For this article, which many would suppose to be but of secondary importance, is here found in such

abundance and perfection as to command a ready market all over the world. Thus, in North Wales the face of the mountains is everywhere dotted or scarred with slate quarries, of which by far the most important and largest are those of Llandegul, six miles from Bangor, in which more than 3,000 persons are employed. This circumstance alone will give an idea of their extent, but still more their having their own harbour, Port Peurhyn, which holds vessels of from 300 to 400 tons, and whence slates are sent not only to all parts of Great Britain, but even to North America. The cost of the inclined planes and railroads which serve to transport the slates from the quarries to the port is said to have amounted to 170,000l. The masses of slate are either detached from the rock by blasting, or by wedges and crowbars. They are then shaped on the spot into the various forms for which they are destined to be used.

The class of bituminous minerals exhibits a long series of inflammable substances, which are supposed to be derived from the decomposition of organic matter in the rocks containing them. Some (petroleum—rock—naphtha) issue in a fluid state from the earth, while others pass by insensible gradations from petroleum into pitch, asphalt, or malha (viscid bitumen), and the latter as insensibly into the solid form of asphalt. Certain bitumens, again, differ but slightly in composition from bituminous coals, so that it is, in reality, very difficult to draw a decided line between them. Hence it is highly probable that in petroleum we see the product of a primeval vegetation which, under the influence of chemical change and heat, has partly assumed a liquid form, and oozing from the deep-seated strata in which it was confined by terrestrial revolution, now permeates the superficial rocks, or exists collected in subterranean cavities, whence it issues in jets and fountains whenever an outlet is made by boring.

Petroleum springs have been known for many ages in Burmah, where there are about 100 wells from 180 ft. to 306 ft. deep, each lined with horizontal tubes, but not all now worked; at Baku, in the neighbourhood of the holy fires, near the village of Amiano, in Parma, whence enough was formerly obtained to light the streets of Genoa; at Zante, one of the Ionian Islands, which has furnished oil for more than 2,000 years, its petroleum spring having been mentioned by Herodotus; at Agrigento, in Sicily, which, according to Pliny, furnished a mineral oil that was collected and used for burning in lamps; on the banks of the Kuban, and many other localities; but it is only since the discovery of the immense sources of supply in the north-eastern States of America and in Canada that petroleum has become not only an article of the greatest commercial importance, but a blessing to millions in all parts of the world. It gladdens the long winter evenings of the Icelandic peasant, and softens the hut of the Australian settler; it has found its way into the remotest glens of the Alps, and to the distant sea-ports of China. No wonder that its economical and cheerful light has caused its consumption to increase with a rapidity almost without a precedent in the annals of commerce. Though scarcely ten years have passed since the American wells first began to pour forth their streams of oil, no less than 670,000,000 gallons were exported in 1866 from the ports of Philadelphia and New York. One-third of this enormous quantity found its way to England; one-fifth to the port of Antwerp, its chief staple place for Western Germany and the North of France; the remainder was distributed among all the sea-ports of the world from Hamburg to Hong Kong, and from the Cape to Valparaiso. When we reflect that this amazing mass of liquid bitumen, which formed the cargo of no less than 731 large vessels, must necessarily be increased from year to year to meet a constantly increasing demand, it might almost be feared that, in spite of the prodigality of nature, its subterranean reservoirs must one day be exhausted.

Asphalt, a mineral pitch of a deep black colour and a conchoidal brilliant fracture, is frequently found swimming on the surface of the Lake Asphaltites, or Dead Sea, in Judea, which receives its name from the circumstance. It also occurs in many parts of Egypt, where it was used for embalming. The ancients also frequently employed it, combined with lime, in their buildings. Not only do we find the ruined walls of temples and palaces in the East with the stones cemented with this material, but some of the old Roman castles in this country

are found to hold bitumen in the cement by which their stones are secured.

"It is a remarkable fact," says the late Dr. Ure, "that the substance thus employed in the earliest constructions upon record, should for so many thousand years have fallen well-nigh into disuse among civilised nations; for there is certainly no class of minerals so well fitted as the bituminous, by their plasticity, fusibility, tenacity, adhesiveness to surfaces, impenetrability by water, and unchangeableness in the atmosphere, to enter into the composition of terraces, foot pavements, roofs, and every kind of hydraulic work. Bitumen, combined with calcareous earth, forms a compact semi-solid, which is not liable to suffer injury by the greatest alterations of frost and thaw, which often disintegrate in a few years the hardest stone, nor can it be ground to dust and worn away by the attrition of the feet of men and animals, as sandstone, flags, and even blocks of granite are. An asphalt pavement rightly tempered in tenacity, solidity, and elasticity seems to be incapable of suffering abrasion in the most crowded thoroughfares; a fact accomplished of late in a few places in London, but much more extensively and for a much longer time in Paris."

Many of the asphaltic pavements made in England have, indeed, proved failures; but as the proper proportions of the respective ingredients may not have been maintained, further trials are advisable. At present, although bitumen is employed, and with seeming advantage, as a cement between paving-stones, its use in the formation of foot pavements has been confined within narrow limits.

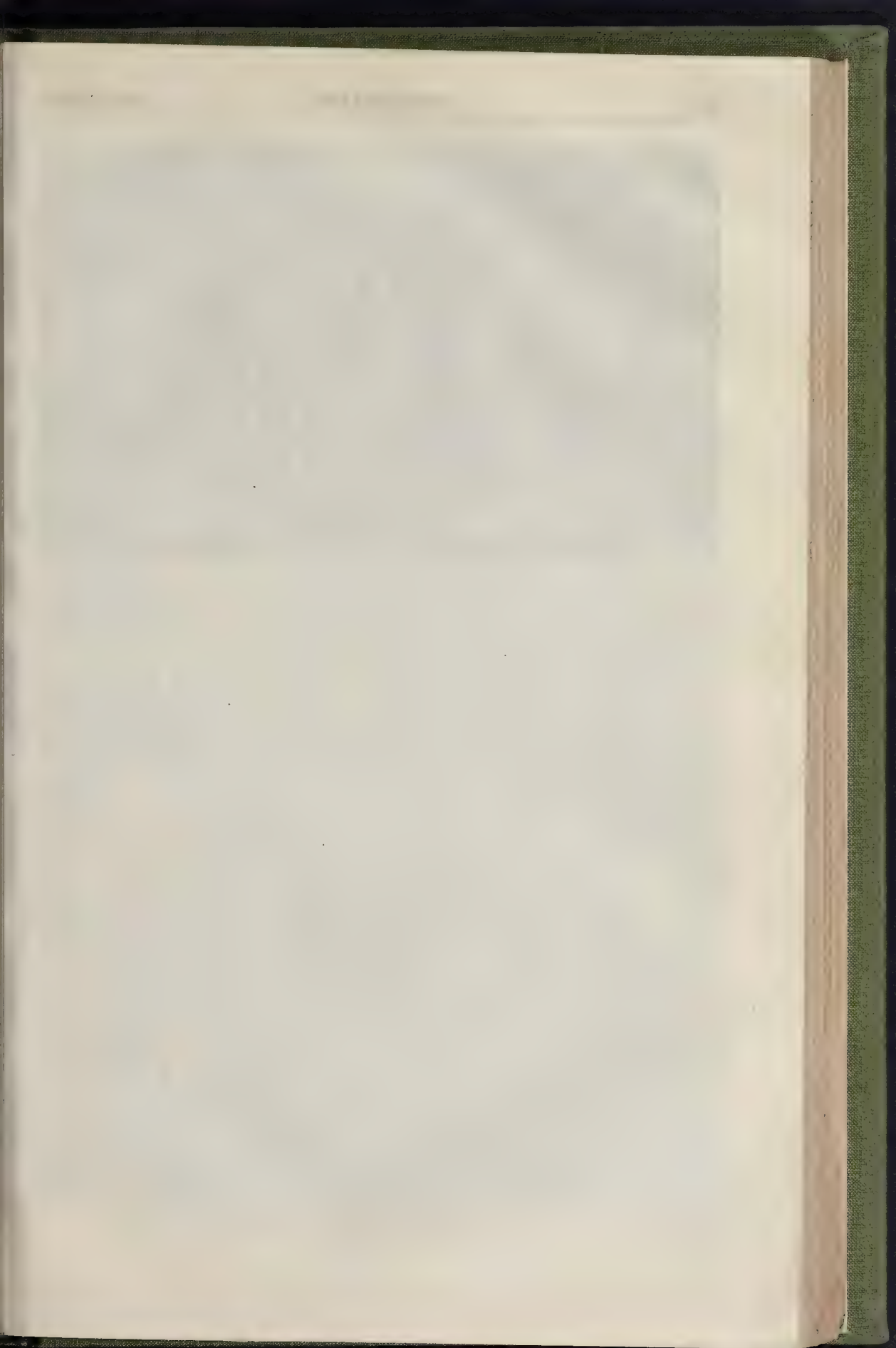
In Europe, the most extensive mine of asphaltic rock is undoubtedly that of the Val de Travers in the canton of Neuchâtel; but the most remarkable deposit of bitumen in the world is the celebrated Great Pitch Lake in the island of Trinidad. With regard to its formation, Sir Charles Lyell remarks that the Orinoco, which discharges its vast volume of water right opposite to the island, has for ages been rolling down great quantities of woody and vegetable bodies into the surrounding sea, where, by the influence of currents and eddies, they may be arrested and accumulated in particular places. The frequent occurrence of earthquakes and other indications of volcanic action in these parts lends countenance to the opinion that these vegetable substances may have undergone, by the agency of subterranean fire, those transformations or chemical changes which produce petroleum; and this may, by the same causes, be forced up to the surface, where, by exposure to the air, it becomes inspissated, and forms the different varieties of pure and earthy pitch or asphaltum so abundant in the island. The Pitch Lake is a mile and a half in circumference; the bitumen is solid and cold near the shores, but gradually increases in temperature and softness towards the centre, where it is boiling. The solidified bitumen appears as if it had cooled so from the lake to the sea, a distance of three-quarters of a mile, is covered with a hardened pitch, on which trees and vegetables flourish, and the best pine apples in the West Indies, called black pines, grow wild. As the Trinidad pitch has been found by chemical analysis to be an excellent material for the making of gas, it will probably become an important article of commerce. The wonder is that it has been so long neglected.

Though jet is frequently considered to be wood in a high state of bituminisation, yet the fact that we find this beautiful substance surrounding fossils, and casing adventitious masses of stone, seems to show that a liquid, or, at all events, a plastic condition, must at one time have prevailed in its formation. This opinion is further strengthened by the circumstance that petroleum strongly impregnates the rock in which it is found, giving out a strong odour when it is exposed to the air.

Jet occurs chiefly in the neighbourhood of Whitby, in Yorkshire, the estates of Lord Minto being especially productive. The jet miner searches with great care the slaty rocks, and finding the jet spread out, often in extreme thinness, between the laminations of the rock, he follows it with great care, and is frequently rewarded by its thickening out to 2 in. or 3 in.

At present the total annual value of the mourning ornaments made at Whitby and Scarborough amounts to no less than 125,000l. About 250 men and boys are employed in searching for jet, and between 600 and 700 are engaged in its manufacture.

Dr. Hartwig's valuable work is well illustrated, as an example of which we are enabled by the publishers to reproduce an engraving of Pannhyn Slate Quarry, North Wales. We must add, too, a word of praise as to the beauty of the paper and the excellence of the print, although a few printer's errors occur here and there throughout the volume.





VIEW IN THE PENRHYN SLATE QUARRY.

INTERIOR OF THE CATHEDRAL OF BOIS-LE-DUC, HOLLAND.

THE ORGAN-CASE.

Our illustration represents the interior of the nave of the cathedral church of Bois-le-Duc, in Holland, and shows the fine pulpit and organ, which are important features in that noble church.* As a musical instrument, the organ at Bois-le-Duc is second only to that at Harlem, but in point of architectural design, it has no rival in Holland, or perhaps even in Europe.

We take this opportunity of saying a few words upon church organs, not from a musical point of view at this moment, but from an architectural point of view. It strikes us as a very singular fact, that while so much has been done of late years to make the altars, pulpits, fonts, and other articles of church furniture beautiful and appropriate, no attention seems to have been paid to the organ, or rather the organ-case.

In fact, the reverse seems to have taken place, for if we look at churches erected thirty or forty years ago, we find that the organ received far more attention, and was made a much more ornamental feature, according to the lights of the time, than in churches built within the last few years. In most of our modern churches the organ seems to be something beneath the notice of the architect, for he apparently considers that if he provides four posts and a few iron bars to tie the pipes together, he has entirely fulfilled his duty towards this article of church furniture. Now, we cannot understand why this should be the case. Why should an article of church furniture, which is deserving of the greatest study and consideration, be looked upon as a necessary encumbrance to be kept as much as possible out of sight, and made as unattractive as may be? There are two answers to this question, neither of which is in the least degree satisfactory. The first is, that so very few examples of ancient Gothic organs exist, that it is difficult to find authority for their design and arrangement in Gothic buildings; and the second is, that the modern practice of placing the organ out of sight in a dark hole at the side of the chancel, renders anything like a design unnecessary. The first of these answers is unsatisfactory, because, although there are very few old Gothic organ-cases in existence, those that do exist are very suggestive, and hundreds of superb Renaissance examples are to be found which any man of very ordinary

capacity as a designer could easily "adapt" as the general "motive" of a Gothic production.

With regard to the second reason for neglecting the organ-case, we simply say this: the organ ought not to be stowed away in a dark hole,—an arrangement to be condemned both upon acoustic and artistic grounds. If it is absolutely necessary to have the organ near the east end of the church, why cannot some kind of transept be thrown out of the chancel, of sufficient height to allow the organ to be well lifted up above the floor? In larger churches the French arrangement might be adopted of having two organs, the great organ at the west end of the church, and a smaller one at the side of the chancel, over the stalls; and the new application of electricity to playing the organ would facilitate this arrangement, as by it both organs could be played by the same musician.

It may not be uninteresting to our readers to say a few words upon the ancient organ-cases still in existence, and some few which are mentioned in early writings.

In the Holy Scriptures the organ is mentioned eighteen different times. It is, however, obvious that this instrument was very small, and capable of being carried about. Organs are also mentioned by Pindar 500 years before the Christian era.

The first mention we have of an organ which must have been a large instrument, is one that is said to have been given to Charlemagne, and is reported to have made "a noise like thunder."

The earliest organ mentioned as having existed in England was at Westminster Abbey, where there was one in the tenth century.

The first organ erected in Paris was at the church of St. Severin, in the year 1358, though they had been introduced into France as early as the third century. In the year 1463, the cathedral church of Toulouse had five organs, all on the roof-screens, which shows that even up to that period the instruments were generally small.

The earliest organs now existing date only from the end of the fifteenth or commencement of the sixteenth century. Those in the cathedrals of Chartres and Amiens are of this date, and in the churches of Perpignan, Honblienx in Picardy, Moret, Clauxy, St. Bertrand des Comignes, and Solies-Villes, in France; also those at Strasbourg, Nördlingen, and St. Anne's, Augsburg, in Germany.

All these examples are elaborately carved and adorned with gilding and colour; they are also supplied with doors richly painted. Those of

Honblienx and Perpignan are of large size and complicated arrangement.

The organ at St. Anne's, Augsburg, consists of a great organ and choir-organ, both of which have superbly painted doors. Those of the great organ are painted by the elder Holbein, and those of the choir-organ by Barchmayer. At Gonessa, in France, is a beautifully designed organ-case of Early Cinque-cento work, which has never had doors: it bears the date 1508.

The organ in the church of St. Anne and Ulrich, at Augsburg, bears the date 1600 upon it. It is in the Renaissance style, but has finely painted doors; the subjects upon which are the Annunciation and the Assumption of the Virgin Mary. The superb organ at Bois-le-Duc dates from the year 1602. The case is entirely of dark oak, and is not coloured.

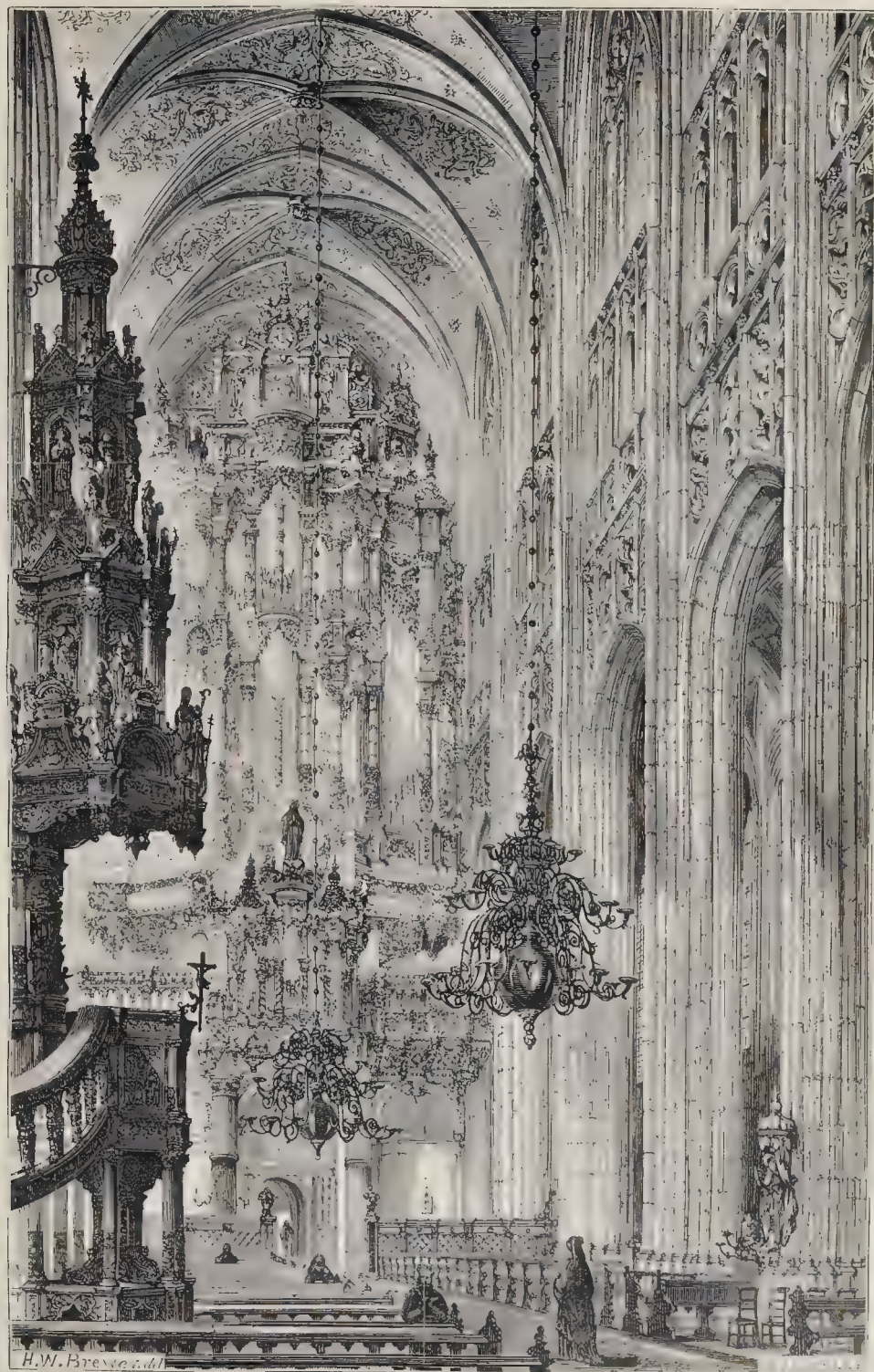
In England we know only of one organ-case which may date from before the Reformation. It is in Northamptonshire. A small Renaissance organ, beautifully decorated, is to be seen in the chapel of Hatfield Hall. It is a work of the first quarter of the seventeenth century. Renaissance organ-cases of great beauty, in their way, are also to be seen at King's College Chapel, Cambridge, and St. Peter's, Mancroft, Norwich. The old organ-case at St. Paul's Cathedral is a work of Grinling Gibbons, and though rather wild, is a fine example of the work of that period.

During the earlier years of the Gothic revival, considerable attention was given to the organ-case, and some of those designed during that period were of considerable merit, especially that at St. George's Chapel, Windsor, which is exceedingly well treated, particularly the arrangement of the "choir organ."

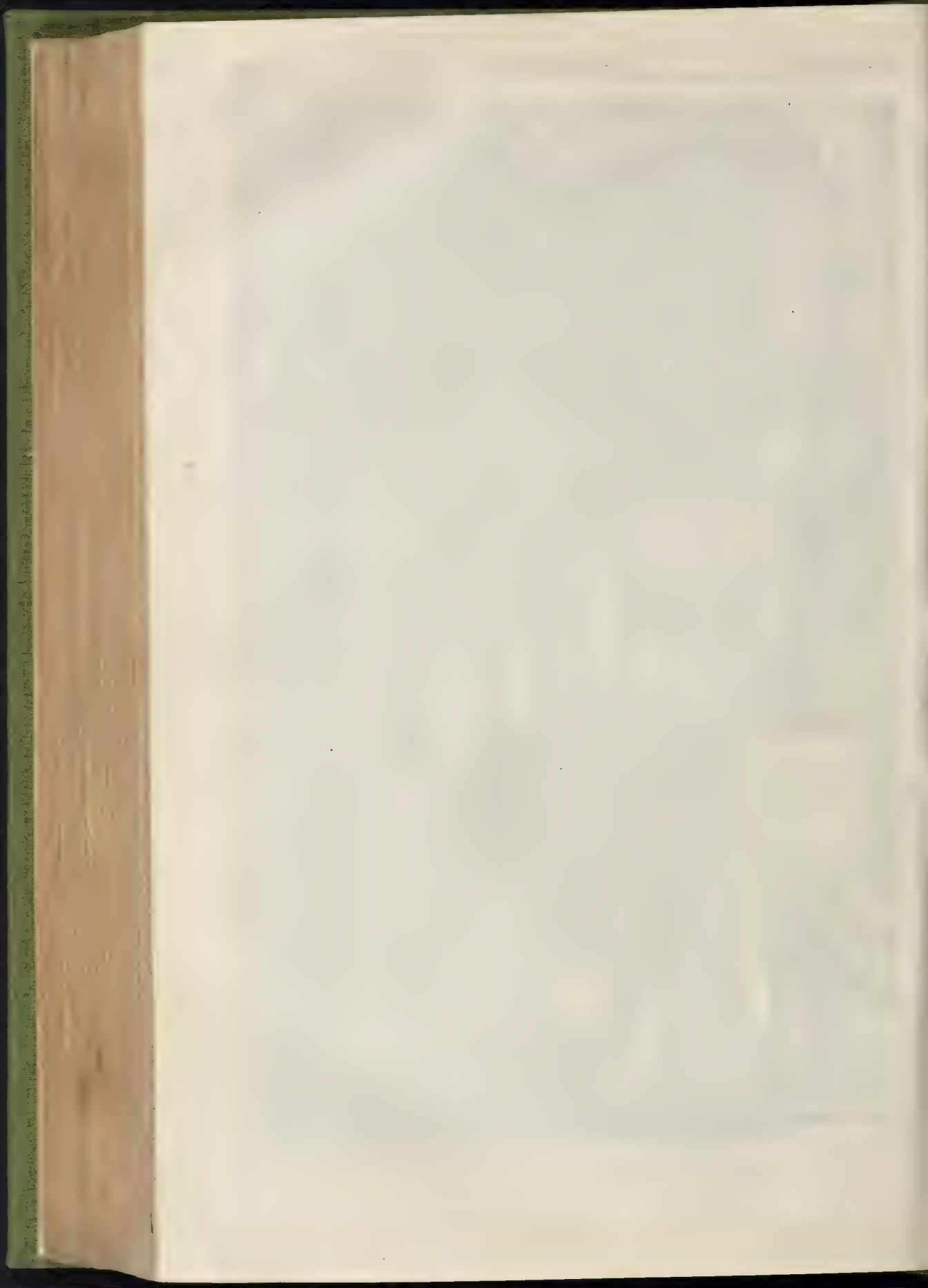
At Jesus Chapel, Cambridge, is a charming little organ, designed by Pugin, with doors well painted. The fine design which he made for an organ to stand on the roof-screens at Ushaw College was unfortunately never carried out.

The organs at Ely Cathedral and St. Mary's, Nottingham, are so satisfactory as to make us wish that Mr. G. Gilbert Scott would give us some more examples of his skill in designing this noble article of church furniture. Before concluding this article we may mention that many valuable hints upon the design and arrangement of church organs will be found in Mr. Sutton's work, which is rendered the more useful by the fact that it is excellently illustrated, and we recommend all those who are likely to have anything to do with church organs to look to it.

* View of the exterior will be found in our volume for 1870, p. 107.



INTERIOR OF THE CATHEDRAL OF BOIS-LE-DUC, HOLLAND: SHOWING THE ORGAN.



A VISIT TO DOLGELLY,
OWEN GLANDWR'S PARLIAMENT HOUSE,
Y VANNER ABBEY, &c.*

SIR R. C. HOARE asserts that there is "no place in the Principality from whence so many pleasing and interesting excursions may be made, and where nature bears so rich, so varied, and so grand an aspect as Dolgelly." So far true, nature reigns triumphant. Now, as for art and civilisation, we may correctly state that there is no town in Wales which possesses less art, or exhibits so small an amount of civilisation, as regards the comforts of sanitary matters, as the town of Dolgelly; the eye proves the former assertion, and the nose the latter. The people, however, have improved since the time of Dr. Fuller, who reported, in his "Worthies of Wales," "that there are more ale-houses than houses;" temperance hotels are now prevalent.

Nature, in sanitary matters, is by far superior to man; the mountain homes, without closets and cesspools, are more wholesome than closets without drainage. The vast quantity of rainfall from the mountains in Wales is surprising, and it not only might be collected with great sanitary advantage, but would also protect the population, principally living in the valleys, from a complete and constant saturation, engendering rheumatism, typhus fever, whooping-cough, &c., now very prevalent in many parts of Wales. On this head there is still much to be done throughout the country, notwithstanding the earnest and powerful efforts which have from time to time been made in the *Builder*.

It affords relief, as usual, to turn attention to the works of bygone ages, when the mind held an ascendancy over manual labour. In Parliament-street is situated Owen Glandwr's Parliament House; the guide-book announces it as "the most interesting object in the town." This is undoubtedly correct, as far as relates to the old and picturesque building in question, and the absence of any other antiquities. The house appears to be of the early part of the fifteenth century, and to have been constructed of timber and plaster, similar to buildings of that period. The upper story projects over the ground story, and the windows are in three lights, and are projected on moulded sills; some of the mouldings have flowing foliated carvings. The photographer has shown the front with the stone steps leading to the upper room, the so-called Parliament House. If a view were to be taken of the back, it would be more interesting to the architect, as it possesses more ornamentation. With some difficulty permission was obtained to enter the rooms, the house being now divided into small apartments, and let to poor people. The armoury, so-called, tenanted by a shoemaker, is 19 ft. by 13 ft., with an open timber roof. As an old English house, in a ruinous state, it is an interesting object; but as a Parliament House for the Principality, at any period, it is, and ever has been, more suitable for Guy Raux and his confederates than for the recipients of enlightened Welshmen.

The church is a large ugly edifice, on an eminence in the midst of the town, having no architectural pretensions in either the interior or exterior. In a popular guide-book the church is absurdly described as a neat and substantial structure, with a fine square tower, built of limestone, in the "Grecian" style of architecture. With the exception of a monument to an ancestor of the Vaughan family, and a few recent monuments, there is not anything noticeable. The county-hall has a pediment, with cantilevers, and on the front of the building are pilasters, with clumsily-moulded capitals supporting nothing, there being no entablature or architrave. The new market-hall, erected last year, is an improvement to the town; it is built with Sarglas blue stone and Craigwen stone, obtained from the neighbourhood. The archivolts mouldings, dressings to windows, string-courses, &c., are of Rnabon freestone. It has not any architectural character, being without cornices. The roof is slated and supported by cantilevers. All the buildings in the town are of stone, slated.

The bridge over the Wadion is crossed by a stone bridge, erected in 1633, repaired and enlarged in 1830, two arches being added; and in 1868 it was again raised and altered, to enable the Great Western Railway Company to form their line under it. The grammar school is of stone, slated, and was erected in 1852. The national school, recently built, in the Medieval

style, on the north side of the bridge, appears to advantage.

The whole of the buildings in the town are square and heavy, most unsightly and unpicturesque. The country being mountainous and romantic in the extreme, demands buildings in a style suitable to the situation; high-pitched roofs, gables, &c., based upon the Swiss and other Alpine styles, adapted to snow storms and rough weather. The chief town of Merioneth, although irregularly built, is surely worthy of attention. Banish the cesspools and smells, form a few footpaths, and render the town better fitted for human beings.

A short distance to the right of the road from Dolgelly, just before reaching Llanelltyd-bridge, an avenue of sycamore trees leads to the farm in which are the remains of a Cistercian abbey, called by the Welsh, Y Vanner, and by different authors Cymmer, Cymner, Cwmner, Kimmer, Kinner, Kimmer, and Kimner. It is dedicated to St. Mary, and was founded by Meredith and Griffith, sons of the Prince of North Wales, in the year 1198, and dissolved by Henry VIII. Lewis Morris (quoted by Bingley), says "it was first founded by some monks, who sojourned there from Cwm hir Abbey, in Radnorshire. It seems it was a colony of monks sent away, as bees do when the hives are too full." The abbey had a narrow escape in 1231; Henry III. was outwitted by the Welsh, and ordered the whole building to be destroyed. He, however, contented himself by burning the out-offices, and receiving from the abbot 300 marks. It is in the Early English style of architecture, the remains being carefully preserved. The abbey church is small and unique, and consists of a nave and chancel; the nave had formerly north and south aisles. The internal dimensions are 123 ft. 2 in. by 25 ft. 10 in., without the former aisles. The east end contains three deeply-splayed lancet windows, with interior edge shafts and capitals; external width of opening about 1 ft. 4 in.; internal width, 4 ft. 2 in.; the central light is wider. In the south wall of the chancel are three sedilia, on the same level. The columns have ornamental capitals and bases, partly of a Norman character; there are separate pointed arches internally. A pointed recess, usually containing the founder's tomb, and a single piscina and ambry, are contiguous eastward. Westward of the sedilia is a pointed doorway, blocked up with angular columns and ornamental capitals. On the north side of the chancel is a large pointed and moulded archway, now filled up, formerly probably connecting a chapel, and a modern square-headed doorway. The nave was separated from the north aisle by two columns and two responds, which are octagonal, with moulded capitals, supporting three pointed arches. The arches are chamfered and plain, with two courses of voussoirs. These openings are now closed with masonry, and farm buildings have been erected on the site of the former aisle. On the south side the columns, arches, and aisle have disappeared. The side walls remaining are about 30 ft. high. The west doorway has a horizontal stone lintel over it. Above the doorway is a small trefoil-headed window; and on each north and south side at the west end is a deeply splayed and pointed window. In the church, by the north-west angle, is a large sycamore tree. A stone staircase appears to have been in the north-west angle. The remains of the west front are about 35 ft. high, with diagonal buttresses. All the walls are covered with ivy. The walls of the abbey are constructed with the blue local slaty stone, and the columns, voussoirs, quoins, string-courses, &c., are of wrought freestone. The orientation is 9° to the north of east.

A short distance westward of the abbey church stand the refectory and abbot's residence; these are attached to an adjoining house, and let to lodgers. The refectory was originally 34 ft. by 20 ft. 5 in.; it is now reduced in length to 25 ft. 3 in. by a bedroom and lobby at the south end. At the north end is a doorway formerly leading to the "black parlour." The walls are 3 ft. 2 in. thick, and the windows splayed, with lead quarry lights. The roof is an open span, with collars, foliated purlin braces, &c. The chimney-opening is 9 ft. 9 in. In the south-west angle is a small gallery. Westward of the refectory, but not connected, are the farm buildings.

Within one mile from the abbey is Llanelltyd Church; it is dedicated to St. Illtyd, and consists of a nave, chancel, two porches, and a bell-turret at the west end containing one bell. The roof is a span without any marked division be-

tween nave and chancel; the length of the church is 52 ft. 7 in., and the width 20 ft. 1 in. The east window is in two lights, the windows in the north and south walls are modern insertions. At the west end is a modern gallery. On the back of each seat is painted the name and address of its occupier. Against the east wall of the chancel is a mural monument to Sir Robert Howel Vaughan, of Hengwrt, and Nannan, bart., who died October 13, 1792. It consists of a white marble tablet, with a flat grey pyramidal stone on the same, with a Roman Doric column, broken and falling, in relief upon it. The pulpit stands against the east wall, but not within the altar-rails; the reading-desk is in the south-east angle. The altar is inclosed with twisted balusters, and paved with encaustic tiles, with a modern brass cross inlaid. In the north-east angle of the chancel are some remains of old oak panelling. The font bears the date of 1689. It is of stone, and octagonal, 1 ft. in diameter, with water drain. This font, a mere basin, used to stand in the old font. It is now mounted on an octagonal pedestal, and fixed against a post supporting the west gallery. The north porch was erected about 1841. The south porch is ancient. In this the old font is preserved, but not now used. It is of stone, circular in form, and 1 ft. 6 in. in diameter. The singular custom of suspending plates against the walls, resembling those usually affixed on coffins, is here retained. They are in memory of William Williams, John Edwards, John Owen, Jane Vaughan, &c. The church is lighted by turned wood slender stands, with brass sockets, and tallow candles. The south porch inner door is said to have been removed from Cymmer Abbey; if so, it is of a more recent date than the abbey, being of the fourteenth century. The lock is 1 ft. 9 in. long by 8 in.

Returning to Corwen, and proceeding a few miles north of Rag, is an ancient church at Gwyddilwern, well worthy of a visit, especially as it will be either rebuilt or modernised within a short period. The church consists of a nave, chancel, south porch, and a bell-turret at the west end, containing two bells. The nave windows are Perpendicular, in three lights, with trefoiled heads. Large iron hooks are in the external jambs, formerly used for shutters. The gallery at the west end is curious, the front being panelled, with buttresses. It bears the date of 1634, and an inscription written in Welsh, "Gabriel Hughes," and a quotation from Proverbs xi. 27. In the north wall are recesses, with doors, containing the registers. The font is Perpendicular, octagonal, with a shaft, 2 ft. 8 in. in height, and 2 ft. 5 in. across the top, exclusive of base-stone, with a copper lid. It stands against the south wall, by the porch door. The pulpit is octagonal, and panelled. It stands in the north-east angle of the nave. On the reading-desk is a Latin inscription, recorded as the gift of Robert Davis, for the use of the parish, the upper panels have dragons carved out of the solid. The seats are of various periods. There are ancient benches, with solid ends. Towards the east end of the nave the seats have carvings of pelican and young, oak-leaves, acorns and birds, lilies, &c.; and some modern pews have the dates of 1705 and 1748 upon them. The church is lighted by an oil-lamp suspended from the roof. The old chandelier is a curiosity, now not used. It lies under the gallery; is of wood, with two tiers of imitation candles suspended from a circular frame, similar to those in a chandler's shop. Above these are wooden sockets, arranged on the frame, in which candles were formerly put; the whole being surmounted by wooden angels, with red faces, blue wings, &c., in the best style of country polychromy. Jones, vicar, is, of course, painted on the chandelier, without date. The paving of the nave is composed of memorial stone slabs, dates 1754, 1780, &c. On the north wall of the nave is a mural tablet to the Rev. Edward Roberts, Vicar of Whitford, Flint, date 1839. Also an old board, with benefactions written in Welsh. Painted on the north and south walls are wreaths, with quotations from Matthew xii. 36, and Mark x. 14. The old oak chest under the gallery is formed out of the solid, the lid is bound with ironwork, and has three padlocks. The length of the nave from the chancel-screen to the west end is 54 ft. 2 in., width, 24 ft. 1 in. In the north wall is a doorway, now blocked up. The nave-walls are 2 ft. 8 in. thick. The chancel is separated from the nave by an ancient screen. The lower part contains carved and pointed foliated panels, with quatrefoils in the angles. The upper part of the screen has been cut

* See vol. xxi., p. 718; vol. xxiv., p. 600; and vol. xxvi., p. 709.

down. The original height can be traced on the walls. The roof is open, and similar to that of the nave, except over the altar, which has been ceiled, and the barbarians have claimed notoriety for their act, by painting the following inscription on the roof:—"Plastered by Ellis Davis: Humphrey Peirce, Thomas Hughes, churchwardens, 1730." The date of the chancel is of the fourteenth century; the side windows have two lights pointed; in one is stained glass. The east window is Perpendicular, in five cinquefoiled lights, with transom and remains of stained glass in head of window. On the south side is a priest's seat of wood, with canopy of late date. The altar is raised one step, and enclosed by a balustrade. Beneath the east window is written in Welsh an exhortation from the Holy Communion. The benches are original, with solid ends. On one is "J. M. M., esq.," on others brass plates, with the names of the owners. Against the east wall is a veined marble classic monument to William Humphreys, 1718, with open pediment and arms on shield in centre. On the south wall are coffin plates in memory of John Humphries, 1824, and the Rev. John Jones, vicar, 1829; and a slate slab to Thomas Hughes, of Clegir, 1691. Attached to the north wall are coffin-plates to John J. Jones, 1829; and Edward Hughes, 1830; and a brass in an oak frame to Catherine Mostyn, of Ddynam, 1703. The decalogue is painted on the north wall of chancel, and the creed on the south wall of nave, with the Royal arms, date of George II., on the north wall. On the same wall is a quotation from Acts xi. 2. The chancel in length is 26 ft. 11 in., the width being 19 ft. 6 in. On the south side is a doorway. Externally the west front was originally built partly battering; the south wall of chancel is 1 ft. out of the perpendicular, and the porch appears to be giving way. The orientation is about 4° to the north of east.

There are more old churches in North Wales sequestered in the mountains well worthy of being recorded; they will before many years are past be modernised or swept away.

Turning from the ancient to the modern, from the church to the chapel, mention may be made of the new mountain chapels. The supineness of the church in former times, and in the present period, has led to the erection of many dissenting chapels on the mountains throughout Wales, which are often miles from towns, and even villages. The cost of building varies according to the size and decoration of each chapel, say from 200l. to 800l., and even more. These prices do not include stone, sand, or carriage; the farmers supply the latter; the timber, slates, lime, and labour, have to be paid for. A mountain chapel is nearly completed on Mynydd Hirathog; the slates were procured from Penmachno, and the stone and sand from the locality. Another chapel is being erected near Rng, with dwelling-house attached, at a cost of 400l. The stone is from Berwyn; the tooled sills are from Ruthin; the timber and rough sills from Corwen; the red and white bricks from Ruabon; and the slates from Llansaint-fraid. The walls are 2 ft. 3 in. thick. The internal dimensions of the chapel are 35 ft. 6 in., by 29 ft.; parlour, 16 ft. square; vestry, 16 ft. by 12 ft. 8 in., with bed-rooms over. A chapel at Maedy, recently completed, possesses an architectural character, and the dwelling-house is more appropriately placed at the side, instead of at the end, as a chancel. At Rhydyddan, near Pentre Foelas, a chapel is being finished at a cost of 500l. And at Gwyddilwern another chapel has been built for about 600l.

No doubt, that when the railways penetrate the valleys they will extend civilisation, and induce the preachers to make the dwelling-house or vestry detached, or at least place it at the side of the chapel, instead of building it at the end as they now do, giving it the appearance of a chancel, only with this difference,—they finish one end of their chapel with a short freestone pinnacle, and the other end with a chimney and pot, in lieu of a cross or more suitable decoration.

The Church cannot compete with these earnest and persevering preachers, unless it establishes a Great St. Bernard, with a staff of mounted courtes, with prog in one pocket and a Bible in the other.

W. F. GRIFFITH.

London Institution.—The first evening lecture, "Michael Faraday: the Story of his life," by Mr. J. H. Gladstone, F.R.S., will be given on Thursday, November 2nd.

NEW BUILDINGS AND IMPROVEMENTS IN OXFORD.

WITH the commencement of the academical year, according to annual custom, a review of what has been done in Oxford during the past twelve months in the way of new buildings and the restoration of old ones is given by the local *Journal*. The only works of importance in the University are the restoration of the Cathedral and All Souls' Chapel. An important work has nearly been accomplished in the western part of the city in the erection of a church in the populous district of Osney. The only other public buildings that have been erected during the past year are schools in the parishes of Cowley Saint John, Trinity, and Saint Ebbe's. Houses of various sizes still continue to be built, and villas on the Norham Manor estate.

Christ Church.—The work of restoring the Cathedral is still going on. Some portions which were first undertaken have been completed, and others are in rapid progress. The interior stonework has been cleaned and made good. The east-end wall has been rebuilt, and two Norman windows, similar to the old ones, have been placed in, with a large rose window and arcade above. A three-light memorial window has been erected in the Dean's Chapel by Messrs. Morrison & Co., of London. The floors of the nave, chancel, and south aisle have been lowered to their original levels, and the two former have been laid with marble. The south transept has been restored to its original form. The mutilated windows in the aisles, chapels, and transepts have been restored, and the monuments which disfigured the pillars have been removed to other and better situations. The tower is also undergoing a thorough renovation. The architect is Mr. Gilbert Scott, and the builder Mr. Symm.

All Souls' College.—The chapel and ante-chapel of this college are undergoing a restoration. The decayed stonework in the exterior of the walls has been replaced with new Bath stone, and new jambs, mullions, and tracery-work of the Gothic windows have also been renewed. The buttresses have been taken down and rebuilt also in Bath stone, and the whole of the pinnacles, parapets, and copings are rebuilt in Ketton stone. The windows will be filled in with the old glass. In repairing the walls in the lower portion of the chapel on the south side, the original entrance to the crypt was discovered. It was built up with ashlar stonework, and no trace of it could be seen from the outside. The work of restoration is being carried out by Mr. Kimberley, builder, Banbury. The architect is Mr. Clutton, of London.

Magdalen College and School.—Various alterations, improvements, and repairs have been effected at this college during the past year. A new class-room, 46 ft. long and 18 ft. wide, has been added to the school. It is connected with the school-building by a corridor, 24 ft. long and 13 ft. wide. The style of the architecture corresponds with that of the school. The walls are built with Bath stone, surmounted by an embattled coping, and cased on the inside with bricks. There are four buttresses on the east, and five on the west side. In the class-room the walls are wainscoted about 4 ft. from the floor, and stuccoed above. There are three windows on the west, two on the east, and one at the north end of the room, and they are all glazed with quarry glass. The roof is of deal timber, and is open to the ridge, and covered with Stonefield slate, with a red-tile crest. The whole of the work is being carried out by Messrs. J. Castle & Co. The class-rooms and corridor were built from the designs of Mr. Buckenidge.

Trinity College.—All the old cesspools have been filled up, and large pipe-drains have been laid throughout the building in connexion with the town sewer. The work has been satisfactorily carried out by Messrs. Wyatt & Son.

St. Mary Hall.—The restoration of the east window of the chapel of this hall, by Mr. Fisher, has greatly improved the building. The window is of the Gothic style, and has five lights. The stonework of the old window was greatly decayed, and it has been replaced by new jambs, mullions, and tracery-work above, and glazed with thick fluted glass, and it is intended to fill it up on the inside with stained glass. A Painswick stone reredos, from the design of Mr. Buckler, architect, has been erected.

University Museum.—A detached porter's lodge has recently been erected by Messrs. Wyatt & Son, from the design of Mr. Denne. The style of the architecture is that of the Early

Gothic. The walls are built of brick, faced with Bath stone range-work. The building has a high-pitched roof, which is covered with Brosely tiles.

Radcliffe Infirmary.—The new ward for patients suffering from fever has been completed. It is situated at the rear of the Infirmary, close to the old fever-ward. It consists of two plain, well-ventilated, airy, and light rooms. It will accommodate sixteen patients, eight of each sex. The nurses' apartments are at one end of each of the rooms, and attached are the lavatory and bath-room, which are supplied with hot and cold water. A range of closets, lavatories, and bath-rooms has been erected on the south wing, so as to render this side of the Infirmary uniform with the northern wing. All the latest improvements have been adopted throughout the building by Messrs. Wyatt & Son.

St. Barnabas Church Tower.—A tower, or campanile, is being added to St. Barnabas Church. It stands at the east end of the south side of the church, and is connected with it by a corridor used by the clergy and choir. The height of the tower from the ground is 130 ft.; it stands on its own foundation, practically unconnected with the church. Its style of architecture is similar to that of the church,—Byzantine. The base of the tower is 22 ft. square, and it diminishes in a slight degree at each stage until the line of the eaves is reached, when the over-covering reaches the width of the base. The walls are very thick, and are built of stone masonry, with brick quoins, arches, and string-courses. The building is plain up to the line of the ringing-floor, but from that point to the roof ornamentation has been given. On each side of the tower is a three-light window, with lancet heads pierced above with three circular windows having cusps. The arch over the windows is turned in red brick-work, and the mullions are also of the same kind of material. The roof is of a pyramidal form, with one small window on each side, and it is constructed of bricks specially designed and made to carry off the water. The entrance-point of the roof is surmounted by an iron cross. The face of the stonework between the red brick courses is covered like the walls of the church with rough cement. The work is being executed by Messrs. J. Castle & Co., who also built the church; and the architect is Mr. A. W. Blomfield, of London.

St. Frideswide's Church.—This church is expected to be completed shortly before Christmas. The architect is Mr. S. S. Teulon, of London, the contractors are Messrs. Honour & Castle, of Oxford, and the clerk of the works is Mr. H. Howes. The cost of the work will be nearly 3,000l., and the edifice is intended to accommodate about 370 persons. The church will consist of a nave, chancel, apse, north transept, vestry on the north side, north porch, and tower at the east end, but the latter is not included in the present contract. The nave will be 68 ft. long by 25 ft. wide, the chancel 18 ft. 6 in. square; the apse, which has five sides, 15 ft. by 18 ft.; the north transept, 18 ft. 6 in. by 11 ft. 6 in.; the vestry, 15 ft. by 7 ft.; and the porch, 8 ft. 6 in. by 7 ft. 6 in. The style of the building is of the Early French period. The walls are being built of local stone, with Bath stone dressings, and with blue relieving arches over the windows and doors. The roofs will be open-timbered, and varnished on the inside, and covered with Staffordshire tiles of a blue tint. There will be a rose window of large dimensions in the tower, just above the north transept.

New Boys' School, Cowley St. John.—A large school for boys has been erected on a site at the corner of Prince's-street, Cowley-road. The building is 70 ft. long and 30 ft. wide, and of proportionate height, and will accommodate 350 children. There is a large playground and the usual offices attached to it. The building was erected by Messrs. J. Castle & Co.

New Schools in Trinity Parish.—New boys' and girls' schools are in course of erection in Friars'-street. The building is about 70 ft. long and 28 ft. wide. The boys' school-room is on the ground-floor, and the girls' on the second, and there is a class-room, 18 ft. by 12 ft., attached to each, besides lavatories and other necessary offices. The walls are of red brick, with Bath stone dressings, and lined on the inside with white bricks. The roof will be covered with local red tiles. The rooms are well lighted and ventilated, and the space at the back, now occupied by the old school-rooms, will be turned into a playground. The builder is Mr. Guise, and the architect Mr. Champneys, of London.

New Boys' School, St. Ebbs.—About twelve months since a new infant school was erected adjoining the girls' school-room in Paradise-square, and a new boys' school has now been built in Bridge-street. The building is 46 ft. long by 18 ft. wide, and will accommodate nearly 100 boys. The class-room is 18 ft. by 12 ft., and the roofs are of open timber. The necessary offices are attached to the building. There are a bell-turret and bell, and some ornamented timber work above the windows on the exterior of the building. Mr. Symm is the builder, and Mr. Champney, of London, the architect.

Miscellaneous.—The house in St. Giles's occupied by Messrs. Dayman & Walsh, solicitors, has just been ably restored from the designs of Mr. J. Gibbs, architect. The house was at one time a place of importance in connexion with the University, and at another it was a farm-house and dairy; and while making the recent alterations the remains of some earlier buildings were discovered. Mr. Dayman was anxious to preserve as much as possible the old architectural character of the building, and this has been done. The work was carried out under the superintendence of the architect by Messrs. Wyatt & Son.

An improvement has been effected in Cornmarket-street by adding the Wellington public-house,—where, it is reported, Shakspeare used to dine while on his way to and from London,—to the adjoining premises of Mr. Palmer, outfitter. The exterior of the house has been restored, and the ornamental work preserved. The work was executed by Mr. G. Jones, of Osney.

The house next door has undergone a transformation. The builder was Mr. G. Jones.

The old police-station at Carfax has been converted into a shop.

Some houses have been erected in St. Aldate's on the site of those which were destroyed by fire about a year and a half since.

One or two more villas have been added to those in South Parks-road, the end one having been erected by Messrs. Castle & Co.

A number of detached and semi-detached villas have been built on the Norham Manor estate. Several shops and private residences have been built in Hythe Bridge-street; and a number of houses have been erected in Cowley St. John district, Walton-street, and Kingston-street.

New school-rooms for boys and girls have recently been erected at South Hinksey; they will accommodate about 180 children.

We understand that an arrangement is in progress for providing a new boys' school for the district of St. Barnabas. It is estimated that about 1,000l. may be required for this purpose.

THE TRADES MOVEMENT.

Newcastle-upon-Tyne.—There were twelve engineering firms in Newcastle and Gateshead, whose men left their works upwards of twenty weeks ago, and nine of these firms made such arrangements on Thursday in last week, as would enable their old hands to recommence work either immediately or within a few days. Sir William Armstrong & Co., Messrs. Abbott & Co., and Messrs. Clark, Watson, & Gurney had not yet arrived at an understanding with the men that were out as to the time for recommencing work. The only hindrance to the men getting into full employment was, that a number of castings which had been in stock when the strike commenced had been worked up, and before the firms could give employment to all their former hands it was necessary that some of the earlier stages of their work should be somewhat advanced. It was unreasonable to expect that 2,000 men at an hour's notice could all resume their old places in factories at which operations had been more or less suspended for five months. Most of the employers, according to the reports of the delegates, behaved very considerably to their old men. Messrs. G. R. Stephenson & Co. have granted the nine-hour day's work, from 1st November, to their men, none of whom turned out with the strike. This announcement in the factory caused great rejoicings among the men, who went out in procession with their band, and at the base of George Stephenson's monument a resolution of thanks to Mr. George Robert Stephenson was carried with great cheering.

Messrs. Palmerston & Co. (limited), at Jarrow, have conceded the nine hours to the men in their extensive engine works, which arrange-

ment, it is stated, will come into action immediately.

The central committee of Amalgamated Trades of London have addressed their fellow workmen as to the Newcastle struggle. They say,—

"An impression is abroad that all is over. We desire to state such is not the case. Unfortunately employment cannot be found for the old hands for a few weeks, until the firms have got their arrangements complete again after the long cessation caused by the struggle; therefore we hope that after sacrificing so much on their part, you will not let these good men wait that support which you have so nobly accorded to them during their protracted struggle. We have to state, there are 800 men and their families to provide for; and also 1,500 foreign workmen left in Newcastle. Great numbers of these men are desirous to go to their homes. We consider it to be our duty to assist in clearing our country of them, and prevent them remaining any longer than can be avoided."

Seventy-five foreigners left Elswick Works in one morning last week, and at the other works great numbers have left. Others are preparing to leave, so that it appears likely that very few will be in the factories this week.

Leeds.—A deputation of the master and operative plumbers of Leeds have met to discuss the claims for an advance of wages and shortening of hours, put forth by the workmen, when the following resolution was unanimously agreed to:—"That for the future fifty hours shall constitute one week's work, and the rate of wages for efficient workmen shall be 6s. 4d. per hour, and that work be commenced at half-past seven in the morning, with no stoppage for breakfast."—To the surprise and pleasure of their 3,000 work people, Messrs. Greenwood & Batley, machine-makers, of Leeds, issued a notice, announcing that on Monday they would adopt the nine-hours system, without any reduction of wages. This concession has been made without any movement on the part of their hands.—Messrs. Fairbairn, Kennedy, & Naylor have issued notices that the working hours at Wellington Foundry are reduced to fifty-four per week, without a reduction of wages.

Hartlepool.—The nine-hours principle has been conceded to the workmen in the Middleton Ironworks at Hartlepool. A reduction of the hours of labour has also taken place in the locomotive carriage works of the Great Western Railway.

Middlesbrough.—Mr. Thomas Hughes, M.P., the arbitrator appointed by the North of England Board of Arbitration and Conciliation for the Iron Trade, has met the Board. In July last he awarded the iron workers an advance of 5 per cent.

Mr. Hughes was, however, requested to reconsider his decision, on the plea that the trade returns upon which it was based were incorrect. These returns having been verified by Mr. Waterhouse, accountant, Mr. Hughes confirmed his award of July, and explained his reasons at some length. Several representatives of the men and the employers took part in the discussion, and it was finally suggested that in future the wages should be regulated by the market prices. The question was deferred for settlement.

THE FIRE AT CHICAGO.

WONDER has been felt and expressed at the frightful spread of the fire at Chicago. The existence of raised footpaths of wood has been pointed to in explanation. Mr. J. O. Heyworth, of Pewtree, West Derby, gives a more probable cause. That gentleman writes,—“We naturally exclaim, could a fire, in this age of large stone churches, walls, and brick houses, &c., sweep all before it? Surely it must have been diverted here and there in its terrible path of destruction by stone and mortar? Such would happen in any English town, but the secret of Chicago's disaster, actually within her own established free limits, where wooden houses are prohibited being built by law, lay in the almost universal absence of slate roofs. Owing to the great expense of slates, caused by tariffs in favour of some miserable specimens of slate quarries in the State of Pennsylvania, we are, in fact, compelled to roof our houses either with wooden shingles or with tar felt paper, swabbed over with melted pitch, and then strowed over with small gravel.

The heat of the sun causes the gravel in many places to sink into this pitch and expose it, as also where the paper is turned up against the interior of the outside walls, which always exceed the height of such a kind of nearly level roof as used to be the case with the roofs of old Jerusalem, which were more safely paved with stone slabs in those ancient days of careful building and small progress. In Chicago, therefore, how hopeless when once a fire had got

beyond the immediate control of the fire department to expect that a stone or brick building would stop or divert the raging flames, while their almost flat roofs of wood and pitch were ready to catch the falling embers, carried along and fanned into flames by a fierce and unrelenting gale.”

THE DISSOLUTION OF A BOARD OF GUARDIANS.

A SEALED order was received last week at Mill-street Union, Cork, from the Poor Law Commissioners, intimating that the Commissioners would forthwith proceed to appoint paid guardians, the elected guardians having failed to discharge their duties. The great irregularity of the meetings of the guardians, who never attended in sufficient numbers, and who continued deaf to all remonstrances on the part of the Commissioners, has led to these steps being taken. The interests of the poor suffered heretofore, and the rate-payers will henceforth feel the screw, in not only being obliged to contribute to the support of the poor, but to the necessary means for the payment of the new guardians. It is some years since this extreme course has had to be adopted in the sister kingdom before; though there are occasions, even in the metropolis, where it might be resorted to with effect. Boards of guardians ought to be warned in time of the latent powers that may be employed to relieve them from the duties they so negligently discharge, and rate-payers should also be careful that their representatives are not drifting, in many districts, into a course of action, or rather inaction, that will render it necessary for the Local Government Board to send their ukase forth.

ENLARGEMENT AND EXTENSION OF THE BOROUGH-ROAD SCHOOLS, LONDON.

The training-school or college for students in the Borough-road, in connexion with the British and Foreign School Society, has just undergone a considerable enlargement in order to provide accommodation for an increased number of students. The height of the building, which is 170 ft. long, has been increased to its entire length by an additional elevation of 18 ft. Red brick, with yellow brick facings, have been used in the construction of the enlarged building, rendering the new portion uniform with the rest of the structure. The windows are circular-headed, with a pediment-headed window in the main centre, and at the extremity of the west wing a square tower has been carried up from the first floor to a height of nearly 20 ft. above the main body of the building. The interior of the additional story is intended to be set apart exclusively for dormitories, of which there will be thirty in number, for the increased students about to enter the establishment. Simultaneously with the increased elevation of the building a considerable portion of the interior has also been re-arranged.

The architects for the new works are Messrs. Beak & Lee, of Finsbury-circus; Messrs. Brown & Robinson, of Finsbury, being the contractors.

CONDITION OF LEICESTER.

PHOSPHATE SEWAGE PROCESS.

SIR,—I am desirous of confirming the very practical remark with which you conclude your description of this process at Leicester in your number of the 7th inst. You observe that “as this highly-organic precipitate is allowed to accumulate at the base of the tanks for weeks and months, secondary decomposition sets in. The generating gases rising to the surface counteract the good effects of the superior gravity of the precipitant,” and “the super-saturated water becomes charged with foul matter that passes off with the effluent water contaminating it with anterior sewage.”

I have for the last four years been advocating,—as you may know, having given place to some of my remarks on the subject,—the separation of the solid parts of sewage from the fluid before they were decomposed and disintegrated; perfectly convinced that no effluent water could be brought to a sufficient degree of purity after they had been allowed to dissolve and decompose in it.

The Improvement Commissioners of Surbiton, in Surrey, have allowed me to experiment on a sewer in that town, and selected one under a

street, the gradient of which was so steep that there could exist no doubt in their minds that the whole contents of the sewers would pass fresh into the portable strainer which I should place in the drain to intercept it.

On analysing the sewage I became convinced that such was not the case, and after a long search I discovered a very large permanent deposit in an injudicious bend of the sewer.

By an alteration I got rid of this deposit, and I now find that whereas the sewage before the alteration contained 290 millionths of free ammonia and 130 millionths of organic nitrogen, so soon as the change in its form was effected, the sewage only contained 29 millionths of free ammonia and 2.79 millionths (say 3 millionths) of organic nitrogen.

Now, my apparatus reduced the 130 millionths to 30 millionths, but that is not sufficient; the fresh sewage does not contain nearly as much.

I reduce the 3 millionths to 2 millionths, and the effluent water is then in that respect much superior to the standard fixed by the conservators of the Thames.

It is proved to be quite practical, and it would be a great economy to the sewage companies to extract the solids fresh from the sewers. They will then find they have sufficient space for, and little trouble in, treating the effluent water.

CHARLES E. AUSTIN.

"SELLING OFF THE ARCHIVES."

SIR,—As you have especially called on me to explain what passed in the late Synod of the Diocese of Ossory, relative to the library left to the clergy of that diocese by two of its prelates (Otway and Morris), I beg leave in the first place to remonstrate against the use of the word "archives." An uninformed reader, and most of your readers can have no information as to the special facts of this case, would at once conclude that Mr. Staples proposed selling the archives of the See. So far from this being the case, the report of the proceedings from which you took Mr. Staples's observations, shows that a salaried registrar was appointed by the Synod to take charge of the archives of Ossory. The library in question consists entirely of printed books, and it has been my anxious wish, since the time I entered this diocese, now thirty years ago, that these precious deposits should be carefully preserved, and made available; and I have taken part in more than one effort, having this object in view. All these efforts have unfortunately been abortive. From the want of a sufficient endowment, and, I am constrained to add, the lukewarmness and apathy of those whom the law gave authority in the matter, things have gone from bad to worse. The deficient arrangement which existed amongst the books, when first I knew the library, has

ceased to exist, and the collection (about 6,000 volumes), is now in total confusion, and the work of damp and neglect fast progressing, to end, at no distant date, in certain reduction to pulp of the greater part of the works comprised in the collection.

The disestablishment of the Irish Church, supervening on this state of things, has made the case still more desperate for the unfortunate library of St. Canice. When the diocese has to strain every nerve to supply its spiritual wants, it is not to be supposed that money can be spared to bind, arrange, and care for a collection, which, however valuable as books of reference, yet are not an actual necessity for the work of the church amongst us. And Mr. Staples, who is a representative of Bishop Morris, one of the donors, was only doing his duty when he called attention to the disgraceful present state of the library. I, for one, cannot blame him for suggesting that they should be sold, in preference to allowing them to perish from neglect. Nor can his proposal be wondered at when in London itself no voice was raised to stay the dispersion of Archbishop Tenison's library,—a far more valuable public trust.

Allow me also to remark that you have omitted to state that the Synod did not adopt Mr. Staples's suggestion, but appointed a committee, whose duty it is, in conjunction with the bishop of the diocese, to consider the whole question, and, if possible, save the library from destruction, and make it available for the clergy of the diocese for the future. To do this funds are absolutely needed,—in fact, with adequate means, their work would be easy; and, as one of the committee, I beg to say that any help afforded by the still endowed churchmen of England will be thankfully received by your obedient servant,

JAMES GRAVES,

Treasurer of the Cathedral of St. Canice.

P.S.—As the library of St. Canice is a religious institution, the Royal Historical and Archaeological Association of Ireland is precluded by its rules from interfering in the matter at all.

PREMATURE OCCUPATION OF NEW HOUSES.

SIR,—A paragraph from the *Builder* has appeared in the newspapers deprecating the haste with which newly-built houses are inhabited, and alluding to the injury to health resulting from this practice. Your readers may be interested in knowing that at Milan a law exists, which enacts, that no house built of new materials shall be inhabited until a full year after its complete construction; and when old materials, arising from the demolition of other houses, have been used in building, a year and a half must elapse before the new buildings are inhabited. See "*Regolamento relativo all'uso*

delle case di nuova costruzione, &c., 1 Marzo, 1837," quoted in "*Milano e il suo Territorio*," vol. i. p. 249. Milano. 1844. It would be well if a similar law were in force in this country.

MARY P. MERRIFIELD.

MORRELL'S DRY-ASH CLOSET SYSTEM.

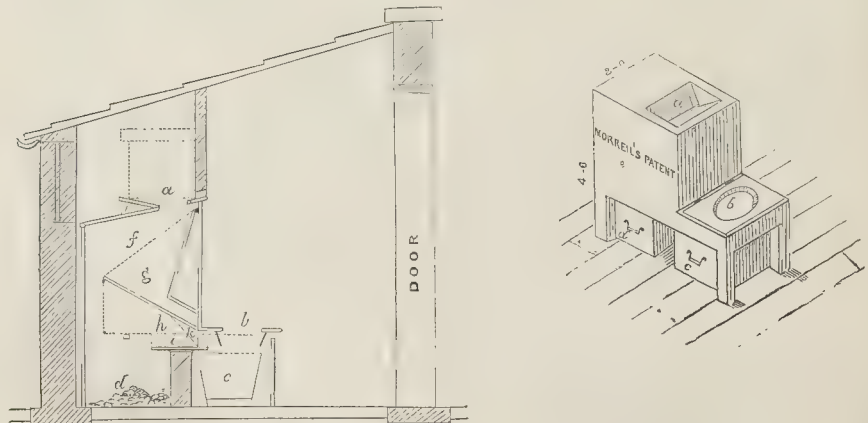
The treatment and disposal of towns' refuse is a question of such importance that we willingly place before our readers any plan which promises to aid, even in part, in the settlement of the problem: hence we give illustrations of a self-acting ash-screening closet, invented by Mr. Conyers Morrell, of Ducie-buildings, Manchester, and exhibited by him at the exhibition of Sanitary Appliances, in connexion with the Social Science Congress recently held in Leeds. The inventor claims for his invention its adaptability for general use in large towns.

It certainly does appear to possess an advantage over the dry-earth or any other dry system yet presented to our notice, inasmuch as it makes use in a practical way of the material which is already on the premises to render inoffensive the excrementitious refuse of the dwelling. In lieu of the old ash-midden, the closet has at its rear an inclining screener, upon which the fire-refuse falls when thrown through a hole in the wall. On use of the closet the seat, by depressing, communicates a motion to this screener, which separates the ash-dust from the cinders, places the ash-dust in a measure, and, in rising, from the seat, scatters the same over the soil, simultaneously throwing for collecting into a box or on to the floor, ready for the excrement and ash-dust forms an excellent manure, which is proposed to be systematically collected and stored in its crude yet inoffensive state at suitable points in the various outlets of the towns, for sale to the farmer, as he returns from market.

That in a sanitary point of view the ash-screening closet will form an excellent substitute for the old ash-midden or cesspool, there can be no doubt. Whether it would meet all requirements for the satisfactory disposal of domestic refuse on a large scale is another matter. We learn that it has already given great satisfaction where in use, and that it is about being applied on a large scale. The inventor claims, that besides procuring a valuable manure for the soil, a saving of fuel to the occupant of the house is effected, and to the town a large reduction in the cost of removing the refuse.

Mr. Morrell also exhibited a sample of the ash-manure, the actual product of the closet; plans of labourers' dwellings; and a sketch showing the process by which he proposes to cleanse the liquid refuse of the dwelling before it leaves the premises.

Dry-Ash Closet System.



- a. Opening to receive unscreened ashes thrown through a hole in the wall, either at the side, front, or back.
- f. Sieve, and g, hopper, both agitated by the action of seat, h.
- b. Lever used to raise the hopper by depression of seat.

- i. Ash-dust measurer.
- k. A-h-dust distributor.
- c. Deodorised excrement pan, removable at either side or front.
- d. Cinders, removable from either side or back.

RELIEF FOR LONDON.

SIR,—To redeem from the hands of callous, careless, grinding, unscrupulous landlords or agents as many as possible of the worst slums of London, in the shape of close, dark, damp, dilapidated tenements, which go to make up many of the courts and squares in its crowded parts, and to reconstruct them in such a way as to secure the decency, health, and comfort of the tenants, at the lowest reasonable rental, would probably effect the greatest possible sanitary and social benefit among the poor population that could be devised. It would also be attended with this great advantage, viz., that though involving an immediate large outlay, a return would, nevertheless, arise therefrom, which, as in the case of Mr. Peabody's scheme, would fructify for further benefit.

I think Lord Shaftesbury did, on the part of some lady, employ a sum of money in this way, for a single court, with wonderful success; and he, and many besides, have most emphatically declared that the condition in which the lower class of poor are, of necessity, found as to lodging and living, is the crying evil of this great city, and lies at the root of much or most of the vice and misery that prevail; so that it is impossible to remedy them while this evil is neglected.

No doubt Mr. Peabody's gift has effected great things; but the remark is made on every hand that it does not go low enough, or clear away the existing abominations that are a plague as well as a disgrace to our civilisation, and especially leave a lasting stain and reproach upon our splendid metropolitan improvements.

One such spot as I have referred to, reclaimed and regenerated, sanitarily and socially, creates a healthier feeling around, and often compels improvements, on the score of self-interest, even from owners of property adjacent. In illustration of this, in a small way, I send herewith a report of a little effort made in the Borough in the way of remodelling a large (and formerly most wretched) lodging-house. The motto there was to help the poor to help themselves, and the benefit is very great.

JAS. LANCE.

SPECULATIVE BUILDERS: UPPER NORWOOD.

SIR,—In reference to an article which appeared in the *Builder* last week, may I state a case in illustration? It is, unhappily, my own.

Three months ago, I took, on lease, a house at Upper Norwood; tempted by its nearness to the Crystal Palace, the pure air, the comfort of the high-level railway, and other advantages. But, unfortunately, my landlord is "a speculative builder" (an order of which until lately I knew nothing). Before I entered on possession, he undertook to make certain improvements and additions to the house (in consideration of which of my own accord arranged to pay him a larger rent than he asked), and to guarantee that all should be as perfect as he could make it,—more especially as to water, gas, and drainage.

He gave these engagements, not only by word of mouth, but in writing; and his written agreement I hold.

But, inasmuch as he has mortgaged the house to its full value (according to his statement to me), what legal remedy I have I shall in due course learn.

When I had taken possession and removed my furniture; waited patiently for my landlord to keep his word; and at length called on him to do so,—well, I will not ask you to print the phrase I was compelled to hold. Suffice it, that one of the things he agreed to do have been done,—that is to say, done by him.

I make no note of imperfect bell-hanging, cracking windows and doors, gates without copers, fireplaces open behind (out of sight), and a dozen like miseries; these are incidents for which I might have been prepared, and on such common ground I expect none of your sympathy.

When the water was to be laid on, the cisterns asked; that the superintendent of the water company made right—*per force*. When the gas was laid on, a respectable fitter (employed by me) discovered no fewer than eleven escapes under the floors or in the walls, any one of which, if undetected, might have set the house on fire. The gas-pipes were "bits" of several rees, put together "anyhow." Worst of all, the defective drainage soon became apparent: the rain-pipes, which conducted to the main sewer,

were covered over with earth,—such, that is to say, as were not out of sight under the basement floors. Some of these pipes were broken, others were "clapped in" (one into another), without joining of any kind: the natural consequence was that under the floors a mass of filth had accumulated, the danger from which may be readily imagined. Of course I have, at considerable cost, made that "all right." I was lucky in making the discovery within a month of my occupation; but my next-door neighbour (whose house is the work of the same speculative builder) was not so fortunate. She had been its inhabitant about a year; in that case mud and filth, a foot deep, had to be removed. The workmen are now finishing a work that must be very costly to the lady, who had bought the house, and has no remedy.

Now, sir, it would be idle to convey my grievances to you if you could do nothing; but you can do much, not only by impressing the warning of the old couplet:—

"Learn to be wise by others' harm,
And you shall do full well;"

but by telling me, and many others who are circumstanced as I am, if there be no responsibility on the part of any public officer. First, is the Board of Health powerless? Next, is the district surveyor able to do nothing? And next, is the wealthy body, the trustees of the Dulwich College (the ground landlords), without any voice in a matter in which that charity is so nearly concerned? And have they no surveyors able and willing to see that wrong is made right, as the guardians of a very large property, let, or to be let, on building leases, in this convenient and very valuable locality?

It is very likely that the cholera will pay us a visit. It may be assured of a rich harvest, and a sure halting-place at Upper Norwood, if matters remain as they are; at least there exists a strong and general belief in this neighbourhood, that the sewerage, in so far as houses are concerned, is execrable; not only calculated but certain to foster and propagate disease.

If there be no one responsible, no one with the power, no one with the will, to arrest this public nuisance and peril, it is high time that the Legislature interfere to furnish a remedy.

A VICTIM.

"INVITATION TO TENDER."

SIR,—If "A very Old Subscriber" will refer to the *Builder* of the 27th of May, 1865, he will see a case tried at the "Shoreditch County Court" similar to his.

H. P.

DRAWINGS AND THE POST-OFFICE.

SIR,—The important alteration in the postal regulation that parcels may not exceed 18 in. in length, will, I am sure, be much annoyance to us architects, for example. A roll of drawings, under 2 ft. long, sent by me on the 6th ult. into the country by train, over 100 miles from London, took just one week on the road, besides involving correspondence and inquiry as to the cause of delay. The carriage paid was 8d., and 2d. booking; total, 11d.; whereas, if sent by the late postal regulations, the expense would have been but 4d., and the delivery of them almost certain the following morning.

T. E. W.

A TWELVE HOURS MOVEMENT.

SIR,—There is a class of men I think ought to be considered before any other class, as far as regards time. I speak of the men employed in retail timber yards; they are, with few exceptions, employed from six o'clock in the morning till half-past seven or eight at night, and, I believe, you will not find in London a class of men that work harder than they do, and in the winter time they have to be out in all weathers. I think if they would all petition their employers for a reduction in the hours, and make it a general time from six o'clock in the morning till six o'clock in the evening, that they would grant their request.

FAIR PLAY.

THE DRY ROT.

SIR,—Having been a reader of the *Builder* almost ever since its issue, it may not be unbecoming of me to ask what is the best remedy to cure the dry-rot in wood (and if any). I have often read in your valuable work, of different processes, of which I have tried two or three, but without avail. The building to which I shall refer is a good house, on the estates of the Earl of Carlisle (or trustees), near to Castle Howard. It having been built about twenty

years only, last autumn it was found to be so bad that it was necessary to take out the floors over the cellars, the joists being oak, and these being as bad as it was possible to be. In substituting new joists, we took great care in selecting the best Baltic timber, also washing it and the walls well with a strong solution of sulphate of copper, of which I found note in the *Builder* of August 5th, 1843 (Margary's patent), and now, to our great surprise, we find the fungi growing as strong as before. The joists are left open, not lathed and plastered, and well ventilated, the cellar-windows being opened daily. As there have been several dry-rot remedies recommended during the last twenty years in the *Builder*, may I take the liberty to ask which of them has been most efficacious? I saw the question asked in your number for September 16th, by "Churchwarden."

C. W.

ELECTRIFY THE FISH.

SIR,—When fishermen have a full net, so great is the resistance of the captured fish that the meshes often break, and they escape. Anglers know how troublesome large fish are to land; they (the fish) do not spare the rod, but bolt off with it, or hook it with a joint. Swimmers tell us it is easy to raise a half-drowned man to the surface; I have seen a man bring up a large lump of rock to the surface to show it, then let it sink again. What I am driving at is this,—an electric battery on board fishing-ships, a copper wire to extend to the net, to give the *qualifies* to the fishes. Flat fish are torpid dormants; they will school on the bottom. To wake them up I would trail the electric chain across their backs; the underliers also would receive full favours.

"One touch of nature makes the whole world kin."
Shakespeare.
One touch of chain would start the flats to the swim.
Myself,
R. T.

MEN OUT OF WORK.

SIR,—I see in last week's *Builder* a statement of Mr. Potter's, that 700,000 able-bodied men are out of work. I should like to ask, where are they, and what are they? If building operatives, that class is particularly scarce in the Midland Counties; if agricultural labourers, we have also room for some. If they have daughters fit for domestic services, an importation is much wanted in the same district. But if these men are of the description too often to be found since the rise of trade-unions, namely, a worthless set of fellows, perfectly ignorant of the trade they profess, with no desire to learn it, we do not want them.

AN OLD BUILDER.

JOINTING IRON PIPES.

SIR,—About two years ago I built a conservatory for a gentleman, and the hot-water pipes were put together with iron borings, sal-ammoniac, hemp packing, and red-lead cement, and now nearly all of the joints are burst, and all of them burst during the time no fire has been kept up. Can you explain the reason? The gentleman has an idea it is the sal ammoniac that has done it; the man that put the pipes in declares it is not.

Would you be kind enough to give me your idea of the iron borings and sal ammoniac for such purposes.

WM. BARNARD, JUN.

* * * An overdose of sal ammoniac in the packing would be very likely to produce the result complained of.

THE OPENING OF DOVER COLLEGE.

THE Dover College has been formally inaugurated, under the presidency of the Lord Warden of the Cinque Ports, Earl Granville, K.G. The Dover College, which has been brought into existence by the Dover Chamber of Commerce and the principal townsmen, is an institution of great importance in a town like Dover. The college is founded on the site of the ancient Priory of St. Martin, for which Dover was renowned in olden times. To the antiquary and archaeologist the remains of the Priory on which the college is established have many attractions. When the question of establishing a middle-class college in Dover had been considered feasible, and when the promoters of the undertaking were looking for a desirable site for their institution, attention was called to the refectory of the ancient Priory by Mr. Parker Ayres, who assisted Dr. Plumtre in making investigations on the site. Mr. Ayres wrote a letter, in May of last year, to the secretary of the college, in which he said,—

"I think no better site could possibly be had than that portion of the Priory house and buildings now occupied by Mr. Chignall. It is a fine open space, having a frontage on the east side, abutting on Effingham-street, of 340 ft., and on the main road to Folkestone of 108 ft. There are open roads of 40 ft. wide, both on the east and south sides of the property. On the north side stands the building known as the 'Refectory,' which is generally considered one of the best of its kind in England, and dates from A.D. 1136. It is 107 ft. long and 34 ft. wide,

(It might easily be converted into separate schools at a small outlay.) And when restored, would afford a great local attraction. On the west side stands the old entrance gate. This building might likewise be restored, and made a comfortable residence. There is a substantial and well-arranged residence for a head-master, with accommodation for over 30 boarders. The whole of the grounds, which contain an area of about 1½ acre, are laid out with great taste, and contain some fine trees, and might altogether be made one of the prettiest spots in the vicinity. Seeing the great importance of at once establishing this school in our town, and the many and great advantages this site offers, I would suggest a deputation wait on Mr. Chignell, and ascertain if he would dispose of his interest in the property, and upon what terms."

This suggestion was ultimately adopted, and the refectory has been restored by Mr. Perry, the architect, who has taken pains to effect the restoration without impairing the Norman style of the venerable buildings.

Miscellaneous.

Condition of Leicester.—The *Leicester Journal* says,—"The high death-rate of Leicester has been the subject of alarm and observation for weeks past. Several causes for the increase of mortality have been mentioned, one being the defective system by which Leicester is drained. At the last meeting of the Local Board of Health the town was assured by authority that the sewage was quite equal to the demands upon it, except in occasional instances, when flushing of the drains was promptly applied. But we now have it on the authority of the *Builder*, in an article on the condition of Leicester, that 'completely choked sewers may be counted by the dozen.' The article generally, which we publish elsewhere, draws such a picture of our unsavoury condition as a town as to heighten the alarm which was not unreasonably felt at the unenviable position the town had attained in the Registrar-General's returns. We have always urged the necessity of dealing in a comprehensive way with our system of sewerage, and have felt that the time must rapidly come when the local Board of Health could no longer decline to deal with it. For this reason we have also urged economy in matters that in themselves did not press for settlement, and were not important as not affecting the highest interest of all, the public health. The question has now been raised, and must be practically dealt with. If Local Boards, through ignorance, local jealousies, political party prejudices, or any other cause, do not or will not take the matter resolutely in hand, we trust the Government will at once deal with it as an imperial question. The evil has grown to such a magnitude that it cannot longer be tampered with,—it must be met, and if possible eradicated."

Cemetery Consecration in Yorkshire.—The Archbishop of York has consecrated the new cemetery for St. John's Parish, Masbrough. The new cemetery is situated near the village of Kimberworth. The ground is inclosed by a stone wall, and the buildings were designed by Mr. Blackmore, of Rotherham, architect. There are two chapels, one for the members of the Church of England and one for the Dissenters, each of stone, in the Early English style. Messrs. Bacon & Rawson, of Rotherham, had the supervision of the work. A house for the sexton has been erected near the entrance-gates, and a broad carriage-drive runs the whole length of the cemetery. The total area of the ground is 19,370 square yards, of which 8,800 yards have been consecrated for the use of members of the Established Church, 5,500 yards are appropriated to the use of dissenters, 3,000 yards to Roman Catholics, and 2,070 yards are unappropriated. It has been estimated that the consecrated portion of the ground will contain 1,652 graves; the Dissenters' portion, 1,063; the Roman Catholics' 588; and the unappropriated, 404. The total cost of the cemetery has been about 1,800*l*. After the consecration the archbishop proceeded to Kimberworth parish church, where he consecrated about 1 acre of ground which has been added to the burial-ground of the church. At the Rotherham Cemetery, 2a. 2r. 34p. of ground, lately added to the cemetery, were also consecrated.

Discovery of Minerals in Jersey.—The researches that have been going on here for the past few weeks tend to confirm the belief that a rich vein of lead ore had been struck. Some copper ore has been found in the parish of St. Clement, and the belief is gaining ground that the island is rich in mineral ores, that only require capital and skill in order to ensure their being brought to light.

A Clock Tower for Gatehouse.—The new clock tower, which has been in course of erection for some time back at Gatehouse-of-Fleet, in the south of Scotland, has been inaugurated with an appropriate demonstration. The site is the space immediately in front of the Murray Arms Hotel, where a view of the clock is obtained from all directions. The tower is 9 ft. square, and rises to a height of 55 ft. from the ground. The design and plans were furnished by Mr. Pilkington, of Edinburgh; the contractor for the work was the late Mr. Cairns, builder, Gatehouse; and the cost of the erection was 267*l*. The architect had to confine his plans to the amount of money raised, and a plain edifice has been erected. The tower is square in form, and is divided into three stages,—the lower portion being battered to the height of 17 ft., the middle story pierced on four sides with long, narrow, round-headed windows, and the masonry of both is of whinstone with granite facings. The upper story is built entirely of Craigairn granite, and on each face it is arched recesses for the reception of the clock. Above the clock is the belfry, which is open. The structure is surmounted by a corbelled parapet, built of granite. The manufacturers of the clock are Messrs. Gillett & Bland, of Croydon, Surrey. Several modern improvements are introduced into the mechanism.

"The General Asphalt Company."—The General Asphalt Company is announced, with a capital of 60,000*l*, in 12,000 shares of 5*l*., of which 8,800 are offered to the public, the balance of 3,200 being allotted to the vendors, fully paid up, in payment of purchase-money. The company is established to take over and extend the well-known business of Messrs. Armani & Stodart, of 35, Poultry, and Millwall, including a contract entered into with the former gentleman for the exclusive supply to him for thirty years, from 1st July last, for the United Kingdom and British colonies, of any quantity of asphalt, whether rock, powder, or prepared mastic, with a minimum of 600 tons from the mineral rock asphalt quarries at Garde Bois and Lovagny, forming part of the asphaltic basin of Seyssel, Upper Savoy. The firm has been established for twenty-three years, and has executed various works, including the road and paths at Osborne, at Tattersall's, Aldershot Camp, the arsenal and barracks at Woolwich, the barracks at Chatham, Colney Hatch Lunatic Asylum, Pentonville, Chatham, and Broadmoor prisons, &c.; and as the company take over the business, with the staff, plant, and everything complete, they have the opportunity of at once rendering the capital productive.

Monthly Report on the Health of St. Marylebone.—The report for August and September, 1871, by Dr. Whitmore, medical officer of health for the parish, has been printed by order of the Vestry. The annual death-rate for the period was 22.33 per 1,000 of the population of the parish, being nearly the same as at the corresponding period of last year. Complaints having been made of the defective state of the drains at the London Crystal Palace, in Oxford-street, they were carefully inspected by Mr. Windle, who discovered no less than thirteen cesspools, some of them 4 ft. square and several large quantities of night-soil; the small drain-pipes, which were 4 in. in diameter, were choked up, and the soil leaking through their joints had accumulated in large masses beneath the flooring. The proper sanitary condition of the building has since then been provided for by the abolition of the cesspools and the removal of the old pipes, and by laying down upwards of 400 ft. of 6-inch and 9-inch pipes properly trapped, which carry all the drainage of the building into the sewer in Great Portland-street.

Asphalt Roadways.—The City Commissioners of Sewers have withdrawn from the Streets Committee the power they had hitherto exercised of determining the kind of asphalt which should be laid down in the streets. At the instance of Mr. Cotton, the Court resolved to exercise this power themselves. The Holborn Board of Works having complained of the dirty, slippery, and neglected state of the asphalt pavement in High Holborn, the Val de Travers Company have, through their agent, promised to see that it is properly cleansed in future. The smallness of the asphalted part of the roadway was alleged as reason for its uncleanness, dirt being, it was said, carried on to it from the granite paving which it adjoins.

Lodgings in Mint-street, Borough.—The first annual Report of the "Farm House" Improved Lodgings, Mint-street, Borough, year ending June 25th, 1870, has been issued in a printed form. The Report bears the motto, "The best way of aiding the poor is to help them to help themselves." The objects are to establish a model house or lodgings for the residence of the known deserving poor, at a charge for rent not exceeding the scale of the common lodging-houses, which shall be self-supporting, and free from anything like the appearance of so-called "charity." The committee say, "A happy success is attending our efforts. . . . The improved lodgings have gained a surprising influence in the district. No sooner had we commenced in earnest to make the place attractive, than many of the other lodging-house keepers determined they would not be left behind; and there has never been known such repairing and cleansing in the Mint district as during the past twelve months. . . . Whilst the building account has cost us 835*l*., we have received only 628*l*. towards this sum, leaving 207*l*. still to be cleared off."

College Improvements at Cambridge.—Extensive alterations and improvements have been made in the colleges of Cambridge during the past few years, and still the movement does not appear to flag. The building of a new master's lodge and block of students' rooms at Pembroke College is rapidly progressing. The contract, which is being executed by Mr. Horsman, Wolverhampton, is stated to be over 25,000*l*. Both buildings are of the Tudor style of architecture. The new building in Trumpington-street will provide seventeen additional sets of students' rooms, besides lecture-rooms and fellows' apartments. The building is fireproof, and is from designs by Mr. Waterhouse. At King's College operations have been commenced for erecting twelve additional sets of rooms next Trumpington-street. This contract will exceed 7,000*l*. Other alterations are contemplated at Trinity Hall and Christ's College. At the Fitzwilliam Museum, the workmen of Messrs. Cubitt & Co. are busily engaged in completing the entrance-hall according to the main features of Mr. Bassett's original design, which Mr. Barry, architect, estimates will cost 2,000*l*.

Waterworks, Berwick.—The works for an additional supply of water to the inhabitants of Berwick-upon-Tweed have been opened. The works are at the Tower Foundry, Tweedmouth, where the water springs from the rock on the site of an old quarry at the rate of 200,000,000 gallons per day, and is stored in a tank, which has been constructed, 80 ft. long by 50 ft. wide, and 8 ft. deep. Thence the water is pumped by steam power across the Tweed to the high-service reservoir outside the town, whence it flows through the pipes for the use of the inhabitants. The lift from the engine-house to the high-service reservoir is 185 ft., giving a pressure on the lowest points of the rising main of over 80 lb. on the square inch. The cost of the new works has been computed at 7,500*l*. This sum has to be added to what had previously been expended (8,200*l*) for waterworks done in 1854, and 1,000*l*., the sum which has been deducted from time to time from the ordinary district rate to pay engineers.

Opening of Free Public Library, Derby.—The Free Public Library at Derby has been formally opened by the mayor and corporation. The premises are those formerly known as the Old Town and County Library and Museum, and are situated in the centre of the Wardwick. The number of books in the lending-library alone exceeds 8,000 volumes. The total number of volumes (including the reference library) is over 13,000. Mr. Bass, M.P., gave books amounting in money value to about 400*l*., Mr. Alderman Barber gave 50*l*. towards the purchase of books; and the Mayor of Derby 20*l*. Mr. T. W. Evans has also given 500*l*. towards a building fund.

Acquirement of Land for Street Improvements in Liverpool.—Mr. J. J. Aston, Q.C., and a special jury have determined the compensation to be paid by the corporation for property extending from Davies-street to Camberland-street, off Dale-street, the site of which is required for improvement purposes, under the Liverpool Improvement Act of 1867. The ground required was 72½ square yards, and included the sites of the Commercial Hotel, Tiger Inn, and a druggist's shop. The jury awarded the claimant compensation to the amount of 1,615*l*. 6s. 6d., at the rate of 19*l*. per yard.

The Newcastle College of Physical Science.—The first lecture in connexion with this College was given in the lecture-room of the Literary and Philosophical Society, West-gate-street, by Professor A. S. Herschel, B.A., F.R.A.S., the head of the department of Physics in the new institution. There was a crowded audience on the occasion, the lecture being open to the general public. Next night, Professor W. Steadman Aldis, M.A., who has been appointed to the chair of Mathematics, delivered his inaugural address in the theatre of the Literary and Philosophical Society in the presence of a large and appreciative audience. On the following evening, Professor David Page, LL.D., one of the four professors recently appointed to the College, delivered an inaugural address on "Geology" to a large and appreciative audience. Professor Marecoco on the following evening delivered his address, and was also honoured with a large audience and much applause.

The Oxhydroic Light.—The officials of the Crystal Palace Company, according to the *Mechanic's Magazine*, "have laid pipes, placed gasometers in position, and will illuminate their crystal fountains and rare works of art with the Oxhydroic light; and in order that the public may have ocular demonstration of its vast superiority over gas, the lights will alternate, and then the dull yellow haze of the flickering gas-lamp will become doubly so in the steady bright light emanating from the other, which is so intense that it causes the flame of gas to cast a shadow itself on the wall it is intended to illuminate. This new light can be obtained at a much lower rate than gas; and it is not only brilliant and clear, but healthy." Gas nowadays is a very inferior article to what it once was, and anything will be acceptable as a substitute that is only equal to what gas can be, much less so promising a substitute as this is said to be.

Exhibition of Water-Colour Drawings.—To aid the National Hospital for Consumption at Ventnor, a number of collectors have lent water-colour drawings, which are now open as an Exhibition at the Institute of Painters in Water-Colours, Pall-mall. It is a remarkably fine collection, 240 in number, and includes excellent works by G. Bach, Barrett, Bennett, Rosa Bonheur, Barton, Callow, G. Catermole, D. Cox, J. Cox, jun., Davidson, De Wint, Duncanson, J. Fahey, Copsey Fielding, Birket Foster, A. Frapp, G. G. J. Gilbert, Goodall, Carl Haag, Hine, Holland, W. Hunt, Jackson, Sir Edwin Landseer, R.A., J. F. Lewis, R.A., W. Murelady, R.A., Palmer, Prout, David Roberts, Rossetti, Collingwood, Smith, F. Taylor, F. W. Topham, J. M. W. Turner, R.A., J. Varley, J. D. Watson, and others. We cordially recommend a visit.

Constant Water-Supply.—The directors of the East London Waterworks Company have given notice that it is their desire, and so far as they can lie their intention, to substitute service by service for the company's present intermittent supply, the system of constant supply in all houses supplied by the company, and they say that if after this notice constant supply be not, service by service, introduced into the houses of all the water consumers, the failure will lie at their door, and will be because the water-fittings, which it is the duty of the consumers to provide in their houses, are not in proper condition to receive such supply. Let the consumers look to it.

Employment.—Under this title a report of the Sub-Committee of the Council of the Charity Organisation Society, Buckingham-street, Adelphi, has been printed and issued. This is the society to which Mr. Holland, who recently arranged for the transference of labour from London to Lancashire, belongs. The tractate treats of "the conditions under which the society can co-operate with the guardians of the poor in effectually utilising the labour of able-bodied destitute persons." It also contains remarks by Dr. Hawkeley, the chairman of the sub-committee, who signs the report.

Substitute for White Lead.—The mineral compounds proposed by Mr. S. J. Henniss, of Liverpool, to be used as a paint and for other purposes, are manufactured from finely disintegrated native silicate of alumina (which forms an excellent substitute for white lead) as a base, together with vegetable and other stainers, mixed with dryers and raw linseed oil. When used as a cement, to be applied to damp walls and other purposes, a mixture of the native silicate of alumina is compounded with glue, barytes, and resin, or boiled oil.

Holbeck Church Bells.—The new peal of eight bells, presented to this church by Mr. J. E. Woodhouse and his wife has been inaugurated. The Leeds parish church ringers rang a plain course, and then a peal of Kent Treble Bob Major, consisting of 5,120 changes, brought round in three hours and sixteen minutes. There was no serious hitch of any kind. During the day the bells were also rung by sets of ringers from Osley, Dewsbury, Birstal, Hunslet, and Burley, who treated the listeners to various touches of Bob Major and Kent Treble Bob. The practical men present agreed in saying that the Messrs. Warner, of London, the founders, have supplied to this church one of the best peals of eight bells in the north of England.

The Utilisation of Sewage.—The Portsmouth Local Board have resolved to utilise their sewage; and an offer by Messrs. Russ & Minns, of London, has virtually been accepted. The following are the principal terms:—A lease of twenty-five years, the rent to commence on the 29th of September next. For the first five years the lessees are to pay 500l. per annum; second five, 600l.; third five, 700l.; fourth five, 800l.; and the remaining period, 1,000l. The system thus proposed to be adopted is for irrigation, and large tracts of land a few miles from Portsmouth will be put under the system. It is also said that many thousands of acres will be now reclaimed from the sea.

The Durham and Northumberland Architectural Society.—The members of the Durham and Northumberland Architectural and Archaeological Society held their last meeting of the season at Alnwick, last week. By permission of the Duke of Northumberland, the members visited Alnwick and Hala Abbeys. Returning to the town, the members repaired to St. Michael's Vicarage, where the Rev. H. B. Trotter exhibited a collection of rubbings of monumental brasses. The old parish church of St. Mary and St. Michael, close by the vicarage, was next visited. At the invitation of the society, Mr. F. B. Wilson acted as guide throughout the day.

Belgravia and South Kensington Road.—The Post wisely puts in a plea for this undertaking. It understands that the promoters of the long-desired improvement purposes making a last effort to carry it into effect. The powers of the company for the acquisition of the necessary land expire shortly; but it is stated that another (the fourth) Act of Parliament will be applied for in the coming session, if the Metropolitan Board of Works determine upon aiding the undertaking. There is an absolute necessity for a thorough communication between Belgravia and the important new neighbourhood of South Kensington.

The Sewage of Salford.—It has been unanimously resolved in the Town Council of Salford to construct, by contract or otherwise, an intercepting sewer for the Salford district, to carry off the sewage and ordinary rainfall from the whole of the district, with provision for discharging the storm water by means of existing or other outlet sewers, according to the plans or specifications of Scheme No. 1, prepared by the Salford district surveyor; the estimate of the cost of the works, including the cost of reconstructing subsidiary sewers, amounting to 15,220l. The cost of the scheme No. 2 would be 27,000l., and of scheme No. 3, 26,000l.

Sculpture: All Saints' New Church, Cheltenham.—Four more statues of Apostles have been placed in the niches of the nave; carvings to the north door are now also completed, being special gifts by members of the congregation. Mr. B. L. Boulton, of Cheltenham, is the sculptor. The same sculptor executed the stone and wood carvings on the pulpit, font, and church at Duffryn, mentioned in our last number.

Columbia Fish Market.—There have been great quantities of herring, plaice, and the cheaper kinds of fish in this market throughout the past week. The blocks of "model dwellings" (by the Industrial Dwellings Company), adjoining the market, are being roofed in, and one-half of them will be fit for occupation by Christmas. They will accommodate several hundred persons.

Windsor Castle.—Mr. G. G. Scott's works in the Horse-Shoe Cloisters, Windsor Castle, are now complete. A new library is to be erected on the site of the old one, with a turret—the whole in brick.

Avebury Temple.—It is stated that the owner of this remarkable monument, Mr. Edwards, of Pewsey, has consented to set aside arrangements which had been made for erecting several buildings on the site, and is willing, on public grounds, to sell it on reasonable terms, so that it may be secured from future risk. We are glad to hear that a movement has been commenced to promote this purchase.

Elvaston Castle.—This building has been lighted with gas. The fittings for the hall have been supplied by Messrs. J. Desfries & Sons, Houndsditch, and the work has been done under the superintendence of Mr. Harvey, engineer. Provision is also made for the ventilation of every room. There is a ten-light chandelier in the hall, and three figures in armour supporting the upright portion.

The late Dean Alford.—On Monday afternoon a statue of the late Dr. Alford, Dean of Canterbury, was publicly unveiled by the cathedral architect, Mr. Harry G. Austen, in the niche of the west front of the cathedral at Canterbury. It has been subscribed for and erected by the Canterbury Harmonic Union, of which the late dean was both founder and president. The memorial of the late dean is placed next to the statue of Erasmus.

TENDERS

For town-hall and free library buildings, Bliston. Mr. G. Biddle, architect:—

Bansom	25,600	0	0
Chapelle	5,625	0	0
Garlick	5,484	0	0
Corbett	5,484	0	0
Trow	5,407	0	0
Moore	5,292	0	0
Lowatt	5,207	0	0
Barrett	5,193	0	0
Nelson	5,173	0	0

For office and warehouse to sugar refinery, Love-lane, Liverpool, for Messrs. Henry Tate & Sons. Mr. W. J. Mason, architect. Quantities supplied by Mr. G. Northcroft, Liverpool:—

Nicholson & Ayre	24,650	0	0
High	4,317	0	0
Walsh	4,320	0	0
Urmon	4,146	0	0
Rome	4,140	0	0
Tomkinson (accepted)	4,127	0	0

For the insertion of shop-front, and sundry additions and repairs, to No. 8, Ghebe-street, Stoke-on-Trent, for Mr. W. Moody. Mr. Edwin Peau, architect:—

Millin & Davis	2,185	0	0
Ogden	180	0	0
Bradbury	173	11	0
Pope	135	0	0
Barlow (accepted)	124	0	0

For Holy Trinity Church, Penge, Messrs. Newman & Billing, architects. Quantities by Mr. W. F. Meakin:—

Doune	23,380	0	0
Brace	5,234	0	0
Mansley & Rogers	4,137	0	0
Carruthers	7,439	0	0
Browne & Robinson	7,245	0	0
Patrick & Sons	7,195	0	0
Wood	7,184	0	0
Crisman	7,151	0	0
Turner & Son	7,125	0	0
Dore, Bros.	6,975	0	0
Palman & Fotheringham	6,846	0	0
Colls & Son	6,770	0	0

For the erection of dwelling-houses, shops, stabling, &c., Whitecross-street, St. Luke's. Mr. W. Seckham Witherington, architect:—

Cross & Holmes	22,170	0	0
Elkington (accepted)	2,127	0	0

For Belohamp Walter National Schools, Essex:—

Mason & Son	2,597	17	0
Grinwood & Son	583	0	0
Theobald (accepted)	552	0	0

For new offices at Sandy, for Mr. E. T. L. Smith. Mr. John Usher, architect:—

Field	2,779	0	0
Corby	274	0	0
Haynes (accepted)	247	0	0

For new shop and premises, 57, High-street, Bedford, for Mr. H. A. Smith. Mr. John Usher, architect:—

Carter	21,114	0	0
Corby	1,681	0	0
Howe (two lots)	1,070	0	0
Hull (accepted)	1,040	0	0

For new printing works, for Messrs. Hill, High-street, Bedford. Mr. F. T. Mercer, architect. Quantities supplied:—

Harvey	2,346	0	0
Day	473	0	0
North	308	0	0
Curvin	491	0	0
Corby	443	0	0
Haynes	443	0	0
Richards	393	9	6
Carter	377	15	6

For works at Outwood, in Surrey, for Admiral Giffard. Mr. F. J. Dibble, architect:—

	House.	Couch-house, Stable, &c.
Putney	22,217	0
Russell	2,200	0
Barnes	2,100	0
Hamblin (accepted)	2,024	0

For the erection of new training college, Battersea, for the Wesleyan Educational Committee, Westminster. Messrs. Pocock, Corfe, & Parker, architects. Quantities supplied by Messrs. Northcroft & Co.

Cullum	2,995	0	0
Hobson	4,978	0	0
Myers & Sons	4,989	0	0
Parsons	4,980	0	0
Hill, Keddell, & Waldram	4,978	0	0
Carter & Son	4,797	0	0
Mill & Co.	4,699	0	0
Sheppard	4,680	0	0
Thompson	4,560	0	0
Niblett & Son (accepted)	4,300	0	0

For infants' school and sundry alterations and additions to St. Paul's Schools, Dorking. Mr. F. J. Dibb, architect. —
Hamblin (accepted) £552 0 0

For alterations, &c., No. 36, Walbrook, for Mr. Toker. Mr. Wimbles, architect:—

		Fittings.
Ramsay	£227	0 0
Staines & Son	427	0 0
Newton & Mann	476	0 0
Falkner	425	0 0

For new corn-exchange and offices, Bedford. Messrs. Ladd & Powell, architects. Quantities supplied by Mr. Thos. Ladd:—

		Extra for	Allowance for
		wainscot.	old materials.
Brass	£28,850	£450	£190
Harrison & Son	8,260	320	260
Carter	7,930	470	200
Twelvevess	7,881	277	164
Staines & Son	7,880	380	260
Patinson Brothers	7,618	340	216
Howe	7,495	300	175
Jackson & Shaw	7,430	420	124
Dover, Dorel, & Co.	7,400	364	250
Young	7,368	400	110
Lacey	7,245	330	250
Moore	6,965	400	124
Vickers	6,780	270	250

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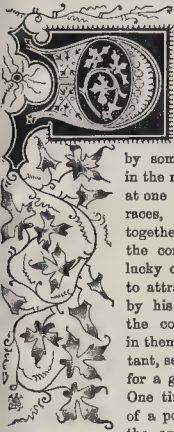
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The Builder.

VOL. XXIX.—No. 1499.

The Great High Farming Controversy.



FAD seasons of the political world,—and the month of September usually brings such a period of silence,—are for the most part enlivened by some casual controversy in the newspapers. As when, at one of our great national races, the spectators press together in anticipation of the coming event, some unlucky crow so often contrives to attract shouts of laughter by his unwary rush across the course, so do matters, in themselves not very important, serve to furnish occasion for a good September chery. One time it is the character of a poet; another time it is the authenticity of a poem;

it little boots what is the subject that crosses the vacant space of the columns of the journalist, the hunt is up in a moment, and every one joins in the pursuit.

Last year, indeed, the tremendous events of what proved to be little more than a triumphant military promenade through France by the legions of a more formidable Germanic chief than Ariovistus proved himself to be in the days of Caesar, occupied every mind, and filled the pages of every journal. In the present year we have had, as the *prix de résistance* of the journalist, the unexpectedly satisfactory display of an armed force of our own. Into that subject we shall not be expected to enter, as the technical lessons to be drawn from this piece of real experience are more suitable to the columns of a military journal than to our own. We may be allowed, however, to remark in passing, that every incident of modern warfare, whether actual or experimental, points to the rapidly-increasing importance of the Engineers. It is no slight matter for the civil branch of the profession to watch the action of their military brethren. It might, perhaps, be unfit to speak of the Sappers as a distinct arm of the service; yet in the protection of guns and of infantry the services of the Engineers are no less distinctly requisite than are those of the cavalry. As the mechanical engineer furnishes the very train of manufacturing industry, so does the military engineer supply almost an equally important function in the army; while in many details of his duty,—bridge-building, rapid construction and demolition, mining, and entrenching,—the operations of the soldier and the civilian are identical. The second remark is, that the importance of maintaining and increasing a good domestic breed of horses for military purposes, especially in transport, is becoming yearly more apparent.

Side by side with the stately pageantry of mimic war in our summer campaign, has raged a more silent but more deadly struggle, in the north. We are not about here to enter into the discussion of the battle between the engineering workmen at Newcastle. A very painful piece of

experience has been attained; and, however strong may be our own convictions as to the upshot, the fact itself will speak in louder tones than any we can venture to employ. But we refer to the subject as showing that a portion of the year which is generally barren of important events, was by no means so in 1871.

We come to the chase of the moment—the coat which has been dragged across the green by a stalwart and active combatant, and on which a dozen others have hastened to set their feet. Nor is this, in the present year of grace, a trifling or non-important issue. On the contrary, it is one that deeply affects us all. Mr. Meehi and his friends, speaking from the enviable vantage-ground of well-filled barns, have ventured, this time, a little beyond that experimental wisdom in the utterance of which we have more than once supported them. “Look,” they say, “at our wheat crop! See how it pays, by steam culture and good farming on land naturally unproductive. Thirty-eight per cent. of our land is under wheat, and returns a golden increase. Throughout the United Kingdom, not a ninth part of the land is so devoted. The sure way to wealth is, grow more wheat, by the aid of steam culture, deep drainage, and artificial manure.”

The grower of beef and mutton hereupon joins issue with the growers of bread. “Wheat,” says he, “you can and do import; but as to meat the matter is less easy. If we follow the advice of Mr. Meehi, we shall have meat at famine price directly. Besides, look at our returns. We are content with their profit. Turnips and clover have their market value as much as wheat, nor do we need to be taught how to put money into our pockets. We are quite able to take care of ourselves.”

A dispute of this nature has both its advantages and its disadvantages. It is of immense value to the producer to be told, not by theory but by practical experience, what production costs his neighbours, and how that account is made up. In questions involving much or long unrepaid outlay, experience of this kind is of the utmost use. It tells a man upon what he may fairly count with certitude. On the other hand, it cannot fail to be perplexing to those who are in the habit of using ready-made opinions to find the very opposite views urged by practical and able men. “Break up your pasture,” cries one,—“nothing like wheat.” “Stick to your old turf,” says the other,—“it is stock that pays best.” “But I am a political benefactor,” urges the first. “If you don’t take my advice, you will have to send thirty-five millions out of the country to buy wheat, which I would grow at home,—and there is a loss!” “And if we want no such supply,” says the other, “how will the foreigners pay for our manufactures? It is I that am the true politician, after all.” “Settle it between yourselves, gentlemen,” says the perplexed farmer. “Each of you seems to me to be in the right, as long as I listen to the argument; but, as you flatly contradict each other, you cannot both be right: so I shall just go on as my grandfather did, till you are all agreed. Perhaps, after all, I know best myself how to till the farm of Sleepy Hollow.”

Let us recommend our friends to banish any idea of settling a practical agricultural question of this sort on political grounds. Let foreign exchanges take care of themselves. It is pretty clear that if an intelligent and well-informed man turn his attention to the question of what his farm can produce with most profit to himself, he will be the best judge as to the answer. What is wanted is,—for him to put that question. If he is content to go on in a groove the probability is that he will be left behind in the race. That a certain method of culture has been practised for so many years, on a given estate, is a *prima facie* presumption that it is the best method. But it is no more than a presumption.

The truth of the assumption depends on the intelligence, and not only on the intelligence, but on the knowledge, of the farmers whose example is followed. What new facts has the advance of science revealed since such and such a course of crops was adopted for such and such land? Have any of the latest improvements been tried? Have they succeeded or failed? If the first, are they being fairly applied; if the second, what is the reason?

The farmer who will question, first his own brains, and secondly his own land, in this way, will be likely to form a much better opinion as to the wisest course to pursue than he who takes advice, off-hand, from the most successful agriculturist on paper. And the result of such special study in individual cases will be that the whole island will by-and-by be cultivated in that mode which, by insuring the best special returns in every case, will have the greatest aggregate return from the agriculture of the kingdom. The whole is equal to the sum of the parts. The man who looks at the whole, which he can only infinitesimally affect, and neglects, in so doing, to make his very best of the part of which he can actually dispose, is like the old philosopher in the fable who fell into a well while attempting to read his fate in the stars.

While practical farmers, shunning to mount the stamp of the politico-economical lecturer, will give the public facts and results, they may feel sure that they are doing good service to their countrymen. The remark becomes verified even as we write, for Mr. Meehi returns to the charge, and shows that all that can be said against him is, that he has understated his case. Nearly half the profit of his farm is derived from breeding, while the average return of the cultivated area of the kingdom is some 3*l.* 15*s.* per acre, and that of the pastureage farm little more than half this rate. Tiptree Farm produces meat to the value of 5*l.* per acre, besides setting off the land for mangal, wheat, and other crops, to the amount of 6*l.* 10*s.* per acre. Rather more than three times the average return of the cultivated land of his native country, to say nothing of the large additional area that might be properly cultivated, rewards the intelligent toil of this agriculturist. Nor can we omit the remark that a tried, certain result, tested by book-keeping year after year, which would have induced many men silently to add acre to acre, to multiply that wealth of which they had thus discovered a mine, and to confine the benefits of their experience to themselves;—in fact, the true spirit which political economy assumes to rule mankind,—has had a very different result in the present instance. Mr. Meehi has invited all his neighbours, not only to rejoice with him, but to share the money he has found. He opens his farms to the observant, and his books to the incredulous. Such a man, be he who he may, deserves well of his country.

The present controversy between the pastoral and the scientific farmer is, in its intimate nature, almost identical with that which is going on, on a larger scale, and supported by more deadly arguments, in Western America. It is an ethnological dispute which we can trace back to the earliest records of human history. The shepherd has everywhere preceded the tiller of the soil, as the former has, in his turn, been preceded by the hunter. The existence of un-civilised man, physically considered, is supported in the same manner as that of the majority of the flocks and herds which civilised man consumes for his food. The buffalo requires a wide range of country, and the food of the Red Indian is the buffalo. As the rapid increase of the population of a young country requires a constantly-increasing area of land for cultivation, the two people are brought into hostile presence. The war must, it should seem, be interminable. To change his habits, to give up his hunting-grounds for pasture or for tillage, to seek from

the earth any benefit but such as she offers to the wildest of her children, seems worse than death to the Red Indian. The agricultural Anglo-Saxon may meet him with both precept and example. He may point to stately cities, to navies riding the deep, and bringing the fruits and spices and costliest products of other lands; to the march of science, giving men, step by step, the command over nature without the need of bodily toil,—for the obedient spirit of steam is gradually superseding the need for all degrading human labour, even as it has already extinguished the Irish hodman in the yard of the builder. He may point out how all that renders life luxurious, and much that renders or may render it noble, springs, in due course, from the first step of enclosure of and private property in soil; and he will contrast the highest product of the civilisation of the day,—the well-bred girl of some empire city,—with the squalid squaw of the Indian. He will but reason to the wind. None the less are those who watch the progress of this tribal strife aware of what the result will be. It is matter of pure calculation. The hunter will be exterminated by the farmer.

It is only another case of the same general law that regulates the breeding of cattle for the European market. It is true that it may be said that it is late in the day to announce the discovery; but we confess to be among those who believe that the application of pure reason to the solution of the great problems of human life is as yet in the most rudimentary state. Meat is a necessary of European life. Meat can be produced with little trouble, comparatively speaking, by allowing flocks and herds to range over a wide extent of pasture, feeding themselves, and living in only one degree more of restraint and security than the Indian buffalo. The production of this meat may pay the producer, the pastoral farmer, some 30s. or 40s. an acre. His neighbour, the scientific farmer, finds, by actual experiment, that he can produce meat at least equally good that shall pay him 100s. per acre. Not only so, but these very acres of land, which in the pastoral farm have earned their utmost when the stock is sold, will in the very same year earn an additional 130s. an acre in saleable produce. It is only necessary to put the facts thus clearly in evidence to infer that, within a few years, over all land that may not prove unsuitable for such purpose cattle will be treated as their eater has been treated before them. That hidden but irresistible force which has led man from the panther-like range of the African or American savage, collected him in hamlets, towns, and villages, surrounded the peopled provinces of Mesopotamia with walls of 100 ft. in height and 25 ft. in thickness, and crowded the capitals of Europe with one, two, and three millions of inhabitants, will assuredly interdict the free range over slope and fell, once enjoyed by our British ancestors, to the flocks and herds bred for the tables of their densely-packed descendants.

A question may, it is true, be raised as to the respective quality of the meat produced under what the advocates of pastoral farming call natural conditions, and in the case of the stall-fed animal. It is true that the sweetness and wholesomeness of animal food depends very much upon the condition of the animal during life. The requisites, however, are health and ample food. Meat-producing animals may be starved or fully fed, as much on the field as in the stable. In the case of the cows, which,—we are speaking of some time ago,—were kept by one great master for the supply of milk to London, the animals were fed upon brewers' grains, as the most milk-producing food. The effect on the general health and on the muscular tissues of these poor creatures was something like that produced by excessive dram-drinking in the human subject. They were positively deanted into milk, and their flesh was scarcely fit for food. If we contrast with this the sweet, wholesome taste of three-year-old Welsh mutton, from the little wild sheep that browse on the wild hills of many parts of the principality, the balance turns every way in favour of the wholesome quality of the latter. But these are extreme cases. The Welsh mutton, notwithstanding the completion of railway communication to Milford Haven, has not competed in the London market with the fat meat which is there chiefly prized. And the expense of allowing sheep to live and browse for the three or even four years which brings their flesh to the condition most proper to the table is such that even in Wales it is difficult to obtain such mutton as *connoisseurs* used to demand. It may be well worthy of considera-

tion whether venison could not be produced as cheaply as four-year-old mutton, or at all events at a price so far corresponding to the superior nutritive quality of the meat as to form a staple article in the market.

Apart, however, from any extreme cases, the condition of the horse in this country may be thought to furnish a convincing argument as to the superiority of treating cattle rather after the fashion of the European than after that of the red Indian. With masters who secure and who earn the best return for their care of this noble animal, the stable is almost as much an object of care as the nursery. Such a man cannot go to sleep in peace without having paid an evening visit to each. With perfect cleanliness of stable, sweet fresh straw, proper and perfectly distributed diet, and thorough grooming, the horse is as superior in condition to the ponies that run wild over the Welsh mountains as if he were a specifically different animal. Our experience, very happily, does not go far as to his edible qualities. But there can be no doubt that the horse in condition is, any way, a more healthy, and therefore a more wholesome, animal than the horse out of condition. The same rule applies to the bullock and the sheep. As to the pig, that brisk rent-payer has been long treated as one of the family, and in England has taken kindly to sty-life. In all these cases it is well known to those who have a practical acquaintance with the subject, that fastidious cleanliness is an absolute requisite for the finest condition. You may see sheep penned up, as is now usually done, to eat off a turnip-field patch by patch, who are far more unapproachable by persons of delicate senses than the inmates of a properly-tended pig-sty. Some kind of currying, of the application of human care to the skin, tells remarkably on the condition of the bullock and of the pig, no less than on that of the horse. In fact, we should not contrast the case of the buffalo or the fallow deer with that of the neglected stall-fed animal, any more than we should compare that of the red Indian with some of the most neglected of our City ostlers. Physical education, whether at college or on the farm, raises the properly-nurtured animal, human or bovine, not only above the level of his city neighbour, but above that of the most freely-ranging savage.

WHAT THEY ARE DOING IN MANCHESTER.

The capital of cotton-spinning is certainly one of the most active, perhaps the most active in building enterprise among our large provincial towns; and a stranger visiting it generally finds some new works of more or less importance in progress. Among those at present completing or just completed, one of the most noticeable is the Roman Catholic "Church of the Holy Name," which was formally consecrated on Sunday, the 15th ult. This is a very large church, almost a small cathedral in size, designed by Mr. Hansom, of Bristol. The general style is that of a rather late type of Decorated Gothic: the plan comprises a very large west tower (not completed), an inner west porch or narthex, nave and aisles, and a row of small chapels opening from the latter, rendering the external design practically that of a five-aisled building; large transepts, and a chancel with *chevet* termination eastward. The roofs are entirely vaulted, and carried by flying buttresses on the exterior; these latter, which, of course, form a main feature in the external design, are treated with a simplicity and true feeling for masonic treatment which cannot be too highly praised; and the whole building groups very finely from the south-east view, though the detail of the buttresses and other features of the lower portion is less satisfactory, and rather too much in the "Gothic manual" style. The interior shows a novelty of treatment; the piers and archivolts of the larger arcades are executed in stone, but all the rest of the internal walls is faced with cream-coloured terra-cotta, the vaulting being executed in the same material, which in some places is used also for piers and arch-moulds, and niches. The result is only partially satisfactory. Where the terra-cotta is used purely as a wall-surface, as in the spandrels of the nave arcades and of the vaulting, where it is entirely covered with a stamped design forming a diaper, the effect is very good, and, of course, less expensive than anything of the same kind in stone would be. But where the terra-cotta has been tried for

mouldings, even in the vaulting ribs which are far from the eye, the result is painful; twisted surfaces and bad joints predominate to a melancholy extent; and it is clear that if terra-cotta is to be used in such situations it must be better and more truly made than the English manufacturers are as yet able to make it (some German firms, we believe, have achieved the manufacture of very satisfactory and regular terra-cotta moulding). The general effect of tone, too, is somewhat cold; if a little more of the red terra-cotta which has been used for bands in the vaulting surfaces had been dispersed over the walls, the result would have been better. The quatrefoil panels in the spandrels of the nave arcade offer a good opportunity for the use of mosaic, which would give a little colour; and, of course, stained glass when introduced will make a great difference. Whenever this is done, let the glass be so designed and selected as to add to the aerial effect, by the employment of stronger and heavier colour in the lower windows and lighter and fainter treatment in the upper ones: the church is lofty enough to give opportunity for fine aerial effect, which heavy and loaded windows in the clear-story would destroy. A large organ by Messrs. Hill is being erected in the west gallery of the church, but is not yet complete.

In Portland-street Mr. Waterhouse's large warehouse, which we noticed while in progress some little time since, shows us a very good, satisfactory, sensible-looking, modern Gothic building, severe in its simplicity. This architect's predilection for smooth-rubbed masonry in his recent works is a doubtful experiment for town architecture. Masonry of this kind loses its pleasing appearance very rapidly in the smoke of towns, much more so than tooled masonry with a more varied and broken-up surface. A little way out of Portland-street the tower of the new Police Courts, by Mr. Worthington, catches the eye. These courts, which are completed externally, are built of brickwork, with very good red facing-bricks, and stone dressings, strings, and plinth; the general design is of an Early Gothic type, with pointed windows in groups of two and three, with granite shafts between. The principal court has a wooden panelled roof in three parts, and large windows with corresponding wall-recesses continuing the window-range. Are these recesses to furnish opportunity for painted decoration? They might be well employed so. There is an open court between the two wings of the building, the upper portions of which are surrounded and traversed by hanging open wooden galleries of communication, piled over each other in a picturesque but rather bird-nest kind of fashion. The general plan of the building seems, so far as one can judge in its present state, rather deficient in simplicity and unity of arrangement. The external effect is solid, with a certain picturesque character; but the tower cannot be called a success: there is no definite aim or character in it, and its vertical lines are disturbed by the frequent insertion of thin stone strings in the red brick, spaced and proportioned without much apparent purpose or aim. Stone string-courses upon brick are under very different conditions from stone upon stone; they attract the eye more strongly and harshly by contrast with the brickwork, and require to be used sparingly and with much care and judgment, or they prove excrescences rather than ornaments.

Messrs. Salomon & Jones's new Reform Club, in King-street, illustrated in our pages some little time ago, is a successful building in general design and expression, and looks like what it is; and the corbelled-out angle oriels help it a great deal in this way. But there is a want of refinement and consistency in the treatment of detail. The corbels under those same oriels look more like wooden than stone brackets, in their shape and treatment; the foliated ornament, here and elsewhere, is ragged; the balcony railings, though of masonry, seem stuck into the window recesses without any connexion with the structure; and the corbelled-out soffit over the main entrance, with festoons of foliage meandering over its surface, is too like cabinet-maker's design. The total effect is better than the detail. "Brooks's Bank," by Mr. Truett, which also we engraved not long ago, is a contrast to it in this respect. It is true that, with regard to the constructive design of the porch (about which a question was raised at the time our engraving was published), we do not think an inspection of the actual building would lead most architects to regard the treatment of this feature as satis-

factory: the flat arches are so palpably *not* arches of construction—it is so evident that they could not for a moment stand as arches, except by mere cohesion of mortar, that it seems a pity that the arched form was adopted at all, or at least that the real means of supporting the quasi-arch were not more prominently shown, instead of being designed as if with an effort at concealment. This is, however, almost the only serious fault which the most critical could find with this very pleasing design. The style is really original, showing in a successful combination some of the best characteristics both of Gothic and Italian design; the carved ornament in the soffit of the angle bay is admirable in style and execution; and the treatment of the high blank wall, connecting the new portion with some adjoining old building, is a capital specimen of what may be done in the way of the picturesque in walling. The lower portion is regularly rusticated (in horizontal joints only), and at the top a recessed arcade, with disengaged shafts, gives an incident of light and shadow to this part of the structure. The backs of the niches in this arcade are fucated, forming a series of very flat square cones in juxtaposition on the wall surface, giving additional play of surface,—a device employed to diversify the wall face in other parts of the building. Altogether this is a most pleasing and refined bit of modern building, and we hope the front of the bank, to King-street, is shortly to be rebuilt in a similar style.

The new Exchange is now completed externally, and the large room also open for use, though the decoration is not yet complete; and as the interior is still consequently occupied by a good deal of scaffolding, the effect of the room cannot be judged of. Of the exterior we gave a view some little time since. The building would perhaps look better were it so placed that a more distant and comprehensive view of the whole could be obtained. Surrounded as it is by not very wide streets, this is impossible; and any advantage it might derive from distance is destroyed, while the eye is impressed even more than it would otherwise be by the commonplace, inartistic character of the architectural detail. The new town-hall does not as yet make much show above ground, and its site is chiefly marked from a distance by the forest of scaffolding standing out against the sky, in itself an important and laborious work. Terra-cotta, we perceive, is being employed as a lining for the internal corridors, in the same manner as in Mr. Hansom's church, above mentioned. The new buildings for Owen's College are also in progress, but not in so forward a state as to exhibit anything for comment or criticism.

Among present objects of interest in Manchester we must count the splendid mounting of the "Merchant of Venice," at the Princess's Theatre, briefly referred to in our columns the other day. In regard to scenic decoration, it would be difficult to surpass it. The scenes, from the pencils of Messrs. Tolbin, Gordon, Hawes Craven, and others, not only present, in some instances, most remarkable achievements in illusory perspective, but have an additional interest as forming representations of actual buildings and scenes in Venice, from sketches taken on the spot. Equal care and artistic taste has been bestowed upon the dresses and other accessories. Mr. Calvert's *Shylock* is an original rendering of the part, emphasising the sordid and clinging element in the Jew's character, rather than the fierce and passionate ideal some have formed of it, and representing him, when foiled in the trial scene, as utterly broken down and prostrated by the ruinous result, and with no spirit left for anything like a tempest of revengeful passion. Probably arguments in favour of either rendering of the part might be brought forward; but there can be no doubt as to the thorough care and minute consistency with which Mr. Calvert has wrought out his idea of the character. *du rerre*, it must be confessed that the interest lies more in the getting-up than in the acting. This ought not to be the case where any play of such a high class is concerned. In the preface to his acting edition of the "Merchant," Mr. Calvert expresses a strong opinion that Shakespeare ought to be presented to the public with the same advantages of scenery and decoration which are bestowed on most modern plays in the present day, and that only such a treatment is required to render his plays as popular as they ought to be. The first half of the proposition is undeniable, supposing that the acting, in the main parts at least, has first been adequately

provided for. But to say that people in the present day will not come to see Shakespeare unless with the accompaniments of first-class scenery, stage illusion, and decoration, is an odd way of inferring their appreciation of the great dramatist, and is capable of being construed into a tacit admission that scenery, and not Shakespeare, is the attraction. Whether it is quite in good taste and keeping, either, to introduce into such a play a semi-grotesque ballet,* at best but a vulgar and commonplace species of entertainment,—and whether, being done, it was worth while for a musician of Mr. Sullivan's position and capabilities to write music for it,—may be, in Falstaff's phrase, "questions to be asked."

The Theatre, we may mention, has recently received some further alterations and redecoration under the direction of Mr. A. Darbyshire, of Manchester. Some of the altered decorations are manifest improvements; others, as the treatment of the large pilasters flanking the proscenium, the reverse. The alterations include lining the whole of the wall round the back of the dress-circle with mirrors. There was an ostensible reason for this, as it gives more light where it was a good deal wanted, but it is not a treatment which we should like to see adopted as a precedent in the fitting-up of theatres.

THE BIRMINGHAM SEWAGE QUESTION.

The midden system, which prevails in some parts of the provinces, presents a problem to deal with at Birmingham, which, in our opinion, increases the difficulties connected with the sewage question many-fold. The extent of the Birmingham midden system is now for the first time ascertained. There are in Birmingham 3,884 premises, containing 7,065 water-closets, accommodating about 26,000 persons; and 70,000 houses, connected with 19,551 privies and middens, accommodating about 325,000 persons. Of these middens or ashpits, nearly 14,000 are drained into the sewers. The middens cover an area of 65,170 square yards, or about 1½ acres; and practically all of them, containing fecal matter and solid and liquid refuse, are open to the air. Some of them are situated beneath houses or workshops, and large numbers are built against the walls of houses, which are thus permeated with the filthy liquid soaking through the walls. The consequence is that although the sewers constantly aid the drainage from the middens, the surface wells generally become the receptacles of sewage matter, with which the earth surrounding the middens is absolutely saturated.

The Town Council of Birmingham, some time since, appointed a committee to inquire into two subjects,—the "best mode of disposing of, or dealing with, the sewage of the borough;" and the possibility of "excluding from the sewers all excreta and other animal and injurious matters that tend to cause the sewage, as now discharged, to become a common nuisance."

The results of the inquiries thus directed, and the recommendations of the committee arising therefrom, are now presented in a printed volume,† in two main divisions—(1) the exclusion of Excreta and other Injurious Matters from the Sewers; and (2) the Treatment of the Sewage at the Sewers' Outlet.

Under the former division some account is given of the methods in use in other large towns, and under the latter division the treatment of sewage is considered in regard to the methods of precipitation, filtration, and irrigation,—the various processes incident to these systems being described, and reports being furnished of inspection of sewage farms.

Special reports and communications on the several matters of inquiry have been obtained from the borough surveyor, the borough analyst, and the inspector of nuisances; and from Mr. Hope, of Romford, Mr. Bailey Denton, C.E., Mr. Hawkesley, C.E., and Professor Frankland. These are embodied in the Report. Other communications of value, from Mr. George Shaw, F.R.S., and other gentlemen, are published in an appendix to the Report.

* Called in the bill the "Lorenzo Masque," the excuse for it being the allusion in the play to a masque to take place at Lorenzo's house. But the thing is an exercise, totally unequalled except by the taste of a certain portion, possibly a minority, of the audience.

† Borough of Birmingham. Report of the Sewage Inquiry Committee. Presented to the Council on the 3rd of October, 1871. Birmingham: The "Journal" Printing Works, New-street.

The recommendations of the committee are summed up as follow:—1. The gradual abolition of middens and substitution of a new privy system, based upon the principle of exclusion from the sewers, and weekly collection of all excrementitious matter, solid and liquid. 2. A system to be developed in connexion with the above, of exclusion from the sewers and collection of refuse from slaughter-houses, cattle markets, urinals, cow-houses, and stables. 3. An experimental trial of the Rochdale and Manchester systems, on a sufficiently large scale, and under the strictest supervision; and ultimately an extension to the whole town of that system which shall be found to be the most efficient. 4. The imposition of a rate on occupiers, in respect of water-closets connected with the sewers, on a scale to be sanctioned by the Council. 5. That a register be prepared and kept of all connexions with the sewers, and that no future connexions with the sewers should be made without the consent of the Council. 6. The exclusion from the sewers of the refuse from the works of German silver manufacturers, galvanizers, wire-drawers, and manufacturing chemists, and from such other works, the refuse from which may, from time to time, be found to interfere with the utilisation of the sewage of the borough, unless such refuse shall, previously to being discharged into the sewers, have been so treated as not to interfere with such utilisation. 7. The purchase of 800 acres of land for the purposes mentioned in this Report. Other recommendations relate to the obtaining of borrowing powers for the purchase and leasing of land, execution of works, &c.

The purification of the sewage, so as to avoid the creation of a nuisance by the pollution of rivers and the deposition of offensive solid matter, is to be effected by excluding the sewage altogether from the River Tame, at Saltley, carrying it a distance of seven miles to suitable land, and there cleansing it, on a limited area, by the system of downward intermittent filtration, so that the effluent water may be safely passed into the river; provision being also made for the use of sewage by agriculturists along the line of conduit, and a small model sewage farm being established to instruct the neighbouring farmer in the use and value of sewage as a manure.

In their Report the committee state that they consulted medical men in Birmingham as to the effect of the middens on health, and the following are the points on which there is a unanimous opinion:—1. That the pollution of well-water by sewage matter is general, and the use of such water most dangerous to health. 2. That sewer gases arising from the decomposition of fecal matter do penetrate through house-drains into the interior of dwellings, and that their effect is dangerous to health. 3. That emanations from middens are also highly dangerous. 4. That fevers of a typhoid character, diseases of the digestive organs, diarrhoea, and diseases of a similar character, besides others, are directly traceable to the above causes, and that the same causes greatly increase the susceptibility to all epidemic diseases. The medical men consulted make, among others, the following suggestions for remedying the sanitary evils attributed to the present sewage system:—(a) appointment of a medical officer of health; (b) better system of ventilation and flushing of sewers; (c) cutting of the continuous pipe in connexion between the sewers and the interior of houses; (d) the closing of all wells; (e) the improvement of middens; (f) the use of disinfectants; (g) the interception of fecal matters.

The land under the present system is irrigated by raw sewage taken direct from the mains. A portion only is drained, and that to an insufficient depth, so that for the most part the effluent water passes over instead of through the land. Moreover, the land lies so low and near the river that it cannot be efficiently drained, and thus is in a position which renders it liable to floods, and unfit for sewage irrigation.

Of the Rochdale new system the committee say a new system of dealing with human excreta, known as the Rochdale system, is now being rapidly introduced, and the conversion of the old privies is being effected by nearly the same means as those employed in Liverpool for the introduction of the trough water-closet, and in Manchester for the improved privy, —*viz.*, through the powers vested in the Health Committee. Mr. Alderman Taylor, who has devised and patented the Rochdale system, furnishes the following explanation:—"Beneath each closet-seat a receptacle containing a small

quantity of a chemical disinfecting fluid is placed, in which the feces and urine are collected, the vessels being removed in a covered cart in the daytime to a manure manufactory, weekly or more frequently if required, an important feature of the process being a retardation of the fermentation of the excreta, so as to prevent it from fouling the atmosphere, and being depreciated in value as a manure, which is effected by frequent removal of the receptacles prepared as above stated. The cinders and dry refuse from the houses are in like manner collected in common barrels or other receptacles, and when full, the contents are tipped into a corporation cart, and removed to the same depot or manufactory as the excreta, where they are sifted by a winnowing machine, which separates the cinders, refuse, vegetable matter, and fine ash. The vegetable matter is burnt, and its ash and the fine coal ash are used in the manufacture of the manure. There is a ready sale for the large cinders at the price of 8s. per ton, and the smaller cinders are used for working the engine at the manufactory. The fine coal and vegetable ash is mixed with the excreta from the prepared receptacles; the mixture is subjected to a chemical process; and after being allowed to remain in heaps for a period of about twenty-one days, is passed through a screen to ensure perfect mixing. It is then a damp powdery manure, containing all the constituents of the feces and urine, except a large portion of the water. By this process a valuable manure is produced, which will allow of the addition of several valuable manorial agents, if it be found desirable; but such addition is not necessarily a part of the process. By this method of collecting and treating the night-soil and refuse of towns there is nothing lost; all is made profitably available, the cinders being found sufficient to raise steam for any motive power required in the process of preparing the manure, and all other kinds of refuse, such as glass, iron, &c., can be disposed of for their usual purposes. The urine from the public urinals, and that portion which can be collected from dwelling-houses, to which is added a quantity of the same before-mentioned mixture, which is put into the receptacles for night soil, is evaporated and added to the prepared manure. The blood from the slaughter-houses is also, by a simple and inoffensive process, brought into a state fit to be added to the prepared manure, and forms a valuable addition to it."

The committee say that this system, as far as it has been carried out, appears to be a great sanitary and economical improvement. They inspected many of the converted privies, which were perfectly clean and inodorous; and the complete utilisation of the dry refuse, they state, materially diminishes the cost of the scavenging department. In the erection of all new houses the Health Committee require the adoption of this system, and all the structural alterations from the old to the new system are done at the expense of the owner. The cost of the new privy entire on this principle is estimated at from 17. to 51., and Mr. Alderman Taylor is of opinion that 25. per privy would be a fair average cost, to which must be added a charge of 10s. for the galvanised iron receptacle and the wooden ash-tub, which are supplied by the Corporation.

Of the Manchester system the Report says:—"It is almost impossible to make any accurate estimate of the number of water-closets and middens; but the number of the former may be approximately taken as 15,000, and of the latter 50,000. The Health Committee are compelling owners, among other sanitary improvements, to make structural alterations in privies and ash-pits, upon the certificate of the Medical Officer of Health, and according to a particular plan and specification furnished by the Health Committee, a copy of which is attached to this report. The new improved privy consists of a common privy and ash-pit; but the ash-pit is small and covered, and a ventilating-shaft is taken from the top of the ash-pit to the roof of the house to which it is attached. The floor of the ash-pit is of glazed earthenware, absolutely water-tight; and its door, which is either at the side or back, is kept locked, and only opened by the night-soil men when they come to empty it. The ashes can only be emptied into the ash-pit through the privy-seat, which is provided with hinges, and can be raised entirely for this purpose; and the ashes must, of necessity, be poured over, and thus deodorise the fecal matters. Dust-boxes are provided for the miscellaneous solid refuse. The house slops and liquid refuse are poured into the sewers through a properly-trapped grid in front of the dwellings;

and a further improvement is also sometimes adopted by which all continuous communications between the house-drains and sewers is cut off, and an escape of sewer-gas into the interior is made impossible. Where the new privy and ash-pit have been introduced into courts or thickly-populated districts, it is usual for two privies to have a common ash-pit. They are at present emptied regularly once a fortnight; but a weekly emptying is recommended by the Officer of Health. The cost of this new privy and ash-pit, where the ventilation-flue has to be carried two stories high, is from 31. 10s. to 41. About 1,400 of these privies have, up to the present time, replaced the old open middens; and they represent privy accommodation for about 4,200 houses. The process of conversion is going on as rapidly as possible, and the Officer of Health states that the effect of the above and other sanitary improvements, particularly the abolition of cellar-dwellings in the converted district, had been to diminish materially fever and diarrhoea, especially infant diarrhoea, so dangerous in large communities, and in most cases, attributable to a foecal atmosphere, and that the death-rate in 2½ years had been reduced from 33 to 27 in 1,000."

On the subject of irrigation and utilisation the Committee make the following remarks:—

"The only other method yet known for purifying sewage is the passing it through a natural soil. For this purpose, land may either be regarded as a natural filter, by means of which it may or may not be possible to purify the sewage on the smallest possible area continuously, so as to allow of its admission into a running stream, without seeking, as a direct object, to utilise the elements of fertility which it may contain; or it may be sought to purify, and at the same time utilise it, by applying it to land in such quantities, at such times, and in such a manner as shall produce the greatest return in the shape of marketable crops without injuring the permanent fertility of the soil.

The Committee take the subject of utilisation first; and on this the following questions arise:—1. Does ordinary sewage possess a manorial value sufficient to make it worth the while of landlords or tenants to incur the expense, which is considerable, in laying out land for its reception by way of irrigation? 2. Can it be applied continuously without injury to the permanent fertility of the soil? 3. What area of the land of a given character is necessary for the perfect utilisation of sewage of given quantity and strength, so that no fertilising element of the sewage shall be wasted? The Committee say that on these points chemists of the highest scientific attainments express absolutely contrary opinions, and engineers of the greatest eminence are equally at variance; and that, in this state of uncertainty, it is therefore of special importance, in dealing with the immense volume of sewage at Birmingham, to proceed with the greatest caution,—at any rate, until some agreement be come to between the various scientific authorities. They have visited the sewage farms of Warwick and Rugby, and Mr. Hope's model farm at Romford, and have addressed questions to the authorities of such towns as have adopted the irrigation system.

As to the money question, "Will irrigation pay?"—a very secondary one, in our estimation, by comparison with the sanitary question,—the Report says:—

"As to the general financial result of sewage farming, it is to be regretted that so little information has been obtained, the questions on this point having been generally unanswered. The two replies received are to the following effect:—At Warwick the estimate for the present year (which has been the most satisfactory one) is that the value of the crops, sold and rickied, will about equal the total annual expense, including interest on outlay and pumping. At Cheltenham the loss, after paying interest and yearly repayment of principal for purchase of land and permanent works, is almost nominal. Cheltenham, as before remarked, is somewhat favourably circumstanced; for out of the 330 acres of land irrigated, 130 acres only belonged to the Corporation, and 200 to adjacent owners, who pay a small yearly rent for the sewage."

The Committee do not doubt the sale of large crops at considerable sums, but from the silence as to the cost of production, they conclude that the general financial results have not been satisfactory. Considering that compulsory purchase always involves the paying of more than the market price of land, that costly works are required to convey the sewage to the land, and

that there is great expense in laying out the surface and draining, they observe that it would be quite unreasonable to anticipate anything but loss, though sewage may in itself possess considerable manorial value.

A HOME VIEW OF YEOVIL.

YEOVIL again! Yes, but from her own point of view, and out of her own mouth comes the tale. The stranger's account of things in this model town has been always resented as a piece of impertinence; the Yeovillians, we were told, could manage their own affairs, and did not require to be lectured from London. Twelve months have nearly elapsed since our notice of various matters in Yeovil resulted in an official inquiry on the part of the Government. After this matters seemed to mend a little, but we believe now it was only a spurt; for, judging Yeovil by her own statement from within, her evils are her own, and are the natural result of her own innate sluggishness and corporate incapacity. Both in the town and in its environs small-pox and scarlet fever are very rife, and have been during the year. Scarletina has increased in some districts. In Great Western-terrace, consisting of fifteen houses, in twelve out of the fifteen there have been thirty-four cases of fever and three deaths. Seven of the houses drained into an open ditch in the Sherborne-road, and the remainder into a brickyard. With a singular fatality, as if to ensure a sufficient mortality return for a future season, the brickmakers are mixing their clay with the sewage. A lad was taken ill with fever in the brickyard, and died within two days, without his clothing being for one moment removed.

The mayor declares in council that he wonders any houses could be found free in the above neighborhood from fever. From Gear-gap and Rusty-well accounts come swelling in weekly of unabated nuisances. In the latter district, five cases of fever are reported from one house, and small-pox existing in addition.

The want of drainage at Gear-gap has led to the poisoning of the miserable squatters or inhabitants who are forced to reside there. A drain is ordered to be made here, and notice to be served on the tenants, calling upon them to connect the house-drains with the public sewers. Properly speaking, several of the houses have no drains, but seething sinks and cesspools that continually exude the foulest poison.

A few days since the town of Yeovil itself was flooded with dirt, mud, and slush, of every description, occasioned by an inundation through ineffective drainage. Many houses in the lower quarter of the town were flooded. In fact, the principal cause of the dire evils of this badly-managed town results from imperfect drainage, and unabated nuisances. The local authorities are acknowledging this now, though a few months since it was a piece of impertinence on our part to hint that Yeovil stood in need of care.

MODEL VILLAGES.

SIR,—In a speech made by Mr. Godwin, in Leeds, a short time ago, as reported, he stated that a gentleman was anxious and willing to come forward in support of any movement having for its object the improvement of the social condition of our working classes (equal in magnificence to that of the Peabody gifts), if such movement could be originated in a practicable form, and with reasonable hopes of attaining the object in view.

I confess, so far as the Peabody scheme of benevolence is concerned, to very little sympathy with the erection of palatial residences in which working men and their families may find accommodation in the heart of London; such buildings may be, perhaps, a great improvement upon the houses and mode of life which their present occupants formerly endured; but they do not, it is to be feared, meet the domestic wants, spirit, and feeling of the working-class Englishman, who prefers to have a home of his own, however small and inconvenient, and unprovided with a proper and reasonable accommodation, for his wife and family.

This feeling is a good one, as it conduces to the exercise of the great qualities of self-government and control, and a more reliant and independent tone of mind and spirit, at least to a far greater degree than can be the case where, as the member of a large establishment, however comfortable and costly, all his wants and requirements are provided for by others.

The great necessity of the time appears to be to provide workmen and their families with comfortable, convenient, and healthy homes on the margin of this wilderness of brick and mortar, the metropolis, where, during their hours of rest, they may be surrounded by everything to make life enjoyable which science and experience can place at their command, at reasonable cost.

This can only be achieved by the erection of workmen's houses on a large scale, so that the beneficial action of the co-operative principle may ultimately be brought to bear for the successful financial management of such a property.

Having been connected in past days with the governing authority in a large manufacturing town, ample opportunity has been afforded me of studying the daily life and wretched social condition under which so large a proportion of the sons of toil live,—a state of things appealing strongly to the heart of every kind and thinking man for some assistance, however slight, to ascertain the causes which operate to tie down human beings to a miserable existence.

I have seen the operation and effect of workmen's building societies on a somewhat large scale. Rows of houses, wretchedly constructed and badly drained, built on swamps called roads, the whole system defective in arrangement and organisation from beginning to end,—entire suburbs of such houses have been built and occupied for years, when it has been impossible for a cart to pass along the so-called streets, which have never been either formed or constructed until (although private property) such a state of things, being a crying disgrace and scandal, has compelled energetic and costly action in remedy by the local authorities, which the occupiers of such houses have been totally unable to sustain.

These are some of the many evil results of the action of working men having good motives and a dim appreciation of a better state of things, but wanting in knowledge, experience, and sufficient means to work out the results aimed at.

It must also be a source of pain to many to see the style of the enormous building operations now going on in the suburbs of London, where attempts are being made to provide workmen and the class just above them with houses.

Termines of unmeaning, horrible-looking buildings, doing their best to shut out light, ventilation, and health; built right up to the street, and with a mere narrow slip of garden at the back of each house, so surrounded by brick walls that vegetation can only drag on a weary existence, in a daily protest against the cupidity, ignorance, and greed which rear such piles of brick and mortar for human beings to pass a weary life in.

The enormous wealth and widespread poverty, misery, and degradation side by side in this country afford food for great and serious reflection. If the daily life and frightful social condition of our poorer classes arise from their vices of intemperance and improvidence,—are they to blame? Can it be supposed that the reeking courts of the metropolis, the polluted and enervating atmosphere surrounding the poorer class of dwellings, the utter want of proper accommodation and decent sanitary appliances, with a nest of other evils, are isocretions to virtue, industry, temperance, and sobriety?

No; with the present generation we may, perhaps, fail to do much; but the future is in our hands, and by bringing up the younger members of the working community far removed from the causes which to an enormous extent at the present time operate to daunt the good, the earnest, and the philanthropist in their endeavours to improve the human family, we may hope to make rapid strides towards that time when the workman may have a happy home and a joyous existence within his reach, and rise to a higher appreciation of his duties as a citizen and a member of this great commonwealth.

The first step in so high and noble a task, is to provide such a home; and it does appear that this is not beyond the power of the capitalist and the philanthropist.

The great toilers of the earth who help to create the wealth which surrounds us in every direction, have at least a right to decent habitations; they cannot of themselves do much towards providing the same, and it is therefore for others imbued with horror at the position of such a class, to devise a remedy, and enlist sympathy and capital in so great a cause.

Large sums of money have been and will be spent upon costly and impracticable schemes, which for a time artificially improve the position of a small number of operatives; but the results are not of such a character as to warrant further progress in a similar direction.

A real progress would be to originate and carry out a scheme well considered and reasonably costly, which, great in results, and remunerative in character, would, by the force of brilliant success, drag investors of money to follow in the wake, and which would place the working man in the position of being master of, and responsible for, his own well-arranged house and home; every sanitary appliance which the experience of others can suggest at his command; health and a healthy existence within his reach; a share in the control of an important organisation which will tend to raise the faculties of mind and body to the highest pitch; educational establishments at command for his children; parks, clubs, assembly rooms, and other institutions, within reach, and identified with his own home.

These great benefits, which as much surpass those offered by Peabody institutions as the grown man does the child, can be obtained at reasonable cost by the exertions of the capitalist and philanthropist who would provide the means to carry out, and for a time only, carefully watch and guide the development of such a scheme before leaving it for future management to a citizen and municipal spirit.

Your subscribers have read with great interest no doubt an article in the *Builder* of the 8th ult., under the heading of "French Solutions of Social Difficulties;" but whilst M. Godin's work may stand out as a beacon to guide us in the advancement towards a solution of the social question, the "Famillistère" is an institution which would hardly permanently flourish on English soil. An entire change in the customs and habits of the people would be necessary, a work of time and difficulty; and if successful at first, future mismanagement might imperil, if not destroy, the entire labours of a generation.

A movement, with the same end in view, but suited to English ideas, and dependent for lasting success upon the people themselves, may thus be briefly described:—

The English "Famillistère."

Eighty acres of land to be purchased upon one of the principal railways running into the great working centre of the metropolis, say the east end, as short a distance out of town as possible, and having a special station, and special arrangements as to trains and workmen's fares; the land to cost about 200l. per acre.

Upon this estate build 500 workmen's cottages in pairs, say 10 cottages to an acre, so arranged and distributed about as to obtain the greatest possible effect in a landscape point of view, combined with economy of allotment.

The cottages to be reasonable in size, but not in any way expensive in construction; good drainage, dry foundations, dry walls, and convenient internal arrangements to be all-important. Each pair of cottages to be set back from the principal road, and surrounded with just sufficient ground for good back-yards and flower and kitchen gardens. Excepting for purposes of privacy in the back premises, all unsightly brick walls to be avoided, and strong wire fencing, trees, and shrubs to do duty as boundaries.

The roads to be park drives, with a margin of turf on either side, planted at stated intervals with specimen trees and ornamental shrubs.

The drainage, water supply, and sewage works to be perfect.

Land to be laid out near the centre of the estate for ornamental gardens or park, small in size, but well arranged; from five to ten acres in extent.

In the park,—to be erected, schools and museum, club-house and assembly-room, co-operative stores, laundry and drying-ground, baths, and green-houses.

The whole of the buildings on the estate to be of a plain, substantial architectural style, devoid of excess of ornamentation or needless expense in construction, but suitable in every respect for the purposes in view.

When completed, it would be, in fact, a model village of 2,500 inhabitants, with every means of health, happiness, comfort, and recreation at command, besides "numerous arrangements enabling them to partake of luxuries or the equivalents of riches."

If well managed, the whole cost would

probably not exceed 125,000l., to be apportioned in the following manner:—

80 acres of land	£16,000
500 cottages	100,000
Roads, drainage, &c.	2,500
Schools, museum, stores, laundry, bath, &c.	5,000
Planting trees, shrubs, &c.	1,500
Total	£124,500

The revenue would be from the following sources:—

Rents of 500 cottages, at 6s. per week	£6,500
Profits upon stores and other establishments ...	3,000
Total	£9,500

From this sum to be deducted the cost of administration, &c., which should not exceed for the first three years 1,000l., and afterwards be probably reduced to 500l. per annum; this would leave an available surplus of 8,500l.; a sum of 6 per cent. only to go to capital account, the balance to be carried to the administrative fund.

It is difficult to estimate the profits upon stores, &c., but as M. Godin shows them to be 3 per cent. upon 50,000l., and, as all the inhabitants on the estate would be deeply interested in supporting every institution upon it, the amount placed to that account probably understates the receipts.

The management for the first three years should be in the hands of the capitalist. Afterwards, when every institution had got into working order, the representative and municipal principle might be evoked.

Such a scheme but faintly shadowed forth, if successful and economically carried out, would be a step towards the solution of a great social problem.

To you, as one of a noble band of pioneers, I suggest the same. If it will not bear critical examination, let it be like so many other propositions which see the light of day, but to die; but, if practicable, something, perhaps, may be done to help surely and speedily those who otherwise cannot help themselves, and obtain willing workers in so noble and great a field of usefulness.

JOSEPH S. FORBES.

IMPROVED DWELLINGS FOR THE VERY POOR.

SIR,—My attention has for a long time been directed to the necessity lately referred to in your pages, namely, that of providing healthy dwellings for the very poor. Skilled workmen and others receiving comparatively high wages, have organisations and capital of their own, which need rather direction and development than material aid for the accomplishment of the desired purpose. They have also leaders of ability and energy, who do not fail to make known the requirements of their followers. Those, on the other hand, who are much lower in the social scale, have but small means that can be developed, and their voice is rarely heard, except in cries and groans. It is these who, most particularly, need the material assistance of the wealthy.

But the problem is a difficult one to solve. It is, how to help those who are on the verge of pauperism, without completely pauperising them? In other words, how to help them in such a way that they shall not rely upon your help, but rather learn a more stringent lesson of self-help.

A proposal to pay wholly or in part the rent of the very poor, whether by the State, in "rescuing" the people from "the dismal lanes," and "planting them out in the clear," or by the benevolent in providing model dwellings or otherwise, is, to the extent to which the proposal can be relied upon, subsidising the earnings of the poor, and, by subsidising them, ultimately reducing the amount received from employers. It is out-door relief in another form. The same may be said (though with some limitation) of dwellings of a superior and more expensive kind which are provided at the same rent as the old, inferior, and less expensive, unless, indeed, the old rent is at "famine" price, produced by scarcity or monopoly.

The difficulty of our present question lies in this, that no increase of rent, even if for superior accommodation, can be borne by the class to which we refer. But this difficulty is met in part by the magnificent offer of your benevolent anonymous correspondent; if this offer, great though it is, were supplemented by recurring gifts of others, the difficulty would be by so much further overcome. This will be seen more clearly if we consider (1) the duties of trustees; (2) the main want of the very poor; and (3) the component

parts of rent. I will, then, sketch the outlines of a proposal based upon these considerations.

1. As to trustees. I am assuming that all the moneys to be applied for the benefit of the very poor are placed in the hands of trustees. Their first anxiety as trustees is the security of the principal of their trust. Bearing this in mind, they cannot trade with the money, for trade involves, perhaps rather implies, a possible loss. They cannot invest it in ordinary stocks or shares, for this is another form of trading. They cannot accept any security, however tempting, which requires continuous or periodic action for the maintenance of the security intact. Hence their investments are confined to real property and Government Stock. These yield from 3 to 3½ per cent. Though as investors the trustees would deem this too small an interest, yet *quid* trustees, with a desire to maintain their capital intact, they cannot obtain more.

2. When we consider the immense reproductive advantage that in England capital has over labour, there can be but little doubt as to the main want of the very poor. Capital, in fact, is the ladder by which wealth is attained. The great difficulty of the worker is to get his foot upon the first round. Let him do that, and his greatest difficulty is conquered. Notwithstanding the dearth of work at times, and the pressure of the labour market, I venture to think that current necessities are generally met in some way, and that the great want is the union of capital with labour in the same person.

3. As to rent. Rent may be regarded as composed of three parts, to which a fourth must sometimes be added. (a.) There is first the repayment of the capital. In short tenures, this is an important element. In long leases it is practically forgotten, and the increase of interest which should go to replace it is consumed as it is received. In permanent tenures it is sufficient if the capital is refunded when the property changes hands; in this case, therefore, this item of rent is minimised. (b.) The interest for the use of capital forms the second item of rent. The amount of this interest varies with what the individual capitalist can get. In a dense and concentrating population, dwellings of all sorts being of the nature of a monopoly, rents rise, and the landlord-capitalist has the advantage. It is true, local circumstances may cause some fluctuations, but the movement is in the end favourable to the monopolist. (c.) The rent has to provide a fund to meet current expenses and those of maintenance; as, for instance, the labour of collecting rents, looking after and paying for repairs, certain imperial charges, and, in the case of weekly rents, the local rates also. (d.) The fourth item which goes to form rent is the insurance against losses of rent. This is in some cases a very heavy item; in some it is nominal. If the losses can be avoided, the necessity for the insurance ceases. From this analysis it will be seen that (where property is fairly used and fairly kept) the first and third items are independent of the will either of landlord or tenant. The last item is dependent upon the action both of landlord and tenant, but may be reduced to a nominal amount under given circumstances. Only the second item shows the advantage at which the capitalist is placed. It is subject to modification according to his will and desire, within the limits imposed by the laws of supply and demand.

We have, however, seen that the trustee is unable to secure more on an average than 3½ per cent. Can we bring him, with his 3½ per cent., into relation to the tenant, whilst we secure to him his principal sum and do not saddle him with liabilities? I think that this is possible, and that we shall at the same time gradually secure to the poor that great desideratum, an available capital.

The proposal I would make is this. Let the trustees of the benevolent fund (the existence of which I must assume) obtain by purchase or building suitable dwellings of one room each. The block system would perhaps be the cheapest. A cottage system, however, where each cottage would have four, six, or eight dwellings, would in many ways be preferable, and would present greater adaptability to the exigencies of sites. Obtain, by division, the cost of each dwelling, carefully separating the cost of the land from that of the building. Say that the cost of the land divided by the number of rooms represented 30s. as the cost of land to each dwelling, and 48s. as the proportion of building cost. These amounts are subject to calculation and correction; they probably, however, would not be far wrong. Let the trustees reserve to themselves the free-

hold or otherwise the cost of the land, and issue shares of 48s. each representing the building cost of each dwelling; the shares to be issued to occupying tenants only. The tenants would enter into possession at once, and would out of their rent have to pay off (a) the 48s., (b) interest upon the money advanced by the trustees, (c) all current and maintenance expenses, and (d) the assurance against loss of rent. Now the rent paid for a single room varies from 1s. 6d. to 2s. 6d.; it is rarely under 2s. The annual rent would be appropriated in the scheme under consideration in the following way:—

(a.) Repayment of principal of building cost, 48s.	£2 2 102
(b.) Interest at 3½ per cent. on 30s., the cost per dwelling of the freehold	0 19 6
(c.) Interest at 3½ per cent. on 24s., the average amount advanced for building	0 15 74
(d.) Contribution for expenses, at 2s per cent. of the rent	1 6 0
(d.) Assurance against loss of rent	Nil
Gross annual rent, at 2s. per week	£5 4 0

At any time the value of the contributions paid upon a share would be represented by the amount paid under the first head (a). In case of withdrawal, the amount so paid would be subject to two deductions; first, for arrears of rent, together with a small fine for non-payment; secondly, for further interest upon the difference between the average of the amount *actually* advanced, and the *assumed* average,—that is, the average if the share were completely paid up. This fund would by itself form the assurance against loss of rent. The only danger from this cause would be in the first three weeks,—a danger of so short a duration, that it could be readily obviated. The time required for paying off the share would be about 22½ or 23 years.

In order to prevent trafficking in the shares, and to prevent sub-letting in a way that might thwart the intentions of the founders, I would suggest that the trustees only should be allowed to purchase the shares of those who might wish to withdraw; the price to be paid would be the value determined as above. A shareholder, therefore, having paid all claims for five years, and wishing to emigrate or otherwise invest his money would be entitled to receive 10s. 12s. 5d., less the interest on 18s. 12s. 9d. for five years. The net amount the shareholder would receive would be 7s. 13s. 11d. Withdrawing money would naturally cause a forfeiture of all rights and privileges. As withdrawal could be effected at any time, it would be desirable to prevent resort to it in any trifling difficulty. I would therefore grant remission to the same individual for only a limited number,—say, three times. In case of death, the share would come under the head of personality, and would be treated accordingly.

The shares should not represent the right to a special room, but the right to any vacant room of the same class as that for which the shareholder has been paying. To meet the requirements of the labouring population, whose work takes them first to one part of London and then to another, I should suggest that the blocks were not too large, but that they were scattered about; so that a shareholder at the south, when his work took him to the north, might remove thither, if a room were vacant.

It is obvious that, in carrying out this proposal, the property would gradually change hands,—that is, the interest of the shareholders would increase, and that of the trustees would decrease. I would therefore give the tenants a progressive representation amongst the trustees. For this purpose, I should propose that the tenants of each block or group of cottages should elect one of their number annually to serve on a committee, whose duty it would be to represent and watch over the interests of the tenants. One or more of the committee would be elected to act on the tenants' behalf on the board of trustees. The representation should not commence until a certain sum had been accumulated,—say, not until the expiration of the first year. During the next seven years give the tenants one representative trustee to five original trustees; during the next seven years give the tenants two representatives, and during the next seven years three; a representation increasing with the funds invested, but always giving the original trustees a majority. The first year of non-representation would give time to the original trustees to bring affairs into routine order, and would likewise allow of the tenants getting to know one another, enabling them to make a better selection.

In connexion with each block or group, a club-room or common sitting-room would be a great

advantage. Its cost would not largely increase that of each dwelling, but it would do so to some extent. The weekly payments would have to be increased, or the term of repayment prolonged. Subject to the control of the trustees, the management of the club-room should be vested in a committee of the tenants.

When the cost of building had been paid off, it would be a question for the trustees to determine whether they should allow the tenants to proceed to the redemption of the freehold in the same way. This would proceed more rapidly than the former, by the amount paid for interest on the building cost, and the interest on 15s., half the cost of the freehold. The annual amount paid under (a) would be 3s. 8s. 3d., and the time for the redemption of the freehold would be somewhat under nine years. At the end of this time, in the middle-age of a shareholder who started when he was eighteen, the rent would be 6d. a week for expenses only; besides which he would be possessed of an available capital of 78s. There might, however, be some difficulties in the way of the redemption of the freehold.

The presumption throughout has been that only single-room dwellings were provided. Such are, I believe, most in request. Subletting and lodgers should be rigorously excluded, though rooms might be arranged to accommodate a man and his wife, or two friends. In the latter case the payments would be made in definite proportions, which would also determine the respective claims upon the share. Tenements, however, of two or three rooms might be treated in the same way. The amount paid in one class might be made transferable to another class. Thus a man, having subscribed 15s. in the small single-room class, might transfer it to the large single-room class when he married; and thence, again, when his family increased, to the class of dwellings having two rooms.

I am not prepared to go into the particulars of the application of this system to the cottages of agricultural labourers. In many cases it could only be done with the active consent of the great landowners. They would, however, not have to part with the freehold; a long lease would answer every purpose. But there are other difficulties in the way; the greater cost of the cottages in the first instance, and not unfrequently a rent of less than 2s. a week. Nevertheless, so long as the margin of rent left is sufficient to make the first item, the contribution to the share, an appreciable quantity, so long must the system present advantages to the tenant.

It is unnecessary at present to enter into other particulars. The principle upon which the proposal is based is already exemplified. To lend money at the lowest rate, and with absolute security to secure repayment of the principal, to cause the tenant to pay all expenses; to educate the poor man to take part and interest in a complex organisation; to give him the dignity and sense of stability which result from the possession of capital; and finally, to enable him to use his capital at any time and in any way that may subserve his interests when they do not clash with those of his fellow tenants: such are the objects it is sought to effect by this proposal. So far from pauperising the poor, it would, to a certain extent, lift them to a level of comparative comfort and independence.

In conclusion, I cannot refrain from considering the action of the present Poor-law upon such a state of things as I have endeavoured to depict. The class of people it is hoped to benefit are specially those most likely to be in occasional receipt of out-door relief. Shareholders of the association would be paying the same rent as those outside, but by the prudence and foresight of availing themselves of the opportunities offered, they would effect a weekly saving. Would this be a bar to out-door relief? If so, they would save less than 10d. a week; if not, perhaps 2s. 6d. Hence those outside would be 20d. a week better off than those within; the beneficent intentions of the founder would, in such cases at least, have the immediate effect of reducing the rates, and injuring those it was intended to help. Such is the inequality of the action of out-door relief. But it is to be hoped that a wiser and more far-sighted policy might be pursued, and that the savings would be made no bar to relief, until they had reached a given point. It must not, however, be forgotten that the thrift and sense of proprietorship engendered by the associated action I have sketched, would not fail gradually to increase self-respect, self-reliance, and independence of the help of the Poor-law.

J. WALLIS CHAPMAN.

AN OVERLOOKED ARCHITECT AND HIS WORK.—JOHN AHERON.

In a recent issue of the *Builder* (p. 789, ante), in an article on "Archæological and Architectural Literature in Ireland," it is stated, "there is a manuscript work in the British Museum by an Irish architect, John Aheron, entitled, 'A General Treatise on Architecture, divided into Five Books.' It consists of 176 folio pages, with this epigraph, 'This book was written, and drawn in pen and ink, and finished by the 13th of April, A.D. 1751, by John Aheron.'" It was also added that the history of the writer was unknown. Since the publication of the article, we have picked up a printed copy of the work, which was supposed to have existed only in manuscript. It bears date,—"Dublin: Printed for the Author, by John Butler, on Cork-hill, MDCCCLIV." Now, although the printed copy affords us little or no further personal particulars concerning the author's life, we are able, by a system of deduction, to arrive at a few items of his practice which are of interest, and which may lead the way to further discovery in relation to the author. The book is a goodly-sized volume, well arranged, well printed, and illustrated with 140 plates, well engraved, and all drawn by the author himself. A list of subscribers' names begins the volume, comprising several of the most celebrated public men of his day,—lords, earls, prelates, knights, public officers, English and Irish, holding appointments under the Government in Ireland, ladies of title, architects, and several building operatives. There are also several members of the Universities, including Oxford, and some authors who then and afterwards were known to fame,—Philip Dormer Stanhope, Lord-Lieutenant of Ireland, and known as Lord Chesterfield; Edmund Burke; the Earl of Mornington (the Duke of Wellington's father or grandfather); Dr. George Stone, Primate of Ireland; Richard Boyes, Earl of Cork and Burlington; Henry Howard, Earl of Carlisle; the Earl of Abercorn; Dr. Delany and Dr. Dunkin, friends of Dean Swift; and numerous others. The list of names throughout goes to prove that Aheron was well known, and received a fair share of patronage. In his preface the author acknowledges his indebtedness to the Earl of Burlington, who caused the work before it was put to press, and gave it his entire approbation. Aheron laments the sudden death of his patron while the plates were under the hands of the engravers. We will give a short epitome of the matter of the volume. The first book is devoted to arithmetic, geometry, trigonometry, in view of the practice of both military and civil architecture. The second book treats of architecture in general, with many useful tables for charges and estimates, and also in relation to materials. The third book contains "A Parallel of Architecture," or a collection from ten of the principal authors who have written specially of the Orders. The fourth book contains several designs for doors, windows, chimney-pieces, piers, gates, entrances, temples, pavilions, &c.; and the fifth and last book contains a great variety of plans and elevations for parsonages, farmhouses, manufactories, charter schools, country parish churches, and even palaces; also a number of designs for gentlemen's houses, at a cost ranging from 500*l.* to the large sum of 100,000*l.* The treatise is supplemented at the end by a useful "builder's dictionary."

The author spared no pains throughout his work to make himself understood, and to give the best specimens of the Orders from the works of Palladio, Scamozzi, Serlio, Vignola, Alberti, Viola, Perrault, Le Clerc, and others. He also enters into a criticism of their respective merits, suggests improvements in the arrangement of the columns, and differs in some respects from the generally received canons laid down by the above authors. Among his designs there is one of Stradball Hall (or House), built for Pole Cosby, Queen's County, Ireland. There are also the plan, elevation, and section of a house designed for a Mr. James Cotter, in the County Cork. There are many of the designs which bear a striking likeness to several of the old public buildings of Dublin, and the gentlemen's mansions in that county and other parts of Ireland. The drawings on the whole show a decided superiority to the general class of designs of the period in which our author practised, about the middle, or earlier, of the eighteenth century. We think it may be fairly concluded, from the nature of the designs, that the majority, or a great number of them, were

erected. The following explanation in table of contents to plans 83-4-5 would lead us to suppose it was erected or designed with a view to erection:—

"The plan and elevation of a palace extending 407 ft. in length and 815 ft. in breadth, in the middle of which is a circular court, 87 ft. diameter, with an arcade and columns of the Doric order, and supporting a gallery of the Ionic order, whose circumference is 324 ft., whose breadth is but 12 ft., which ought to be 18 ft., but the court could not afford room without making it too small; the rooms on the first floor are 21 ft. high, and those on the second, 23 ft. Here are the angular courts which light the inner apartments."

All of Aheron's designs are severely Classic. In the concluding paragraph of his preface the author rather modestly observes,—

"Though I have presumed for the benefit of young beginners, and those who are yet strangers to architecture, to compile this Treatise, wherein I am chiefly a collector of other men's works, except in the designs, I do not pretend to more infallibility than others, who are liable to commit errors in their calculations; therefore, if I have committed any in mine, I hope the candid reader will spare censuring me, or bringing my judgment in question for the same."

It would be well if some of our overlooked architect's successors and copyists showed a like modesty in respect to their abilities and designs. From the list of his patrons, we conclude that Aheron practised for some time in England as well as in the sister country.

In the manuscript preface of his book in the British Museum, there is an erasure at the end of the preface, through which the name of "Sir Edward O'Brien, baronet, Dromoland," appears. On referring to the list of subscribers in the printed volume, we find the name of the "Right Hon. William O'Brien, Earl of Inchiquin," a member of the same family. It is plain from this that he was employed by the O'Brien family, in the county Clare, or other of the southern counties of Ireland, where this family held large properties.

Of the date of our architect's birth or death, we are still in the dark, but perhaps this scant notice will help to further inquiry relative to the life and practice of John Aheron, architect.

THE DRY-ROT.

THE dry-rot in the house near Castle Howard is an instructive lesson; and, so far as we have the materials before us, may be read as follows:—The house is probably of stone—retentive of wet. The oak joists are timber of the estate indifferently selected and seasoned,—not free from sap. The damp walls favoured the development of dry-rot. (If our premises are false, "C. W." will oblige by correcting them.) In such case, to take out the rotten timbers and replace them with sound timber, and simply washing the timber and walls with a strong solution, was insufficient to decompose or destroy the seeds, spores, or germs of the dry-rot: none of the solutions in vogue are sufficiently penetrating. To have used kyanised timber might have been effective. This case requires a more powerful agent, and this we have in chlorine gas—a disinfectant of the greatest power: it is volatile, and can seek out noxious matter. To generate sufficient for the present purposes, apply to the local chemist: it is simple and inexpensive. Care should be taken to stop up the flues and openings into the cellar; and the floor above, if not tongued, should have the whole of the joints covered with brown paper pasted down. These precautions are necessary if the gas is to penetrate and eradicate the evil. Carefully seal up every crevice. The doors and windows in the cellars may be stopped in like manner, and sand heaped against the bottom of door. With all these precautions, so volatile is this gas that its presence will doubtless be felt throughout the house; in such case open the windows. This gas is very irritating when inspired, and is rarely used in this form, but more generally as chloride of lime; but this would not be sufficiently effective for our purpose. Leave the gas to its work forty-eight hours, or more. During this time it may be found desirable that the house should be uninhabited.

Having so closely sealed the cellars, it may be desirable to point out the simplest mode of getting rid of the gas:—Make a provision for this by closing your windows from the outside, so that they may be opened a few hours previously to an entry into the cellar.

The result some months hence should be recorded in the *Builder*. A. Z.

Nothing more can be said regarding the destruction of this pest than has been printed in former volumes of the *Builder*. No perfect remedy is known for the total destruction of the

spawn in the infected wood; the best is by impregnation with some poisonous metallic salt,—gas-tar or corrosive sublimate; but so retentive of vitality is the spawn that it is seldom, if ever, utterly destroyed when once it has gained possession.

The dry-rot of our old built ships is *Polyporus hybridus*, and that of our dwelling-houses principally *Merulius lacrymans*. The latter plant has the power of attracting and absorbing the moisture in the atmosphere, and without this moisture the plant cannot exist. The example mentioned in last week's *Builder* is one where the fungus attacks the timbers of the cellars, and although "C. W." states the place to be well ventilated, yet, from the habitat of the pest, one is led to believe that its presence is fostered by damp air.

Till within a couple of years ago we seldom met with (then) a rare fungus in this country,—parasitic on pine, *Lentinus tephidus*. In 1869 it suddenly appeared on railway sleepers and wooden railway bridges all over the country. We had it sent to us from all quarters, and we gathered ourselves more than 100 specimens near the Hampstead Heath tunnel of the North London Railway. Undoubtedly this comparatively new and most destructive pest to pine-timber is now common with us. In 1869 we received our first specimens from a railway bridge at Abergavenny, and passing over the bridge a few days ago, we found a new bridge in course of erection, the old wood being reduced to so much rotten tinder, with the blackened fungi still adhering to the planks. W. G. S.

ECCLESIASTICAL DILAPIDATIONS ACT, SURVEYORS.

Lincolnshire.—The following gentlemen have been elected surveyors for Lincoln under the new Act:—Mr. Hine, of Nottingham, for that district; Mr. Fowler, of Louth, and Mr. Goddard, of Lincoln, for Lincolnshire.

Peterborough.—This diocese has been divided into three districts. Mr. E. B. Browning, of Stamford; Mr. Colin Alex. Macaulay, of Leicester; and Mr. Thos. Graham Jackson, of London, have been elected.

Chichester.—Mr. Lucy W. Ridge.

Salisbury.—Mr. G. R. Crickmay, for the archdeaconry of Dorset.

Lichfield.—The names of two of the surveyors were not given last week. In addition to Messrs. Stevens & Robinson, of Derby, the others are Mr. G. Lyman, of Stoke-upon-Trent, and Mr. Groves, of Shrewsbury, the County Surveyor of Salop.

Canterbury.—Mr. Clarke, jointly with Mr. Spooner, already mentioned.

SUSSEX ARCHÆOLOGICAL SOCIETY'S OUTING.

THE autumn meeting of this society proved in many respects agreeable, although there are complaints as to the management, notably for want of conveyances at some of the points, and the lateness of the hour at which any refreshment was obtainable. The chief building visited was the parish church of Witham. The Sackville Chapel here includes three monuments, respectively by Chantrey, Flaxman, and Nollekens. Buckhurst was visited. At two o'clock a move was made in the direction of Bolebrook, the site of the remains of an ancient brick mansion—one of the earliest in the county, where Earl Delawarr had given instruction for a luncheon to be prepared. Of Bolebrook the only parts now remaining are the gateway tower and the north-eastern portion of the house, which is now used as a farmhouse, and is the residence of Mr. Whitmore, who occupies the land in the immediate neighbourhood, under the earl.

After luncheon, Lord Delawarr gave the following particulars:—

"Bolebrooke is one of the earliest brick buildings in this country, being built about the middle of the fifteenth century. From what remains, the original plan may be traced. It probably was suffered to go to decay in the reign of James I. on the transfer of the property to the Tuftons, earls of Thanet. There were a park and demesne. It was originally the property of the Delyngdges, of Bodiam, and passed to the Sackvilles by marriage of Margaret, daughter and heiress of Sir Edward Delyngdurge. The Tuftons succeeded to the property by marriage, and bequeathed the estate to charitable purposes. In 1770 it was sold

under a decree of the Court of Chancery, and purchased by Lord George Germain, formerly Lord George Sackville, who, when created a peer by the title of Viscount Sackville, took from it his second title of Baron Bolebroke. Afterwards it was again united to the large possessions of the house of Dorset, in 1870, when it was bought by John Frederic Sackville, third Duke of Dorset, maternal grandfather of the present Earl De la Warr, whose father, the fifth earl, succeeded to the Sackville estates through his marriage with Lady Elizabeth Sackville, daughter of the third Duke of Dorset. Her ladyship was the last of the old family of Sackville."

STRASBURGH PROTESTANT CHURCH COMPETITION.

We have had before us for some time the programme of this competition, which is addressed to all architects, but the treatment received by English architects in similar matters abroad has not been such as to lead us to persuade any of our countrymen to give time to the speculation. However, the programme is at our publishing office, and may be seen by any who apply. The designs are to be sent in by the 31st of January, 1872. The total amount to be expended is £2,000, including the fittings and organ, which is to be of high character.

ARCHITECTURAL ART CLASSES.

The opening of these classes at Lupton-street, Westminster, on Thursday, November the 2nd, is intended to be made the occasion for a general meeting of the profession and all interested in the promotion of the technical education of the young architect, with the view of eliciting opinion upon the general scope of these classes, and suggestions for the more successful carrying out of them. The proceedings will be commenced at 8 p.m. by the distribution of prizes by the President of the Joint Committee, Mr. Waterhouse, to the most successful students in the three classes; viz., the Life, the Antique Figure, and the Architectural Ornament, for work done in the Museum. The drawings will be exhibited, and then an open discussion will be invited upon the general question, in which it is hoped that some of the leading members of the profession will take part, and it is to be wished that all who may be engaged in the education of the young architect, either as receiving pupils or employing improvers, will endeavour to be present, and, if possible, contribute something to the general information.

THE LATE MR. CHARLES BABBAGE.

The death is announced of this eminent mathematician and mechanician. He was born on December 26, 1792. In his work entitled "Passages in the Life of a Philosopher" will be found interesting details of his boyhood and early youth. Perhaps by no work will Babbage be so widely known as by his "Tables of Logarithms," upon the preparation of which he bestowed the highest care. In order to diminish the fatigue of constantly picking out figures from black and white pages, he experimented upon tinted papers and their effects upon the eye, the result being that his logarithms were partially printed upon green and fawn-coloured sheets. These logarithms were used in the calculations of the whole of the Trigonometrical Survey of Ireland, and in those of the English Survey from the period of their publication. They were also printed for foreign circulation.

Babbage's researches as a mathematician had always been directed in a special manner to those branches which are connected with the recognition of law in numerical series. The idea was early suggested to him that it was possible by means of mechanism to perform the operations involved in the calculation of such series. He had noticed that even the best tables hitherto published are wanting in accuracy; and he considered that if, in place of tables constructed (however carefully) by ordinary computation, the unerring results of mechanical operations could be employed, a large gain would accrue to the astronomer and the seaman, whose calculations depend so largely on the accuracy of the tables they make use of. He visited the principal centres of machine labour in England and on the Continent, studied carefully the various forms of mechanism and the character of the work performed by each; and

finally, in 1821, having, as he conceived, mastered all the essential difficulties of the problem, he undertook the construction of what he called a "Difference engine" for the Government. By the year 1833, a portion of the machinery had been put together, and, on trial, it was found to perform its work with all the accuracy promised by its constructor. But in the meantime various difficulties not contemplated by Babbage had arisen. His association with Mr. Clements, a clever engineer, had not worked so well as he had anticipated. Government began to doubt whether the scheme could be successfully completed; and when Babbage announced that a yet nobler design had been formed by him, which needed only Government aid for its realisation, "an alarmed Government," says Professor Nichol, "with Mr. Goulburn and Sir Robert Peel at the head of the Treasury, abandoned the great enterprise. They offered Mr. Babbage, in recompense, that the difference engine, as constructed, should be considered his own property,—an offer which he courteously declined to accept. The engine is now in the museum of King's College, London." The late Lord Rosse, on leaving the chair of the Royal Society, entered a just protest in the name of the leading savans of England against the injudicious parsimony displayed by the Government in this matter.

Besides having been Lucasian Professor of Mathematics at Cambridge, Mr. Babbage was a member of the chief learned societies of London and Europe, and contributed many important papers to their transactions.

OPENING OF WOLVERHAMPTON NEW TOWN HALL.

The new Town-hall, in North-street, Wolverhampton, has been opened with some ceremony, in which Lord Wrottesley, the lord-lieutenant of the county, took the leading part. The new edifice occupies one side of a square, which is filled by the not very handsome general provision market, the opposite side of the square being occupied, but not beautified, by the Exchange. The new Town-hall is erected on the site of the Lion Hotel, famous in old coaching days. The new building comprises, under the common roof of Town-hall, council-hall, sessions and police courts, police station and barracks, and all adjunctive municipal and parochial offices.

The style of architecture is Italian. The centre portion of the facade projects, leaving double pilasters at the angles, of the Corinthian order, and is surmounted by a dome-shaped roof, terminating with an ornamental iron cresting. The two wings also project slightly, and have single Corinthian pilasters at the angles, finishing with mansard roofs, having also ornamental metal crestings. The new buildings are divided into two portions. The main or principal, facing North-street, contains the sessions and magistrates' courts, council chamber, and various offices required in the new Town-hall; that portion of the building in the rear, with frontages to Red Lion-street and Corporation-street, being devoted chiefly to the police barracks, fire-engine, &c. The ground floor of the barracks contains, firstly, charge-room, with female searcher's rooms, and bedroom adjoining; mess-room, 30 ft. by 15 ft. 3 in.; instruction-room, the same size; library and sergeants' mess-room, each 19 ft. 3 in. by 15 ft. 3 in.; cleaning-room, drying-room, kitchen, scullery, and larder. At the end of the corridor a flight of stone steps, 8 ft. 6 in. wide, communicates directly with the ground floor of the Town-hall. The principal entrance for the policemen is from the yard, with staircase adjoining, leading up to the bedrooms on the floor above. There are twenty-one bedrooms on this floor, with sick-rooms, bath-rooms, water-closets, &c. Owing to the great declivity of the ground from North-street to Red Lion-street, the ground floor of the barracks and basement floor of the Town-hall will be precisely upon the same level. On each side of the entrance to this basement, from the police-yard, are offices for the inspectors of weights and measures, stores for stolen property, &c.; and completely separated are the various cells for prisoners, male and female, with large exercising grounds for each on the opposite sides of the building. There are 17 cells for male prisoners, and 15 for females, the average size of each cell being about 15 ft. by 6 ft. Separate cells are also provided, leading direct to the docks in the courts above. Provision has been

made for the proper warming and ventilating of the different cells. The space under the central hall is required for the heating apparatus, coal-stores, &c.

The whole of the front and two wings of the building are built of Cefu stone, but the main body and police barracks are red brick relieved by blue bands and blue bricks slightly used in the window arches and other parts. The carving in the stone front, and some other parts, is the work of Mr. Frampton, of London. The whole is built from the design of Mr. Bate, of London and Manchester, by Mr. Horsman, of Wolverhampton, and the total cost will be about 20,000. Mr. Whiston was clerk of the works. Since the plan was first adopted it has been modified in many respects, as in raising the elevation by placing it upon a basement of some height. Now, raised up and thrown back, with a broad pavement and ornamental gas lamps before it, it looks all that one could wish the Town-hall of Wolverhampton to be.

In the vestibule, floored with tessellated pavement, furnished by Messrs. Malkin & Edge, of Burslem, is a full-length figure of the late Mr. G. B. Thorneycroft, the first mayor of Wolverhampton, sculptured in white marble by Thorneycroft. It was removed, by the express wish of the town and the permission of the family, from the cemetery, and stands upon a block of polished Cornish granite, surrounded by an ornamental railing in hammered brass.

STEAM-WASHING APPARATUS.

SIR,—Whilst considering over the advantages to the domestic part of an ordinary man's house, in the shape of the wringing and revolving barrel-washing apparatus, it occurs to me that a great saving of labour, and the "terrible washerwoman," might be effected, if steam or water power could be brought to bear on the wheels (substitute drums), at a cheap rate.

Will any of your readers endeavour to enlighten me as to what power would be required in an engine, &c., to drive one of the machines mentioned herein, i.e., that a strong woman could turn; or what height a cistern of water should be, with an inch-pipe therefrom, to give sufficient force to work a turbine that would be as effective; also probable cost?

If steam was used, I think a fan might be applied in a chamber to propel hot-air into a small drying-closet, and thus a great day's work (by hand) be completed in a few hours. I will not go so far as passing steam into rollers for mangling yet. H. T. P.

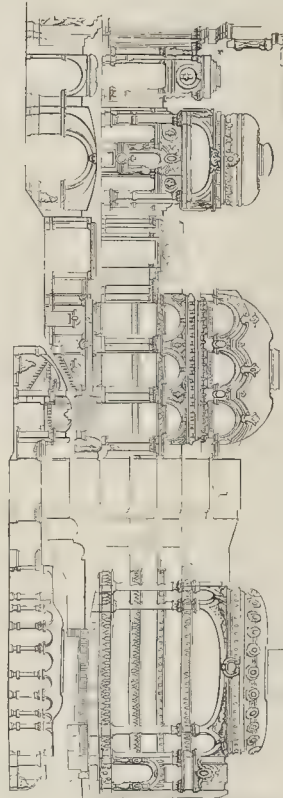
THE NEW CORN EXCHANGE AND TOWN HALL, HUNGERFORD.

This building has been opened. It combines the Corn Exchange and Town Hall, is constructed of red brick and Bath stone for the front facade, and forms an elevation in the Italian style. The arches to the arcade are supported by stone columns, and carved capitals, filled in with ornamental bricks, the frieze ornamented in like manner. The building is entered through wrought-iron gates under a clock-tower, and on the left of the entrance-hall is the justice-room. Out of an inner hall, a staircase of stone, well lighted, leads to the Town Hall. By a short corridor (which gives accommodation on either side for convenient ante-rooms), immediate access is gained to the Corn Exchange, the walls of which are lined with white bricks, interspersed with red brick string courses and bands. There is an open-timbered roof, stained and varnished. A skylight runs along the entire length of the room. A gallery is provided at the east end, approached from the principal staircase, and will be useful as a ladies' gallery, or for an orchestra. At the top of the principal staircase, and opening from a landing, on the right is the Town Hall, and on the left the gallery (overlooking the Exchange) and ladies' retiring-room.

The whole of the works have been carried out by Mr. Hoskings, of Hungerford, contractor, from the designs and under the superintendence of Mr. James H. Money, of Newbury.

The clock presented to the town by Mr. W. R. Hall has been transferred to the new clock-tower, with two additional dials.

Mr. Low, who was the sub-contractor for the plumbing, painting, and glazing, presented a stained-glass window in the Town Hall, bearing the town arms and those of John o' Gaunt. The stone carving was executed by M. de Visse.



PARIS NEW OPERA-HOUSE.—LONGITUDINAL SECTION.

200 FEET

The view we here give of the Opera-House shows that, structurally, as it would appear had it not been hedged in by huge lodging-houses. Unfortunately for the good looks of the House, its approaches were left to the tender mercies of haphazard engineers. Hence, the houses of the square which separates the Opera from the Boulevard conceal the Opera's lateral pavilions. Again, the Boulevard des Italiens having been raised above the level of the surrounding streets, the ground-floor of the Opera, when looked at from the Boulevard, seems as though it were in a pit. M. Garnier, the architect, must be excused for faults not his own.

Worthy of notice in the New Opera-House are the separate coverings of the stage and the house proper; the stage having a large gable roof, the house a low cupola, suggestive of the house's inner form. At a lower level are seen the footings of the minor parts of the building and the small domes quickly spanning over the side pavilions. Thus, the outer building bespeaks its inner arrangement. This many-levelled roofing is certainly a new device; for the old play-houses are, as a rule, capped with one comprehensive roof.

The principal front of the building is a smooth-walled basement story, on which rests large coupled Corinthian columns, whose intercolumniations are occupied by smaller Corinthian columns. These smaller columns bear bald-eyes framing busts of musical composers. The smaller columns meant to do duty as an ornamental screen are of deeply-coloured marble, with gilt capitals; whereas the large coupled or twin columns, on which rests the whole structure, are of hard white limestone. The ornamental effect of the smaller columns has unfortunately been rather spoilt by the heavy attic over the front, which so dwarfs the larger columns, that the smaller columns seem to have been called in as extra hands to help in carrying the

building. In fact, the smaller columns fail to suggest the idea that their purpose is exclusively ornamental. This failure, however, is attributable to an alteration in M. Garnier's original design. Pressed by public or rather democratic opinion, M. Garnier had to throw into one the two foyers of his first plan. Hence, the immense height of the foyer's ceiling, the heavy attic over it, and the consequent patchwork just mentioned.

We have already hinted that the front elevation presents a system of gracefully-broken general lines. The lateral elevation is equally varied. The pavilion which forms a centre to this elevation contains the private rooms of the ex-Empress. Two carriage-ways lead up to it: a covered way inside, and an uncovered way outside. In the elevation of the administration buildings are elongated windows, two stories high, and divided into two parts by little bronze railings. Architectural unity was the reason of this arrangement. Thus, indeed, the windows of the first story of the House proper seem to run round the whole building, and give it compactness. The architect of *Hamlet* already mentioned in a former Number of the *Builder*, when a plan of the establishment was given (vol. xxviii, p. 455), rises to the first story under a large quadrangular dome, supported on each side by three arches resting on red granite columns. Behind these arches are seen the bronze busts of the great French writers. The vaulted room under the theatre is surrounded by a circular archway, and is to be used as a vestibule by persons alighting from carriages under the eastern pavilion.

As for the stage, it is high and deep enough to allow of ships as large as the stage curtain, being freely moved up and down, to and fro. At the back of the stage, for the dancers, is a fantastic ceiling, which can be opened out to the stage.

LAWRENCE H. HALL.



THE NEW OPERA-HOUSE, PARIS.—M. GARNIER, ARCHT. DTL.

ORGAN CASES.

EVERY lover of the organ must feel obliged to the *Builder* for the excellent drawing of the instrument in the Cathedral of Bois-le-Duc, and also for the article which accompanies it. In a musical as well as an architectural point of view I agree with the opinions expressed. Many a good organ is spoilt from being put into any hole or corner so as to be out of sight; the tone, from its situation, is damaged; and, for want of a case, much injury arises from dust and dirt.

Your illustration shows one of the most elaborate cases I am acquainted with, in general design not unlike that at Harlem, but with a far greater amount of decoration. It also has the advantage of being made of dark oak, that at Harlem being painted white. Amongst the early organs should not those at Freiburg, in Bregau, be included? The organ in the nave, plain but picturesque, dates from 1515, and that in the choir about 1700. In Dieppe are also two organs, with fine Renaissance cases.

I have always considered the old organ-case at St. Paul's to be an example of what an organ-case should be, but I do not agree with the views expressed as to the merit of that in St. George's Chapel, Windsor; elaborate it is, but it is also very heavy and wanting in outline. However, it is nothing like as bad as what is put up now as a Gothic case, and lauded as such.

Mr. Sutton's work I greatly admire, and have long waited for that which he mentions at the end of his book, saying, "No attempt has been made to illustrate this subject from existing examples on the Continent, as it is hoped, that ere long, a very fine and exhaustive work on Foreign Gothic Organs, will be before the public." This was written in 1866; the materials for this work I know are ready, and the drawings, I am told, are excellent. What a pity it is that the author does not complete it, and give the world the pleasure and advantage of a work which has been the labour of years.

You say that the organ is mentioned eighteen times in the Holy Scriptures. On referring to Smith's Dictionary, Kito's, and to Carl Engel's "History of the Music of the most Ancient Nations," they all state that the organ is mentioned but four times,—once in Genesis, twice in Job, and once in the Psalms. Can you all have overlooked its mention in other places? J. N.

ST. MARTIN'S LANE.

ATTENTION ought to be directed to the rebuilding at the southern end of St. Martin's-lane (the corner), formerly Palmer's glass warehouse. I am told that a new building is to be erected on the site for the St. Martin's Savings Bank. Should this be correct, surely some pressure ought to be brought to bear on the Metropolitan Board of Works to lead them to embrace so excellent an opportunity for widening that portion of St. Martin's-lane. F.

THE CHICAGO FIRE.

I SEND two or three extracts taken from the *Evening Standard* of the 21st inst., which in turn derives them from American papers. They will explain the causes of this celebrated conflagration being so rapid and extensive.

"The wind blowing a stiff gale had possession of the flames. Harrison, Van Buren, and Madison streets were soon reached. The wooden pavement took fire, making a continuous sheet of flame two miles long by a mile wide."

"In Jackson-street, between Clinton-street and Canal-street, there was a continuous line of wooden buildings, mostly two-storied frame dwellings, and at the back of these were various carpenter shops, barns, sheds, wood piles, &c. The buildings were enveloped in flames, and in twenty minutes a very large space was all ablaze."

Again, "In Adams-street the buildings were all wooden structures, mainly occupied as residences."

It has been mentioned by you already that shingles were much used for roofing.

An estimate is also published in the same paper from a merchant of Chicago, valuing the total losses through the fire. He reckons 10,000 houses burnt, 2,000 business houses, worth 5,000 guineas each, and 8,000 dwelling-houses, averaging 800 guineas each (the "400 dollars" being a misprint for "4,000 dollars"). Aggregate loss of every description, about 40,000,000 sterling.

Although timber is very wisely prohibited from use in the external walls of London houses, yet we run a great danger from which Chicago was exempt, in the narrowness of our old streets. The width of streets in Chicago is stated to be for the most part 80 ft.; while in the ancient portions of London how many scores and hundreds of streets are there of from 10 ft. to 20 ft. only! Suppose a fire once to gain any head in these narrow lanes of the City, who is to say where it would end? H. Y. P.

Among the buildings known to have been destroyed is the Court-house, a not very imposing, but solid structure, of Lookport limestone, which stood in the most central square in the city. It was built in 1855, but since that date it had two wings added to it, for, like the city, it needed expansion. This did not much improve its appearance. Facing the Court House stood the sumptuously-fitted Sherman House, one of the principal hotels of the city, built of Athens marble, and costing 400,000 dollars. The Western Union Telegraph building, two blocks away, was another of the doomed edifices. Crosby's Opera-house, a finely-constructed and costly theatre, on Washington, between State and Dearborn, had a frontage of 140 ft., and ran back 179 ft. It was completed in 1865, at a cost of 450,000 dollars. McVicar's Theatre, on Madison, between State and Dearborn, was not a very imposing edifice, but good plays have been well played within its walls. Tremont House, a large first-class hotel, stood at the corner of Washington and Dearborn streets, and was patronised by the aristocratic circles of the west. Farwell Hall, one of the largest and most famous lecture and meeting halls in the country, which would easily seat 4,000 persons, stood on Madison-street, between Clarke and La Salle. The Chamber of Commerce, built of Athens marble, in the modern Italian style, at the corner of Washington and La Salle, was a fine building. In this was the Board of Trade Hall, sumptuously furnished, brilliantly lighted, and artistically frescoed. Its loss will be a regret, as it was among the most finished specimens of architecture in the west. Customs and Post-offices, on Monroe, corner of Dearborn, was also a fine building, built of Athens marble. The Union Depot, though not handsome, was a solid building, and its loss will be a hindrance to the resumption of business. The City Water-works, which are probably destroyed, stood at the land end of the Michigan Lake Tunnel, which supplies the city with water. They were looked upon not only as a splendid piece of engineering, but also as an object of great interest. This work was commenced March 18, 1864, and completed December, 1869. The whole cost, inclusive of lighthouse and improvements to the present works, probably reached 1,000,000 dollars.

PROGRESS OF STEAM CULTIVATION.

SOME interest has been excited amongst agriculturists by an exhibition of the practical working, on the farm of Mr. King, at Highnam, of steam cultivating machinery, invented by Mr. E. Hayes, of Stoney Stratford. The apparatus has been described, and commended, in the *Engineer*, and also in agricultural papers. It is difficult to give a very intelligible description of the invention without the aid of diagrams. But we may state that the engine is placed in one corner of the field to be ploughed or cultivated, with the windlass behind it; the rope is then led round anchored pulleys, the only peculiarity being in the mode of anchoring at each headland the pulleys, which require to be moved at each bout. The movement is effected by the use of two plain claw-anchors, to which the pulley is secured by double chains, so that it is placed at the apex of a triangle, and each anchor is lifted alternately to double the distance shifted by the implement at the end of each bout. A considerable saving of time is effected by this arrangement. A man sits on the cultivator, and helps to guide it; and the implement makes its way, at a rapid pace, to and fro between each headland. Without check in speed, it runs to within a yard of the turntable, and turns round back into its work without a moment's stoppage. This result is produced by a self-acting windlass, invented by Mr. Hayes. The peculiarities and advantages of the windlass are thus summed up.—1st. By its use there is no stoppage at the headlands in cultivation. 2nd. No checking the speed of the cultivator at the headlands. 3rd. One man superintends both engine and windlass with

ease. 4th. No wheels are put in and out of gear. 5th. The anchor man at each headland can stop the implement at the headland or any other part of the field without stopping the engine. 6th. The work can proceed in fogs or by moonlight. 7th. An ordinary 10-horse power portable engine, with one cylinder is all that is required, as it runs continuously, and the steam is never shut off. The saving by the non-stoppage is regarded by those who have adopted the windlass as equivalent to the pay of the labourers employed. With a 12-horse ordinary portable engine, and recent sets of the apparatus, from twelve to fifteen acres have been cultivated in a day, and the consumption of coal is under 1 cwt. per acre. The engine, we may add, may be used, not only for steam cultivation, but also for thrashing, chaff-cutting, root-pulping, corn-grinding for feeding, and other purposes.

OPENING OF THE NEW CORN HALL, YARMOUTH.

A commodious Corn-hall has been constructed at Yarmouth. The new hall is 60 ft. long by 30 ft. wide, and 23 ft. in height. It is lighted by a skylight 45 ft. in length. The roof is supported by seven wrought-iron principals, and clad with V-jointed varnished boarding. At the ends are fireplaces, with Bath stone mantelpieces. The gas corona, with twenty burners each, are suspended from the iron principals. Adjoining the corn-hall, and at right angles to it, connected by sliding doors, is the auction mart, 54 ft. long by 24 ft. wide, lighted with a similar skylight; but the roof is supported by framed principals, with wrought-iron ribs, springing from stone corbels. The two rooms have a superficial area of 3,000 ft., and can be used together or separately, as required. Adjoining the rooms are offices, settling-room, refreshment-bar, storage-rooms for auctions, lavatories, &c. The entrance into Howard-street is in the Italian style of architecture, built of white bricks, with cement dressings. Over the door is a carved stone spandrel, by Howard, of Norwich, representing wheat-sheaves and harvest implements. An iron palisading is intended to be added to enclose the area. Of the entrance from the Quay, through the Duke's Head yard, nothing is seen but the doorway, having a similar carving to that in Howard-street. The works have been carried out by Mr. J. W. Lacy, of Norwich, from designs and under the superintendence of Mr. J. B. Pearce; and the approximate outlay, including site, is about 3,800*l*.

THE TRADES MOVEMENT.

IN various districts this movement is spreading to other businesses than those of the building and engineering trades, and everywhere the nine-hours movement is receiving favourable consideration from the employers, who now seem to vie with each other in many cases in either granting it at once, or promising it shortly.

Carlisle.—Messrs. Pratchitt, Brothers, engineers, have given notice to their workpeople that on the 1st of January next the working hours of their establishment will be fifty-four per week. This announcement has been received by the entire body of workmen in Carlisle with great satisfaction, more especially as Messrs. Pratchitt have granted this boon without any application at all from the men in their employment.

Hartlepool.—A private interview between eight representatives of the men at the Middleton Iron Works, Hartlepool, and Mr. Richardson, the head of the firm, resulted in the nine-hours system being immediately and cheerfully conceded. A mass meeting of men was held on the Town Moor, to celebrate the event, when it was resolved to present the firm and Mr. Smith, the manager, with a complimentary address, and to subscribe one day's pay per man to the Newcastle fund. After cheers for the firm, the manager, and the deputation, the men marched in procession through the town, headed by their band.—A deputation waited upon Messrs. Denton, Gray, & Co., iron ship-builders, to request the concession of the nine-hours system of labour. They were courteously received by Messrs. Gray & Richard Denton, and, after stating their views, those gentlemen agreed to concede the nine hours, on and after January 1, unconditionally, and arranged special terms for the interval. At four o'clock, the men, who numbered over 1,200 in all branches

of the trade, left work for the day, and paraded the town in procession in honour of the event, it being arranged that a formally-organised demonstration should be held to celebrate their success.

Glasgow.—The lock-out of the Clyde shipwrights has ceased. At a recent meeting of ship-carpenters, in Govan Hall, the following letter was read from the secretary of the Clyde Shipbuilders' and Engineers' Association:—

"Sir,—I am instructed by the Clyde Shipbuilders' and Engineers' Association to inform you that they have this day (October 17) decided to advance the shipbuilders' wages. The rate now to be paid by all members of the Association will be 6d. per hour."

It was then agreed that work should be resumed next day. The question of overtime was afterwards discussed, when it was resolved that no overtime should be worked after six p.m., unless time and a half were allowed.

Lincoln.—Several thousand men and boys are employed at the various engineering works in Lincoln, and their manufactures are in great demand. The boys struck last week, for 1s. to 2s. a week extra, according to their class, the men giving notice for nine hours a day, and advance of wages. The masters afterwards met, and complied with the men's demands as to time—the question of wages to stand over, but refused to set any of the boys to work, as they left without notice. They will most likely reconsider this, as men are not usually employed to do boys' work, and there are no other boys to be had in Lincoln.

SCARCITY OF TIMBER.

THE *Revue des Deux Mondes* publishes an article, by M. Brolliard, on the growing scarcity of work-timber, which has its cause in the frequent sales of forests effected by the *domaines*, and the carelessness and need of private owners. Consumption of timber has wonderfully increased in Europe and America for the last three-quarters of a century. France now buys more foreign building (working) timber than is produced on her soil. England also, almost bare of tall trees, except those fine oaks carefully preserved in her parks, now imports twice as much timber as France, of which supply the British colonies only yield a minor fraction. Deprived nearly of any forests, Belgium and Holland require large imports from abroad, and even Northern Germany, felling her forests too young (under 100 years old), is obliged to supply to foreign countries, and even to France. The magnificent tall woods of Austria disappear under the hatchet of companies who are in a hurry to realise their bargains (sometimes 8l. an acre purchase price).

The statistics of oak timber for France are given:—Twenty years ago the marine required 80,000 cubic metres of round timber. Private shipping consumes from 100,000 to 120,000 cubic metres. Railways, stock and plant, 50,000 cubic metres. 30,000 cubic metres, more or less, are needed for the artillery and engineer corps. But of all the uses, the casks for wine and spirits demand the greatest quantity,—400,000 cubic metres. So that, with other industrial and agricultural employments, we reach a total of one million cubic metres (34,000,000 cubic feet). As matters stand, France wants 1,000,000 cubic metres of oak yearly, which would suffice to make a plankway 20 yards wide, from Marseilles to Dunkirk, and which quantity, in their present state, the forests cannot afford to supply.

FURTHER MUSINGS ON STRIKES AND WAGES, BY A WORKMAN.

SIR,—Since I last wrote, it is settled. And now what about the consequences? After-considerations are nothing; the present is the only time. The workmen have won, and everybody is soon to have the nine hours, even the agricultural labourers. If bread and meat, butter and eggs, rise in price on that account, of course the other workmen are ready to pay it, and perhaps their wives will not grumble, as their husbands have for the present got all they want in their success in the nine-hours movement. The question of the effect of the reduction of the hours of labour on the industry of the country, is not for a moment to be considered. As the engineers have done all others must do, "when the right opportunity arrives." The reduction of the hours of labour is to do something wonderful for self-improvement and self-enlightenment. Well, we shall see.

Steam-engines and other machinery may be higher in price, but that does not concern either

the masters or men. They are only one section of the public, and as they supply the others, it is the public who pay. The engine-drivers get more, the general public less. It is only a question of exchange after all. Still there is no law to compel the public to buy the productions of English engineers. It is no doubt a fable, that not long ago a contract for engines to run on the Great Eastern railway, was taken from English firms, because foreigners could and did make and deliver them at less cost. It was very unpatriotic, more especially as at that time a large number of engineers could not find work. But the shareholders' interests had to be considered, and the directors concluded that it was best for them to buy in the cheapest and best market. It shows that interests are not identical. The tailors are opposed to the shoemakers; the builders to the occupiers and buyers of houses. But perhaps the leaders of labour buy no foreign productions,—they patronise only the produce of their own country. Now, for instance, glass worked up into various articles is useful and ornamental. The glass trade is the perfection of trade-unionism,—a trade that is regulated to the supply and demand,—a close trade, in which apprenticeship is limited; the regulators gauge the public wants, or at least believe they do; and the men would strike to a man if half a dozen apprentices were taken above the regulated number. But more than half the glass sold in this country is imported. A mere glance at exports and imports will tell that this country is fast losing the trade in glass. Why is it that the public do not buy English in preference to foreign? The glass trade is a model trade; sometimes we are told how much it pays to the unemployed in the trade, therefore it is worthy of all support. But, although considerations are not to be considered, the public buys the foreign because it is best and cheapest. I might still further enlarge on that point. We are a flourishing people. The value of imports into the United Kingdom for the last year was 308,296,682l., and the exports amounted to 199,649,983l. It may be all a story, but the book says this country went to the bad side of the account 104,647,000l. Still, the effect of strikes is nothing on the industry of the country. The workmen have won amid loud congratulations. Cost! what is cost? The policy of the leaders of the workmen reminds me of an incident I witnessed in a workshop. A workman was employed in making a pair of large doors; before they were completed, the employer came to him and said, "There are long doors, and cost a good deal of money." The workman said, "Cost, what has cost to do with me? I know nothing about cost." The master said, "It has to do with me. You must find another master who does not consider such items; and I will find a workman that will make the cost less." Such in effect is what the foreign consumers say to the English manufacturer. "The cost concerns us; we now buy of you because you can sell the articles we want, so that it suits our purpose and our pockets to buy; but raise the price above our means, we must find cheaper markets or manufacturers for ourselves." So long as English manufacturers can sell a cheaper and better article than can be produced elsewhere other countries will buy,—raise the price so as to make it worth their while to produce for themselves, they will do it. A trade lost upon such grounds is never regained. Signs of the times as it relates to exports and imports. "What has that to do with it?" say the workmen's leaders. "Have not we formed a new alliance by which all sections are to be fused into one? And when the workmen labour only eight hours per day all wrongs will be smoothed away, and exports and imports will not be required." In the intermediate or transition state I am afraid that practical men will have to consider that question. I am aware that English economists largely ignore exports and imports, as the wages depend on the magnitude of the capital or fund, appropriated to their payment, compared with the number of labourers.

During the engineers' strike that fallacy pervaded the correspondence. The whole case was based on the supposition that, let what would be done, it did not affect any but the people of this country. The workmen's advisers in their press said, "There can be no doubt now in the minds of the working men of England that capital is their enemy, and that it is their duty to wage war with the capitalist as the Germans made war with France, without any idea of mercy." Such are the weekly tirades of men who are

capitalists, and the above extract is a fair specimen of the intellectual wares they retail to the readers, their customers. Comparisons are odious, and I will not make them, but as a practical commentary on these teachings, I would ask why it is they do not give a fair outline of the condition that a workman ought to occupy; and, after doing that, to place themselves in that happy position,—divide the profits of the business among the workmen. The square the proprietor dates from is far beyond the best accommodation of the best workmen, and it is obvious those "who live in glass houses should not throw stones."

England stands in a precarious condition: no other country in the whole world is in a like position. We buy and we sell,—in fact, we live upon,—exports and imports. We are dependent for our bread upon the supplies of corn from other countries; and when men talk of fighting capital, and harassing and ruining capitalists, they are cutting off the supplies of the principal sustenance of life. In a somewhat interesting letter which a professor wrote to the President of the late Miners' Conference, the above fallacy pervades it, and the same advice is given,—namely, "for all classes of workmen to amalgamate for the purpose of having a pull all together against the employers."

These men always speak as though capital was one and indivisible, and that an agreement existed among employers to oppress the workmen. The fact is, and there is no disputing it, that all trades are balanced by competition, the opposition of monopoly, the safety-valve of humanity; and as no one wishes to pay more for an article than he is forced, that is the lever or balance which regulates commodities, so that all may get a share. Excepting we return to primitive usages, and institute a system of exchange of commodities, or establish an equality of value, there is no other known method of regulating prices but competition. Comedians may ventilate their theories, and under the flimsy name of positivists try to introduce a new social system more despotic and foolish than any yet thought of; but it is evident that in this age no Lycurgus would stand a chance, and no one would be able to substitute an iron for a gold and silver coinage. Unless a great change takes place in agriculture, and in the cultivation of the soil, Englishmen will have to work and produce largely to pay for the food which they consume.

Among the curious things of daily occurrence are the criticisms and comments which appear on workmen's agitations; they are wise to-day, foolish to-morrow. A morning and evening Conservative paper has in general some smart paragraphs on the actions and movements of the Democrats. In connexion with the New Alliance and its crude resolutions, it finds there is nothing wrong in the resolution limiting the working day to eight hours. Almost the next day it finds that the contract for the ironwork for the Vienna International Exhibition, 1873, is taken by a Prussian firm, although several English firms tendered for it. It said "England is fast losing her pre-eminence as the Tubal Cain of Europe," and asked what is national superiority in the industrial world compared to the political advancement of the working-class leaders. The next day another article appeared "On the Conservatives and the Working Classes." The writer states "We, the working classes, owe no end of advantages to his party. To them we owe the Factory Acts, which were opposed by Bright and Cobden, and that all the arguments with which the public were recently made familiar in the Newcastle strike had done duty five-and-twenty years ago." The whole gist of the article is,—only be Conservatives, everything will then come right; and every man, I suppose, will live in his own homestead, under his own vine, and no Radical will make him afraid. As the Conservatives seem to go in the interests of party beyond common sense, comments on such trash are useless. I have said that England is unlike any other country. We have far outlived the time which Malthus feared, and have outrun the means of subsistence. Last year, ending the 31st of August, 1871, if the Customs returns are correct, 19,000,000 quarters of wheat were imported into England: almost the whole of it was consumed in this country. The average price was 49s. 2d. per quarter, making the total cost for that alone 46,708,195l. 6s. 8d. And further there were 16,000,000 bushels of foreign barley consumed; allowing for reshipment of grain, the cost to this country for corn food alone would be upwards of 50,000,000l. I wonder

whether the strikers ever considered the effect of that on national industry. I find the cost of unmanufactured tobacco imported for the first nine months was 2,078,274, and hops, 399,166. For 1870, 8,439,386 gallons of foreign and colonial spirits were imported, which, with the duty, cost 9,233,325. If the other imported articles were to be enumerated, it would swallow up the greater portion of the produce of English industry. During the nine months, 2,390,000,000 yards of cotton goods have been exported, of the value of 40,000,000, not sufficient to cover the value of the corn imported. In fact, luxuries alone, such as spirits, wines, and tobacco, swallow up the value of the exports of iron, coal, and machinery. For the eight months ending August 31st, 1870, 6,180,382, worth of iron was exported, and only 5,840,299, worth of iron was exported for the eight months ending August, 1871. I might add many more items of comparison to the above figures, but sufficient is given to show that there is something more involved than workmen's wages and employers' profits. If there were no capitalists Englishmen would still have to produce and labour to pay for the common necessities of life. Strikes cannot alter it. The history of trade and commerce shows many instances of trade leaving one country and establishing itself in another. Strikes, in some instances, have been the cause. No employer can work an unprofitable trade. English workmen must remember that half the food of this country is imported, and when they parade districts with bands of music and other paraphernalia, that no other country is so situated as this. Beer, their commonest luxury, cost last year over 63,000,000, and consumed 60,000,000 bushels of barley. A deal of hard work must be done to pay for that alone. Workmen's successes and masters' failures may be causes for congratulation. But even the cost may be injurious, and may kill the bird which now brings the golden eggs. There are still many considerations unconsidered; and as neither the workmen nor their leaders will undertake the job, I will, with your permission, in another letter return to them. JACK PLANE.

KIDDERMINSTER NEW INFIRMARY.

The completion of this edifice has been a cause of rejoicing, when it was formally handed over by the building to the working committee. The new building is capable of accommodating forty-four patients, and is provided with all the newest appliances that modern science has invented for the charitable objects for which it has been built. It was commenced with hesitation; but the donations of 1,000, from Mr. Lea, M.P., and 500, from Messrs. Brinton & Lewis, gave the committee confidence. They selected the design of Mr. Bland, of Birmingham, and accepted the tender of Mr. Binnian, of Kidderminster. In June, 1870, the memorial stone was laid by the Countess of Dudley. The building is situated at the top of Mill-street, on elevated ground. It is divided into two departments, — the dispensary, for the supplying of medicine to, and examination of, out-patients; and the infirmary, for the reception of in-patients. For the former, an entrance through the sandstone rock, upon which the building is erected, has been provided; also a waiting-room, floored with tiles, and the dispensary. The wards of the infirmary are spacious and well ventilated. Two of them are on the ground-floor, and two on the first floor; the former being intended for the more serious cases. There is room for eight beds in each ward. Thirty bedsteads, of iron, of approved description, have been presented, and the equipment of each is complete. Josiah Mason has presented twelve beds, at 10l. each. On the walls, which are coloured, so as to give them a cheerful appearance, are suspended a number of engravings, the gifts of other friends to the institution. The wards are warmed by drop-pipes; but about these are found inefficient, other means are available for the purpose. The ventilating shafts are an important feature. Opening out of the wards are small chambers, comprising lavatories, bath-rooms, water-closets, and convalescent rooms. A nurse's room adjoins each of the wards, so arranged that the nurse has a command over the ward, and can immediately ascertain when her services are wanted. There are also apartments for the matron, the house surgeon, nurses, together with supplementary rooms. On the second floor the arrangements are much the same as the first. The operating-room is at the rear of the build-

ing, on the ground-floor, and there is a bathroom adjoining, together with committee-room, &c. On the ground-floor are placed the kitchens and domestic offices; and detached from the building, but connected with it by a covered way, are the fever wards, two in number, with two beds in each, and the necessary offices perfectly isolated from the main building. A short distance off is the mortuary.

PROPOSED NEW COUNTY LAW COURTS FOR HANTS.

At the recent Michaelmas Sessions, held at Wantage, Mr. Portal described the proposed new Courts and buildings. The block of buildings in which the Court was assembled would be altered in no material respect, but would be re-arranged for the county officials. The old hall would be restored as near as possible to its former condition; the present unsightly erections in it would be removed, and a large vestibule would remain, 111 ft. in length, by 50 ft. in width. Arches would be placed at the end, forming an approach to the new courts. As to the probable cost, it would be impossible to say what it would be until the specifications were prepared and the tenders sent in. They were, however, afforded an example in other cities. Winchester was about to build a new town-hall and city offices, the contract for which was 10,000, at Taunton a new public building had cost 28,000, at Leeds, 100,000, and at Reading new county buildings had been erected at a cost of 26,000, including a police-station. As to their new courts, supposing they cost 17,000, the amount required to repay the loan would be met by a rate of 1-16th of a penny. The plans were approved and adopted, and the committee authorised to cause specifications to be prepared.

WALL TILES.

SIR,—If your correspondent, Mr. A. Davis, will scrape the incrustation he speaks of with a sharp chisel, and then apply diluted muriatic acid rubbed on with pumice-stone, he will probably find a good effect. The acid should be carefully washed off with clean water.

No cement will completely prevent wall-tiles from falling off, as the back of the tile is at present made. In a short time we shall introduce a white tile, with a back formed in such a manner as will effectually secure the adhesion of the tile to the cement.

HARGREAVES & Co.

HOW THEY DIFFER IN LEICESTER.

HERE you have the tenders that have been sent in for painting the Leicester Union Schools. What do you think of them? Is it roguery or stupidity?—

Wykes	254	0	0
Shiple	40	0	0
Allen	29	15	0
King	19	8	0
Gibbins	15	12	0

The lowest tender was accepted.

B.

FROM CANADA.

SIR,—Before I give my experience of the United States, let me say a parting word for Canada. Leaving the Dutch and French element aside, I must speak in praise of the Canadian dialect, for hundreds and hundreds of miles have I footed and railroaded through the country, and not once did I find any peculiarity in the manner of speaking; the letter H aspirated in the proper place, no provincialism, and the manner of pouring out my native tongue by natives of my own, countrymen from Lancashire, Yorkshire, and other counties, suggests to me that the English from the old country might right well feel ashamed of their schooling. The jokes on a greenhorn are something terrific.

Farmers with small capital I certainly should advise to emigrate to Western Canada. Pay no attention to land agents, and do not settle down without first learning something of the country. Canada markets are reliable, and generally produce can be sold for cash. Raising stock is profitable in some districts. Yankees come over and buy up cows, sheep, and good-bred horses. Butter is eagerly bought up; and now cheese factories are all the rage. A sure market is open, besides not having the bother of selling

individually their produce. The cheese factory is worked on a joint-stock principle. The female emigrant will have to turn to the spinning-wheel; and the male will have to learn to build sheds and log-buildings.

In my future letters I hope to give an outline of my journey through the Southern and Western States; and, in bidding good-bye to Canada, am truly glad to say that British rule in Canada is safer and more honest than the rule of the States. Protection to life and property is on a firmer basis.

QUEBECUS.

THE EAST LONDON WATER COMPANY AND CONSTANT SUPPLY.

IN your issue of the 21st, I read, "The directors of the East London Waterworks Company have given notice that it is their desire, and, so far as in them lies, their intention to substitute, *service by service*, for the company's present intermittent supply, the system of constant supply in all houses supplied by the company." When they gave this notice, I do not know; but this I do know, that it is more than about two months since they reduced the so-called constant supply to about ten hours' time. Not one drop of water could be obtained from the pipes during the night. The intermittent supply which was usually on for about twenty was reduced to ten minutes. The local authorities had notice that the company could not supply water for roads. Manufacturers were deprived of water entirely, and a state of things has been in existence only to be equalled by that of 1868. I think you must be misinformed; for, although I have been a consumer for more than twenty years, I have had no such notice.

I have had, however, a notice that the company have determined to collect the water rates in *advance*, and in the face of the fact that for the past season they have miserably failed to fulfil their engagements with their consumers. The so-called constant supply is a complete farce. Fancy, say, a hole the sixteenth of an inch in diameter being the only outlet from the company's mains to a house containing ten rooms; but this, I assure you, is a positive fact. On the constant supply, it takes nearly five minutes to fill a stable-pail, and this is the blessing which this *most liberal* but most disliked of all public companies in London is about to confer on us. I am glad to know that in the parish in which I live the churchwardens are about to call a public meeting, to consider the question of the inadequate supply and wretched quality of the water supplied by the company; and I hope a resolution will pass asking the Metropolitan Board, as the head of the metropolis, to take steps to prevent the recurrence of the evil of bad water, and short quantity even of it.

T.

THE EXTENSION OF THE FACTORIES ACTS TO BRICK AND TILE YARDS.

THAT part of the Factories Act which now restricts the employment of children, young persons, and women in the manufacture of bricks and tiles is as follows:—

"Section 5.—After the first day of January, one thousand eight hundred and seventy-two, no female under the age of sixteen years, and no child under the age of ten years, shall be employed in the manufacture of bricks and tiles, not being ornamental tiles, and any female or child who is employed in contravention of this section shall be deemed to be employed in manner contrary to the provisions of the Factory Acts, 1833 to 1871, and the Workshop Acts, 1867 to 1871."

By the first schedule to the Act, relating to "permanent modification," under certain circumstances,—

"Male young persons of fourteen years of age and upwards, and women, may be employed between the thirty-first day of March and the first day of the following October, in any year, for a period not exceeding fourteen hours in any one day.

Provided that—

1st. They shall not be so employed except between the hours of six in the morning and eight in the evening.

2nd. In addition to the time allowed for meals they shall be allowed half an hour for a meal after the hour of five in the evening.

3rd. They shall not be so employed for more than three days in any one week."

ACCIDENTS.

Fall of a House in Whitcross-street.—While some workmen were engaged in pulling down houses in Whitcross-street, one of the houses fell. Most of the workmen employed had sufficient time to get clear of the ruins, but one young man was seriously injured in the spine by falling timber, and was at once conveyed to St. Bartholomew's Hospital. The house had been condemned.

Fall of a Bridge near Rotherham.—For some time past a new roadway has been in course of construction at Mexborough, near Rotherham, direct from the new station in course of erection there, on the Manchester, Sheffield, and Lincolnshire Railway, into the village. To make this road, it was necessary to build a bridge over the River Don Navigation Boy's Canal, and this had well nigh approached completion. The bridge, however, 30 ft. in height, and 65 ft. span, has given way and fallen into the canal, completely blocking the traffic, which is very great. It was afterwards learned that two men and a boy were

engaged at the time of the catastrophe in "pointing" the brickwork, and that one of them, a labourer, was killed. A bricklayer was seriously injured. The boy narrowly escaped a premature death, and was forced by the "headings" of the water, caused by the fall of the bridge, several yards into a field.

Destruction of Rolleston Hall by Fire.—Rolleston Hall, the seat of Sir Tommas Mosley, bart., near Barton-upon-Trent, has been destroyed by fire. Great efforts were made, and with considerable success, to remove some of the most valuable furniture, books, works of art, and curiosities collected by the late Sir Oswald Mosley; but the last accounts left little hope of saving any important part of the building. The hose at the hall was found to be out of order, and proved too short. The hall was a mass of flames, and soon the roof and floors fell in with a thundering crash. Three-fourths of the building became a mere shell, the walls smouldering under the influence of the intense heat. As no one had lived in the house since the death of the late Sir Oswald, except the persons in charge, and as extensive works of enlargement were proceeding, it is thought probable that the fire was caused by fires left by some careless scamp of a workman.

MODEL DWELLINGS, COLUMBIA MARKET.

Sir,—I observe, in your last published number, a notice of the "Model Dwellings" near the Columbia Market, at Bethnal-green. I am anxious to know what material the bricks are being bedded and built together. Can the builder, or perhaps the architect, gratify my curiosity? G. W. B.

WAGES.

Sir,—I should feel obliged to your correspondent of last week, who signed himself "An Old Builder," if he would inform me the rate of wages for mechanics in the building trades in the Midland counties; that is, for good mechanics. A JOINER.

SCHOOLS OF ART.

Nottingham.—Three students of this school have recently received appointments to art master-ships, viz., Mr. Joseph Harris, head-masterhip of the Salisbury and Andover Government School of Art; Mr. J. Seddon Tyrer, the masterhip of the art night-class recently opened at Mansfield in connexion with the Department of Science and Art; and Mr. Robert Harris, the assistant masterhip in drawing at the Manchester Grammar School.

MONUMENTAL.

The Proposed Metropolitan Statue to the late Earl of Derby.—At a recent meeting of the Metropolitan Board of Works, Colonel Hogg reported that, in accordance with the instructions of the Board, a communication had been made to Sir John Pakington with reference to the statue of the late Lord Derby, and that, in reply, a letter had been received, thanking the Board for their kindness, and requesting him (Colonel Hogg) to inform the members that the arrangements with her Majesty's Government with regard to the site in front of the House of Commons having proceeded so far, there was no other course open but to decline the offer made by the Board of a site on the Thames Embankment.

The Derby Statue for Preston.—At a recent meeting of the Health and Recreation Committee of the Preston Corporation, Mr. R. Townley Parker made a statement to the effect that, in company with Mr. Noble, the sculptor, he had during the past week viewed many of the statues in London, of bronze and marble, for the purpose of forming an opinion as to what would be best in regard to size, height, and material for the statue of the late Earl of Derby to be erected in the Miller Park, Preston. As the life-size statues they had seen seemed puny when elevated, and as Carrara marble would best resist the prejudicial effects of the atmosphere in which it would stand, they had come to the conclusion that the statue should be of that material, 11 ft. high, and placed upon a pedestal of polished Aberdeen granite, 15 ft. high. The committee unanimously concurred with these recommendations. It is now estimated that the cost of the statue will be 1,700l., and of the pedestal about 500l. The Preston Town Council have already granted 200l. for the foundations, which will consist of a solid block of masonry, 12 ft. deep.

Proposed Memorial of Lord Brougham.—The

Social Science Association may probably take the initiative in proposing that the memory of Lord Brougham shall be perpetuated by a suitable public memorial.

CHURCH-BUILDING NEWS.

Battersea.—St. Saviour's Church, designed by Mr. E. C. Robins, in the Early French Gothic style, has been opened. It has nave and aisles, and clearstory to the nave and chancel beyond, with organ-chamber on the north side of it. It will accommodate 700 adults, at a cost of 5l. 10s. per sitting. The church has been erected with the assistance of the Incorporated Society and the Surrey Church Association, and is expected to be opened nearly free of debt. The district has been taken out of Christ Church, and is a very poor one. The Rev. J. McCarthy is the incumbent.

Sedgley.—The foundation-stone of a new church at Hurst Hill, Can Lane, Sedgley, has been laid by Lord Wrottesley. The church, which is to be dedicated to St. Mary, is to be built in the Early English style of architecture. The external walls will be faced with Gornal stone, and the dressings of Grinshill stone. Internally the church when completed will consist of a nave, north and south aisles, chancel, vestry, and organ-chamber. The nave is to be 71 ft. 6 in. in length, and the aisles 52 ft. 6 in.; the chancel 33 ft. 6 in. in length, and 21 ft. wide. The stonework and nave columns will be composed of Corsham stone. The roof will be timbered. The whole cost of the edifice will be 4,000l. The builder is Mr. Nelson, of Dudley; and the architect is Mr. George Bidlake, of Wolverhampton. The site was given by the late Mr. H. B. Whitehouse, of Sedgley.

Brighouse.—The decorations of the nave and roof of St. James's Church are now completed, at the cost of Mr. S. Barber, of Halifax, the architect of the church. The only portion left untouched is the chancel, which by contrast looks very bare and unfinished. The decoration is plain in character, and is based on the few remains of ecclesiastical work of the fourteenth century left to us. The wall-patterns are all rectilinear in form, with roses and fleur-de-lis introduced in the centre of each block, these blocks corresponding closely to the regular ashlar work of the present day. Where the composition is required to be broken, at the cill and springing of the windows, for instance, enriched bands, stencilled in Indian red and black, are introduced. The colours used are red, yellow, stone-colour, and black, blue only occurring in the borders and crosses of the circular medallions between the nave arches. The roof-timbers, which were originally stained a rich brown, are stencilled in patterns of black and white on the front and sides, with the chambers coloured vermilion. The plaster ceiling between the rafters is of a grey tone, a red pattern being drawn on it throughout. This gives a tone to the roof.

Watford.—The parish church of St. Mary, Watford, has been re-opened for divine service. The work of restoration was commenced on the 24th of April, 1870. The whole of the exterior has been restored, with new flint casing to the walls, and Bath stone facings. The tower, which is about 80 ft. high, and which was in an especially dilapidated condition, has undergone a renovation, and about thirty new steps have been added. The clock has been repaired, and the chimneys are put in order. In the interior extensive alterations and improvements have been made; the south aisle, the south transept, St. Katherine's Chapel, and the porches having been entirely rebuilt. The roofs have been re-boarded and covered with new lead. Four new arches have been put in to support the tower and the chancel, and two new piers to support the south arcade. The only work effected in the Essex Chapel is a new oak ceiling. The windows throughout the church are new, with the exception of those at the east and west ends, and the memorial window in the north aisle. Three memorial stained-glass windows are added, one in the south transept, and two in the south aisle. A slight alteration has been made in the chancel screen and seats, and also in the position of the pulpit. The church has not been re-pewed, but about twenty new seats are added. A reredos, composed of Caen stone, and executed by Messrs. Bell & Almond, is still in the course of erection; the carving in the centre is a representation of the Crucifixion; and figures of the Apostles and other saints are to be placed in the niches on

either side. The Countess of Essex defrays the cost of this. A font, composed of the same material, has been erected under the tower, at a cost of 120l.; the carving has been executed by Mr. Forsyth. The Earl of Essex has undertaken to pave the chancel with Minton tiles. A large organ has been built by Messrs. Walker & Sons, of Tottenham-court-road, at a cost of upwards of 900l. The outlay on the church has been 6,000l., exclusive of the reredos and font. The contractors were Messrs. Gibson & Brothers, Southall, and the architect Mr. J. T. Christopher, of Watford.

Sheffield.—St. Paul's Church has been re-opened. The high straight-backed old oak pews have been cut down and sloped, and their number increased; the windows have been replaced with plain ground glass; the old plain black gas-fittings have given place to spiral brass up-rights; the galleries have been thrown back behind the columns; a new pulpit and reading-desk have been furnished, and the flagstones of the floor have been relaid. Three tablets of Italian design, inscribed respectively with the Lord's Prayer, the Apostle's Creed, and the Ten Commandments have been placed in the chancel. They are from designs by Mr. Lomas, Hartshead, architect. There is to be a baptismal font, in the Italian style of architecture. Another improvement has been the bringing forward from under the tower, and the completion by Mr. Brindley, of this town, of the old organ. The church has been cleaned and repaired. The joiners' and carpenters' work was done by Messrs. Dalton & Taylor; painting and graining, by Mr. Guest; plastering, by Mr. Chadwick; gas-fitting, by Mr. Wilson; upholstering, by Mr. Johnson; the organ, by Mr. Brindley; and the font, by Messrs. Smith. It was estimated that the carrying out of the improvements would cost 1,500l.; but it is now believed they will amount to much nearer 1,700l.

Bristol.—St. Matthew's Church, which has been closed for two months for thorough repair, externally and internally, has been recently re-opened; and from the designs of Mr. E. C. Robins, architect, has been decorated in colour throughout. Grecian ornaments on pale grounds have been freely used, blue and white predominating in the ceiling, pale green on the upper walls, with pale buff pilasters and entablatures, enriched with dark brown, red, and green lines and ornaments; Indian red on the walls under the gallery, forming a ground for the monuments: pale salmon for the gallery fronts; the whole enriched with flat ornamentation. Gilding is freely used at the eastern end. Mr. McLacklan was the general contractor; Messrs. Green & King executed the decorative colouring.

Marton.—The parish church of Marton, a small village situated about midway between Rugby and Leamington, has been re-opened for Divine service after restoration. Prior to the works being commenced, the church was in a dilapidated condition. The total cost of the works done has been 1,544l. The intention to rebuild the whole of the church was modified, the old tower, which is low and embattled, and of very early type, being allowed to remain. It has several cracks in it, and does not appear to possess much strength, although it has been declared to be safe. The nave of the church and the south aisle, with the exception of the arcade, have been entirely rebuilt, and a new north aisle, a vestry, and an organ-chamber added. The roof is of high pitch, with clear-story windows, the timbers being of pine, stained and varnished. A new small stone arch has been inserted in the tower, and the walls internally have been plastered; the quoins and dressings and the new arcade being of Bath stone. The old church was of the Early English period, with a small portion of Transitional, and its characteristics have been reproduced. The chancel is a little more decorated than the other parts of the church, but there has been no attempt at much ornament, and what has been introduced is of a constructive character. Tiles have been laid in the aisles and chancel, and the seats are open, of varnished pine. The pulpit and reading-desk are of Caen stone, with open panels and red marble shafts. A new font of Caen stone, with marble shaft, the gift of the builder, has also been placed in the chancel. The building is of limestone, with Bath stone dressings; the roof covered with red tiles. On the gables of a nave and the chancel are crosses in white stone. Nearly the whole of the work connected with the nave and chancel is new, the exception being a portion of the east end wall of the chancel, the south arcade, and the south door-

way. The porch is new, and at the south side of the tower is a small erection, from which access is obtained to the bell-chamber. The churchyard has also been enlarged by the addition of a piece of ground on the east. The architect was Mr. G. Punsbott, of Leamington; and the contractor, Mr. James Marriott, of Coventry. The original contract was 1,420*l.*, after which it was found necessary to insert a new window in the chancel at a cost of 20*l.*, build a boundary wall at a further expense of 42*l.*, and other extra works, &c., 62*l.*, making a total of 1,544*l.*

Market Wighton.—The church here has been re-opened for divine service after a restoration. The condition of the edifice previously to the recent works was wretched. The nave more particularly bore evidence of dilapidation, and possessed what are now rapidly passing away in the churches of the land,—regulation square piers for pews, and these old, shabby-looking, and of exceedingly worn-out condition. A triplet of galleries which the church possessed,—one across the west end of the nave, a second in the north aisle, and a third in the south aisle,—were in like condition to the pews below. Both galleries and pews were at once cleared away, and opportunity was afforded of giving examination to the flooring. This being found to be damp and uneven, it was taken up and relaid with concrete. The north aisle wall was laid down and rebuilt, and the whole of the church re-roofed, high pitched, open timbered. Staining and varnishing, which were then applied to these parts, have given them a more agreeable aspect, in keeping with the rest of the restoration. The roofs were covered with Westmoreland slates. Early English is the style of the chancel, and the chancel-arch has been rebuilt to harmonise with it. The remaining style of the edifice is Perpendicular. The square tower and brick tower before the restoration was in a tolerably good state of repair, and it, with the exception of putting in a new belfry-floor, remains untouched. The old font has been placed under the tower, and the organ, rebuilt and improved, has been placed in the north aisle of the chancel. The restoration of the chancel has been accomplished exclusively by Lord Londesborough, at a cost of 300*l.*, and the renovation of the rest of the structure has been done by subscription, and has cost about 1,000*l.* Compensation for the removal of the galleries has been given by increased accommodation on the ground floor, which is now fitted up to accommodate 530 persons. This includes 100 seats for the school children. The seats are of ordinary description, being of deal and open, and stained and varnished to correspond with the roof. Twelve months since the chancel was fitted up with new stalls and seats. These have been somewhat re-arranged, and rendered again available in the same part of the building. The east window is of course a part of the chancel restoration undertaken by Lord Londesborough. It is of four lights, with florid tracery and filled with cathedral glass. New windows of two lights, two trefoils and quatrefoil heads, inserted in the north aisle, are also filled in with the same description of glass. The south outer wall and the porch which is on that side of the church are in need of restoration, but it is proposed to defer the work until additional funds may have been obtained to cover its expense. The architects were Messrs. J. B. & W. Atkinson, and the contractors Messrs. Bowman, all of York; and to the following tradesmen of York the contractors sublet their work:—Mr. Denison, joiners' work; Messrs. Hodgson, plumbing and slating; Mr. Wood, slating; and Mr. Cole, stone carving.

Ledsham.—The church of All Saints, at Ledsham, after having been restored, has been reopened by the Archbishop of York. The church has been entirely refitted internally with open benches, in the nave of varnished deal, and in the chancel and chapel of oak. The pulpit, desk, and lectern also are of oak. A new font has been placed near the south doorway, and the ancient one, which has been given back to the church, may be seen near the very old tower doorway, the carving of which has been restored. The few fragments of old stained glass have been collected and arranged in the chancel windows. A memorial by Reedy has been placed in the perpendicular window at the east end of the mortuary chapel; one by Lavers & Barrand in the west window in the tower. Two subjects by Wallis, which formerly occupied the modern windows in the chancel, have been revised and incorporated into a new one adjacent

to the vestry door. One of the small Norman windows on the south side of the tower has been filled with stained glass by Gibbs. The chancel has been restored by the Rev. Charles Wheeler, of Ledston Hall, patron of the living, and, with the exception of the choir stalls, refitted at his sole expense. The mortuary chapel also, with the contribution of 50*l.* from Mr. C. W. Wheeler, has been restored by the same gentleman. The parochial portion of the church has been restored by public subscriptions. Among the presents received we may enumerate the following:—Painted memorial window by Reedy, Mrs. Wheeler; ditto, by Lavers & Barrand, Mr. Broughton; ditto small tower window, by Gibbs; and choir sittings, Rev. J. T. B. London. The Rev. C. Wheeler gave the stone required for the restoration, and the parishioners provided the carting of materials for both nave and chancel. Mr. Henry Garzon, of London, was employed as architect; and the contractors were, in the first instance, Edward Latham & Son, of Wakefield; but the work, after much delay, was brought to a conclusion by Mr. Goldthorpe, builder, Wakefield.

DISSENTING CHURCH BUILDING NEWS.

Lightcliffe.—A new Congregational church, says the *Bradford Observer*, has been opened at Lightcliffe. After some difficulty in regard to the procuring of a site, a piece of ground was purchased at Lightcliffe, by Mr. John Crossley, of Halifax, and towards the end of last year the erection of a new chapel upon it was commenced. The church, which is Early Decorated in style, is built parallel to the Whitehall-road, with the entrance front towards the new roadway about to be made from the Lightcliffe Station to Bramley-lane. Its elevated position makes it a conspicuous object from the railway and from the principal roadways of the district. It is considerably raised upon the natural platform above the level of the Whitehall-road, upon a double terrace, and is approached by wide gateways and steps. On the north side the entrance to the church will be on a level with the road, with a wide sweep for carriages. The terraces and surrounding ground will be suitably laid out and planted, and with walks all round the church. The exterior of the building is of clean-cut wall-stones and boasted ashlar dressings. The principal front has a five-light window, filled with geometrical tracery. The gable is crocketed, and finished with a stone cross. On each side the principal gable are large buttresses, square on plan, terminated with pinnacles with canopied heads and stone finials. On the north side of the church is the entrance-porch, with wide shafted doorway, and four bays of tracery double-light windows, with buttresses between. The transepts have four-light windows, with double-moulded tracery. The clearstory windows are single lancets. On the south-west angle of the site is placed the tower, which is completed to the springing of the spire, and is placed in the position where it will be best seen. The ground most effectually with the church. The second entrance is under the tower, which is separated from the nave by a short corridor, just leaving the tower clear of the church. The belfry-chamber will contain a peal of bells, and has double-light windows, deeply moulded and shafted on every side and filled with oiled louvres. Below this floor is the clock-chamber, with three faces, and below is a moulded parapet with quatrefoil sinkings. At each angle of the square tower, rising from the buttresses, will be lofty pinnacles, with canopies and crocketed terminations. The spire will rise to the height of 150 ft. The interior of the church has been so arranged as to combine a clear and open space for the congregation, with architectural effect. It is divided into a wide nave and side aisles by polished Shap granite columns and moulded arches. At the east end of the church is a circular window which will be filled with stained glass. The south transept window is already completed by Messrs. Clayton & Bell, of London, and has been filled with subjects from the New Testament. The roofs throughout are open, the timbers being exposed. The sittings throughout are open benches with cut and carved bench-ends, stained and varnished. The church is lighted with standard lights and brackets from the Coventry Metal Works. An organ is in course of erection by Mr. Booth, of Wakefield, which will have oak screen with open tracery, and the front pipes of the organ will be illuminated in gold and colour. The walls have

been coloured a warm stone colour, and the roof between the rafters a light grey. At the east-end of the church are placed vestries for the minister and the deacons, and also a ladies' vestry. The total length of the church is 87 ft., and the width 60 ft., and across the transept 66 ft. The seats will accommodate 500 adults and 70 children. Fronting into the same ground as the church, but at some distance from it, is placed the minister's house, which is finished on the exterior in a similar manner, and in the same style as the church, but with ornamental wooden barge-boards. The site will be surrounded by a low wall with stone coping and iron railings, and gates. The buildings throughout have been erected from the designs of Messrs. Lockwood & Mawson, architects, Bradford and London. The building just vacated by the congregation is to be heretofore used as a school. The total expenditure for land, church, house, and school, was estimated originally at 8,515*l.* The clerk of the works was Mr. John Smith. The following have been the contractors:—Messrs. Dyson Brothers, Brighouse, masons; Messrs. Ives & Son, Shipley, joiners; Mr. T. Nelson, Bradford, slater; Mr. J. Walsh, Halifax, plumber and glazier; Mr. Dickenson, Bradford, plasterer; Messrs. Mawer, of Leeds, have been carvers.

SCHOOL-BUILDING NEWS.

Maidstone.—The new Grammar School for the town of Maidstone, the foundation-stone of which was laid about twelve months since, by Sir John Lubbock, has been opened, with some amount of ceremonial. The architect of the new building is Mr. E. W. Stephens, and the plans have been carried out by Mr. J. S. Anscombe. The principal school-room is 50 ft. by 25 ft., and will seat comfortably at the desks 108 scholars, but in reality has floor-space for 160. Adjoining the school-room, and approached by the corridor, is a class-room, 15 ft. by 15 ft., which will accommodate a class of 34 scholars; and in addition to this there is another class-room, 30 ft. by 20 ft., which affords floor-space for a further number of 75 boys. This latter room may be used also as a dining-hall for resident boys and day-scholars. Besides the accommodation for boys, there is a large entrance-lobby, a convenient lavatory, boarders' staircase, separate rooms for books, hats, and boots, and several other conveniences. The whole of the scholastic portion of the building is cut off from the master's residence. The master's residence contains dining-room, drawing-room, study, kitchen, scullery, and pantries, central hall, lighted from roof with principal staircase, and a back staircase for servants. In the upper portion of the buildings, consisting of two floors, there is accommodation for twenty-four boarders, one room for under-master, eight rooms for the master's own use, two infirmary wards for sick pupils, and a nurse's room. There is to be a bath-room on each floor, with lavatories and clothes-store, &c. The whole extent of ground purchased by the trustees contains an area of 3½ acres; the school buildings and master's house and garden taking about ½ of an acre. The play-ground is 1 acre, and the cricket-ground 1½ acre in extent.

Maysey Hampton.—A new school has just been erected in this village, from a design furnished by Mr. James Brooks, architect, London. It is intended to accommodate seventy children, and consists of one principal room, 27 ft. 6 in. long by 17 ft. wide, and a class-room, 16 ft. long by 12 ft. wide. The building is of local stone, with windows, doors, &c., of Box freestone. In the south-west gable there is a little belfry for the call bell; and inside the school-room over the south-west window there will shortly be placed a clock, supplied by Mr. Tanner, of Cirencester. Messrs. J. & T. Mitchell, of Fairfield, were the builders. The building will be temporarily used for divine service on Sundays during the restoration of the church, which internally is very dilapidated.

High Wycombe.—The principal foundation-stone of the Wesley Sunday Schools was laid by Mr. J. S. Budgett, of London, with some ceremony, on the 2nd instant. The new rooms are intended to receive over 500 children, and will be of handsome character, light and spacious. The brick-work will be treated ornamentally, and exposed inside. It is stated, as a noteworthy fact in connexion with this Sunday School, that it was the first of its kind in England, and dates back more than 102 years to its foundation. Mr. Arthur Vernon, of High Wycombe, is the

architect; and Mr. B. Spicer, of the same place, the contractor.

Woodburn (Bucks).—A considerable addition to the National Schools has just been commenced, intended to accommodate about 100 more scholars. The schools are pleasantly situated near the lately restored and well-known fine old parish church, and this enlargement will much add to their present handsome appearance in this picturesque village. The style is Early English, in stone and flint; and the roof is somewhat quaintly supported by diagonal trusses dividing the interior into squares, of strong and effective construction, and leaving spaces available for arch openings into old or new rooms if desired.

Mr. Arthur Vernon is the architect; and Mr. W. Banghurst, of Bourne End, Bucks, the builder.

Kennington-road.—Archbishop Sumner's Memorial Schools, which are situated in the immediate vicinity of the Church of St. Philip, Kennington-road, have been opened by the Archbishop of Canterbury. The ceremony took place in the boys' school. The elevations of the schools are in the Gothic style, built of light brick, with red brick bands and arches. In the principal gable-end is a stone carved niche for a statue of Archbishop Sumner. On the ground plan are the infants' and girls' schools, each 47 ft. by 34 ft., divided by a movable partition, so that when required for any lecture or meeting the two schools may be thrown into one, with the infants' gallery at one end. Each school has a class-room, 14 ft. by 12 ft. The boys' school is on the first floor, 68 ft. by 34 ft., with two class-rooms, 15 ft. by 14 ft. A small soup-kitchen is provided. The schools are to accommodate about 450 children. Mr. Cole is the architect, and Messrs. Bashe, Brothers, are the contractors. The building cost about 2,000l. Masters' and mistresses' dwellings are yet to be erected, at a cost of 800l., the greater part of which remains to be subscribed.

Reading.—An educational scheme, instituted by the vicar for the district of New Town, has been completed by the opening of the school that has been erected in connexion with the Church of St. Stephen. At the close of last year an effort was made by the vicar and the inhabitants of the district to meet the educational wants of the working classes. It was at first hoped that by the co-operation of the inhabitants of Earley, a joint school might have been built for the accommodation of all the neighbouring district, including that part which is situated in Earley parish, and also that the infant school formerly instituted by the charity and public spirit of Mr. Sutton, might have been affiliated to the scheme. These designs, however, proved abortive, and it was then determined to build a school-room in connexion with the district church, capable of accommodating 150 children. To this it is now proposed to add a department sufficient to provide room for forty infants. The work of the present building was commenced in June, from plans prepared by Mr. Morris, architect, of this town, and was finished during the past week. The building is a plain structure of red brick and tiled roof to correspond with St. Stephen's Church, on the south side of which the school is placed. The school is a mixed one, for boys and girls, and will accommodate 136 children. The main room is 51 ft. long, and 18 ft. wide, with a class-room adjoining, 18 ft. by 15 ft., and separate porches for the boys and girls. The rooms are lofty and well lighted and ventilated. The walls are unplastered, and the roofs are open, showing the main timber. The woodwork internally is stained and varnished. The site contains an area of about 1,000 yards, and is divided into separate play-grounds. The exterior of the building is decorated with bands and cornices of ornamental brickwork. The design has been only partially carried out, and it is intended at a future date to add another school-room and probably a teacher's house. The contract was taken by Mr. G. Barnes, of Reading, who has carried out the work, at a cost of about 450l., to the satisfaction of the architect, Mr. Joseph Morris, of Reading.

Churt.—New schools have been opened at Churt, in Surrey. The schools are 43 ft. in length, by 18 ft. in width, and have a class-room, 20 ft. by 14 ft. 6 in. They are built with local stone, with brick and Bath stone dressings, having an open roof, stained and varnished. The desks and seats are those known as "the Excelsior," which have been approved by the Council of Education. The cost of the erection, about 500l., has been chiefly defrayed by voluntary contributions.

Rosherville.—The Rosherville Church Schools, with teacher's residence, are situated on the summit of a hill, commanding beautiful views of the river Thames and surrounding country. They are built with local materials, being faced with white flints and red brick quoins; the roofs are covered with Kentish tiles. The schools internally are faced with fair Gault bricks, relieved with red and blue bands. The windows are glazed with cathedral glass, bedded in the straight joints of the brick jambs. The fire-places and doors are placed, contrary to the usual custom, in the centre of the building, affording greater warmth and convenience. Accommodation is provided for 200 children. The first stone was laid on the 4th of March, and the schools were opened on the 15th of August. The outlay, including play-sheds, inclosure-walls, water, gas, and all other expenses, amounted to about 1,800l., which, together with the site, has been chiefly given by the Bosher family, aided by the Diocesan Board and the local gentry. The buildings were erected under the direction of the vicar, the Rev. J. G. Gilling, from the designs of Messrs. Wadmore & Baker, by Mr. Gould, of Gravesend, with Mr. Andrews as foreman of the works.

Woodbury (Devon).—The new National Schools were opened last week. They are built of local brick, with dressings of Ham-hill stone, a plinth of Westleigh limestone, an open-timber roof covered with Bridgewater tiles, and surmounted by an ornamental bell-turret. The plan consists of a mixed school-room, 65 ft. by 20 ft.; class-room; a lean-to porch, for boys' and girls' caps and bonnets; and an open-timber porch. The master's house is attached to one end of the school-room, with offices, &c., behind. The general character of the building is Early Pointed. The total cost of the schools, master's house, boundary-walls, &c., was 950l. The architect was Mr. R. Medley Fulford, Exeter; and Mr. R. Phillips, of Woodbury, the builder. After the opening ceremony, the vicar (the Rev. J. L. Fulford) presented Lady Drake with a lace handkerchief, in the name of the mothers and children of the school, made in the village, from a design given by the architect.

Books Received.

A Handy Book on the Ecclesiastical Dilapidations Act, 1871. By EDWARD G. BRUTON, Architect. Rivingtons. 1871.

In this little volume Mr. Bruton examines the provisions of the new Act, section by section, and shows the way in which, as he thinks, it must be worked; noting at the same time its shortcomings. He adds something on "Emblements," and quotes a judgment of Lord Campbell's as to the power of executors to remove certain fixtures.

It is to be regretted, we agree with Mr. Bruton, that no provision is included for the making of a terrier of the lands and buildings belonging to the living: without some such document there is great difficulty in ascertaining if the property is intact. However, the corporation of archdeacons and rural deans, presided over by the bishop, may in such case provide for the performance of this and other duties, if they think fit.

Mr. Bruton suggests the following

"SCALE OF SURVEYOR'S CHARGES."

For each survey a fee of	£5 5 0
Where the sum named in the order exceeds 100l.:-	
For the second 100l., and fractional parts thereof, an addition (per cent.) of	3 0 0
For the third 100l., &c.	3 0 0
For the fourth 100l., &c., and upwards ...	1 0 0
For each copy of the report, beyond the first	0 10 0
For each visit of inspection during the progress of the works	3 3 0
For each certificate	1 1 0
For each copy of special certificate beyond the first	0 5 0
Travelling expenses, measuring only one way:-	
By rail (per mile)	0 0 6
By road "	0 1 6"

The Village Churches of Denbighshire; Illustrated by Perspective, Geometrical, and Detail Drawings. Part I. By LLOYD-WILLIAMS & UNDERWOOD. Published by the Authors, at Denbigh.

MESSRS. LLOYD-WILLIAMS & UNDERWOOD, who are architects, propose to supply, in ten parts, containing about seventy plates, a complete record of the whole of the village churches of Denbighshire. They will further, if possible, and the churches prove insufficient to fill the

plates, illustrate any castellated or monastic remains they may find in the county. At the end they will give some few pages of letterpress, calling attention to special features or historical facts in connexion with the buildings illustrated. The churches, of course, vary in value, but the part before us gives promise that the whole will form an interesting and useful work.

A Treatise on Ventilation. By LEWIS W. LEEDS. New York: Wiley & Sons, 15, Astor-place. 1871.

This treatise comprises seven lectures delivered before the Franklin Institute, Philadelphia, 1866-68; showing the great want of improved methods of ventilation in American buildings; giving the chemical and physiological process of respiration; and comparing the effects of the various methods of heating and lighting upon the ventilation. The work is illustrated by many plans of various classes of public and private buildings, showing their present defects, and proposing what the author regards as the best means of improving them.

Although Mr. Leeds is in business as an engineer of ventilation and heating, in Broadway, New York,—and this, therefore, is, to a certain extent, a trade book, treating of plans which he claims as of his invention, or recommendations,—the treatise is an elaborate one, and enters very fully into the subject. Some of the illustrations, which bring the distribution and motion of foul and fresh air within eight, as it were, in the way first illustrated years since in the *Builder*, are instructive and suggestive. They have the additional advantage of colours to bring them out.

On the merits and originality of Mr. Leeds's plans and recommendations, we cannot at present enter. The subject is a vitally important one, and the *Builder*, for the last thirty years nearly, is a vast repository of information and opinion as to it, by many writers and inventors, who must not be ignored in such a case. There is one subject closely connected with ventilation, however, to which we regret to find that Mr. Leeds has not devoted even a single chapter or lecture,—namely, draughts. No system of ventilation can ever be finally adopted without the utmost and most special regard to this. Of course there are incidental remarks here and there on this subject throughout the volume; but it merits far more attention than Mr. Leeds would seem to have given it, from the fact, as we have said, that not a single division of his subject is devoted to it. The work, too, as Mr. Leeds himself admits, requires reconstruction, as it was not only prepared as lectures, but as two separate series of lectures. It contains, however, a great deal of valuable and suggestive matter, reference to which is facilitated by an alphabetical index.

Miscellaneous.

Mounds in Argyleshire.—Mr. John S. Phené has excavated a chambered tumulus, the stone cairn of which was 130 ft. long. The tumulus is on the Duke of Argyll's estate at Ach-na-Goul, near Inverary. The excavations were made at the request of the Marquis of Lorne, and they resulted, after 70 ft. of the structure had been opened, in a series of chambers, some sepulchral and others not; a side chamber, 5 ft. square, appeared to have been designed for some other purpose. The 70 ft. excavated formed a continuous line, and throughout its length were evidences of cremation. Some incised stones, with "cup-and-ring" marks, and fragments of pottery, were also discovered. On Thursday a large mound, 300 ft. long, was examined on the estate of Mr. Murray Allan, of Glen Feaschan. The mound is shaped exactly in the form of a huge saurian, and a number of gentlemen of standing have certified to its extraordinary construction. In the head, formed by a cairn, was a megalithic chamber containing burnt bones, charcoal, a beautifully formed flint instrument, and burnt hazel nuts. On the peat moss being removed, the spine of this animal form was found to be carefully constructed with regular and symmetrically placed stones.

Vienna Exhibition Building.—Harkard's tender for the great iron building forming the centre of the Vienna Exhibition of 1873 has been accepted. In the competition, according to the *Mechanics' Magazine*, England was considerably distanced; France and Belgium ran close together, but Prussia won the prize.

Irrigation Works at Leamington.—The chairman of the Leamington Board of Health has formally opened the sewage irrigation works, constructed at a cost of 16,000*l*. The magnitude of the works and of Lord Warwick's irrigation farm (the latter is intended to include 5,000 acres) has excited considerable interest. The two condensing rotary beam engines erected at the pumping station are of 180-horse power each, and either will pump 1,500,000 gallons in twelve hours. Steam is supplied by three Lancashire boilers, each 24 ft. long by 7 ft. in diameter. The rising main, 18 in. in diameter, is 2½ miles long. The engine-house is in the modern Italian style, and is 70 ft. by 30 ft., 55 ft. high, the foundations being 26 ft. deep. At the preliminary trial one engine pumped 25,000 gallons of sewage in an hour and a half, working on strokes and a half per minute, with a recorded pressure of 60 lb. per inch on the boiler. In ordinary weather one pair of pumps will exhaust the whole of the sewage by working four hours a day. The engines and boilers cost nearly 5,000*l*. The Earl of Warwick undertook to dispose of the sewage for a term of thirty years. In consideration of his lordship paying 50*l*. a year towards the pumping expenses, the local Board agreed to erect, at their own cost, the engines, main, &c., and to pump the sewage up to his lordship's estate, the highest altitude to which it is to be pumped being 132 ft. The irrigation farm has been prepared by Mr. Clifford, who has had considerable experience in such matters. Many acres have already been sown with Italian ryegrass, &c. A model cottage-house has been erected for several hundred head of stock. Supplies of crops, fat beasts, and milk, are to be sent to the metropolitan and other markets. This, if not the largest sewage farm in the country, will, in all respects, be a model. Lord Warwick having spared no labour or expense in order to test the principle of utilizing sewage by means of irrigation.

Sanitary State of Liverpool.—Relapsing fever is again spreading in the most impoverished parts of Liverpool. The medical officer declares that he has no hope of combating the epidemic, unless he is armed with exceptional powers for dealing with the cellars and fetid habitations of these districts. The mean average annual mortality of Liverpool for the last ten years has been 31 per 1,000 of population, as compared with a mortality for the same period in London of 24·5 per 1,000, in Hull of 24·9 per 1,000, and in Bristol—with its excellent sanitary staff—of 25 per 1,000. Compared with its contiguous neighbours of Birkenhead and Claughton, the mortality of Liverpool is as 7 to 4. A recent examination by Drs. Parkes and Sanderson has disclosed some of the local causes. The mortality of children under five years of age in the Castle-street district stands at from 10 to 40 per cent., while that of Scotland-yard ranges over 60 per cent. Much, of course, is due to the peculiar defects of building. The miserable houses of the poor are packed closely back to back, whilst the subletting and overcrowding, the inexpressible dirt and fetor, and the amazing intemperance and improvidence of the population, combine to make up a set of as perilous conditions as human creatures can live under. The municipality should cut boulevards through the crowded quarters, and remove the workmen to a wider area, whence tramways and soap trains could bring them easily to work.

New Water Tanks for Great Malvern.—It is designed to erect two additional storage tanks, one to be placed at the Wycho, the other at North Malvern. The new Wycho tank will be constructed to hold 2,000,000 gallons of water, and will be 163 ft. in length by 83 ft. in breadth, and in depth 25 ft. It will be divided into two equal compartments, in each of which there will be two ventilators of new design, and sixteen iron 10-in. columns, to be raised in circular Stourbridge blue-clay bricks specially manufactured for the purpose. The roof will be carried over the whole length of the section by means of five arches in each division. These arches will be carried on iron girders. The North Malvern tank, as regards principle and construction, will be simply a reproduction of the one described, but only upon half the scale. The former is estimated to cost about 700*l*., and the latter 2,470*l*.; beside which 50,000*l*. will be required for the mains and extensions, and 1,000*l*. more to supply meters. The present scheme will raise the available storage capacity to 4,000,000 gallons. Mr. Sandoe, the town surveyor, has the matter in hand.

Messrs. Spiers & Pond's New Concert Hall and Restaurant.—Mr. John Bettyses, of No. 222, Piccadilly, was summoned before Mr. Knox, by Richard Gay, a workman, for unlawfully obstructing him while employed to execute certain work in pursuance of the Metropolitan Buildings Act, 1855. Mr. Besley appeared in support of the summons, and counsel appeared in opposition. It appears that Messrs. Spiers & Pond, the well-known refreshment contractors, have become the possessors of a large piece of ground situate between Jermyn-street and Piccadilly, with the view of erecting a large concert-hall and restaurant, at a cost of 45,000*l*. and at a ground-rent of 1,500*l*. a-year. All the owners of the adjoining property have given their consent, with the exception of Mr. Bettyses, and the summons against him, on the part of Messrs. Spiers & Pond, was that they might try their rights, they having sent workmen in to enter on the necessary work on a party wall, but they were denied the right of entry by Mr. Bettyses, which, as was stated by Mr. Besley, had caused the loss of a considerable amount of money, and rendered the offender liable to the penalty of 10*l*. After the case had been argued at considerable length, it appearing that differences had arisen between each party's surveyor as to the appointment of an arbitrator, Mr. Knox adjourned the matter for the production of one of the surveyors, who, it appeared, had gone to the Marylebone police-court by mistake.

Unflammability of Asphalt.—At the last meeting of the Council of Common Council, Mr. H. A. Isaacs asked the chairman of the Commissioners of Sewers whether the commissioners had considered the probability of the asphalt pavement in the narrow streets of the City becoming ignited, and whether any measures had been adopted by the commissioners to ensure that the asphalt should be unflammable. The question had been suggested to him, he remarked, by the obvious softening of asphalt during the summer, and by the fact that in Chicago the wooden pavement had become ignited. Mr. Deputy De Jersey, the chairman of the Commissioners of Sewers, said, in reply to the question, that he had directed experiments to be made, and his belief was that no danger possibly could exist because the amount of bitumen in the pavement was small compared with the large amount of grit and other non-inflammable materials. With regard to the streets of Chicago to which reference had been made, there could be no wonder the fire had spread in that city, when they knew that the wooden pavement had been cemented with bitumen, and that there was a current of air underneath the pavement.

Reading Architectural Association.—The first general meeting of this newly-formed Society was held at the residence of the president, Mr. Charles Smith, Friar-street. The object of the Association is not merely to increase the knowledge and improve the taste of those immediately connected with the profession, but to induce a study of architecture and kindred subjects amongst all in any way interested in it, or the arts and sciences connected therewith. The opening meeting was well attended, and in every way successful. The president having delivered his inaugural address, an introductory essay on the "Principles of Architecture" was read by the vice-president, Mr. F. W. Albury, in which he traced the gradual development in the art and method of building from the earliest times to the completion of the first Grecian temple. The meetings of the Association will in future be held at the Athenæum. The hon. sec. is Mr. E. J. Shrewsbury, of 164, Friar-street.

Will of Sir J. Pennethorne.—The will of Sir J. Pennethorne, architect, late of Worcester Park House, Long Ditton, who died on September 1st, at the age of seventy, was proved in London on the 15th of the same month by his sons, Messrs. Deane Parker Pennethorne and Frank James Pennethorne, the acting executors and trustees; power being reserved to his brother, Mr. John Pennethorne, of Hampstead, Isle of Wight, also an executor, to prove hereafter. The personal estate was sworn under 25,000*l*. The will is dated November 19th, 1867. The testator has directed that his estates, both real and personal, shall be sold, and the proceeds divided amongst his children.

Monster Safe.—Messrs. Chubb & Son, of St. Paul's Churchyard, have just completed, for a banking firm, an iron and steel safe, weighing 15½ tons, the size being 8 ft. high, 8 ft. 8 in. wide, and 10 ft. 6 in. deep.

Petroleum.—It is stated in the *Journal de l'Eclairage au Gaz* of Paris that petroleum can, by a new process not published, be converted into a permanent solid (like solid paraffine, we suppose), which can burn without liquifying, and be preserved a firm mass for any period of time. M. Byasson has, in the *Comptes Rendus*, some researches on the Pennsylvanian oils. He states that they furnish fourteen volatile hydrocarbons, boiling at different temperatures. M. Byasson thinks the ordinary methods used for testing the inflammability of these oils unsatisfactory, and he proposes an apparatus for determining the tension of the vapours given off at different temperatures. The names paraffine (solid and fluid) and petroleum sadly want revision and appropriation or limitation. We shall now be having the word petroleum applied, like paraffine, or paraffin, both to a solid and a fluid, and perhaps to essentially the same solid as the paraffine solid.

Great Basses Lighthouse, Ceylon.—This lighthouse, which is all in Dalbeattie granite, is now almost completed by the contractors, Messrs. Shearer, Smith, & Co., Dalbeattie Granite Quarries, who are now setting the final portion of it. It is from a design by Mr. James N. Douglass, C.E., engineer to the Trinity Board, and will be erected by that Board at Point de Galle, Ceylon. Some idea of the extent of the work may be formed when we say that it contains about 20,000 cubic feet of granite; and as the stones are all carefully dovetailed into each other by joggles out in the top, bottom, and sides of the solid stone, the lighthouse will form a most solid and secure structure. The whole work has been finished and fitted together in the quarries before being despatched, and, when transported to its distant destination, will be quietly put in its appointed place.

Improvement in the Strand.—An improvement much needed, and one which will greatly facilitate the transit of traffic between the eastern and western parts of the metropolis, will shortly be carried out. The parish authorities of St. Mary-le-Strand have decided, with the cordial consent and co-operation of the rector, the Rev. Dr. Evans, to move back the railings on the southern side of the church for the distance of 8 ft., and on the northern side for 18 in., thus widening the Strand on each side to the extent mentioned. The eastern and western approaches to the church will also be altered, and the entire amount of space thus given up to the public use will be nearly 2,000 superficial feet. The only matter necessary to complete the negotiations is to obtain a faculty from the Bishop of London. The entire space from Newcastle-street to Somerset House will be paved with asphalt.

The German North Pole Expedition.—Dr. Petermann has received detailed accounts from the North Pole explorers, Herren Payer and Weiprecht. These despatches fully confirm their discovery of an ice-free ocean round the North Pole, swarming with whales. The route they take is that pointed out in the *Builder*, as we have shown, before Dr. Petermann's suggestion of it, namely, the route of the warm Gulf Stream, north-eastward, between Spitzbergen and Nova Zembla. By this route, as we said, the pole is supplied by an actual warming apparatus, which carries warmed water in and brings cold water out. Is it possible that we, who have in our endeavours to reach the North Pole, so laboriously, expensively, and clearly shown the world how not to do it, do not mean now to go in and do it? The whalers may if the Government will not.

Metropolitan Board of Works: Mr. Gladstone's Visit to Greenwich.—At the last week's meeting of this Board, Mr. Baxter Langley presented a memorial, requesting, on behalf of the committee for arranging the reception of Mr. Gladstone by his Greenwich constituents this Saturday, that the Board would, by virtue of the Metropolitan Commissioners Supplemental Act, 1871, chapter 57, consent to the temporary erection of a covered platform and posts and rails, on Blackheath Common. Colonel Hogg said in reply that he had much pleasure in informing the deputation that the prayer of the memorial would be granted.

Opening of Queen Victoria Street.—The Metropolitan Board of Works propose to open the new thoroughfare named Queen Victoria-street, leading from the Victoria Embankment at Blackfriars Bridge to the Mansion House, on Saturday, November 4th.

Tramway-Carriage Steering Apparatus. Difficulties and inconvenience have arisen in the working of the tramway system in the metropolis at places where it is necessary to give to the carriages a slight deviation from the line upon which they have been moving, and cause them to pass into a branch or siding. This has already led to the application of considerable mechanical ingenuity to the subject, and some patented apparatus, the invention of Mr. Samuel Norman, of Westminster-road, is said to supply the necessary remedy in a simple manner. The specification and drawings set forth as many as twenty-nine modes, which may be used according to the construction of the carriage. The principal, and perhaps simplest, method is that of partially skidding one of the leading wheels of the carriage on the side which corresponds to the inner side of the curve.

Pictures for Brighton.—At the last town council meeting, Mr. Cordy Burrows informed the meeting that he had received a communication from Mr. Samuel Appleby, of Alexandravilla, presenting the town with three views of Brighton in the olden time, for their proposed picture gallery. Mr. Appleby, he said, was a gentleman eighty-two years of age, who had removed to Brighton with a desire here to end his days. His collection of paintings was unequalled in the county, including no less than eight very fine and important works by Turner. The views of Brighton which he now presented were early works of that celebrated artist, and showed what the town was in 1800. A vote of thanks was unanimously passed to the donor.

Rail into Central Africa.—While people are talking of a railway to India direct, to accomplish the passage from London to Calcutta in five days, the Viceroy of Egypt has actually commenced one of the most gigantic undertakings ever attempted in his territory,—that of connecting Upper and Lower Egypt by rail. Assisted by an army of English engineers and navies, and unless stopped by the jealousy of the Sultan, he will drive an iron road and a team of iron horses, not only to the very confines of Nubia, but into the heart of Africa, opening up new fields for commerce. Twenty of the engineers for the undertaking passed through Malta lately on their way, to be followed by the remainder of the staff in a short time. The line, commencing at the Second Cataract, is to be 600 miles long.

Sanitary Movements in Shoreditch.—The sanitary authorities in our London parishes are making arrangements to prevent or assuage the violence of anticipated cholera by putting the houses of the populace "in order." At Worship-street Police Court, occupiers of houses in Garden-walk and Ingram-buildings, immediately adjoining, have been ordered to set theirs in order of cleanliness "forthwith," under a penalty not exceeding 5*l.* for each and every day such nuisance was suffered to continue as that shown in evidence. The medical officer of health for Shoreditch said he had found the houses in a very dirty and dilapidated state, quite unfit for human habitation.

A Monster Casting.—The largest cylindrical iron casting ever made was run on Tuesday last, by Messrs. Robinson & Cottam, of the Battersea Works. It is an immense iron ring, 21 ft. in diameter, 4 ft. 6 in. in height, and 1½ in. in thickness. Its weight is about ten tons, and it is the first of several of the same kind which are about to be cast by the above firm for the piers of the Albert Bridge at Chelsea. It is a fine specimen of loam casting, and although nearly double the diameter of anything ever before attempted, is a thorough success. About forty tons of iron were used in forming the mould and core of this cylinder, besides a large number of bricks.

The Alterations at Woolwich.—The high wall enclosing the Dockyard on the land side has been cut through, to form the new road which is to lead to the public wharf and the plots for sale from the town, and the demolition of the building slips at the eastern end of the yard is almost complete. The plots for disposal, including the site given to Woolwich for the wharf, amount to hardly five acres, and this now appears to be all that the authorities either of the War Office or Admiralty will not retain.

Architectural Books.—Some of our readers may thank us for mentioning that Mr. Bernard Quaritch, of Piccadilly, has purchased the library of the late Sir James Pennethorne, and that the books, separately, are now on view and for sale.

Grosvenor Working Men's Club and Institute, Fimlico.—A special meeting of the committee has been held, when the trustees attended, and submitted the plans, which were unanimously agreed to by the committee; also the trust-deed was submitted and approved. The club will be commenced forthwith. The committee are sorry to state that the amounts promised are not nearly sufficient to cover the cost of the building, and they earnestly appeal to the friends of the working classes for further support, which may be sent to the treasurer, Mr. Hamilton Hoare, 37, Fleet-street.

Embankment at Battersea and Chelsea. The extension of the river embankment from Chelsea to Battersea Bridge, which, when completed, will open up a roadway for a distance of upwards of two miles in a direct line from Westminster, has just been commenced, and is now to be vigorously pushed forward. The embankment on the Surrey side of the Chelsea Suspension-bridge, and fronting Battersea Park, is now finished, and open to the public. It is planted along its whole length with trees, and forms a very agreeable promenade.

Opening of the New Corn Exchange at Rochester.—The new Corn Exchange for the city of Rochester has been formally opened by the mayor. The building is an exact reproduction of the Cutlers' Hall, at Sheffield, and consists of a hall, 100 ft. in length by 50 ft. in width, which is approached by a flight of steps from the present Corn Exchange. Underneath is a large reading-room, as well as a kitchen and other domestic offices. The new building was erected by Mr. Sollitt, Strood, from designs furnished by Messrs. Flookton & Abbott, architects, Sheffield.

International Arbitration.—At a meeting of the Workmen's Peace Association, held recently in London, it was resolved to commence a vigorous campaign in support of Mr. Richard's motion for the establishment of a High Court of Nations, for international arbitration, by holding, in the first place, meetings at Colchester, Ipswich, Norwich, Peterborough, Bury St. Edmunds, and the adjacent towns. There will also be a series of meetings commenced nearly simultaneously at Liverpool, Birkenhead, and those districts.

The Guinness Dispensary, at Dublin. founded through the liberality of Sir Benjamin Lee Guinness, bart., is now completed. It is 60 ft. in height, and is built of granite. Internally, the building is elaborately supplied with all the modern appliances for medical and surgical treatment. The ground floor will be appropriated for dispensary, waiting-rooms, laboratories, &c., and the two stories overhead will be set apart for convalescent wards for the patients.

Lodgers' Goods.—In reply to some inquiries we answer:—That in consequence of the Lodgers' Goods Protection Act, passed last Session, any lodger whose furniture, goods, or chattels, from being on the premises, are threatened with distress for arrears of rent due from his landlord or landlady to the superior landlord, must, in order to have them protected from distress, make a written declaration stating the furniture to be his own, and mentioning the rent (if any) which is due from him to his immediate landlord.

Cholera Hospitals.—At a meeting of the Metropolitan Asylums Board, the threatened approach of cholera to this country has been taken into consideration, and the building of some eight or ten hospitals in different parts of London, to meet the contingency of its approach, was talked of. The majority of the members took alarm at the annual cost,—not less than 200,000*l.*,—which such a step would involve, and the whole matter was referred to the consideration of a committee.

The Albert Memorial Chapel, Windsor Castle.—The internal decoration of this chapel, the works within which were interrupted by the war in France, is again being proceeded with. Several marble tableaux, from the atelier of Baron Trignetti, have been received at the Castle, and these will be at once placed in position on the walls.

Sheet-Zinc for roofing is, in many respects, very useful, but hitherto it has not always been found to be durable. M. Artas, of the Vieille Montagne Company, has introduced a zinc white paint with silicate of potash as a vehicle, which is said to be exceedingly durable, and to keep the metal roofing very cool. This is reported the *Comptes Rendus*.

The Law Courts.—Mr. Street has addressed a letter to the Metropolitan Board of Works, submitting, with the approval of the Chancellor of the Exchequer, a proposal for widening the Strand by removing the Church of St. Clement Danes to a portion of the site cleared for the new Law Courts, which, by being brought slightly farther south than originally intended, would allow of the widening of the whole length of Carey-street, north of the new buildings.

Opening of a New Hospital at Dudley. The Countess of Dudley has formally opened the fine hospital given by the earl to the people of Dudley, but locally known as the Quest Hospital, in consequence of a wealthy mail-master having endowed it with 20,000*l.* The hospital has been furnished throughout by his lordship, and the total cost is about 30,000*l.*, including the value of materials below the surface.

Builders' Benevolent Institution.—The annual dinner will take place on Thursday, November 2nd, Mr. Joseph Taylor, the president, in the chair. We would earnestly bespeak for it the aid of our readers.

Winter Exhibition.—The private view of the Winter Exhibition of Cabinet Pictures at the French Gallery, Pall-mall, is fixed for this Saturday, October 25th.

The Darmstadt Theatre.—The court theatre in Darmstadt has gone the way of all theatres. Fire has wholly destroyed the interior of it.

Vestry Hall Competition, Camberwell.—The designs have been sent in, and are now under consideration.

TENDERS

For providing and fixing pendants, brackets, &c., and laying on gas to same with necessary pipes, &c., and providing and fixing radiating apparatus at the new Infirmary, Newington Workhouse, Walworth-common, for the guardians of St. Saviour's Union, Surrey. Messrs. Henry Jarvis & Son, architects:—

Martin & Co.	230 0 0
Beck & Co.	200 0 0
Richardson, Slade, & Co.	185 0 0
Clutterbuck	170 3 5
Jaques & Co.	164 10 2
Buchanan	157 10 0
May	150 0 0
Mills	148 10 0
Biggs	143 7 6
Chandler & Son	131 17 0
Randall	127 5 0

For providing and fixing washing and other apparatus, and supplying same with hot water, &c., at new Infirmary, Newington Workhouse, for the guardians of St. Saviour's Union, Surrey. Messrs. Henry Jarvis & Son, architects:—

Smith	21,895 0 0
Jaques & Co.	1,720 0 0
May	1,573 9 0
Turner & Co.	1,549 0 0
Benham & Co.	1,495 0 0
Fraser, Bros.	1,485 0 0

For constructing and fixing at new Infirmary, Newington Workhouse, bar, coal, and dinner lifts for the guardians of St. Saviour's Union, Surrey. Messrs. Henry Jarvis & Son, architects:—

Jaques & Co.	4204 0 0
May	165 0 0
Elford	169 0 0
Benham & Sons	159 0 0
Turner & Co.	155 0 0
Waygood	155 0 0
Stannah	151 0 0
Warren, Hands, & Co.	149 0 0
Smith	127 0 0

Additions and alterations at Sydenham-rise for Mr. J. Edwards. Mr. J. Roger Smith, architect. Quantities not supplied:—

	House.	Stables.
Ashwell	£1,339 0 0	£296 0 0
Capps	814 0 0	304 0 0
Jerrard	818 0 0	285 0 0
Vincent	718 0 0	284 0 0
Wright & Goodchild (house and stables), 42670.		

For a house for Mr. R. Robey, Lincoln. Mr. Watkins, architect. Quantities supplied:—

Young	£1,495 0 0
Goodbarns	1,425 0 0
Huddleston	1,420 0 0
Taylor	1,412 0 0
Sharpe	1,398 0 0
Barnes & Wright (accepted)	1,357 0 0

For part alterations at Messrs. Dawson's, City-road. Mr. James Harrison, architect:—

	Extra for Suezell's Shutters.
Groves	£234 0 0
Brown & Sons	224 0 0
Pask	179 10 0

For house for Mr. E. Dawber, Lincoln. Mr. Kelham architect. Quantities not supplied:—

Young	£1,270 0 0
Hallam & Co.	1,130 0 0
Otter & Elsay (accepted)	1,119 0 0

The Builder.

VOL. XXIX.—No. 1500.

The Trent Bridge,
Nottingham.

NOTTINGHAM is proud of the new bridge which has been erected over the Trent, and with some reason, as our readers may infer from the view of it in our present number.* The old bridge is full of story, and we give a view of that also. There must have been a ferry or ford here before the Muse of History began to take notes; and at the beginning of the tenth century a bridge was built, partly of stone, partly of timber, to which succeeded, apparently in the latter part of the twelfth century, one wholly of stone. The two southernmost arches of the existing bridge are the work of this period, and we are glad to hear that one of them is to be retained as a relic and memorial of the ancient structure. Wise is a town to forget not its past. In 1683 much of the old bridge was destroyed by a flood, and was soon after restored and partly rebuilt.

The old bridge has echoed to the tramp of war-horses in many reigns. Over it, in 1194, marched the lion-hearted Richard, in all the pride and panoply of war, attended by his faithful knights and companions in arms, to wrest the castle from the unfaithful and rebellious John; and over it did the perplexed John march to sign the Charter of Rannymede. "Our Old Trent Bridge," it has been related, "has had also another traveller, not less magnificent than Richard, not less imperious than John, and who, an outlaw himself, made Nottingham subject to his laws, and made kings and sheriffs obedient to his will. In the very old ballad of 'Robin Hood and the Potter,' we read how Robin took his stand on the Trent Brigg, and demanded passage of the potter:—

'All these three yer, and mor, potter, he seye,
Thou hast hantyd this wey,
Yet were tow never so coveys a man
One peny of passage to pay.
What ys thy name? seye the potter,
For passage thou aske of me;
Robin Hood is my name,
A wedd shall thou leffe me.'

It would, indeed, have been a sight to see this proud potter who would pay no toll for three years, and who thrashed Little John and Robin Hood, come 'dryfing owyer the ley.' Passage is still levied on the Trent Brigg, or, as the ballad corruptly has it, 'Went brigg,' to this day." The Trent Bridge was trod by King

Edward III. in his expedition to capture the perfidious Mortimer, and over it was led that prodigal favourite, on his way to execution in London. Over it also passed King David of Scotland to his dungeon in Nottingham Castle. It could tell tales, too, of tyrant Richard, and Richmond, his conqueror, and has not forgotten Wolsey as he passed over on his mule a disgraced and dying man, or events in which Charles I. and Cromwell were concerned.

The old bridge as it now stands, includes 15 arches in that portion of it which may be termed the Bridge proper; of these arches the first 11 appear to have had each a span originally of 25 ft. at the widest points, making an extreme waterway of 275 ft.; the remaining 4 arches, varying from 18 ft. to 22 ft. span, were evidently either for flood water or for sustaining the roadway: the waterway in the aggregate afforded by the 15 arches, measured at the widest parts of the openings, amounts to about 347 ft., but measuring between the platforms of the starlings, the waterway does not exceed 270 ft. The sum of the widths of the several piers amounts to about 191 ft.; this gives a total length for the bridge proper of about 538 ft. Immediately south a mass of masonry occurs, supporting the roadway, and then follow the two small and most ancient arches already alluded to.

The bridge has been widened at different times; the original width did not probably exceed 12 ft., but to increase the convenience of the roadway the pointed arches have had collateral arches of segmental and elliptic form built against them of comparatively inferior and inartistic workmanship.

The foundations of the old bridge are formed of oak piles, which are driven into the gravel bed of the river. The masonry does not extend much below mean summer level, and during a dry summer the skeleton platform of the piers is greatly exposed. The materials of the bridge are bricks and stone; the former have been of a very durable quality. The stone of the older parts of the work has been obtained from the local Keuper beds of the new red sandstone, and that of the modern parts from the millstone grit of Derbyshire. In this bridge is proved the durability of the local beds of sandstone which now are very little used, and also the suitability of Derbyshire grit for similar purposes.

The old bridge has been considered for many years past to be in a precarious state; and in 1853, the late Sir William Cubitt, C.E., recommended the erection of a new one, for which some preliminary sketches were then made, but no further active steps were taken until the latter end of the year 1867, when instructions were given to Mr. M. O. Tarbotton, the Borough Engineer, to prepare fresh plans and estimates for the new bridge, and in April, 1868, these plans were submitted to the Town Council, at a special meeting, and unanimously agreed to. The estimated expenditure was put down at 31,000l.

In the early part of September, 1868, the first sod was turned on the south side of the river. No architectural deviation, says Mr. Tarbotton, in an account published by him, and to which we are indebted, was made from the original designs. The total length of the bridge is about 700 ft. from the north abutment; to the end of the south approach on the London road, the clear width between the parapets is 40 ft., and from face to face of the abutments, 48 ft. 3 in., being practically the same width as Southwark and Waterloo Bridges, London. The width of the approaches increases very rapidly from the bridge proper, in order to facilitate the junctions of the several roads on the north and south sides of the river. The height of the roadway above the summer water level of the Trent is 27 ft., and there are two footpaths each 7 ft. wide, with a carriage-way 26 ft. wide, capable of accommodating easily three lines of carriages. The new bridge consists of three main arches

or spans, each 100 ft. wide in the clear, one north flood and haling path arch, 10 ft. span, and three south flood arches, 18 ft., 15 ft., and 12 ft. wide respectively. The surface of the bridge is quite level, and the north approach has a gradient of 1 in 47, and the south 1 in 34.

The material of the large main arches is cast-iron, and each arch has eight ribs or girders, which weigh about 200 tons. These ribs sustain transverse wrought-iron girders, which are bolted to them, and in turn carry the roadway sheet; the latter is formed of wrought-iron curved plates and Mallet's buckled plates, all which are riveted together and to tee and angle iron bearers and straps. Every arch has strong bracing frames to connect the several ribs together, and all the joints of the ironwork are planed true and connected with iron pins or bolts, which were previously turned smooth in a lathe and fitted into holes correspondingly drilled through the ironwork. The face ribs are of an ornamental character, and are moulded on the lower edges, and on the upper lines of the arches. The spandrels are recessed and moulded, and contain medallions of cast-iron fitted within geometricous which are enclosed in moulded circles or tracery. The designs for the enrichments vary in each compartment both in size and detail—these were all modelled and prepared by Messrs. Farmer & Brindley, of London, the sculptors, but cast at Derby. Over the arches and spandrels, an ornamental moulded cornice, of cast-iron, runs from pier to pier, and the lower part embraces a filling of conventional foliage, composed of leaves and lilies, also of cast-iron. The whole is surmounted by the parapet, which is of geometric and continuous design formed of cast-iron open-work, with pateras or flowers at the intersections of the curved lines. The top member is moulded, and the lamp standards, for lighting the bridge are designed as permanent features to correspond with the parapets, and form an integral part of it. The parapets of the north and south approaches, over the stone arches, are of similar design and construction to those over the iron arches; the lamp standards, for lighting the approaches, are dwarf columns, fixed upon stone pillars. All the lamps are globes in one piece of glass, with copper finials and mountings, and supplied with gas in the usual manner.

In the construction of the abutments and piers, difficulty was experienced with the foundations. There are two large main abutments which receive the iron arches, one on the north and the other on the south side of the river, and between these there are two piers, built entirely in the water. Another abutment receives the north flood arch, and on the opposite side are two piers and an abutment for the south flood arches. The residue of the north and south approaches is sustained by curved stone battering retaining walls. All the foundations in the river were built by the aid of coffer-dams. On the completion of the dams, the water was pumped out, and the bed of the river was excavated down to the white sandstone rock, and the latter was also excavated to a depth varying from 2 ft. to 5 ft. to procure a solid and level bottom for the masonry. The foundations of the piers were constructed of large blocks of Derbyshire ashlar, cramped together with iron, and upon these the masonry of the piers was built up. The faces are formed of blocks of stone, filled up behind with rubble masonry, the whole being laid in ground Barrow Lias lime and washed Trent sand. The abutments are similarly built, but the foundations rest upon Portland cement concrete, composed of cement from the works of the Burham Company in Kent. The general stonework of the bridge, and of which all the ordinary faces are formed, is from the quarries of Mr. Sims, Whatstandwell, Derbyshire; the ashlar is clean hoisted, and the front walling blocks are rock-faced, some fronts being

* See p. 887.

carefully dressed with the chisel, to suit the architectural composition. The ornamental parts of the stonework, the cornices, caps, pedestals, recesses, and other superior features are of Darley Dale stone, from the quarries of Sir Joseph Whitworth, and of red Mansfield and Mansfield Woodhouse stone, from the quarries of Mr. R. Lindley. All this stonework is cleaned and either moulded or carved. The south approach parapets are also of Darley Dale stone, rock-faced. The south flood arches have moulded stone arch quoins, the arches being of brickwork, each arch is on the skew, and the angles of each vary in consequence of the approach being on a curve, the radius of which is about 300 ft. The river piers are terminated at all the ends with clustered columns of polished Aberdeen granite; these support large carved caps, upon which are placed blocks of red Mansfield stone, the latter forming on the inside next the footpath seat recesses for the accommodation of foot passengers crossing the bridge. Cornices over these of carved Darley Dale stone complete the upper finish of the piers; the recess blocks on the external faces are deeply sunk in the solid stone, and have on all the fronts arched ornamentations, with polished serpentine granite shafts from Cornwall.

The carriage road way of the bridge is formed, firstly, of a layer of bituminous concrete, to protect the iron plates from oxidation; secondly, of foundation of Portland cement concrete, several inches in thickness; and thirdly, of a layer of Val-de-Travers asphalt. The channels and curbs are of cast iron, and the footpaths are laid with sawn Spinkwell landings from Yorkshire.

The contractors for the works of the new bridge were:—Messrs. Borton & Woodiwiss, of Derby, for the general building and masonry work; Messrs. Andrew Handyside & Co., of Derby and London, for the ironwork; Messrs. Mawer & Ingle, of Leeds, for the general carving; and Mrs. Marshall, of Nottingham, for the painting and decoration.

The whole of the works have been executed from the designs and under the direct superintendence of Mr. Tarbotton, Mr. George Thompson being the clerk of the works.

The eight coats of arms sculptured on the abutments of the new bridge have been selected for the purpose of typifying some of the principal events which connect the old bridge and the town of Nottingham with the general history of the country, and were supplied by Mr. Thos. Close, F.S.A. These are carved in hard red Mansfield stone, and severally inserted on the exterior faces of the Darley Dale blocks of stone, which form the upper members of the abutments. The shields were carved and prepared by Mr. W. P. Smith, of Nottingham, from sketches by Miss Hind, under the supervision of Mr. Close. The events commemorated range from the date of the erection of Nottingham Castle, early in the reign of William the Conqueror, to that of the passage of Queen Victoria and the Prince Consort over the old bridge, on their way from Chatsworth to Belvoir, in December, 1843.

The new bridge was opened for traffic, by the mayor of the borough of Nottingham, on Tuesday, the 25th day of last July.

A contract was entered into a short time ago, between the corporation and Mr. W. Smart, of Nottingham, to take down and clear away the old bridge for the sum of 572*l.*, the materials, stonework, brickwork, and other things becoming the property of the contractor. The work of demolition has commenced, and is in active progress; and in a few months it is expected the Trent Navigation Company will commence deepening the river, for the purposes of extended navigation. In connexion with the removal of the old bridge, the contract comprises the construction of river-walls, and an embankment or terrace on the north bank of the River Trent, to improve the line of river, and develop the waste grounds which belong to the corporation for building or recreative purposes. The cost of the bridge will be about 31,000*l.*; but including the new public buildings, and improvements in connexion with it in the neighbourhood, about 36,000*l.*

Working Men and Building Societies.—13,000 houses in Birmingham belong to working men. There are streets more than a mile long, in which absolutely every house belongs to the working classes, and which are the healthiest districts in the town.—*Labour and Unity.*

VAGARIES IN BULLION.

It may be assumed that the precious metals, silver and gold, which are almost the only recognised and correct materials for the execution of the innumerable testimonials which it is the fashion for us all to give to each other, have that in their nature which offers peculiar temptations to the artificer to stray from the path of correct and artistic taste, or rather to save himself the trouble of seeking it. Any object executed in wood, stone, or even marble or alabaster, or any material the intrinsic value of which is not very high, must show some worth in its design, some special beauty of form and treatment, to render it a suitable offering or token of esteem to be presented by one man to another. But if we look at the style of articles in goldsmiths' and silversmiths' work, such as cups, epergnes, centre-pieces, &c., which form the staple memorials of victories at Epsom or Newmarket, Cowes or Henley, or the testimonials of goodwill or gratitude from friend to friend, we are tempted to the conclusion that in these matters the intrinsic value of the material gives a worth to the article which supercedes the necessity for any effort at original or artistic design. It seems only on such an hypothesis that we can account for the commonplace character, the total want of connexion or suitability of design to material which belongs to so many works of "bigotry and virtue." Silver especially is a material so brilliant and attractive in itself, with its white lustre and capability of varied surface treatment, that to execute in this medium an imitation of any object *à propos* to the occasion, seems at once to constitute a satisfactory and suitable "testimonial," fit to be described in the papers as "an elegant and chaste product of the silversmith's art."

If the achievement of a noble lord's horse is to be commemorated, a cup, with a date-tree stem and foliage, and one or two "Arab" horses strolling leisurely about the base, is a motif which cannot fail to recommend itself to the critical eye and taste; or perhaps a couple of horses rearing in a frantic fashion, and carrying the bowl of the cup on their backs. If the victory is of an aquatic nature, ships' prows, seaweed, anchors, and dolphins may be mixed in wild profusion. In some towns it is the custom, if the lady mayoress for the time being is blessed with an addition to her family, for the township to present—a silver cradle. A butter-dish is adorned with a silver cow, to lift up the lid by; and a fruit "centre-piece" will be made with twisted stems and spiky vine-leaves growing out of it, rendering it impossible to grasp the thing anywhere with comfort to the hand. Fifty other instances of this "realistic" treatment of silver will occur to many of our readers; and the general impression from a collection of this class of productions would certainly be, that so long as the material is silver, any design must be pleasing; but we do not know that we have ever come across so extreme an instance of this kind of aimless trifling in bullion as one which was notified to the public last week. We quote the following from our (nevertheless) highly-esteemed contemporary, the *Daily News*, for the 26th ult. —

"THE 'BESIEGED RESIDENT' IN PARIS 1870-71.—A work of art of somewhat unique character has just been presented, on the part of the *Daily News*, to Mr. Henry Labouchere, whose letters in our columns, under the title of 'The Besieged Resident,' attracted much interest during the siege of Paris. It is an exact copy in silver of the celebrated fortress of Mount Valerian, the most powerful of the defensive forts of Paris. The trophy is 2 ft. 7 in. in length by 2 ft. high, and 14 in. broad. On the top of the hill stand the barracks and the officers' quarters in plain silver, also the two great pieces of artillery by which St. Cloud was destroyed; somewhere lower down, and at the side, are seen the chapel and a Martello tower with the tricolour waving from it. The platform and base of the trophy are in oxidised silver of the finest workmanship. It is, in fact, the product of the more delicate hands of the artificer. There are fifty guns on this part of the fort, all capable of being elevated or lowered at pleasure, and with the necessary ammunition behind them. These cannons are necessarily small in size, and are not such as would be likely to frighten either Prussians or Communists, but they are executed with elaborate care and precision. The silver part of the work rests on a basis of vert antique marble which represents the outward embankment of the ditch. The stand is of red marble, and is

ornamented with six mortars, twelve cannons, twelve Chassepôts, six with bayonets and six without, and accoutrements in oxidised silver."

Those who read the letters of the "Besieged Resident," during that extraordinary crisis, and appreciated the mixture of vivid, racy description and pointed sarcasm which characterised them, will certainly think it only natural and right that Mr. Labouchere should receive some recognition, from the conductors of the journals in question, of the value of contributions which added so much to the interest of their readers at the time. But could there be imagined a more absurd and senseless form for such a testimonial to take,—a more thorough waste of money and material, than that described above? The valuable material used is, in the first place, utterly thrown away and mis-used. If an exact topographical representation of the famous fort and its environs were considered to be, under the circumstances, a suitable and interesting memorial to offer, it might have been made far better, and with infinitely more *wassemblance*, in less costly materials: the sole possible advantage of making such a thing in silver is to afford its owner the satisfaction (if it happen to be any to him) of reflecting that it is all solid silver, and, as such, worth an appreciable sum in the bullion market. The same cost of labour and material, if directed into an artistic channel, would have sufficed to produce a work of art not merely valuable as material, or as a mere imitation of something else, but for its own original and intrinsic beauty—something which might be handed down for generations as a thing to be carefully preserved and admired, when the recollection of the circumstances it was designed to commemorate had faded, or had ceased to interest any one strongly. We must not forget, however, the practical use which this "unique work of art" is contrived to fulfil.

"The trophy, which is the production of Mr. Streeter, of Conduit-street, contains, we should add, various openings for holding cigars and cigarettes."

This puts the finishing touch to the whole. A model of a fortress, in silver, to hold cigars and cigarettes! It is really difficult to think that the description of such an incongruity can be anything but a "mild" hoax on the readers of the paper.

We may be told, of course, that it is no business of ours, and that it is a small matter to make a fuss about. Granted, in one sense. The proprietors of the *Daily News*, or any other paper, have certainly a right to give anything they like in the way of testimonial to their contributors; and if the recipients are satisfied, it is, in one sense, nobody else's business to grumble. But we could not help being struck by the description, thus publicly given, which we have transcribed, as a vexatious instance of the inherent vulgarity and bad taste prevalent in England in these kinds of things,—a consideration the more forced upon us, inasmuch as the testimonial in question emanates from a journal of exceptional ability and originally started by thoughtful and educated writers for thoughtful and educated readers. We doubt whether any Parisian journal, of anything like the same position, would have signalled its gratitude to an able contributor by the present of such an absurd toy, and have recounted the achievement to its readers as something worth their attention. If the work were really, what its donors appear to think it, a "work of art," they would be perfectly justified in saying that it was one of a "somewhat unique character." But we must beg to tell them that such a thing is not in any sense a "work of art" at all; it is merely a piece of handicraft, very likely excellent in its kind, but of a kind of excellence of the most trivial and commonplace description; and that no man of artistically-cultivated perception would care to have such a production, certainly not to exhibit it on his sideboard or library-table as an ornament. The value of silver as a material for art-workmanship lies in its beautiful and brilliant lustre, its susceptibility of being worked in fine and thin laminæ, its ductility and capability of taking every variety of surface finish, from a high polish to a rough or embossed surface; and when it is employed as metal should be, not in slavish imitation or attempts at imitation of natural objects, but as the medium for the execution of refined and delicate artificial ornament, there are few materials more beautiful in themselves; and when these higher qualities are present in the work, of course the intrinsic costliness of the material does add something to

the value of the article, and render it more worthy of presentation as a gift or testimonial. But to make a model in silver of an object totally unfit for ornamental treatment in that material, merely because silver is costly, is, to put it plainly, one of the most senseless uses to which a beautiful material can be put; and the kind of value thus gained for an object is of a nature which can only recommend itself to ill-educated minds. We heartily wish this view of the matter could be got into the heads of English people, and then we should not see the shop-windows of jewellers and the drawing-rooms of wealthy people crowded with so many senseless and costly knick-knacks, which seem to have no object but to waste labour and material that might have been better employed.

THE WORKMEN'S INTERNATIONAL ASSOCIATION.

At a length too extended to find room in the columns of any but a daily paper, our contemporary the *Times*, on the 27th of October, gave in a detailed and very interesting account of the origin, history, and professed aims of the Workmen's International Society. The subject is one of so much importance; the field around it at once so wide and so close at hand; there is so much wisdom blended with so much folly,—so much of attempted good, and so much of unmixt evil, bound up in the same heterogeneous bundle,—that an exact appreciation of the subject becomes the duty of every thoughtful man who loves his native country.

The form which the new movement is taking is capable of consideration from many points of view. To some persons it is a source of unmingled alarm. It is, they think, an organised crusade of the great majority,—that is, of the people who want,—against the comfortable minority, the people who have. It is not to be denied that there are many persons associated with, and even prominent in, the International Union, whose creed may be simply and truthfully condensed in such a sentence as the above. Nor can we forget the close connexion of international organisation and aspirations with the brief and fiery rule of the Commune in Paris. The only wielders of power who have perverted their energies to the purposed destruction of the most precious records of civilisation have been the fanatics who deemed that all human instruction was contained in the Koran, and the Communists of Paris.

But the International movement in this country owes, and must owe, any weight and influence that give it claim to our consideration to the canons of men of a very different stamp. In the English nature, amid all its defects, there is a solid substratum of common sense. A party-ory may be very well at an election, a wild theory may be seducing enough on the platform; but when we come to regular organisation, and to that which alone can render organisation effective,—regular subscription of funds,—we may be sure that there must be some show of right, of reason, and of experience, that will at least have a plausible appearance.

The main idea underlying an international association of working men is as follows (we are not stating it as a truth, but as a proposition which its advocates maintain):—

Society is now divided, contrary to the welfare of the majority of the people, into classes. Of these classes a certain section, formerly clothed in hereditary right, but now only distinguished either by superior education, or by the mere fact of possession, enjoys the fat of the land. Indeed, they hold the land itself, the common property of the people at large, in a tenacious grip. They monopolise the offices of State, the functions of education, the imposition and execution of law, the command of the army and navy, and the observation and respect of the world. They convert the mass of the producing community into a set of wage-paid helots, ground into the dust. And the means by which this is effected, the instrument by which an unorganised but all-powerful aristocracy maintain the bottom of the pyramid in the air, and the apex on the ground, is the class of masters, and employers of labour, connected with, or even themselves dependent on, the owners of capital.

To counteract this powerful alliance, the working men have one great force on their side. It is that of the majority of numbers. They wish to add a second, and a third. The second is, intelligence; and the third is, European solidarity, or rather a brotherhood wider than the

narrow bounds of Europe, embracing the New World and the busy and thriving colonies of Old England,—knowing no divisions of Teutonic, of Slavonic, or of Latin race,—and forming an association more wide, more general, and yet more intimately bound together, than any that now or at any previous time has become known by the name of Christendom.

Questions of policy proper,—that is to say, of the form of national institutions,—are stated to be foreign to the discussions of the Institution. So, also, are questions of religion. Considering the wide European range from which the leaders of the movement look for support, it is clear that such a profession of impartiality is peremptorily demanded by prudence. It is little less certain that the abstention would be nominal only. In this country there are two subjects, and two only, that very deeply interest the working classes. These are, Religion and Politics. Exclude these from their discussions, and ninety-nine men out of a hundred will be of opinion that nothing remains to discuss. To interest the masses in this country in such a programme would be altogether out of the question.

There is, moreover, a further reason why abstention from religious and political discussion can form only an unreal, or a temporary, condition of international organisation. Supposing the objects of the leaders of the movement to be attained, the association must, sooner or later, come into collision with the established institutions of every kingdom or state. Grant that the workman has no *pénchant* to republicanism, monarchy, or empire. He has set his hand to frame a republic of his own,—a republic of labour. Let but a small portion of the objects of the association be carried out, and one of two things must result. Either a perfect political chaos, or a definite and ever-growing influence of the new brotherhood, modifying laws, habits, social distinctions, and transposing the very framework of society.

In so far as the second requisite of the associated reformers of labour is concerned, information as to the exact state of their brother-workmen elsewhere, the impulse has not been given by the leaders of the International movement. It has a widely-different origin. As it is in this very branch of the subject that much of what we consider most important as well as most hopeful for the future is to be found, it is well to pay gratitude where it is due. It is to the diplomatic service of Great Britain, and pre-eminently to that wise statesman, the late Earl of Clarendon, that we owe our fullest and most exact information of the industrial state of other countries, as it is to the statisticians and compilers of the census, the Registrar-General's reports, the Board of Trade returns, and similar statements in this country, that we are indebted for such amount of certain knowledge as allows of our discussing questions of great social changes with any more claim to attention than is due to the voices of a congregation of jackdaws.

Into the first outcome of these valuable returns,—the relative condition of the English workman and of his compeer in other parts of the world,—we do not at present enter, because that does not so much affect the solution of the questions brought on the carpet by the leaders of the International. From our own point of view,—resting, as we have no choice but to do, on the unequivocal lessons of history,—this is the main point. We have not yet found that even so potent a set of motives as those which impelled the early apostles of Christianity,—motives which have actually founded that which, according to its professed principles, should be an *imperium in imperio*, a universal brotherhood, acknowledging no distinction of race or of colour,—have yet had any signal effect in preventing nation from arraying itself against nation. The very gregarious nature of man,—tending to produce the local associations of villages, tribes,—of what the Romans called *gentes*, and the Italians call *paghe*—has been one main element of civilisation. The tie that connects man to the near and the palpable has hitherto always been stronger, with rare exceptions, than that which binds him to the distant and the theoretical, or the problematical. Until human nature is quite changed, whether for the better or for the worse, we do not anticipate that any European fraternisation of guilds would exert so powerful an influence on the craftsman, of any kind, as the national claim, which, however it may be disguised, we call by the name of patriotism. Those of us who have been large employers of labour,—who have known, for example, what it has been to conduct a skilled

body of English workmen, to shed wealth on Ireland by opening her railways, or to pierce the pine forests of the Landes by a line of iron road carried out under a semi-military organisation,—are pretty sure how the working men of any country, in the main, will be likely to welcome the arrival among them, to take any practical share in their work, of those whom they will stigmatise, each in the evil vernacular of his own *patois*, as “those cursed foreigners.”

We think, then, from a rather wide experience in this matter, that the time when any real and actual fraternisation of guilds or crafts, on the International principle, may become an accomplished fact will hardly be in our own day. None the less does it follow that there may not be very important results produced, in our own or in other countries, by the movement now attempted. We do not believe that,—say within the present century,—it will lead either to the establishment of the Commune in London, or to the declaration of a strike at Birkenhead because the shipwrights of Genoa make a claim to an increase of wages; but that it may have, notwithstanding, very serious consequences, is quite another matter.

The first result, which, if not an unmingled good, has, at all events, a very large portion of what we desire, is the stimulus that is likely thus to be given to the co-operative movement. Those of us who know, practically and certainly, what the great commercial tool of capital really is, when stripped of the trappings in which its priests have invested it, will fully concur in this view. The true capital of a country is the shews and sinews, the muscles and limbs, of its able-bodied population, directed by the brain and wit of its competently educated leaders. To set this magnificent machinery in motion, a certain very small amount of money is required, in credit or in specie, to which the title of capital is amusingly conferred by most “books in breeches.” And where is this capital found? In the pocket of the workman. This is the great truth as to which employers are sternly silent, but which they cannot deny to be the case. It was an appreciation of this truth that enabled the late ruler of France to supply the prodigal waste of the imperial administration, to corrupt the manners of Europe by the profuse splendour of the men who glittered in the livery of a sham and shameless court, to attempt to look the German giant in the face, and to culminate at Sedan. French bankers and capitalists whom we could name, and whose names are household words in Europe, could not a smiling comment on this remark. “Do you think,” said one of these princes of finance to the writer, “we ever put our hands into our pockets? The first maxim of a great capitalist is never to subscribe a penny of his own.” This maxim was understood by the late occupant of the Tuileries. He took an unfair advantage of his communicative friend. He went to the peasant, the small *bourgeois*, the great mass of the people, direct for his loans. He interested the millions in the Bourse; and thus, not only did he readily obtain whatever he wanted, but he opened a door through which the septagenarian president of the French Republic now sees tens of thousands of ready investors hurrying to fill his till. Public loans, taken direct from the savings of the people, have been an immense success. And such will they prove until—when?—until the crash comes, as come it must.

What politicians have, greedily, wastefully, and, as we believe fatally, taken from the pockets of the people, wise economists may advantageously find in the same untasted repository. We do not say that they will,—we do not profess to prophesy; but we assert that they may. We know that they have already done so to some extent. We believe that this process will continue and extend. And we are of opinion that it will conduce, more, perhaps, than anything else, to the augmentation of the real national wealth. Let us point to co-operative building societies, as a proof of what we mean. Were the results of these institutions fully and clearly brought before the public, it would cause many a man to open his eyes. And there is this further result of these small, constant, fertile investments. Each one is not only good in itself,—a seed sown on fruitful ground,—that will increase and multiply, almost as if with organic growth,—but each represents an actual economy, an act of self-denial, an extra half-day's work, or so many pots of ale or quarters of gin not drunk. The co-operative economy of the rightly-conducted building society, like mercy itself, is

twice blessed. Each shilling thus put to usury represents both forethought for the future, and self-control in the past. It tends at the same time to increase external and internal respectability. It goes to make the subscriber a proprietor, and in so doing, it exercises the nobler function of making him a man.

Do not the great employers of labour—do not the men who, forty years ago wheeling barrows with their own hands, are to-day rolling about in very comfortable stuffed broughams, know this? Put the question to one of them in plain language, and mark the knowing wink with which it will be received. One word alone is enough to supply demonstration on the subject. One word alone will prove both that the actual capitalist is the labourer, and that the shrewd contractor knows that such is the case. That word may be unintelligible in the drawing-room, or even in the council-chamber; but all workmen, and employers know well what it means. That word is in one county pronounced *tommyshop*; in another, *truck*; in another, *ticket system*;—in all the meaning is the same. On the great majority of our public works, at one time, the largest profits of the contractors were those (and they were often very iniquitous) made by the retailing to the workmen of those commodities which were purchased by the contractor on credit of the very number of men whom he employed. Let the ganger of a cutting find, by hook or by crook, enough actual specie to buy the small cash balances of two or three fortnightly pay-sheets, and he had enough. The bulk of the payment was made in bread, bacon, tobacco, cheese, beer, gin, shovels, boots, and other articles (to particularise some of which would raise a blush on many an innocent cheek) which were paid for, over and over again, by the labourers before they were paid for by the contractor who retailed them.

Now, if the workman will act for himself and by himself, for good and well-regulated purposes, with the same forethought, though without the same rapacity, that has enabled a few of the most long-headed of his own fraternity to pile together fabulous fortunes, there is a very fine future before him. If he calls to his aid, in endeavouring to secure this future, the experience of other countries, he will do well. If he adopts the special virtues of other countries, without at the same time losing any of those proper to his own, he will do better. The frugal economy of the French peasant, the profound observation and sharp intelligence of the Italian, the un-fathomed industry of the German,—let us import all these. But it is, as yet, to England that a Frenchman, and German, and Italian must look for the best example of the creation of capital from the labour, and its collection from the pockets, of the workman. Self-control, self-respect, and self-culture are the only requisites, in addition to the resources of our island, mineral and otherwise, and the energies of our working men, for the creation of great and wealthy guilds of co-operative engineers, builders, weavers, miners, or what not. A little resolution, a little application to definite, preplanned, organised labour of that time and energy which are now chiefly profitable to the brewer, the maltster, the spirit merchant, the distiller, and their allies, and we may have establishments founded by workmen, supported by workmen, and owned by workmen, in which they shall fix their own week's horary, and their own week's wages. Establishments thus founded and supported would become the normal regulators of their respective trades. Thus may the tyranny of capital be overthrown,—for its existence we are the last to deny. Like one of those enchanterers of old, powerful only till they were encountered by one who knew the secret of their spell, the owner of the unemployed store of bank-notes, the capitalist proper and the man who knows no trade but that of money, and who is timid enough in the management of that, will come humbly bending to the hero who boldly confronts him. Thus, and thus only, will the tyranny of capital be overthrown, when men see, and practically act upon the knowledge, the true genesis, and true nature of that medium of production.

To do this no legislation is necessary. Not a line has to be added to that cumbrous mass of Acts of Parliament which, some few years hence, will be remembered only as the object of the ridicule of the civilised world. No International organisation is needed, although its aid need not be despised, for the peaceful solution of that vexed problem. We repeat, and we speak not from theory or from mere opinion, but from

definite practical experience, the main part of the capital employed in every industry is taken by the managers of that industry from the pockets of the workmen. It is turned over, week by week, upon the counter. The workman only needs knowledge, brains, and self-control, to do this for himself. In a year he might, in any craft with which we are familiar, become his own master. In a very few years he might become his own landlord. It is probable that his views as to the tenure of land would receive more illumination from that process than from the very hardest logic of political economy. Regarding a certain class of ideas from the inside, it is singular how different they are from their guise when viewed from the outside. The views which a thriving member of, let us say the "Builders' Co-operative Shoemakers' Association," possessed of a snug house, a fair garden, a bit of grass for his cow; working so many hours in the week, and as many more or less, as he chooses, at a rate of wages influenced by no difficulty in collecting his debts; vexed by no shop-front rent; scourged by no loss of time spent in the vain endeavour to obtain custom; ruling his apprentices or journeyman according to well-established guild law; with a good school for his children, a handsome church for his Sunday's attendance; a doctor, who runs up no bill, but weekly looks in to see that all is right; an Athenaeum or reading-room for his evenings; a gymnasium or open exercise-ground for his recreation; all this secure so long as he have life and health to enjoy it; and an honest sick club, a decent burial, and a sum put by in a life assurance, if he departs this world unexpectedly;—his views, we say, will be naturally different from some of those laid down by the propaganda of the International Association, as self-evident and eternal truths.

If our working men can only be persuaded to hold to the practical, and to shun the theoretical; to take that good which experience demonstrates to be within their reach; to choose the good and to eschew the evil,—they will have occasion to bless the mode in which they respond to the invitations of the International Association.

DECENT HOUSES FOR THE INDUSTRIAL CLASSES.*

A SMALL work has just been published by Messrs. Longmans, Green, & Co., bearing upon a subject that has been discussed in these columns, persistently, and for a purpose, for the last quarter of a century. It is entitled "Model Houses," and contains a set of registered plans showing groups of new houses suitable for the occupation of workmen's families, and two suggestions for the conversion of ordinary houses, originally intended for the use of one family, into flats containing distinct dwellings independent of each other. We cannot, however, but regret, as we scrutinise his pages, that the author, Mr. Banister Fletcher, has not taken the trouble to turn to the indices of the *Builder*, and make himself acquainted with what has been said and done by others during the last twenty years. He has, doubtless, done well as it is; but if he had known more he would have done better.

The question of healthy homes is one that is always transforming itself. The earliest aspect of it, perhaps, was the crusade that urged reform. Then the question became a discussion as to what are the requisites of a healthy and comfortable home; then it merged into an inquiry whether the erection of model homes could be made a remunerative speculation; then into a doubt whether it would not be better to make additions to existing homes rather than to destroy them and build others in their stead elsewhere; and so on. Those who had the question at heart had to adapt themselves to its changes with as much adroitness as the Lady of Beauty in the Arabian tale, who transformed herself successively into a sharp sword, a serpent, an eagle, a wolf, a cock, a pike, and ultimately into flashes of fire, to carry her point, and vanquish the evil genius opposed to her. The late Prince Consort, as early as 1851, showed us how much thought he had expended upon one branch of it in his model cottages erected adjacent to the first Great Exhibition. The ex-Emperor Napoleon also showed us that he considered the question one of the most important social problems of the day when he built two sets of model dwellings of his own planning in Paris. There are but

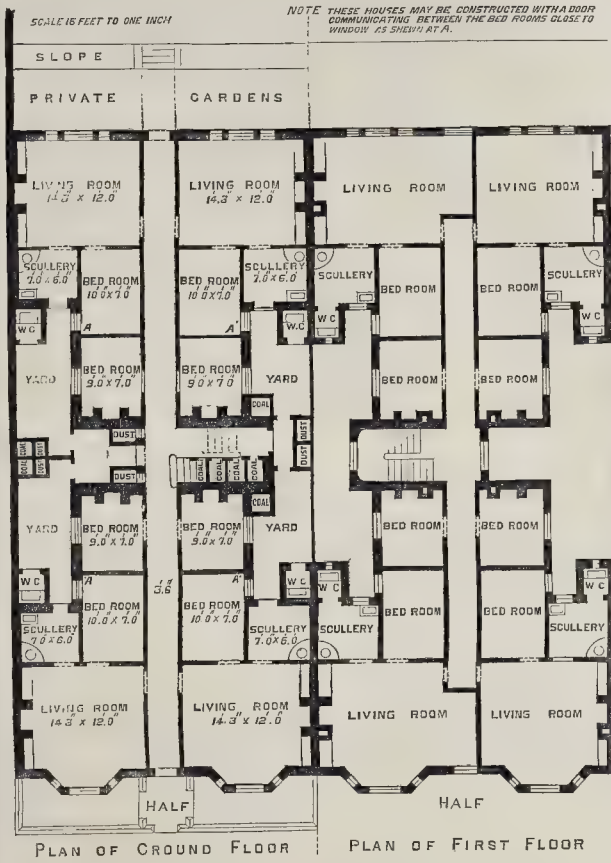
few of the nobles but have caused experimental structures, or model cottages of some kind, to be erected upon their own estates. Our great manufacturers have followed suit, and in several notable instances have led the way. French manufacturers and companies have done the same. Some of our corporations have pondered and experimented over the difficulty. Leading philanthropists have given their days and nights to the solution of the problem. The Society of Arts has made it a subject for prizes. An English Commission has sat to consider the merit of French and other foreign model dwellings; and, on the other hand, the French Commissioners of the last Paris Exposition offered prizes to those who, in model dwellings and by other means, had improved the chances of happiness to the great masses called the industrial classes. We have but given the headings of different lines of endeavour. If we entered into details our list of efforts would fill a column. No new-comer into the field, therefore, can complain that there are no well-trodden paths upon it. It is settled that every respectable working man should have a respectable and comfortable home; that to be respectable and comfortable, a home for a family should consist of a good-sized, light sitting-room, at least two bedrooms, a w.c., a water-service with sink, and a small scullery or wash-house, with provision for coals; and that it is possible to furnish such accommodation for sufficiently moderate sums to insure remuneration in the rent. But there are other branches of the question that still require consideration. For instance, it is not yet settled whether the preference should be given to large blocks of houses, piled story upon story, as in the Social Palace of M. Godin, at Guise, in Alderman Waterlow's buildings, and in the Peabody blocks; or whether it should be awarded to smaller groups, such as those consisting of six houses built by the ex-Emperor in the Avenue Dumesnil, near the Bois de Vincennes, or single or double houses, as at Saltaire and elsewhere.

Mr. Banister Fletcher takes up the position that "a huge, ungainly mass of brickwork, in appearance something between a barnack and a workhouse," does not advantageously represent "Home, sweet home." Neither, he contends, is the external staircase any real advantage over the more common internal staircase of an ordinary house. His opinion is that the respectable poor of London have "an almost ineradicable prejudice" against structures thus stamped as "model lodging-houses." Acting upon this conviction, his first registered design, as far as the elevation is concerned, consists of a row of low, neat, two-storied houses, each house having a central street-door with a bow window on either side of it rising from the ground to the upper floor, and a small ordinary ash-window over it. On peering about a little it is seen that there is a similar row of houses running close behind these; and that both are finished off with a tiny inclosure in front, compassed by a low wall ornamented with an iron bar and standards. But on entering one of the street-doors the visitor finds himself in a long entrance-passage, only 3½ ft. wide, which runs not only right through the house, but also through the house built at the back of it and, out of the street-door belonging to it, into the next street. This long, narrow passage gives access to eight homes, four of which are upon the ground floor and four upon the floor above. We give the plan of a set of these houses, erected under the author's superintendence at Pentonville. On reference to it our readers will perceive that the space yielded by the site has been very carefully economised. Each home consists of a living-room, two bedrooms, a scullery with a copper in it, and a w.c. A door on the right-hand side, after entering the "slype" or passage, gives access to one sitting-room, and another on the left, exactly opposite, gives access to a second. Further on, we come to a bedroom door on either side. Midway in the slype, facing an outlet into the tiny yard, is a staircase leading to the floor above; and at the end are two more dwellings, one on either side, the sitting-rooms of which, as explained, look into another street. Above stairs, there is a long, narrow corridor, corresponding with the passage below, into which open the doors of the several dwellings. It will be observed that each sitting-room has three doors: one of entrance from the passage, one leading into an inner bedroom which has no other approach, and the third leading into the scullery. The second bedroom is in the rear of the first, but it can only be entered from the common passage. The

* "Model Houses for the Industrial Classes." By Banister Fletcher, A.R.I.B.A. London: Longmans, Green, & Co. 1871.

B. FLETCHER'S MODEL DWELLINGS FOR THE INDUSTRIAL CLASSES.

REGISTERED 16 MARCH 1871.

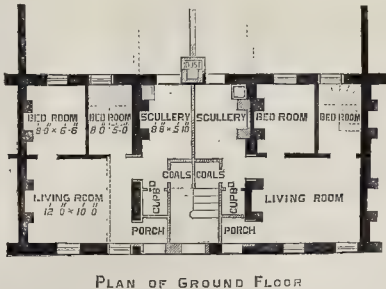
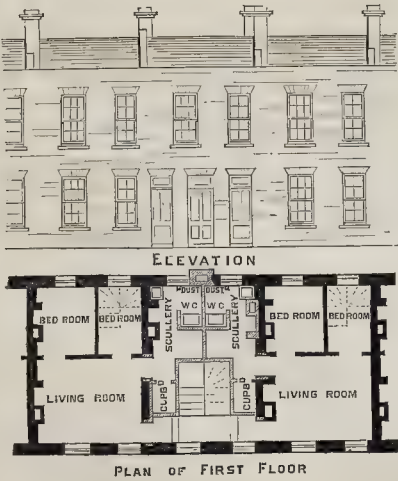


w.o., on the ground floor, is in the rear of the scullery and is approached from the yard; but above stairs it is less healthily inclosed in the scullery, which in its turn, it will be remembered, opens into the sitting-room.

Now, it would appear desirable, in such small homes, to allow the bedroom nearest the sitting-room to have two doors to admit of one of them opening into the sitting-room: because, in summer, by opening the door at night, the occupants would treble the amount of air for their consumption, and in winter have the benefit of the warmed air of the sitting-room, and, if carefully continued, even get a sight of the fire; while in the few cases where the communication would not be suitable, it could be cut off, or blocked up, by a piece of furniture. But it is not so clear that the scullery should also have a door of communication with the sitting-room. In Mr. Fletcher's ground plan, the scullery has the additional disadvantage of being pitch dark, as it has no windows, unless this door, or that opening into the yard, is open. The steam from the copper could scarcely be kept out of the sitting-room, and it would probably find its way, frequently, into the adjoining bedroom. Our readers, too, will notice another blemish in his plan, which a little more experience, or even consideration, would have caused him to cast out. We allude to the exact correspondence of the doors of the opposite dwellings. In the case of the sitting-rooms, the doors open into the passage at precisely the same spot: so that, left ajar, what passes in one dwelling will be heard in the next, and the inmates coming in and out will be constantly clashing against one another: which inconveniences could be both obviated by placing one door further along the passage than the other. Again, in the second bedrooms, the doors of those belonging to the two front dwellings, and those belonging to the two rear dwellings, are precisely opposite, making privacy very difficult of attainment, except by the most rigorous vigilance. This drawback might be obviated by the same simple means as we have suggested for the sitting-rooms. The complete isolation of this apartment from the surveillance of the person in charge of the home appears also to have struck Mr. Fletcher as a blemish, for he suggests that a door might be broken through the partition which divides it from the bedroom adjoining the sitting-room, if approved. For a lodger who likes to put the key of his room into his pocket, the present arrangement would suit; but few parents would like to shut their sons or daughters so completely out at night as they would do by assigning them these outer rooms.

Before turning from this particular plan, which Mr. Fletcher has registered, we will quote his account of the internal fittings:—

"In the internal finishes of these houses, though a proper economy has prevented the introduction of any expenditure and unnecessary embellishments, care has been taken to provide, both in appearance and in fact, all the comfort and convenience of an ordinary English home."



SCALE 15 FEET TO ONE INCH. ALTERATIONS SHOWN IN HALF TINT.

In this spirit it has been thought wise to adhere to the usual system of plastering and papering the walls, rather than to favour the proposals of some to colour merely the bare brickwork of the walls, with the view of preventing the harbouring of vermin, or to line the walls with glazed tiles or bricks, with the same view, and for the greater facility of cleaning. One great point to be considered in these dwellings is that they should present to the occupant all the appearance and sense of comfort, and,—to coin an expressive word,—“hominess” of the rooms to which he has been accustomed, and to insure this end the old familiar plaster and paper are surely best adapted.”

Further on, speaking in more general terms, he advocates the use of wooden floors, except in the scullery, which may be cement, or half wood and half cement. He recommends no mouldings nor cornices, and provides only square-framed doors. Each dwelling has a water-closet, a galvanised iron sink, a meat-safe, and a coal-box under it. The sitting-rooms have ranges, with ovens, but not boilers; these last, in his experience, having proved a constant source of trouble; and each dwelling is provided with a separate “pull,” or bell. Below the bell-handle, on the street door-post, is a bronze plate of the author’s design, which has a “hinged piece in its thickness,” which admits of the insertion of a small tablet showing the resident’s name.

Mr. Fletcher informs us that one-half of such a block as that shown on his plan, containing eight dwellings, was built at Pentonville, last year, at a cost, inclusive of the architect’s fees, of £1,152. Each set of rooms was let before it was finished,—four at 7s. 6d., and four at 8s. 6d., the whole bringing in 116l. 8s. per annum. Deducting from this, for ground-rent, collection, rates and taxes, and repairs, the sum of 67l. 13s., there yet remains a gain of 98l. 15s. or more than 8½ per cent. The author thinks that 10s. per week could be as easily obtained as the rent mentioned; but his client having, in the uncertainty he first felt as to the reception of the idea, fixed on the lower sums, is unwilling to make such an alteration. Where land can be obtained, on building leases, at 10s. per foot frontage, the “tempting” interest he quotes may be taken, he adds, for granted; rooms, however will sometimes be unlet, and tenants do sometimes prove faithless.

We also show Mr. Fletcher’s mode of dealing with the streets of miserable little houses that have been erected, in bygone years, in what are called poor neighbourhoods. He takes three of these shabby, tiny, two-storied houselets (the frontage of each does not exceed 12 ft.), and throws them into two. The main walls remain with but the slightest alteration; but the partitions of the central house are removed, and a new arrangement made by which a scullery, a cupboard, a water-closet, and a dust-shaft, are obtained for the other two, on both floors. Here, then, are four tolerably complete dwellings, consisting of a living-room, two bedrooms, and a scullery. The three houses probably accommodated six families before, but in the most muddling manner. At 6s. per week these houses would yield a weekly rental of 18s. Mr. Fletcher urges that when improved in the manner he has shown,—that is, he says, provided with an additional bedroom, a water-closet, scullery, sink, dust and coal boxes, &c.,—each dwelling would be well worth 5s. per week; and thus 20s. per week would be obtained for the three houses, yielding a rise in the annual rental of 5l. 4s. to pay for the required outlay.

There are other plans shown by the author. Some are for two-roomed houses. These he also provides with a small scullery and the other conveniences mentioned. For a workman with his wife, without family, two rooms with this accommodation are doubtless sufficient under some circumstances. An aged woman, for instance, would not care for the charge of more than this. Here, again, the author carries out the cottage, or tiny villa, idea. One central street door serves for four groups of apartments; one on either side of the entrance, and two over these. Here, there are bay windows, again rising from the ground to the roof, so as to suit both floors; and over the door is an ordinary sash, which lights the central staircase to the upper floor. The one bedroom is approached from the sitting-room only, and the scullery is squeezed in between the partition of this room and the central staircase. The space being very limited, the water-closet and the meat-safe are but a stride apart. But contrasted with the Lunsden dwellings, Glasgow, and Sir Sidney Waterlow’s dwellings, in Mark-street, Finsbury, of both of which plans are given, these details do not appear so ill-considered as at a first glance. The bedrooms in the Lunsden dwellings are but

enclosures 7 ft. high made in two corners of the large sitting-room, which is 9 ft. high. And the irregular forms of the rooms in the Waterlow block make the bay-windowed parlours of these small houses look really pleasant. If the scullery and its accommodations were remodelled these would be reasonably good homes. The living-rooms measure 14 ft. by 9 ft. 6 in., exclusive of the bays; the bedrooms are 10 ft. by 9 ft.; while the scullery, with its water-closet, measures but 5 ft. by 4 ft. 9 in., dimensions which are but small for a dining-room table. In another plan the author has endeavoured to make more room here by placing the water-closet, coal-cellar, and dust-shaft, in a balcony erected in the rear of the scullery. This is a much better arrangement.

Mr. Fletcher gives four plans, showing such alterations. Three of them consist of the simplest additions in the rear, to each story. In the fourth the space is obtained for the scullery, w.c., sink, safe, coal, and dust, by cutting off a good third of the sitting-room, and thus packing these conveniences at one end of it. He says of the design he has marked, he has had made the plan of a house situated in a street leading out of the Hampstead-road, as a type of a very common class of house-property that is now let out in separate floors, and has shown upon it such alterations as, with the least outlay, and with no external additional building, will render each flat suitable for letting as a separate set of apartments, furnished with all the conveniences of a dwelling-house of the poorer class. His improvement is thus described by himself:—

“This is effected on the first and second stories by the simple expedient of carrying through to the front wall the partition dividing the back room from the staircase, and devoting the part thus cut off from the front room to the purposes of a scullery, in which are conveniently arranged a w.c. (which has external ventilation by taking in a part of one of the front windows), a sink, and a coal-box with meat-safe over. The shorter piece of partition dividing the front and back rooms thus cut off, being set back to the position indicated by the red tint in the plate, gives space for a separate door into the living-room from the landing, and the existing door in the part of the partition so set back will now afford access from the landing into the scullery, while a new door is provided for ready communication between the living-room and scullery.”

There is a basement story to this house: and as such places, the author avers, will be always used for dwellings as long as there are poor people who must live near their work, and landlords who are determined to make all they can out of their property, he recommends that the two underground rooms should have a door broken through the partition between them, so that thorough ventilation may be secured, and that the scullery, with its w.c., should be made in the area, while the coal-cellar, already there, could be used by the occupiers of this part of the house.

One of the other plans, distinguished by the author as Design B, furnishes the same accommodation, without curtailing the sizes of the existing rooms, as in the instance just detailed. Here we have a small wing, with three stories thrown out behind. Access to this new wing, on the first and second stories, is gained through new doors made in the back wall on the landing, or quarter-space of the stairs, below that of the floor to which the additions belong. Thus the occupants of the first floor would descend one flight of stairs to get to their scullery, and those of the second floor would do the same. A design marked C, goes further, and throws out two receding wings behind, leaving, indeed, but a narrow slice of breathing and light space between them. In one of these additions is an extra bedroom to each floor, and in the other is the scullery, w.c., sink, coal-box, and dust-shaft. The necessity of getting light to the existing back bedroom necessitates an angle being cut off the new one; and to get a ray of light upon the staircase, another angle has to be cut off the other projection, containing the sculleries. A little variety is shown in a design marked and registered as D, which gives the same amount of accommodation over again,—only, instead of lighting the staircase by a narrow slip of window looking out upon the splayed wall of the new sculleries, Mr. Fletcher explains that he carries the scullery-wall straight to the existing back wall of the house, only it “is arched over for a width of about 3 ft. from the face of the back wall, to afford light to windows inserted in the back wall of the staircase, and occupying half its width, the other half being devoted to the doors leading into the sculleries.” But whether one would not be as dark and undesirable as the other nothing but inspection could prove.

For the improvement of courts and alleys

where the houses are built back to back, and there can be no thorough ventilation, Mr. Fletcher agrees with those who suggest a current of air upwards in each house.

“Over the door of each room that leads on to the staircase I have inserted a frame filled with perforated zinc; above the staircase I have placed in the roof as large a skylight as the space would admit, raising it well above the roof, and round the sides and bottom putting laths boarding, so that at all times I get ventilation; and where it is desirable I put perforated zinc in fan-light of entrance doorway, so that night and day there is an imperceptible current of air, and yet so out of sight and so devoid of draughts is it that the tenants do not stop up the openings, as I have so frequently seen done with other modes.”

Then, again, in some cases, an improvement may be made by lowering a floor, or removing one altogether, or by removing a house altogether; but as each particular court calls for its special treatment, it is difficult to make a suggestion that will apply to all. But there is always the pipe to pay, and Mr. Fletcher suggests that philanthropy might step in here, and lend a portion of the necessary capital at 2½ per cent., or for no interest at all, on the understanding that it should be returned in instalments, extending over twenty-five or thirty years.

Our author, who writes under the impression that all his propositions are novel, does not conclude without expressing his opinion of the duty of the Legislature in the matter. A further amendment of the Metropolitan Local Management Act should be made, and in it he would insert clauses to the effect that before a portion of a house could be let as a dwelling, notice must be given to the authorities; that an officer should then inspect the premises, and finding each portion intended for a dwelling completed as such, should give a notice in writing that it might be so let; that each dwelling should contain, or have conveniently attached, a separate w.c., water supply, sink, pipe to convey water therefrom to drains, meat-safe, coal-box, or a place for coals, none of which accommodations are to be in either of the bedrooms; that the power of inspection of nuisances should be extended; that damage to fittings and fixtures should be punished by fines; and that should the leaseholder be unable to make the necessary alterations, to comply with the Act, he might require the freeholder to take the property off his hands, for a sum calculated upon the poor-rating. He proposes that poor-rating should guide all compensations, and that no alteration should be made in it, either by way of decrease or increase; he would have it to stand at the value stated at the date of the first reading of the Act. To meet another difficulty, Mr. Fletcher imagines an intermediate interest, copyholders; in their behalf he would calculate “what sum it would require to enfranchise, and so make the houses freehold, and then proceed as for freehold property, deducting of course from the result the sum required for the enfranchisement.” Two surveyors and an umpire, at fixed fees per room, should be sufficient in this rough and ready programme to settle all disputes. His Pentonville houses are too highly rented for the great army of workmen employed in London whose wages range from twenty to thirty shillings per week. In the middle classes the sixth of an income is considered more than sufficient to devote to rent. The same rule applied to working men with wages of thirty shillings or under, should preclude them giving more than half the rent demanded in this instance. For 8s. 6d. per week to be spent for rent, there should be a weekly income of 50s. A healthy home for the workman, whose means do not amount to a moiety of this sum, has yet to be provided. Meanwhile, we must compliment Mr. Fletcher upon progress in the right direction.

RAIKES HALL PARK, BLACKPOOL, COMPETITION.

SOME time ago the inhabitants of Blackpool determined to establish public gardens and recreation-grounds. A company was formed; the Raikes Hall Estate, about 60 acres in extent, was bought for 14,000l.; and premiums were offered for designs for laying it out. The committee offered, for the best design, 70l.; for the second-best, 30l.; and for the third in merit, 20l. Twelve sets of plans have been sent in, and have been on view at Raikes Hall. Last week the premiums were awarded as follow:—

1st, 70l.—Mr. T. Lewis Banks, architect, 23, Finsbury-circus, London; motto, “A thing of beauty is a joy for ever.”

2nd, 30d.—Mr. T. P. Worthington, architect, Blackpool; motto, "Priapus."

3rd, 20d.—Mr. J. W. Wade, Latchford, Warrington; motto, "Nature and Art."

It was also agreed to offer 10l. to Mr. J. H. Carrington, landscape gardener, Stockport, in acknowledgment of the merit of his design; motto, "Speranto." The other designs, bearing the mottoes named, were sent by the gentlemen stated below:—"Well Meant," by Messrs. Watson & Mather, Manchester; "Querous," Messrs. Dwyer & Shaw, Manchester; "Onward," Messrs. J. Yates Dixon & Co., Manchester; "St. George," Mr. Lewis Solomon, London; "Square within a Circle," Messrs. Dyson & Dyson, Harrogate; "B," Mr. W. G. Bradford; "Semper Parans," Mr. C. Eastwood, Luddenden Foot, Yorkshire; "Sons Dieu Rien," Mr. John Gibson, jun., Battersea, London.

According to the particulars which have reached us of Mr. Banks's design, he has adopted three types of ornamental ground, the English, the Italian, and French. The whole of the grounds to the west of the hotel have features of English gardening—slopes, mounds, lakes, islands, rustic bowers, and flowery lines; the varied beauties of this portion of the plan being opened to view in succession through clumps of trees and shrubs as the visitor passes along the ornamental walks. The Italian style is displayed on the ground nearest the hotel. It shows straight gravel walks intersecting each other at right angles, leaving square and oblong plots of turf, relieved by flowers and statuary. This portion is separated from the French by a low balustrade, upon which are placed at intervals vases of flowers. A flight of ornamental steps leads to the lower level of the ground treated in the French style, the distinguishing feature of which is an artistic combination of geometrical forms, producing quite a different kind of beauty from the natural windings of English landscape. All the flower-beds are planted to produce artificial patterns in colour, so that, looking down upon this portion from the Italian terrace, it will appear like a beautiful carpet, if the great law of harmony of colour be well observed. Winding down the centre of the trees, bounding the French garden, on the north, is a bath, between rockeries leading to a grotto, which, the competitor suggests, may be made to rain from the roof, with jets of water playing upon the entrance, with bowers, and seats, and gravel walks, prepared for practical jokes, after the manner of Chatsworth. The pavilion, as the principal building, is placed centrally, and is seen from all parts of the grounds, and is adapted for concerts or theatricals. The ends are circular and the roof elliptical, and there are two side galleries and one end gallery. A conservatory is placed near a croquet-ground and bowling-green. Hot-houses and aquaria are seen at the south-west corner of the Italian garden, the latter being enclosed in the former for reasons of economy and appearance. Octagonal buildings at the corners of the hot-houses are intended for orange-trees, lemons, azaleas, &c. Near to the hot-houses are a maze and gymnasium, and in the south-west corner of the estate are a cricket pavilion and a shed for equestrians. The estimated expense of carrying out the plan is 16,900l.

CONVERSAZIONE OF THE ARCHITECTURAL ASSOCIATION.

THE *conversations* commencing the new session of the Architectural Association was held on Friday evening, the 27th of October, at the House, in Conduit-street. The members and guests began to arrive shortly after eight o'clock, and the rooms were soon filled with a company that included a considerable number of ladies.

The committee of the Association had arranged for the occasion a special exhibition of architectural working drawings, sketches, perspective, and photographs, which it is proposed to repeat annually, kept open free for a week from ten a.m. to ten p.m. The outer gallery was lined with the numerous drawings and sketches of the students in the various classes, and those submitted in competition for prizes offered by and through the Association,—of all degrees of interest; noticeable, indeed, as it was stated in a report at the meeting, for traits of genius, considerable talent, and any amount of inequality, even in single subjects and series signed with the same name; the quality of sustained excellence being apparently one of the very latest obtained. The working drawings failed to put in an appearance. The sketches included nearly a score by Mr. R. P. Spiers, showing the recent condition of the Hôtel de Ville, Talieries, St. Cloud, &c., rendered with a ready brush, and much relief for the picturesque accidents of disposition and of colour in these

desolated palaces. A good-sized cartoon by Mr. Lonsdale,—a persevering student from the life under Mr. Weekes, the instructor of the figure-drawing class,—shows an architect with the costume and compasses of the future guiding an ambitious tower-builder that he may not "half-through give o'er, and leave his part created cost,"—an interesting specimen of the use of figures by a young architect. A fair number of competition drawings, a few photographs, sideboards by Messrs. Gillow and by Messrs. Collinson & Lock, some Venetian and other glass by Messrs. J. Powell & Sons,—the Venetian imitations with a special spring and grace of outline,—assisted in filling walls and recesses; as also a case of Salvati's glass and a set of communion plate, by Mr. Keith (Cox & Sons), from the designs of Mr. J. Jones—submitted for a prize offered through the Association last session. Some embroidery designed by Mr. C. Brangwyn, a case of relics from Parisian buildings—sarcophagi of marble, stone, pottery, &c., and the usual museum of building appliances, assisted also in forming the little exhibition,—which, once a year, this flourishing institution should be able to renew and to improve.

"The business of a *conversations* is talk,"—prefaced in this case by the nomination of several new members, and the giving of prizes after the reading of careful reports: thus:—

The Essay Prize (Monograph of William of Wykeham). Mr. W. B. Mallet.

Class of Design.—1. Mr. S. J. Newman; 2. Mr. W. Penstone. Mr. A. Webb ineligible, having received the second prize last year.

Elementary Class of Design.—Mr. P. J. Marvin.

Class of Construction (Summary of Subjects).—Mr. R. E. Fownall.

Sir W. T. P. Tild's Prize (Subject, a Hospital for 100 beds). Divided between,—1. Mr. K. D. Young, and 2. Mr. W. Scott.

Architectural Union Company's Prize (Measured Drawings of Old Buildings).—1. Mr. P. J. Marvin; 2. (Prize for the same offered by the Association), Mr. J. W. Brooke.

Mr. E. W. Godwin's Prize (A House in a London Street, worked out at the Rooms of the Association on eight evenings (this October).—1. Mr. H. Avery; 2. Mr. T. E. Hudman.

Then the president for the year, Mr. Rowland Plunbe, F.R.I.B.A., read a short address of welcome, alluding briefly to the various activities of the Association. It would apparently, at least for some time to come, find a separate existence necessary and desirable, while he believed it would always be ready to co-operate for worthy ends with kindred bodies. After alluding to the evil of the tendency to imitate the eccentricities of masters of the craft, and to other obvious shortcomings in the profession, he concluded with a few general art-maxims, and called on Mr. Chatefield Clarke, a member of the London School Board, who said that the Association was doing useful educational work, and deserved every success. Professor Kerr was not sorry that he had spoken for many years past at similar meetings; he had acquired a sort of right to say that the work of this session would add interest and strength to the Society if performed as aforesaid. Mr. R. W. Edis praised and practised brevity. Mr. Wm. White spoke of the importance of the measured drawings competition, and offered an additional prize. Mr. T. Roger Smith considered at such a meeting obedience to the chairman the first duty of man, so came forward to speak of the start into fresh life that was taken by the Association some years since, from an apparently moribund state, a contrast with its now manifest vitality.

The chairman then dismissed the assembly to their sections, Coote & Tinney's band playing a selection of music, and again after short intervals throughout the evening.

The president and the Association generally, may be congratulated on the successful beginning of a session of which we trust to have to report an equally successful course and conclusion.

DIAMONDS AND GOLD.

STRANGE and tempting stories come over to England now and then of the exceeding richness of the South African diamond-fields, which stories tend to unsettle the minds of young men, and to draw them from regular employment at home, to uncertain modes of life and precarious results abroad. Precious stones and precious metals have in all ages lured men into random adventures and uncertain results. Gold-mining is now however, for the most part, a regular business, requiring capital, machinery, and technical skill. The primitive random scratching, digging, and washing of the early period having been almost superseded by the methodical sink-

ing of shafts hundreds of feet in depth, by pumping, by expensive underground workings, winding, and washing by machinery. Where quartz-reefs are extensively worked, there is also regular systematic sinking, with the use of machinery for crushing, washing, &c. Raw adventurers might just as well think of raising coal from a deep coal-mine, without capital and technical skill, as of obtaining gold to any paying extent either in Australia or in California. Adventure has become business; skill has replaced blind chance.

South Africa and diamonds are now the chief subjects of adventure and speculation. The climate of South Africa is not very deadly, and means of travelling to and from the diamond-fields are provided at what may be considered moderate rates. But still a journey of several hundreds of miles over a wild country must wear out a considerable share of human life. Young men, in the pride of their strength, like the spendthrift with a balance at his bankers, may live regardless of the future; but in each case the stock wears down. Health, overdrawn, cannot be renewed so readily as wealth; and for the most part men learn when too late that for them neither is renewable. Diamond-finding necessitates personal exposure to the elements in a distant, rude, and strange land. Each man, in such communities, finds enough to do to look after himself. A lame or sickly man must be, and is, in the way. Let honest working-men think seriously of these things before they permit the tempter to lure them from home and work, to seek fortune at South African diamond mines.

A few words about diamonds may be particularly interesting, especially as to the value of hundreds recently sold at Cape Town, and reported in the *Times* of the 26th of October, 1871. It appears that 483 diamonds weighed 621 carats, and sold for 3,044l. 16s., so that on an average the stones weighed about 1½ carat, and sold for 6l. 6s. each. The record of this sale should tend to open the eyes of would-be adventurers to their chances. 483 diamonds, averaging not more than 6l. 6s. each in price. Take this fact with other recorded facts, such as that hundreds of men scratch, dig, toil, wash, and sort gravel for months, finding no diamonds. Steady labour at home, with every night in bed, regular food, and civilised comforts, should not be lightly discarded for the dangerous exposure and random chance of blundering on a few diamonds averaging in value not more than a few guineas each. It must be remembered that large diamonds are only ones in thousands, and cannot command price in proportion to size. Diamonds are valued for weight, shape, and quality. Diamonds in the rough have much less value than when cut and polished. The value is, indeed, principally in the cutting and polishing. The quality is only fully ascertained after cutting and polishing.

Diamonds of perfect form, cut, polish, and quality, are valued as the square of their weight; that is, a perfect diamond of 1 carat in weight (about the size of a small pea), is now worth from 20l. to 25l. Some twenty-five or thirty years ago their price was only from 8l. to 12l. per carat. A diamond of 2 carats weight is worth 80l., and 3 carats 180l., 4 carats, 320l., and so on. To show that this rate is not, however, maintained with stones of extra weight, a South African diamond of reputed fine quality was sold at Messrs. Debenham's auction-rooms, October 25, 1871, weight over 23 carats, for 670l. In cutting this stone may probably lose half its weight, or, say, become a gem of 12 carats. (12 x 12 = 144.) It should then, if sound, perfect in form, purity, and brilliancy, be worth, at 20l. per carat, 2,880l. Rough Cape diamonds have been recently sent over weighing 40 carats, 41½ carats, and 54 carats. This 54-carat diamond, if fine in water, may be worth 3,000l. in the rough; but, if cut down to a perfect gem of 27 carats, and perfect in form, polish, and water, ought to be sold for 14,580l., valued at 20l. the carat. How many purchasers can there be found for such a gem at such a price? Half or one-third will probably be gladly taken for it. The Koh-i-Noor, at such a rate of valuing, is worth half a million sterling, and the interest, at 3 per cent., would be 15,000l. per annum. This may serve to show that extra large diamonds cannot be sold at a similar rate in price to that obtained for those up to 10 carats weight.

The question may be asked, What are diamonds? The chemist answers, "Pure crystallised carbon." It is supposed that they are crystallised gum, just as amber is fossilised gum. There is no known matrix of the diamond. They are found in alluvium,—that is, in surface water-

washed earth, sand, and gravel. They have never been found in the substance of regularly stratified, nor even in unstratified, crystalline rocks. They have occasionally been discovered in conglomerates, but then these are only a sort of natural concrete, and may be of any age, belonging to no true order of strata. Diamonds are of all colours, from the blackness of carbon in its blackest form, to the purest and whitest water, exceeding the purest rock crystal. There are red, blue, and yellow diamonds of great value. Diamonds are not in all cases the dearest gems, as a very fine ruby is worth more than a diamond, because it is much rarer in a perfect state. Diamonds are found containing cavities, and, like amber, even foreign substances. Large and pure water diamonds, like the Koh-i-Noor, are the rarest things in the world. Their number may be counted upon a man's fingers. Out of every thousand true rough diamonds found, fifty may alone have commercial value for ornamental purposes. Diamonds, rubies, sapphires, and emeralds, the four most valuable precious stones, are all liable to flaws and imperfections, both in substance, colour, and form. Probably 5 per cent. of rubies and emeralds only will be perfect; the 95 per cent. being flawed, of colour, or of bad form. It is this which gives the high price to perfect stones. Cabinet specimens, flawed and of colour, may be obtained for a few shillings, which, if perfect in substance and colour, would command hundreds or even thousands of pounds. There are many perfect diamonds, some perfect rubies and sapphires, but very rarely a perfect emerald.

The ancients regarded precious stones with strange superstitious veneration. They were said to possess magical powers and talismanic virtues. They were supposed to prevent diseases; to cure heartache; to bring good luck; and also, in some cases, to be the cause of dire misfortune. But their prime and chief use, in all ages, has been ostentation, personal adornment, and yet none of the ancient monarchs ever saw a diamond at its best, as the means and art of cutting and polishing diamonds are modern. The world-wide celebrated Koh-i-Noor was only properly cut and polished after the Exhibition of 1851. The diamonds, rubies, sapphires, and emeralds of Eastern potentates are, for the most part, second-rate. Many of the stones are flawed, of colour, of irregular forms; some are also uncut or defectively cut. The finest samples of precious stones are now either in Europe or in North America. Diamond dust and defective diamonds are used for cutting and polishing perfect diamonds, and other precious stones, and also for cutting and polishing jade, &c. Sparks of diamond are used by glaziers for cutting glass, but the greatest value of the diamond is undoubtedly that of personal adornment; and as civilisation advances the demand for this purpose will wear off. Eastern potentates and semi-barbarous male people alone use precious stones. The celebrated Easterday suite of diamonds and pearls has been broken up, and scattered never more to be restored. The use of jewelry by males in England, at least, excepting in great moderation, is a mark of snobism. Shirt-studs and a finger-ring may be tolerated with evening dress; but the perfect gentleman abstains from wearing even so much of adornment. Ladies alone can now consistently wear diamonds with good taste, and as they acquire their rights, and become strong-minded, we suppose that even they also will repudiate such gewgaws. The day of diamonds, as a gem for personal adornment, will then have passed.

ALLHALLOWS CHURCH, THAMES STREET.

THE church of the united parishes of All-hallows the Great and All-hallows the Less, which has been closed for some time past, was re-opened on Thursday week, having been repaired and decorated by Mr. MacLachlan, of St. James's-street, under the superintendence of Mr. Edward I'Anson, the surveyor to the parish, at a cost of about 500l. The Lord Mayor and Sheriffs attended the opening service in their robes of office, and a sermon was preached on the occasion by the incumbent, the Rev. John Russell Stock, M.A.

The church was much injured by the construction of the viaduct carrying the terminus of the South-Eastern Railway, which crosses Upper Thames-street, immediately to the west of that building. The piers for the arches of the railway having been carried down below the

foundations of the church, considerable settlements took place in the walls, which became so serious, that service was suspended, and the church shut up. Some litigation then ensued, and the question of damage was referred to Mr. Clifton, who awarded a certain sum as compensation for the injury inflicted upon the fabric of the church, and a portion of this sum has now been expended, under the direction of the Court of Chancery, in repairs, and in such works as were requisite for fitting the building for the performance of divine worship.

The church of All-hallows the Great and Less is by Sir Christopher Wren, and is one of those doomed to destruction. The benefice is proposed to be united with the rectory of St. Michael Royal with St. Martin Vintry, and a new district created out of the parish of St. Mary Haggerstone. The Commission to effect this incorporation was issued by the Bishop of London as long ago as 1861, under the Act 23rd and 24th of Victoria, cap. 142, commonly called the Union of Benefices Act; but the alteration has not yet been accomplished, in consequence of a difficulty in arranging as to the retirement of one of the incumbents, as is stated in a return made to the House of Commons at the instance of Lord Sandon, in which return, however, the name of the recalcitrant clergyman is not given. The population of the united parishes of All-hallows the Great and Less was, by the census of 1861, 673 persons, and is now, probably, much less. The church contains 400 sittings; but the average attendance is only about a dozen persons, exclusive of the charity children and office-bearers. The net income is given in the return just quoted as being 486l. 3s. 4d.

As one of Wren's works, the church is deserving of something more than mere passing notice, and in view of its approaching demolition, it may be well to put together a few notes as to its past history, as well as its present condition.

The only mention of the building in "Parentalia" is comprised in the following:—"All Hallows the Great, situate on the south side of Thames-street, in the ward of Dowgate, within the walls of London, was re-erected and finished in 1683, of the Tuscan order, supported and adorned with pillars and membretos of that order, and built strong of stone. Its length is about 87 ft.; breadth, 60 ft.; height, 33 ft.; with a square stone tower, 86 ft. high." The walls are cased externally with what appears to be Reigate fire stone, which seems to have belonged to some older building. It has been suggested that these stones were procured from the ruins of Cold Harbour, a large dwelling-house that formerly existed on the east side of the church, on the site now occupied by the premises of the City of London Brewery Company (formerly Messrs. Calvert's), but it is more probable that they formed a portion of the old church, and that Wren made use of such of the stone as he found upon the spot as was suitable for the rebuilding. This stone is now very much decayed, and the surface scales off on being touched. The upper stage of the tower, and the dressings to the doors and windows, are of Portland stone, which is for the most part well preserved. Nearly the whole of the openings have, however, suffered from the operations of the railway company.

The walls of the church were not quite rectangular, the east wall against which the altar is placed being considerably inclined. This is accounted for by the church being built upon the old foundations, and that it was desired to cover the entire area occupied by the former edifice. On the south side next Upper Thames-street is a spacious aisle, 17 ft. wide, and the whole length of the church. This is an unusual feature in Wren's churches, and it has been conjectured that that distinguished man planned this aisle so that in case at any future time Thames-street should be widened, the widening might be effected without interfering with the body of the church, by the mere removal of the aisle, which is entirely independent of the rest of the building. Be this as it may, the arrangement of the church lends itself readily to any scheme for enlarging the width of the street in front, and it was lately proposed by the City Commissioners of Sewers that the parish should give up the ground covered by the south aisle for the purpose of widening this street, which is extremely narrow at this point, in return for a new vestry and campanile, and certain repairs and alterations to the church. The necessary drawings were prepared, and the matter had made considerable advance, but remains in abeyance in consequence of the reluctance of the City Commissioners to

pledge themselves to any course of action in view of the changes contemplated by the Union of Benefices Act. It will thus be seen that the recalcitrant clergyman before referred to not only prevents the accomplishment of a very desirable ecclesiastical reform, but also stands in the way of a very necessary municipal improvement in the widening of Upper Thames-street.

Although the exterior of the church is plain and unprepossessing, the internal proportions are good, and there is an air of grandeur and repose in the interior, which is very seldom wanting in Wren's churches. The most noticeable feature in the interior is a carved oak screen carried across the whole width of the church, and occupying very nearly the same position that a rood-screen would occupy in a Gothic building. This screen is said to have been a present from the Hanseatic merchants in the reign of Queen Anne in memory of their former connexion with the church, they having occupied for many years a privileged depot at the Steel-yard, now the site of the South-Eastern Railway terminus. There is no record in the parish books of the date of this gift, which has been commonly ascribed to the reign of Queen Anne, but without sufficient evidence. The arms on the top of the screen are those of King Charles II. The Steel-yard was suppressed in the reign of Elizabeth, and it is not easy to account for the Hanse town merchants being moved to testify their gratitude for past privileges so long after these privileges had ceased. Allen, in his "History of London," asserts that the screen was not manufactured in Hamburg, as the tradition goes, but that it was the work of Grinling Gibbons, and that the present made to the church by the Flemish merchants was the present altar-piece, which bears every evidence of being of foreign workmanship. The screen is not good enough for Gibbons's work, nor is it apparently part of Wren's design; but there is some plausibility in the latter suggestion. The altar-piece is of unusual design, and is probably of Dutch or Flemish origin. It consists of an elaborate Classic frontispiece somewhat similar to the painting discovered at the east end of the Dutch Church in Austin Friars, with figures of Moses and Aaron, one on each side, bearing their usual insignia.

In Godwin & Britton's "Churches of London" it is stated that the communion-table was of marble, supported by a kneeling figure. The marble slab has disappeared, and the kneeling figure, after having been relegated for some years to the ringing-loft, is now in the churchyard, on the south side. The present communion-table is of carved oak, of moderately good design, and probably of the reign of James I.

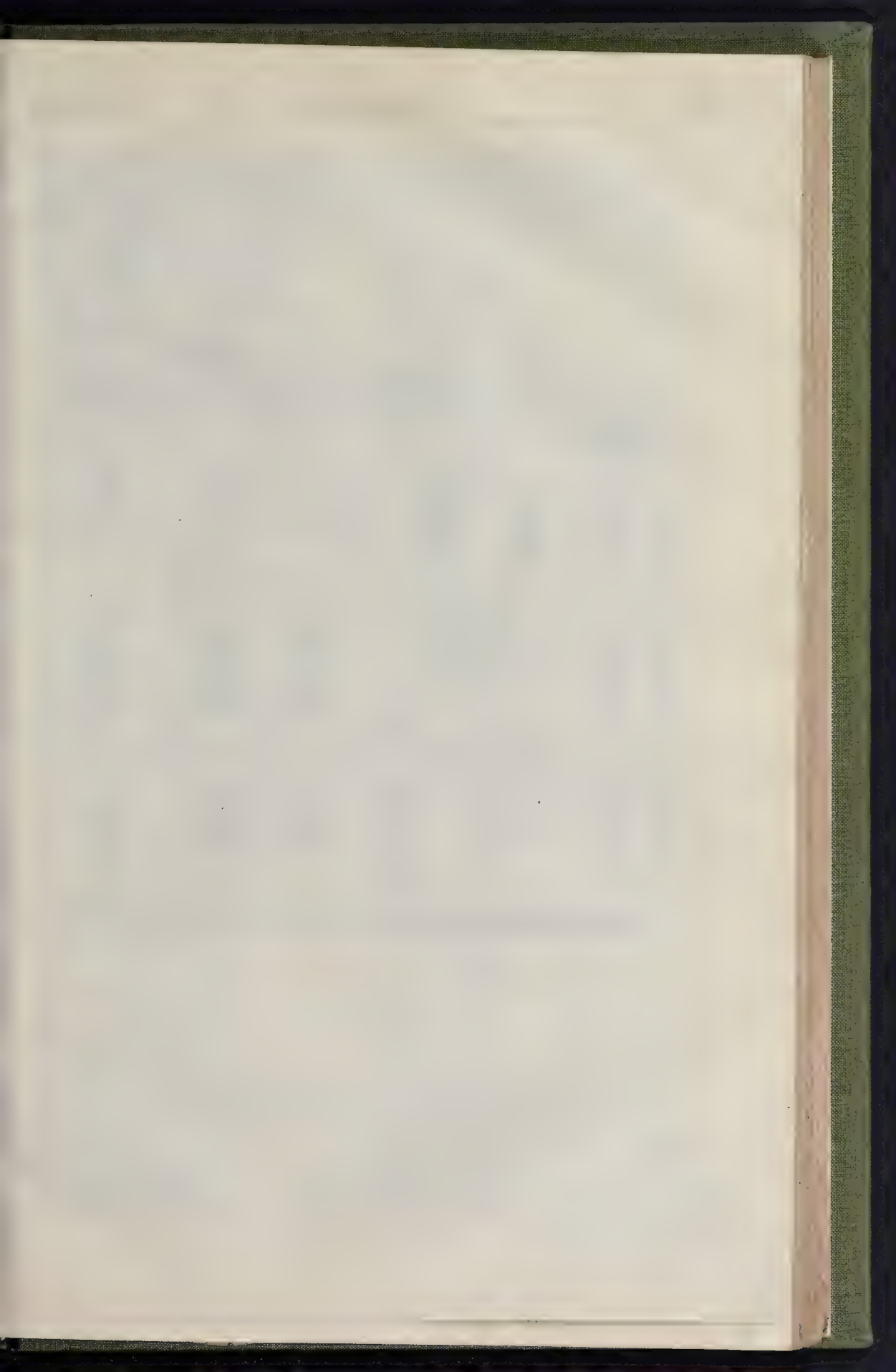
The sconces and candelabra are very handsome, and are in very good preservation. They are of the Flemish type with which we are familiar through the pictures of Van Eyck and our own Hogarth.

There are but few records to recall the connexion of the Flemings and Dutch with this parish; but on the north wall is a monument to Jacob Jacobson, who died in 1680, and who may have been a descendant of the admiral of the same name, nicknamed "Runaway Jacob," who so grievously frustrated the plans of St. Aldegonde during the famous league of Antwerp, in 1584, under Farnese, duke of Parma.

The cost of rebuilding the church in 1683 was 5,641l. 9s. 9d.

SCIENCE AND ART CLASSES.

Barnstable.—From the report of the classes here, read at their late anniversary, we gather that they are in a flourishing condition. The classes consist of about 250 pupils, 100 of them being free members of the institution in connexion with which the science classes are held. Over 70 prizes were distributed to successful candidates by the chairman, Alderman Guppy, after a vote of thanks to whom, and their indefatigable secretary, Mr. T. MacKrell, a very pleasant meeting was ended. The classes in question were established some four years since by the late honorary secretary of the Literary and Scientific Institution, Mr. J. L. Dunstone, M.A., at the wish of the president, Mr. Rock, who pays annually 100l. for the instruction of the artisans in connexion with the institution of his native town. Classes in mathematics, physical geography, chemistry, electricity, and drawing, have been established, and it is proposed to add still further to the number during the coming session.





THE HOUSE OF THE SOCIETY FOR THE PROPAGATION OF THE GOSPEL, DUKE STREET, WESTMINSTER.—MR. BUTTERFIELD, ARCHITECT.

HOUSE OF THE SOCIETY FOR
THE PROPAGATION OF THE GOSPEL,
DUKE STREET, WESTMINSTER.

THE House, No. 20, Duke-street, Great George-street, has been re-arranged and refitted, to suit the requirements of the Society, and a new front, as shown in our engraving, has been erected. The board-room and chapel are on the first floor, the east window, which is filled with stained glass, forming a prominent feature in the elevation. A new fence-wall, facing St. James's Park, has also lately been built.

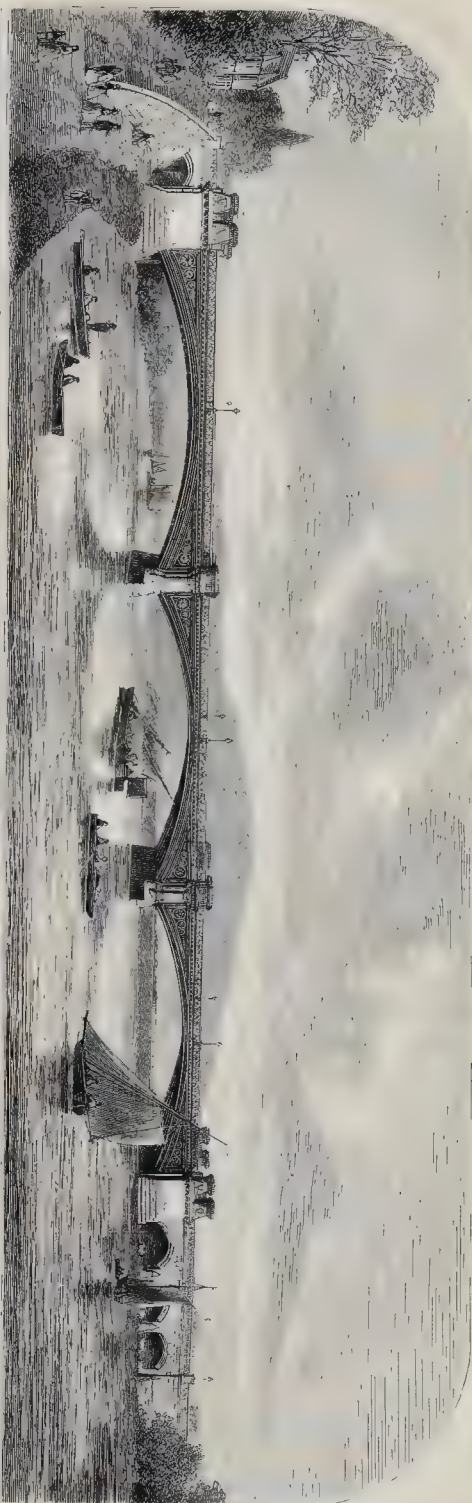
The materials used are red brick, with white brick diaper, and stone bands and dressings. The works have been carried out by Mr. Joseph Norris, builder, of Winkfield, Windsor, from the designs of Mr. Butterfield, architect.

THE PALESTINE EXPLORATION FUND.

WE hear that the new Expedition, which has been in preparation for a considerable time, has just started for the Holy Land. It has been placed under the charge of Captain B. W. Stewart, R.E. He has under his orders two

Non-Commissioned Officers of the Royal Engineers, and hope is expressed that the party will be joined before Christmas by Mr. C. F. Tyrwhitt Drake, who is described as an Arabic scholar, an archaeologist, and a naturalist. The insufficient return, as we are forced to regard it, as yet obtained for the money and time already expended, is mainly to be ascribed to the absence of a trained archaeological architect. We have said this before, and we say it again.

We see no evidence in the account now given of the new Expedition that this want is supplied.



THE OLD AND NEW TRENT BRIDGES, NOTTINGHAM.—MR. M. O. TAYLOR, ENGINEER.

[See p. 857, ante.]

THE ECCLESIASTICAL DILAPIDATIONS ACT 1871.

The above is the title by which the Act may be cited (1). Its operation is limited to England and Wales (2), to commence from August 1st, 1871 (1).

DIGEST SHOWING THE SCOPE AND EFFECT OF THE ACT, AND PARTICULARLY OF THE DUTIES OF THE SURVEYORS.

(The numbers refer to the sections of the Act.)

Principles and Powers left undisturbed.

The Act does not make any alteration in the principle (72) that the incumbent of a benefice, dignity, or office is bound to maintain the church, the residence, and buildings which the benefice, office, or dignity has been accustomed to maintain (4); nor in the principle that a new incumbent is entitled to recover for all deficiency in such maintenance (that is to say, for dilapidations) from the estate of his predecessors (36, 60, 61); but it provides (53) that no sum shall be recoverable for the future, except by the methods prescribed by this Act; and it aims at preventing dilapidations being neglected for long periods, by bringing about an adjustment every five years (28 and 47); nor does the Act alter any of the faculties for borrowing from the governors of Queen Anne's Bounty for purposes hitherto allowed (73).

Fixtures not in the Scope of the Act.

The law of fixtures has by long practice become intimately associated with that of dilapidations, but in this Act they are completely separated; for the question of fixtures is never once mentioned or referred to, and the subject is therefore entirely outside of the authority of the Act.

Buildings are separated into two Classes.

The buildings which are liable to an assessment for dilapidations are distinguished by the Act into two classes, all buildings (5) being taken for the purpose of this Act to belong to that class in which they are locally situated. One class consists of those belonging to archbishops, bishops, deans, and canons, or any dignitary, or any officer of a cathedral or collegiate church (25, 26, 27, 28), which are in effect hereby for the most part placed under the authority of the Ecclesiastical Commissioners.

The other class consists of those belonging to the parochial clergy, to which class chiefly the provisions of the Act relate, and for these buildings the governors of Queen Anne's Bounty have a position somewhat as trustees, the bishop being the chief executive.

Class placed under the Ecclesiastical Commissioners and Queen Anne's Bounty.

In the case of dilapidations at the buildings belonging to the class placed for the most part under the Ecclesiastical Commissioners, any dignitary or officer may employ a surveyor approved by the said Commissioners, who shall report (to whom is not said) the works required, and the time for their execution. A certificate from the surveyor, filed in the registry of the diocese, showing that the required works have been duly executed, exempts the subject of it or its incumbent from all claim for dilapidations for five years. A duplicate of the certificate, furnished by this surveyor, must be sent by the registrar to the incumbent.

But in regard to destruction by fire, this exemption will not apply, unless the buildings have been insured as required by the Act (28, 7, 54 to 57). The circumstances relating to insurances and accidents by fire will be hereinafter referred to. The sections 54 to 57, prescribing the proceedings in reference to these circumstances, are worded solely with reference to parochial incumbencies, yet by Section 28 they are made directly to apply to the incumbencies of dignitaries, whose buildings in those circumstances come under the governors of Queen Anne's Bounty; and "the surveyor" (3, 7), that is to say, the elected surveyor of the diocese or district, whose duties we shall presently describe.

In regard to buildings let on lease for years or for lives, there is also a separate provision (58, 59), which will apply to the buildings of dignitaries much more frequently than to those of the parochial clergy. Where the lessee is bound by the lease to repair, the lessor is exempted to the extent to which the lessee is bound; but the lessor must take care that "the surveyor" can peruse the counterpart or the lease, or that the counterpart shall be found in

the bishop's registry, or with the Ecclesiastical Commissioners.

Class placed under the Governors of Queen Anne's Bounty.

In reference to parochial incumbencies, the Act applies to each the term, "benefice" (3), and includes in this term "all rectories with cure of souls, vicarages, perpetual curacies, donatives, endowed public chapels, and parochial chapels, and chapels or districts belonging or reputed to belong, or annexed or reputed to be annexed, to any church or chapel."

The concern of the Act is to appoint qualified surveyors to assess dilapidations, to provide for adjudication by the bishops on the surveyor's assessments, for the recovery of the adjudicated amounts, and for the administration of the sums recovered by the governors of Queen Anne's Bounty, and for the survey of repairs, where the incumbent provides the fund.

The appointment of a surveyor to act for each diocese is to be made (8) within three months from August the 1st, 1871, by a meeting of the archdeacons and rural deans, presided over by the bishop or the senior archdeacon. The appointment is to be for a general or limited term; it is to be approved by the bishop; and the surveyor is to be removable by the bishop for sufficient cause. He is to be paid (10) by a rate of charges fixed or varied by the bishop, the archdeacons, and the rural deans, and the chancellor of the diocese (the latter officer being concerned for this purpose only), and is forbidden to have (11) any interest in any work or contract for repair of dilapidations in his district. The surveyor, his servants, and workmen, have right of entry for the purposes of the Act "at reasonable times and within reasonable hours" (67). The surveyor is liable to action at law for irregularity or trespass, provided the proceeding be commenced within three months after the alleged default, and that one month's notice of the proceeding be given to the surveyor; the same liability for irregularity attaches to every authority or officer acting under this Act (68).

On a vacancy occurring in the office of surveyor, it is to be filled up (9) in the manner of the first appointment. A new surveyor is to adopt the acts of his predecessor so far as the predecessor may have carried any process (65).

It will be seen that the services of the secretary to the bishop and the registrar are often in requisition. For their fees, have to be settled by the same authorities and method as for the surveyor (10).

The bishop must order a survey within three months of the vacancy of any benefice having buildings or land,* unless hereafter the benefice shall be exempt, under the operation of the Act (21 and 29), and at every fifth year where a sequestration continues (13).

The bishop may order a surveyor at any benefice now under sequestration or in future cases of sequestration, within six months of the sequestration (13), or at any benefice, upon request of the incumbent, or upon complaint in writing from the archdeacon, rural dean, or patron (12), a copy of such complaint being sent by the bishop to the incumbent or sequestrator one month before ordering the inspection. The incumbent or sequestrator may, within twenty-one days, undertake in writing to the bishop to execute repairs (22), and may thus avoid the order of survey; but the bishop may direct the surveyor to inspect the work when in progress or finished; and if found deficient, proceedings will follow, as if the order of survey had been issued.

Upon receiving an order from the bishop, the surveyor (14 and 29) is "as soon as conveniently may be" (14) to make an inspection, and to report within one month of the inspection, or (30) in vacancies to report as soon as the new incumbent shall have been instituted or admitted. The report (15 and 31) is to specify the works needed in detail, his estimate of their cost, and a limit of time for their execution, except that in vacancies the limit is fixed by the Act (42) at eighteen months, and the report may in addition "state any special circumstances" (31), and the surveyor is to prepare and send two copies of his report; viz., one to the bishop and one to the incumbent or sequestrator (14), or in vacancies to prepare and send three copies (29 and 30); viz., one to the bishop, one to the late incumbent or his representatives, and one to the new incumbent.

* If a vacancy occurs in a case where the discretion of the bishop is allowed, and where proceedings have been commenced, under an order made at his discretion, a fresh order is, nevertheless, to come (21, 24).

Moreover, in vacancies the surveyor is to certify to the bishop (30) the time, the manner, and the person to whom each copy was sent.

These things being done, it appears that the surveyor is entitled to the fees prescribed for him under the Act (10), and that the existing incumbent or sequestrator (43) is liable for them. Expenses will also occasionally have been incurred by the necessary attendance of workmen to aid in examination of work, and these should be allowed in the scale of charges.

Yet the report is of no force for a time and until after further proceedings. An incumbent, or sequestrator, or executors can (16, 32, 33) object to the surveyor's report within one month of receiving it (the bishop may in cases of vacancy allow a further time), in writing to the bishop on grounds of fact or law. When no objections are made, the mere lapse of the month allowed for them gives force to the report, and it is final when made respecting an existing incumbent (16). But if the report originates in a vacancy, force is given to it by the act of the bishop himself (34), who must make an order (evidently a copy of the surveyor's report), signed by himself in triplicate (35), and the bishop shall send (35) one copy to the late incumbent or his representatives, one to the new incumbent, and one to his registrar, which is to be filed. Moreover, the registrar is to make another copy, and send it to the governors of Queen Anne's Bounty.

Why two copies of the surveyor's report should be sufficient in existing incumbencies, and no less than seven be required in cases arising out of vacancies, is not clear. It is quite evident, however, that a more parallel treatment of the two sets of cases could be framed, saving expense to the incumbents, circumspection in the proceedings, and giving brevity and clearness to the Act.

If objections are made to the surveyor's report (16 and 32, 33, 34), the bishop may, at the expense of the objector, direct a second report to be made by some other person not the surveyor, or take the opinion of counsel thereupon; the bishop may modify or retain the surveyor's report, and in existing incumbencies the bishop is (16) to give his decision in writing, though it does not appear to whom he is to give it; but in cases arising out of vacancies, the exact method of his giving is prescribed, viz., in triplicate under his own signature, to the late incumbent or his executors, to the new incumbent, and to the registrar (to be filed, 35), who is to send a copy to the governors of Queen Anne's Bounty. The sum named in the bishop's order (36) is a debt due from the late incumbent, his executors, or administrators, to the new incumbent, recoverable at law or in equity. When an incumbent vacates a benefice before prescribed repairs are completed, he remains liable for all which he has not paid of the cost of works and expenses (49). Moreover, in cases of sequestration under the Act, the amount due, or remaining due, is a debt due from the incumbent or his estate (60, 61), and recoverable at law or in equity.

When the Act is applied to incumbencies which are not vacant, the incumbent can proceed to execute the works of repair required by the final report, and provide the funds for the work; but whether his own purse or not be used, he is bound to get them done in the time fixed by the report (19), or extended by writing under the hand of the bishop. So a new incumbent (42) after a vacancy is bound to get the works done within eighteen months; yet the latter may decide on rebuilding the premises, or any incumbent liable for the works (50, 51) may, with the consent in writing of the bishop and patron, remodel the buildings, so as wholly or in part to supersede the specified works.

In all cases of vacancies the sum determined for dilapidations must come into the hands of the governors of Queen Anne's Bounty, from the hands of the new incumbent (37, 40, 41, 43, 49), within six months of the report (but the bishop may enlarge this to twelve months); in default the bishop will raise the money by sequestration.

But all incumbents, except in cases of destruction by fire, can relieve themselves by resorting to the lending powers given by the Act to the governors of Queen Anne's Bounty (16, 18, 38, 39). The governors have a discretion to lend the whole, or part of the dilapidation money, with the whole or part of the amount of expenses of the proceedings. The repayment of money borrowed is allowed to extend over thirty years (schedule No. 1), at interest.

This facility to incumbents removes all excuse for neglect to undertake the specified repairs, or for contumacy. Should such perverse cases arise, the bishop can resort to sequestration (23, 43), and the money will be paid over to the governors of Queen Anne's Bounty.

When a benefice is under sequestration, the sum fixed by the final report (20) is a first charge (after the curate's stipend), upon the proceeds coming to the sequestrator, and (21), the sequestrator is to pay the same to the governors of Queen Anne's Bounty.

Money being thus provided for the repair of dilapidations, the surveyor is again in requisition. He may, at the desire of an incumbent, certify that the works may be postponed for a limited period, and what annual or gross sum the incumbent must pay to the governors of Queen Anne's Bounty for increment of dilapidations in such period (52). Whenever the incumbent desires to pay on account to the builder whom the Act permits him to be the employer of, on works of repair, out of money held by or issuing from the Bounty Office, the surveyor must certify to the Bounty Office what sum should be paid (44, 45). Whenever repairs executed under the Act have been finished, if completed to the satisfaction of the surveyor, he shall make a certificate in triplicate, and shall deliver one copy (46) to the incumbent or sequestrator, another to the registry of the diocese, and the third to the governors of Queen Anne's Bounty; and upon the filing of the said certificate in the registry, the benefice or its incumbent shall not be liable for dilapidations for five years (47), provided that the incumbent does not lose this privilege by neglect of the directions of the Act as to fire insurance. Moreover, this protection is gained to the late incumbent where he shall have duly provided for the cost of repairs and for their postponement (52) if he should vacate before the expiration of the allowed postponement. When, however, a benefice is under sequestration, or when an incumbent refuses or neglects to execute the prescribed works, the surveyor is to employ builders, and execute the works (45). The surveyor's final certificate exempts for a period of five years in the like manner as above.

For these certificates, and for his duty in the execution of works, a due appointment of fees payable to the surveyor has to be made (10).

Cases of Dilapidations by Fire.

A special class of dilapidation arises from accident of fire, to meet which the Act has some further special clauses, and these clauses relate, as has been already pointed out (28), to the cathedral and collegiate, as well as to the parochial clergy.

All buildings for which an incumbent is liable, must be insured by the incumbent to the satisfaction of the governors of Queen Anne's Bounty to at least three-fifths the value thereof (47, 54, 55), in the joint names of the incumbent and the governors; the bishop and archdeacon are empowered to ascertain that this is done and continued. Insurance money, when recovered, must be paid over to the governors, and be dealt with as dilapidation money (56).

Where insurance money is found insufficient (by whom?) to restore the buildings destroyed (57), the surveyor is again concerned (45, 57). It does not appear who is to call upon him to act, but as the bishop originates his action in every other case, it is probably proper that the bishop should direct him to act now. The surveyor is to make a certificate in writing in triplicate, specifying the sum in which, in his opinion, the insurance money is deficient. One copy of his certificate is to be filed in the bishop's registry, another to be sent to the incumbent or sequestrator, and the third to the governors. The certificate is open to the same course of treatment as to objections, and becomes of force in the same way as the surveyor's report (16) respecting dilapidations of benefices not vacant; but when the certificate has become final, the incumbent is bound to pay the sum named in to the governors within three calendar months "next after the date of such certificate." In default, the bishop can resort to sequestration. The money for the restoration of the buildings being thus provided, the incumbent can proceed to rebuild exactly as if he had borrowed the money from the governors; but it is to be observed, that for these cases of restoration the governors are not allowed to lend or advance money (28), with the object, no doubt, of compelling insurance. If the incumbent refuse or neglect to restore the building after the

governors are in possession of the insurance money, and the certified addition to the same, then reinstatement is to be made by the surveyor as in cases of dilapidation at benefices under sequestration (45, 57).

For the services of the surveyor in connection with the restoration of the buildings destroyed by fire, appropriate fees have to be assigned by the authorities (10).

Buildings pulled down, or desired to be.

Lastly, as to buildings belonging to parochial incumbencies, where portions have been removed, or where the incumbent desires to remove portions (70, 71). Where, prior to this Act, buildings have been pulled down without authority, and others of equal or greater value been substituted, the bishop can exempt the incumbent from claim for dilapidations on the buildings pulled down, provided the substituted buildings are duly insured. Moreover, if the buildings were removed by a preceding incumbent, the existing incumbent shall in no case be liable beyond the amount he is entitled to recover from the last incumbent, or his estate.

When the incumbent desires to remove a building, he must apply to the bishop, who, with the consent of the patron in writing, may, in writing, authorise the removal, and the bishop and the patron will direct the application of the proceeds for the improvement of the benefice.

There is no authority contained in these clauses for employing the services of the surveyor, yet it would appear that such an aid to the judgment of the bishop might sometimes be advantageous. In regard to the value at which (54) a building is to be insured, such an aid to the judgment of the incumbent and governors appears also to have been overlooked.

Miscellaneous Regulations.

The only points of the Act remaining to be noticed are sections prescribing the form of security to be used by the governors of Queen Anne's Bounty when they are desired to make advances under the Act (62), and their remedies against the property comprised in the security; that an incumbent is to furnish particulars in writing, verified by oath or declaration, as to the profits of his benefice, and to procure the consent in writing of the bishop and patron, signed by them, or in the case of a corporation sealed (63); the form of dilapidation account to be kept by the governors where they receive or advance money on account of dilapidations (39, 44, 45, 46, 57, 62); the investment of dilapidation moneys by the governors (65), and arrangement by them of their charges, and of interest to be paid to them on advances (schedule 1). And sections 3, 6, 7, which define, where any doubt can possibly arise, who is to be treated as patron of a benefice, and provide for the execution of the bishop's duties under the Act "by the guardian of the spiritualities of the diocese" when the see is vacant, or "by the person lawfully empowered to exercise his general jurisdiction" when the bishop is disabled, and by the archbishops in their own dioceses, as if they were mentioned wherever the word "bishop" is used. All consents, orders, and directions of the bishop must be in writing (69).

Lastly, as to the sending of documents or papers directed by the Act to be sent, they are duly sent "if sent through the post in a prepaid letter," in the case of an "incumbent" addressed "to the house of residence of the benefice," or, if there is no such house, to one of the churchwardens at his usual place of residence; in all other cases to the "usual or last known place of residence in England of the party."

ECCLIASTICAL DILAPIDATIONS ACT.

SURVEYORS.

Chester.—Mr. Cornelius Sherlock, architect, Liverpool, has been appointed surveyor for the diocese of Chester.

Oxford.—Mr. E. G. Bruton, architect, has been elected to the office. We mentioned Mr. Bruton's "Handy-book" on the new law in our last. There were eleven candidates.

Salisbury.—The surveyor for the Northern Division is Mr. H. Wenver, of Devizes.

Rochester.—Mr. F. Chancelor, of London, has been elected for the two archdeaconries of Essex, and Mr. Gordon Hills, who already holds office for the diocese of London, has been chosen for the archdeaconries of Rochester and St. Alban's.

SPECULATING BUILDERS.

The speculating builder,—sufficiently a terror to most of us on account of his many sins and bad habits,—seems to your correspondent, "A Victim," in the *Builder* for 21st October,* a "*chimera dire*," calling at once for slaying or crippling at the hands of a Bellerophon, in the form of a public officer aloft on the fiery Pegasus of a brand new Act of Parliament.

This tradesman, of ill-omened name,—name so unpleasant that one would be loath to soil another word of our language and talk of speculative builders as "A Victim" does, it is fair to say is made to bear sometimes on worthy shoulders the burden of the unworthy acts of a good majority of his fellows. One of the heaviest which one would lay upon him would be about the last to seem worth attention from any very large number of people. The utterly unnecessary meanness, or commonplace or vulgar pretension of village, town, and city cottages, shops, and houses, may be fairly considered of a nature intangible to too many people to make it a subject for legislation with much promise of practical result. We are all agreed, or resigned, to putting ourselves in the hands of ground-landlords, or their agents, who may possibly be heedful and skilful; or of fate, or chance, or of what we are in the habit of reverently alluding to as "the influence of the growing appreciation of genuine excellence."

The bad materials, bad construction, the readily-confessed inefficiency of large portions of many buildings erected by the worst specimens of the class, seem however to touch more nearly the practical minds of house occupiers and buyers.

It may be taken for granted already that something approaching a fair amount of structural security is provided for in new buildings in London and some other places, even if only what may be called a working minimum, by the machinery of Building Acts, and some amount of sanitary efficiency by other public Acts, having for their purpose the protection of the public interest, as it may be affected by the property being dealt with,—not at all directly the interests of property owners themselves.

A considerable extension of any interference ever yet sanctioned, of set purpose, by law, would obviously be involved,—if not merely the existence, but the thorough efficiency of the drainage and water supply (and perhaps some might add the gas supply, and so on) should be the subjects of municipal supervision and guarantee. These matters may be properly mentioned by your correspondent as of great importance, and the possible sources of public as well as of private injury; but it may be doubted whether they are so far beyond the reach of the ordinary citizen as to justify the interference thus of a *deus ex machina* in the midst of a system which we pretty generally agree shall limit the interference of Government in special legislation, to such matters as cannot well and efficiently be performed by the people for themselves. I have been told that there are in London, and within moderate distances of most parts of the country also, a class of persons known as architects and surveyors, who are ready to make for modest remuneration examinations of buildings.

On being properly instructed to do so, they ascertain the nature of the construction and the state of efficiency of every part of a building, and report to their employers with candour and trustworthiness. These and allied services are required of them not infrequently by people who are not able or willing to trust their own judgment or knowledge of such technical affairs, and who are about to rent or buy houses property, which they wish, not only to afford them size, but also some amount of thorough serviceableness. Unfortunately, however, it appears that there are a considerable number of people to be confiding, or parsimonious, or ill-informed to be able to safely dispense with, or to avail themselves of, so ready and effective a manner of ascertaining the nature of the buildings and appliances they wish to hire or to purchase. It is hardly necessary, however, to point out that the speculating builder, like any other tradesman who hopes to live and gain by his trade, will rarely produce what he cannot hope to sell: it is because he with sufficient surety counts on the nature of the examination to which his goods will be subjected in a sufficient (for him) number of instances, that he fails to put into the

market anything other than he does, although he knows it will be in appearance traded for under the *caveat emptor* caution of the law, or under the more classical warning against buying a pig in a poke, of average humanity.

The worthy house-owner, whose woes are graphically depicted by Mr. Du Maurier in the *Punch* of the same date as that over "A Victim's" communication, may be fairly credited with less intelligence than his appearance would indicate, in that the prodigious dislocations of the walls of his newly-acquired house now reveal themselves to him for the first time,—cracks of such a size and in such situations that few buildings could stand up and exhibit them. "A Victim" cannot, however, be reproached with a similar want of prudence; he carefully ascertained the defects of his residence, and obtained a written agreement as to their remedy. He is only in truth "A Victim" of an unfortunate want of substance in the agreeing party, which has cost him much personal trouble, and will probably cost him a little more when he sets himself nearly right, as he would seem to have the means of doing, by pleading a set-off at rent-day.

Of course this does not touch on the question of the system of speculating building, as it is at times pursued, where a man of no capital and character is enabled to cover eligible land with buildings, living the while on the advances, and scamping all that passes through his hands. The provision of houses by private enterprise has truly fallen into very bad hands in too many instances; all that can be said in moderate comparison to that remedy, as things exist, especially in the case of comfortable and intelligent middle-class people, is in their own hands; and that it is hardly necessary or advisable to assume that they must always continue too wilful or supine to use it effectually.

S. F. C.

PURCHASE OF THE LIVERPOOL AMPHITHEATRE BY THE CORPORATION.

In view of carrying out certain improvements in Liverpool by the widening of one of the main thoroughfares leading to St. George's Hall and Lime-street, and connecting them more directly with the Town-hall, the Exchange, and several of the chief centres of business in the neighbourhood, the corporation have this week completed the purchase of the Royal Amphitheatre, and several houses and buildings in connexion with it, for the sum of 19,000*l.*, the present income from the property representing about 2,500*l.* a year. The object of the corporation was to get possession of the houses only attached to the Amphitheatre for the purpose of removing them for the intended improvement, then the Amphitheatre itself would form one side of the street; but the vendors refused to sell the property except as a whole, and hence the purchase of the Amphitheatre by the municipal body. In answer to a question on the subject, it was stated by the chairman of the committee which had negotiated the purchase that the council would get "a certain portion of the weekly receipts," which elicited the humorous remark from one of the members that the council of course "never contemplated ceasing a theatre."

CONDITION OF HAWICK.

MR. JOHN DAVIDSON writes a sensible and important letter to one of the local papers, urging attention to the subject of sewerage and water supply, and the disposal of the sewage of the town, either by irrigation or by defecation. He thinks the sewage might be disposed of to advantage on Hawick Moor, which is town property. With a population of upwards of 12,000 inhabitants, Hawick does not possess a main sewer; only a number of private drains, which are generally discharged into the rivers, and a cesspool still exists in the town. A large number of dwelling-houses have neither water-supply nor any *closest accommodation* whatever. The local authorities went to the expense of obtaining a special Act of Parliament to obtain power to carry out a system of sewerage and water-supply. This Act cost the town 600*l.*; and now that the want of both sewerage and water-supply is becoming more and more urgent, the town increases in population, no further thought ought to be lost in making good use of their quired power. Nowadays, too, the authorities must avoid polluting their river, otherwise they

will get into no end of trouble and cost; and they cannot have proper sewerage and drainage without some way of defecating the sewage, either by irrigating the land with it, or by causing it to undergo some other cleansing process, before it is turned into the rivers. As the authorities seem to possess land of their own, however barren it may be, they may, with proper advice and management they may, perhaps, be able to repay the cost of defecation, or even to reap a profit. This, however, ought to be a secondary consideration when compared with the health and energy of the inhabitants, which proper sewerage and water-supply will certainly improve.

BLACKBURN FREE LIBRARY AND MUSEUM COMPETITION.

THE successful competitors for this building are Messrs. Woodzell & Colclutt, of Finsbury-place South, London.

DISTRICT SURVEYORS

UNDER METROPOLITAN BUILDING ACT.

MR. G. TULLIANY has published his annual report on the monthly returns of district surveyors. The total of the gross fees received for the year is 30,008*l.* 2*s.* 4*d.*, in respect of 18,599 works, of which more than two-thirds were done within the year. The gross fees received in 31 districts vary from 5*l.* to 493*l.*, 4 being under 200*l.*, each, 10 under 300*l.*, 11 under 400*l.*, and 13 under 500*l.*. In 21 districts the incomes vary from 500*l.* to 1,443*l.*

The expenses of district offices are 7,155*l.*. The fees remaining due for all arrears are 29,543*l.*, but probably mostly of little value. The sums abated or lost are 1,908*l.*. Compared with the results of former years, the present abstract shows still a considerable decrease.

	Works.	Fees received.
1867	21,313	236,674 6 0
1868	21,915	37,791 13 5
1869	18,947	33,248 19 6
1870	18,599	30,008 2 4

THE INSTITUTION OF CIVIL ENGINEERS.

The members of this society have been informed, by circular issued during the current week, that the ordinary meetings, for the reading and discussion of original communications on subjects connected with mechanical science,—more particularly those which constitute the profession of a civil engineer,—will be resumed on Tuesday, the 14th of November.

The deaths have been recorded, during the last three months, when the institution has been in recess, of F. M. Sir John Burgoyne, G.C.B. & Co., honorary member; of Messrs. Joseph Hamilton Beattie, John George Blackburne, Robert Benson Dockray, Albinus Martin, and Josiah Parkes, members; and of Messrs. Arthur Field, Edward Mosely Perkins, and Henry Beadon Rotton, associates. The numbers of the several classes now on the register are 14 honorary members, 725 members, and 1,056 associates, with a class of 205 students attached, making, together, of all grades, 2,000.

THE TRADES MOVEMENT.

THE promoters of the nine hours' movement have an interest in a report to the effect that some of the iron-masters and colliery-owners propose to commence the importation of Chinese coolies on a scale sufficiently large to enable them, in the course of a short time, to carry out their works independent, or nearly independent, of certain kinds of British labour. There is no Act of Parliament to prevent the importation of such labour; and, as the patriotism of most English working men may be summed up in the new axiom, "Look after yourself," they cannot complain. A similar policy was adopted in California, and found to pay; but if it tended to demoralise the working people in that thinly-populated country, what must the effect of such a movement be in England? Should the intention be carried out, one of the severest struggles that has ever marked the long contest between labour and capital will inevitably be the result. Meantime, the nine-hours system is spreading everywhere.

It is likely that the master joiners and carpenters of Newcastle and Gateshead will shortly come to an arrangement among themselves to offer the "nine hours pure and simple,"—fifty

four hours per week,—to the operative joiners and carpenters of the two towns, as a settlement of a dispute in the trade which has been so long pending. A majority of the masters have, we understand, decided to commence the nine-hours system in their shops at once.

Messrs. Marshall & Son, of Gainsborough, have conceded the nine-hours system to their men, beginning on November 1st.

The nine-hours system has been adopted by the principal ironfounders and machine-makers in Bradford.

Messrs. Elgood & Co., brassfounders, finishers, &c., Darlington, have granted the nine hours to their workmen.

The engineers and boiler-makers at Dewsbury have resolved to agitate for nine hours. Several leading firms have conceded it.

The *Birmingham Post* states that meetings of the principal engineering firms in Birmingham have been held, and it has been decided that the principle of working nine hours a day will take effect from the 1st of January. About thirty firms, employing between 2,000 or 3,000 hands, will be affected by the arrangement. The *Birmingham Morning News* adds that the nine-hours movement has now reached the gun trade; and Mr. Walker, breech-loading action maker, Summer-lane, has voluntarily adopted the system. The engineers will, under this arrangement, work fifty-four hours a week, and will leave work on Saturday afternoon at one, and return on Monday morning at nine o'clock.

It is stated that some of the Sheffield engineering firms have already taken into consideration the circular issued on behalf of the men by the Sheffield Nine Hours League, and are disposed to grant the fifty-four hours per week from January 1st next, so as to get the present contracts out of hand.

Messrs. Mather & Platt, of the Salford Iron works, have issued a notice to their workmen's committee, in which they say:—

"We are informed that an important firm in Manchester has agreed to give the nine hours, commencing from the 30th instant. This event has relieved us from the suspicion of taking up an isolated position, and we now gladly avail ourselves of the earliest opportunity to inform you that from the 30th instant we shall place all the men in our employ on the nine-hours system,—that is, working 54 hours instead of 57½ hours per week, at the present wages. Time in future to be paid by the hour. We need scarcely remind you that in taking this step, considering the high rate of wages we now pay, we run the risk of sacrificing for your benefit a large amount out of our profits. It is to be hoped, however, that you will make it a point of honour to be guided by the example of the firm in question, by increased industry and conscientiousness in your work. The extra leisure at your disposal will, we trust, be spent in increasing the happiness of your families, and adding to your own intelligent enjoyment."

The firm of Messrs. Lindley, Taylor, & Co., machinists, Nottingham, have, unsolicited, made known to their workmen that on and after the 6th of November nine hours will be the working day at their establishment. Overtime to be paid time and quarter until ten o'clock at night, after which time and half will be paid. The men are highly gratified at this timely concession.

The two principal firms of engineers and machinists in Carlisle have intimated to their workmen that after the 1st of January next they will adopt the nine-hours system.

The Sheffield working engineers have formed themselves into a nine-hours league. They request an answer to their demand for the nine-hours day's work from the employers.

Newcastle.—In a week or two all the German workmen are likely to leave Newcastle, on account of the treatment to which they are daily subjected by the men who have returned to work.

A representation has been made to the Prussian Government, and the men are advised to leave England as soon as possible. The Belgians are also going to leave, and some who have left have published in the Belgian papers particulars of the insults and assaults to which they were subject, and the utmost indignation is expressed against what is designated the cowardly conduct of the Englishmen. Public meetings have also been held on the subject, and their treatment has given rise to considerable feeling, even among the workmen who were opposed to the Belgians coming to England.

Leeds.—The master plumbers have agreed that fifty (?) hours shall constitute a week's work, and have granted their men an advance of one penny per hour.

Batley.—The master plumbers of Batley have conceded an advance of 2*s.* per week to their workmen, to be commenced on the 1st of next January, but the men hold that they should begin to receive the increased rate forthwith, and have agreed to strike if the concession be not made.

Glasgow.—At an aggregate meeting of the joiners in the Glasgow district, held in the Trades' Hall, Glasgow, it has been resolved to refuse, after intimation given to their employers, to fit up finishing and other work done by joiners working ten hours per day. It was also agreed to demand the present rate of a halfpenny per hour on an advance of wages,—the advance to come into operation on and after the 1st of March next. A committee was appointed to carry the resolutions into effect.

WIDENING ST. MARTIN'S-LANE.

THE wish expressed by your correspondent "F." will soon be gratified, as "Pursuant to the provisions of sec. 74 of the Metropolitan Management Act, 1862, it is the intention of the Board to require that the house, &c., shall be set back to line of the building of the wider part of the line." A plan is being prepared which will be annexed to the formal notice under the above section, and will be served upon the parties interested as soon as practicable.

P. PALMER.

HIGH ART IN THE STREETS.

THE excellent drawing of the large cartoon poster of the "Woman in White" must have been noticed by many of our readers. We believe we are correct in stating that the picture in question was drawn directly upon the wood for Mr. Wilkie Collins by Mr. Frederick Walker, A.R.A.: the smaller copy of the same subject is a bad reduction on stone. It is not generally known that these large posters are as a rule drawn upon sycamore wood, the flat way of the grain; the one in question, however, is drawn upon pine.

We have observed several other very good posters, such as the gigantic one advertising the *Gardeners' Chronicle*, the smaller one for *Science Gossip*, and one or two others, all evidencing thought and considerable power of drawing.

WOOD TURNING.

THE Lord Mayor of London has distributed the prizes gained at a small but interesting exhibition of articles in wood-turning, which has been held at the Mansion-house, under the auspices of the Master, Wardens, and Court of Assistants of the Company of Turners, one of the oldest of the City guilds. The ceremony was conducted in the presence of the Master and other leading members of the company, the past-president of the Institution of Civil Engineers (Mr. Charles Hutton Gregory), Professor Tennant, and other known persons. It was also graced by the company of several ladies. The judges were Mr. Charles Hutton Gregory, Mr. John J. Holtzapffel, and Mr. John Jaques—all citizens and turners,—and they awarded the prize of this year to Mr. W. H. Ridout. It consisted of a large medal in silver gilt, bearing on one side the arms of the company, and on the other the name of the successful competitor, with an inscription that it had been awarded to him, together with the freedoms of the company and of the City, for superiority in hand-turning in the competition of 1871.

TINNED LEAD PIPES.

WE have received a well-made specimen of tinned lead pipe produced under the patent of Mr. Hamon, by Messrs. Lane & Nesham, successors to the firm of Burr, Brothers, Old Shot Tower, Lambeth.

Lead-poisoning cases are well known to have arisen from the use of lead pipes when the water had remained for some time in contact with the metal: it may be assumed that every drop of water we drink, which has been brought to us through lead pipes, contains an amount of lead salt which, although infinitesimally small, acts, in the course of time, detrimentally to the system, especially for all who are liable to lowness of spirits, and nervous excitement: the introduction of carbonate or nitrate of lead into the blood has brought about many a case of paralysis.

The price, which must vary according to the state of the tin market, is slightly above that of lead pipes; but the difference is lessened by the fact that tin being tougher than lead, the same strength can be obtained with less thickness.

Some care is, of course, required in soldering tinned pipes.

An Englishman (Mr. Alderson) tried to produce such pipes as early as 1804; Mr. Burr nearly succeeded in 1836, we believe.

THE SEWAGE QUESTION AT HERTFORD.

At a special meeting of the town council, held—

"To consider the several schemes for dealing with the sewage of the town, namely, Messrs. Smith & Austin's plan; the question of joining Ware; also, to receive the recommendation of the sewage committee that the plan proposed by Mr. Grindle for extending and improving the purification works be carried out; also for applying to the Home Secretary for authority to borrow 3,000*l.* on security of the borough fund and rates, for carrying out the works and lining the sewers; and to take such steps concerning the several schemes as to the council shall seem expedient;"

After a long discussion it was resolved, by a majority of 10 to 5,—

"That the report be adopted, and that the scheme proposed by Mr. Grindle, the borough engineer, for extending and improving the sewage purification works belonging to the mayor, aldermen, and burgesses of this borough be carried out; and application be made to the Home Secretary for his sanction for the corporation borrowing the sum of 3,000*l.* at interest on security of the borough fund and rates, to pay the expense of carrying out the works and rates, pursuant to the provisions of the several Sewage Utilisation Acts, and of the several Acts incorporated therewith, such loan to be paid off in thirty years by equal annual instalments."

The *Hertford Mercury* remarks upon this decision, that "the result of all the experiments that are being made throughout the country point more clearly every day to irrigation as the most only method by which sewage can be rendered harmless and at the same time turned to good account as a fertilising agent; and that Messrs. Smith & Austin showed conclusively that irrigation for Hertford would be a far more economical, as well as a more effectual, method of meeting the difficulty."

A PLAN OF THE DRAINS.

SIR,—The unwearying efforts you have ever made in all sanitary movements induces me to offer an suggestion through your columns upon a subject I consider of great importance upon that matter.

Every one who has had any works to carry out in old buildings well knows how complex, difficult, and expensive a matter it is to discover and trace out the course and position of drains. I need not say anything of the time and money lost in such work, or the discomfort and often danger caused thereby, these being too well known. My remedy for the entire batch of such evils is as follows: "Every houseowner shall by law be compelled to provide and fix at the back of the front door of the dwelling or warehouse, or some other given place, a proper plan to scale of the entire system of drainage, so that in the event of necessary repairs to same, the workmen may at once possess a key for the immediate and proper execution of his work."

R. H. TAYLOR.

THE STATE OF THE SOUTH TRANSEPT OF YORK MINSTER.

IN consequence of the many indications of decay which have recently become evident in the south transept of York Minster, the Dean and Chapter have sought the advice and assistance of Mr. Street, who has since presented a report of the critical state of this portion of the cathedral, of which the following abstract has been furnished to us:—

"It is with unfeigned regret that I ever find myself under the necessity of recommending any considerable works of reconstruction in the case of an old building, not excepting value and interest, and when the part to be dealt with is, as in the present case, the most precious and beautiful portion of the whole church. By way of preface, I beg to say that I propose to act in the most conservative manner, and to preserve as far as possible intact, not only the design of the building, but the very stones in which that design has been clothed.

The south transept of the cathedral is most beautiful, and excels the work of most of the artists of the thirteenth century. Its dimensions are unusually large. It has stables on either side, and the clear width between the arcade is no less than 48 ft. The triforium walls over the arcade are very delicate in their design, and the latter is constructed of two thin walls, one of them consisting of a delicate open arcade, and the other pierced with a number of windows. Such a design was evidently not made originally with any idea of its carrying a stone vault; nevertheless it received, probably not long after, its timber roof of very great weight, imposing a considerable thrust on the side walls and clerestory. Serious as the work in prospect is, I think we may be thankful that it is no worse. The lower part seems in fair substantial repair, but the clerestory, owing to its great width, to the thrust of the groined ceiling, to the absence of any distinct tie, and to the weight of the roof of heavy slates, has dangerously bulged out, and this bulging has now produced a great vertical fissure, which is becoming serious, and must lead to a serious catastrophe unless rigorous measures are taken to remedy the defects.

The result, therefore, at which I have arrived, is that

the only safe course is to take down and rebuild the whole of the side walls of the clerestory, and in doing this to provide for giving them greater strength than they now have."

I propose, as far as is possible, to build flying buttresses under the steep roof of the clerestory, so as to support the upper part of the triforium, and to prevent any chance of its moving outwards.

The walls having been strengthened, it will be necessary to prevent the thrust of the clerestory, which is modern but well constructed, and in good condition.

The slates with which it is covered are extremely heavy. I very strongly recommend that they should be removed, and that the roof should be covered again with lead.

Connected with the South Transept are other works of repair, which might, with great advantage, be undertaken. The five pinnacles are in bad condition, and ought to be renewed.

The gables which surmount the doorway are decayed, and the whole design, which must have been very good, is spoiled by the clock over the doorway.

There will still remain considerable work to be done in the way of the repair of defective stonework.

The plinth is much decayed, but its exact design is fortunately preserved, and its careful restoration all round the transept is an obvious and most necessary measure. Its section is of the best kind of thirteenth century work.

With these and some other repairs, this exquisite transept might be preserved in all its original beauty for many centuries. The cost of such works will be considerable, but the result will be commensurate."

LANDLORD AND TENANT.

Action for Damages to a Chandelier.—James White v. Charles Courts.—In this case, heard at the Clerkenwell County Court (before Mr. Gordon Whitbread, J.), the plaintiff, a builder, residing at 235, Essex-road, sued the defendant, his landlord, for the sum of 2*l.* 10*s.*, for damage done to his chandelier in consequence of the defendant's negligence. Mr. Ricketts appeared for the defendant.

It appeared from the evidence that the plaintiff had been a tenant at will of the defendant for some six or seven years. The plaintiff stated that the house was in a dilapidated condition, and drew the attention of the defendant to the fact, especially to the ceiling of his drawing-room, and the defendant promised to have it remedied, but never did so. In August his chandelier fell from the ceiling and was destroyed. It was the duty of his landlord to keep the house in repair.

In answer to Mr. Ricketts, he stated that he had an agreement with the defendant, but he did not produce it because he did not know where it was. Excessive dancing in his house had not been the cause of the accident.

Mr. Ricketts contended that the defendant could not be held liable for the sum claimed, because it was clearly the duty of the defendant to keep the house in repair unless he had an agreement to the contrary. Besides that, he had witnesses to prove that dancing was continually going on in the house, and that had, no doubt, brought about the damage.

The defendant was called by the plaintiff, and in answer to that gentleman stated that he had not been in his house for some time. He did not expect any part of the wall of the house to fall down, and he certainly did not promise to do anything to the ceiling. He had paid the plaintiff to make some repairs, but he was not bound to do that, and in fact only ordered the work to be done because it was to his interest to keep his property in fair repair.

The Judge observed that the plaintiff's case had failed. He gave a verdict for the defendant with costs.

THE LAW COURTS.

IN the letter addressed by Mr. Street to the Metropolitan Board of Works, as mentioned in our last, that gentleman says,—

"My proposal is to remove St. Clement's Church from its present site, and to build in its stead a new church on the extreme western portion of the Courts of Justice site at the spot indicated on the accompanying drawing. This is a part of the site which is not at present appropriated to any other purpose, and the irregular shape of which would lend itself very readily to the erection of such a building as a church. It would be a perfectly quiet site, well guarded, with good access and surroundings, and well placed for the convenience of the parishioners."

It would, indeed, in every respect, be more suitable than the present site, and I should hope that, in spite of their natural partiality for a church to which they are used, there would not be any opposition on the part of the parishioners to its removal. The general removal of the church, not only to the great thoroughfare which passes through their parish, but also to their own convenience and comfort. If the church were removed, it would be very easy, and it is part of my proposal to bring the whole mass of the New Courts of Justice slightly farther to the south. This would be rendered easy by the removal of the present impediment to the building on the south-west angle, caused by the roadway on the north side of St. Clement's, and might be done, leaving the Strand at this point of the sufficient width of 105 ft., while on the north side the result would be that the whole buildings of the Courts of Justice would be moved southward the whole length of Carey-street north of the new buildings might at the same time, and without additional cost, be sufficient widened. It is not necessary that I should point out to you the many advantages which such a scheme offers."

The Courts of Justice are built, and the whole of the present cleared site arranged without reference to it, it would be most difficult, if not impossible, at any other time to find a suitable site for a new St. Clement's Church, and consequently it would be impossible to improve the Strand at its worst point; and though it would not be impossible to widen Carey-street, it could only be done by an Act of Parliament, which would probably excite opposition, and at a cost very far beyond what would be supposed to be likely, owing to the great and rapidly increasing value of the property on the south side of Lincoln's-inn.

Whether St. Clement's Church is to be taken down or not, the advisability of bringing "the whole mass of the New Courts of Justice," further to the south, and consequently nearer to the traffic line of the Strand, seems to us doubtful. At the Temple-bar end, at any rate, such an advance appears to be out of the question, so that if the proposed alteration of site be made, the whole mass must be either "put out of square," or slewed round diagonally. The difficulties in the way of the proposition strike us as considerable.

The cost of the proposed new church, in lieu of St. Clement's, is put down at 50,000l.

The working drawings for the New Courts are, to a great extent, prepared, and the surveyors are at work taking out the quantities as the drawings progress. The plan adopted, with some few alterations made since, will be found in our volume for last year (xxviii. p. 666.)

DEVON AND CORNWALL BUILDING NOTES.

At Torquay, a new wing is being added to the Imperial Hotel (the residence lately, *pro tem.*, of the Emperor Napoleon), at a cost altogether, it is said, of 10,000l.

Efforts, it is understood, will be made to complete the great hall connected with the New Public Buildings at Plymouth, in time to receive the Social Science Congress next year, but there is considerable doubt as to the possibility of this. The hall is intended to seat more than 2,500 persons.

The Plymouth School Board purpose erecting, immediately, schools for 1,000 children. Messrs. Hine & Norman have been appointed architects to the Board.

The Roman Catholics of Plymouth have lately purchased extensive premises for a nunnery and schools in the eastern part of the town. Additions are being made from the designs of Mr. Hansom, of Clifton.

Shevick Church is being restored under the direction of Mr. Street, by Mr. Pethick, of Plymouth, contractor.

Merivale Church, in the parish of Antony, has lately had a spire added to it. Mr. White was the architect.

At the Cornwall County Asylum, a new building for 128 patients is being erected from the designs of Messrs. Alfred Norman & James Hine, Plymouth. Mr. Jonathan Marshall is the builder.

Lanncoston, the ancient capital of Cornwall, and still overshadowed by a grand old castle, is being much improved by new buildings, and has become a favourite resort of tourists.

Bodmin, the present assize town of the county, a miserably drained and paved place. The Corporation possess an ivory casket of the thirteenth century, with some painting on it. This it is proposed to sell to the highest bidder, and to devote the proceeds to the construction of new sewers. It is thought that probably the casket will find its way to South Kensington. 700l., we are told, have been offered for it.

The restoration of Exeter Cathedral is regarded with a good deal of interest in the West. Mr. Scott and the Chapter have gone in for the retention of the Grandison screen, close, as at present. Outside opinion appears to favour the piercing of the screen.

OPENING OF NEW NORTH BRIDGE, HALIFAX.

The new North Bridge, which has been erected across the river Hibble, at Halifax, has been opened to the public. The principal streets and bridge were decorated with flags and banners, and a half-holiday was generally observed.

Mr. John Fraser, civil engineer, of Leeds, designed the bridge. It is of iron, having two elliptical arches, of 180 ft. span each, with a rise of only 16 ft. The outside ribs, which are of cast iron, are 5 ft. 3 in. deep at the springing, and 4 ft. in the centre, carrying open-traceried pendants at the haunches, crowned by a cornice and partly-opened quatrefoil and battlemented parapet. The inside ribs, six in number, are placed 8 ft. 7 in. apart. The centre part, for a space of 52 ft., is composed of wrought-iron plates, the remaining portion of the ribs being of cast iron. The transverse bracing, connecting the wrought-iron parts is composed of wrought-iron bars, the other portion being cast-iron spans.

drels. Over these are the cast-iron road plates, on the top of which is laid a macadamised road, composed of hard whin-stone, which has been rolled down by a steam roller, while the foot-paths on each side have been asphalted by the Val de Travers Company. The total width within the parapets is 60 ft., and on each side of the bridge the road is lighted by numerous ornamental lamps. Near to each end of the bridge are piles of masonry, supposed to represent towers. The new bridge is about 11 ft. above the level of the old one, which was 56 ft. above the bed of the stream. It is nearly a level from Cross Hills to the bottom of New Bank. The approaches at both ends are not entirely completed. The first half of the bridge, which was erected alongside the old one, was formally opened last year, after which the old structure was demolished, and the other half of the work commenced. The total cost of the bridge, land, and property for the improvement of the approaches has been about 45,000l.

A BRITISH BURIAL PLACE.

UNDER the direction of three officers of the British Archaeological Association, a series of very interesting researches in what has proved to be an ancient British burial-place, between Felkham and Sunbury, have lately taken place; the expense attending the excavations being very liberally borne by Mr. Thomas Ashby, of Staines, to whose exertions in thus bringing to light evidences of the existence of a very primitive people, in close proximity to our great metropolis, all honour is due. On the two occasions of a careful examination of the field in which the discovery was first made by Mr. Lennard, a farmer, of Sunbury, no less than some fifteen urns, of unburnt clay, of different sizes and shapes, have been brought to light, and eight of these ancient vessels, containing burnt bones, small fragments of charcoal, and a few flint arrow-heads, successfully taken from the earth, where they have possibly lain between 2,000 and 3,000 years!

These urns will be exhibited at the opening meeting of the British Archaeological Association, on the 22nd inst., when a paper will be read on the subject of this interesting find by Mr. Edward Roberts, F.S.A., with notes and explanatory remarks by Messrs. George Wright and W. H. Black, who assisted at the examination, under the guidance of Mr. Roberts, of the above referred to Early British cemetery.

THE LEICESTER MUNICIPAL BUILDINGS COMPETITION.

THE report of the Municipal Buildings Committee was read at a recent meeting of the Town Council. After reviewing the course of proceedings in connexion with the question of erecting new municipal buildings up to the decision of the Council to erect such buildings on the Friar-lane site, at a cost not exceeding 25,000l., it analysed in detail the selected plans which had been submitted to the Council. Since Mr. Street's objection that no one of the three plans selected should be carried out as drawn, the committee, to whom the subject had been referred back, requested each architect to reconsider his design. An interview was afterwards had with the architects, and their attention directed to the requirements of the committee as to the cost, convenience of arrangement, quiet, light, and ventilation. Mr. Goddard and Mr. Innocent at once adopted the suggestions of the committee, and consented to amend their plans, so as to make them capable of adaptation to a handsome building at a cost not exceeding 25,000l. Mr. Barnard, however, the winner of the first premium, declined to amend his plan, if the other architects were at liberty to do so. As the winner of the first premium he claimed the right to erect the building. That claim was not entertained, it being contrary to the architects' instructions. The committee have since examined the three original plans, and the two amended designs of Mr. Goddard and Mr. Innocent; and it is their deliberate judgment that they are much superior to any previously exhibited. Mr. Street's observations as to the difficulties of the site are obviated. After stating the advantages of each plan, the committee do not make any special recommendation, but leave it to the council to select one or other of the amended designs.

The report having been received, Alderman Burgess said it now remained to bring the report

to a practical issue. He begged to propose that the amended design sent in by Messrs. Goddard & Spiers be adopted, subject to conditions stated in a letter from Messrs. Innocent & Brown, of Sheffield.

Dr. Pearce said he thought the committee had exceeded the instructions given them by the council, and in asking the architects who obtained the second and third premiums to remodel their designs and enter again into competition, had ignored the decision of the council awarding Mr. Barnard the prize for the best design. He was pleased that Mr. Barnard had so much manliness as to decline the invitation to compete. He thought the course was irregular, and one which could not be sanctioned, and he should move a resolution which would certainly be a censure on the committee for taking this course. He begged to move—

"That the council having awarded the first prize to 'Spiers & Partners' for the best design for the proposed municipal buildings, are of opinion that the course adopted by the committee, in asking the architects who obtained the second and third prizes, as well as Mr. Barnard, to remodel their plans, and thus re-open the competition, without first submitting the matter to the council, was both unusual and irregular, and that it is incumbent upon this council to refer the whole question back to a committee of the entire council."

After some further observations from several of the council, the amendment was carried, 31 voting for it, and 21 for the resolution. A very proper step.

DRY ROT.

THIS has attacked the floor of a new church at the western end. On taking up a board, it is found that fungus prevails eastward to a considerable extent under the boards, where there is as yet little or no symptom of decay. Information is sought—(1.) Whether, if proper ventilation under the floor be obtained, this fungus will perish and the decay be arrested; or (2.) whether the floor must be taken up and the fungus removed; and (3.) in the latter case, whether any, and what, chemical preparation should be used to destroy the fungus; also (4.) whether every portion of board or joist showing any trace of dry rot, however slight, must be taken away?

RICHOE.

TENDERS FOR SHUTTERS.

SIR.—Our attention has been called to the tenders on part alterations at Messrs. Dawson's, City-road, by our name being placed conspicuously over the tenders for revolving-shutters, and the great difference in the amounts. The first, Mr. Grover, never had an estimate from us, or applied; the others, Messrs. Brown & Son, and Mr. Paak, had duplicate tenders, and nothing like the sums quoted. We feel it a serious accusation to be thought guilty of altering our estimates to different contractors; and in the face of this special publicity may injure our commercial standing, we hope, in fairness, you will treat our denial with consideration.

STOKELL & STENCEL.

P.S.—We are threatened by Mr. Grover with another paragraph to the *Builder* on the subject next week.

PATENTS IN AMERICA.

WE have before us the report of the Commissioners of Patents for the United States for the year 1868, with an alphabetical list of persons whose patents for inventions and discoveries have expired during the year, and an alphabetical list of patentees, and another of the inventions for the year, with copies of the drawings accompanying each, and a remarkable whole is the result. Turning over the pages of inventions for the year, numbering as many as 12,545, we think any waverer as to the desirability of not reducing the fees for patents to a minimum, would scarcely need any further argument to decide him than what he would here find. Patents are, as Johnson in his "Patentee's Manual," informs us, granted for the States to an American citizen, or an alien resident for a year previously in the States, and making oath of his intention to become a citizen, for 30 dollars, and this, too, accompanied with wonderfully easy means for either adding to the original intention, or for getting rid of any portion of it that may be or become inconvenient, or be objected to (the fees, by the way, being to a British subject—prudent distinguishment of poor John Bull—500 dollars, and to any other person, 300), and, as a consequence, the major part of the claims are of the most frivolous, and, in some cases, of the most absurd kind. Fancy in this nineteenth century a patent "Burial-case—a means of deliverance from interment of resuscitated persons." Claim thus deliberately set forth. "1. The application of the tube C, and ladder H, to a burial-case or coffin, substantially as and for the purposes described and set forth. 2. In combination with the tube C, and ladder H, the cord K (placed in the person's hand) and the belt I (hung over the place of interment), for the purposes substantially as set forth and de-

scribed." But after all, the fees for patents are a means of increasing a revenue that must be raised, and we see no reason why the successful inventor should not be called on to contribute to it, and largely too, as by his patent a monopoly is given to him in a special matter, which he may prevent any person dispossessing him of; but to this end our tendencies are to make, after, say the first three years, all fees payable for the keeping up of patent rights *ad valorem*; not as now, loading the minnows in the same way as the tritons, as we fail in seeing the justice of making John Jones, because he desires to maintain a patent that produces him annually, by his own handiwork, 100*l.*, contribute in precisely the same amount as Mr. Bessemer with his iron processes; Mr. Bovill, with his famous millstone patent; and various others that could be named, realising, for the most part by royalties, from 80,000*l.* to 350,000*l.* a year. The American Government spend large sums in making widely known the numerous patents annually granted.

Books Received.

THE current *Quarterly* includes an elaborate article, ascribed to Dr. Carpenter, on "Spiritualism and its recent Converts," which will further confirm those who are already satisfied as to the deceit in the current practices, but will probably not convert a single believer. The error that has been made by scientific men as to this matter is in attributing all the phenomena described to deceit and illusion. The writer of this notice, after long inquiry, is disposed to believe that certain movements may be produced in a table by the contact with it of the hands of persons of particular temperament, without any interference of spirits; and, moreover, that the theory of "unconscious muscular action" does not suffice to explain these movements to those who have quietly watched them. On this small substratum of what we believe to be fact a vast superstructure of deceit and illusion has been raised, and this would be best destroyed, as it seems to us, by a scientific elucidation of the cause of these movements. Articles in the same Review on "Beer, Brewing, and Public Houses," and "Industrial Monopolies," should interest many of our readers.—In a pamphlet on "The Ecclesiastical and Social Evils of Scotland, and how to Remedy them" (Johnstone & Co., Edinburgh), Dr. James Begg says something on the subject of over-crowded cities and cognate subjects. The subjoined extract is part of the minor accompaniment to the major proposition of the pamphlet, which seeks to re-unite all Presbyterian churches in Scotland upon the ancient form of endowment as shadowed forth by Knox, Henderson, and others at the Reformation:—

"The state of matters, doubtless, in town and country is, to a large extent, scandalous. Were general interest awakened, much could be accomplished, and now that tramways are being introduced into cities, so as to stretch into the suburbs, and make locomotion cheap and easy, we do not see why the crowded districts might not be thinned—a first step in sanitary progress—and a great number of the population transferred from the dense centres of our urban districts to the purer air of the country. Thus both health and comfort might be greatly promoted. If, at the same time, the utmost facility that is consistent with secure tenure were given for the transference in small quantities of heritable property, we have no doubt that an increasing number of the people would become owners of their own houses around all our cities, and this would go far to diminish disease, drinking, pauperism, and crime, and consequent expense, and, indeed, to underprop the whole social fabric. It would furnish, at the same time, a moral security of the utmost value to the State and even to the larger proprietors. We do not see why in the rural villages similar facilities for acquiring heritable property might not be afforded. This would secure a direct and thriving population, and greatly benefit all classes of the community. In regard to the ploughmen and other farm labourers, why should some immediate and efficient plan not be adopted for superintending both the bondager and farm-kitchen systems, feeding markets, and other social abuses? An admirable plan would be, and we believe a most economical one, in the long run, although the mention of it may startle some at present, to appoint public inspectors to go through the country, and see that proper cottages, with at least two or three apartments, are everywhere supplied to the ploughmen at the rate of at least one or two cottages for every plough required on the land. This would strike at once at the root of much mischief. If every ploughman, moreover, had half an acre of garden-ground to cultivate in his spare hours, this would do more to inspire them with true patriotism, to make them and their families comfortable, to put an end to roving and unstable habits, and, by giving them a stake in the country, to produce self-respect, and to keep them out of the public-house, than any other similar plan which could be adopted."

We hope, however, that the sanitary question need not depend for its solution on the settlement of the ecclesiastical one.—In the *Leisure Hour* the Editor, continuing his "First Im-

pressions of America," treats of emigration, and, inquiring "Who ought not to emigrate to the United States?" says,—

"All classes of professional men, those who work chiefly with the head rather than with the hands, will find few openings. Commercial men and speculators of all sorts, with little or no capital, are not wanted. Capitalists can make their profitable American investments at home. Mercantile clerks are in no request. An advertisement in any American newspaper will bring as great a crowd of applicants as one in the *Times*, or any English paper. Even of the operative classes, none but the industrious, frugal, and temperate can expect to prosper in America. The advertisements in the papers call for like men everywhere. The chief engineer of one of the large steamers told me that he seldom made a return voyage without some disappointed emigrants working their passage home as stokers and cindersmen. I saw some of these poor fellows, and their experience is that of many. The only occupation that could be obtained by them was in agricultural work, for which health and strength are essential. There are very few of the clerical or shop assistants in England who could stand the fatigue and climate of backwoods life in the West, or of common agricultural life in any part of the Union, any more than they would be fit for it at home. Nor is there any opening for female emigrants, except for domestic service."

In the same part Mr. John Timbs carries on his interesting "Autobiography," eminent Lord Mayors being his theme.

Miscellaneous.

Opening of Bradford New Mechanics' Institute.—The new building, in the Italian style, for the Bradford Mechanics' Institute, which has for nearly two years been in process of erection on a site between San Bridge and New Market-street, has been formally inaugurated. This new building was fully described in our columns of 23rd September last. The contractors who have carried out the works are:—For masons' and joiners' work, Mr. A. Neill; plumber, Mr. C. Nelson; plasterers, Messrs. C. Howroyd & Son; slater, Mr. T. Nelson; painter, Mr. H. Briggs; fire-proofing, Messrs. Phillips & Co.; ironfounders, Messrs. J. Cliffe & Co.; shutter manufacturer, Mr. J. Stones, Ulverston; heating apparatus, Messrs. Haden & Son, Manchester; carving, Messrs. Stake & Ashton; gas-fittings, Architectural Metal Company, Coventry; cement flooring, Mr. Wilkinson, Newcastle; ornamental ironwork, Messrs. Macfarlane, Glasgow. The Scagliola columns in the reading-room are in imitation of verd antique, by D. Dolan, Manchester, who obtained the only prize given at the Exhibition of 1851. The Carton-pierre decorations to the gallery front were by Bookbinder, of London. Messrs. Andrews and Pepper were the architects. The clerk of works was Mr. H. Stewart. The land has cost 12,500*l.*, and the building a further sum of 20,000*l.*

Death of a Warrington Artist.—Died, in Warrington, at the age of seventy-three, Mr. Thomas Robson. He was born at Warrington, and at a very early period of his life he proceeded to London, and was soon afterwards admitted a student of the Royal Academy, under Fuseli, who was at that time Professor of Painting. Mr. Robson had a share in executing one of the earliest efforts of painting in fresco in England. He was retained by Sir Thomas Lawrence, and assisted in the preparation of the backgrounds of his pictures, from which he derived both emolument and experience. At this time he produced admirable copies of "Titian's Daughter," of several of the pictures of Rembrandt, and of the "Strawberry Girl" of Sir Joshua Reynolds, which last, as the copy was made before the original faded, is now of great value. Mr. Robson also painted original subjects as well as copies, but his ideas of art were so high, that his execution never came up to his own conceptions, and many of his pictures therefore remain unfinished.

Brewers' Company's Estate.—On this estate, comprising an area between St. John's-street-road and the Goswell-road, extending from Ratstone-street to the apex opposite the Angel, some improvements are being carried on. The leases having fallen in, a miniature block of three model lodging-houses is being built by Messrs. W. Cubitt & Co., in a superior manner, with wrought-iron girders, brick arches forming solid vaultings, stone landings, stairs, and passages. The basement floor is formed with arches, and quite open as a drying-ground. These are built from the designs of Mr. E. H. Martineau. The Lady Owen's Almshouses and Schools are on this estate, and were rebuilt some years since by Messrs. W. Cubitt & Co. On another portion of the estate, Brewer-street North, the new Finsbury Dispensary has been built.

The late Mr. James Easton.—We regret to announce the death of Mr. James Easton, the founder and, for nearly 40 years, the senior partner of the well-known firm of engineers which still bears his name. He was born in 1796 at Bradford, near Taunton. He came up to London in 1822 to introduce the hydraulic ram, the patent of which he had purchased from the celebrated Montgolfier. In 1825 he was engaged, in conjunction with the late Mr. N. G. Kennie, in a survey of the then projected London and Northern Railway, to which George Stephenson was to have been consulting engineer. Mr. Easton then turned his attention to mechanical engineering, and in 1827 established himself at The Grove, Southwark, where the business is still carried on by the present well-known firm. Among a vast number of works he carried out during his long career may be briefly mentioned the perfecting and extensive introduction of the hydraulic ram, the supplying with water of above thirty towns, the Government waterworks at Trafalgar-square, which supply the palaces and public offices, as well as the Houses of Parliament; the improvement of the navigation of the Dartford and Crayford Creeks, and the drainage of the whole of the marshes from London to Dartford, on the right bank of the Thames.

Crypt at Bruton.—A discovery has been made in the parish church of Bruton during the progress of some alterations. The floor of the nave has been lowered, and in doing this the workmen opened out the entrance to a large vault, which was used during the last century as a burial-place for the Berkeley family. The vault itself is of ancient date, and local archaeologists are of opinion that it was the crypt of an ancient church which stood on nearly the same site as the present fabric, and that it is coeval with the tower on the north side of the building. The roof of the chamber is groined, and is supported on four freestone pillars.

A New Park at Peckham.—The Camberwell vestry have taken the initiative proceedings as to a new park near Peckham Rye. At their meeting last week a proposal was made that steps should be taken for the formation of a park in the vicinity of Peckham Rye, it being contended in favour of the project that the size of the Rye was now insufficient for the recreation of the population. Some members opposed the motion on the ground of expense, and that the Rye was large enough; but the proposal was carried, and a special committee was appointed to look out for a site.

The Dudley Gallery, Egyptian Hall.—The exhibition of Cabinet Pictures in Oil now open here should especially be visited by all who are interested in experiments, whether on colour or the patience of the public; they will be amused where they are not delighted, and they will find here and there delight too. Mr. Watts, Mr. Briton Riviere, Mr. A. Donaldson, Mr. S. Solomon, Mr. Leslie, and a few others deserve full praise; but the collection, as a whole, speaks of weakness and affectation.

A New Gasometer for Leicester.—The great increase in the trade and population of Leicester having necessitated a corresponding enlargement of the gas company's works, the foundation-stone of a new gasholder tank has just been laid. The two first gasholders had a capacity of 25,000 cubic feet. The present ones have 1,205,000 cubic feet; the one now commenced will hold 1,000,000 cubic feet. The contractors for the tank are Messrs. John Aird & Son, of Lambeth, and for the holder, Messrs. Piggett & Co., of Birmingham.

Right of Way in Crossings.—A question at the Hammersmith Police-court, whether pedestrians or the drivers of vehicles had the better right to the use of the public crossings, has been decided by the magistrate, who said he believed there had been a decision in one of the superior courts, by which it was held "that crossings were peculiarly the property of foot-passengers."

South Kensington School of Art.—Dr. G. G. Zerriff will commence, on Tuesday next, the 7th of November, a course of forty lectures "On the Historical Development of Ornamental Art, with special reference to Architecture, Sculpture, and Painting."

Holborn Viaduct.—The railway company has purchased from the corporation a large site of land fronting the Holborn Viaduct. The *City Press* says, in a few months a railway station will be built, on the level with the viaduct, as large as the Charing-cross station.

Timber-yards.—At the meeting of the Commissioners of Sewers on Wednesday last, Mr. Hora drew attention to the danger occasioned in case of fire by the storage of large quantities of timber in crowded neighbourhoods. It was stated that the authorities had no power to interfere in the matter, but Mr. Hora hoped that an Act of Parliament would be passed which would enable action to be taken in protection of the public interest.

Value of Land in Ireland.—It is said that the tenants on the Marquis of Waterford's property, in the county of Londonderry, are rapidly buying up their farms. The prices range from thirty to thirty-eight years' purchase on the rental. "In some cases," says the *Northern Whig*, "thirty-four years' has been refused. No outside purchaser has as yet been able to approach these prices."

Vienna Exhibition Building.—Mr. Scott Russell is said to have designed this building. It will be 250 ft. high. Its diameter will be 350 ft., and its total weight 2,000 tons. It will be supported by 36 iron columns, 80 ft. high.

Society of Biblical Archaeology.—This society will meet on Tuesday, 7th of November, when a paper, "On the Religious Belief of the Assyrians," by Mr. Fox Talbot, F.R.S., will be read.

Cornhill.—The City Commissioners of Sewers have accepted the tender of the Limmer Asphalt Company for paving Cornhill.

Kimberley v. Dick.—The Master of the Rolls will deliver judgment in this case on the Friday morning.

Royal Institute of British Architects.—The first meeting of the new session, will be held on Monday next, the 6th inst.

TENDERS

For post-office, coal office, and shop-premises, at Highbury, for the North London Railway Company. Mr. E. H. Horne, architect:—

Baton & Chapman	22,424 0 0
Bracher & Son	2,425 0 0
Foster	2,382 0 0
Servier & White	2,350 0 0
Hill, Keddell, & Waldram	2,317 0 0
Sewel & Son	2,307 0 0
Wicks, Bangs, & Co.,	2,238 0 0
* Accepted, cost reduced to £2,000.	

For works to do, 48, St. James's-street, W., for Mr. J. R. Marshall. Mr. Peebles, architect. Quantities not supplied:—

Hoare & Postlewaite	2919 0 0
Smith	894 0 0
McCormick	840 0 0
Jaylor	785 0 0
Benstead & Son	737 0 0

For additions, for Mr. G. E. B. Smith, for Mr. J. R. Marshall. Mr. Peebles, architect. Quantities not supplied:—

Kidd	4741 5 0
Taverner	631 15 0
Bird	547 0 0
Taylor	494 0 0
Benstead & Son	462 0 0

For detached house, Lower Foxley Park estate, Caterham Junction. Mr. Richard Martin, architect:—

Baker	8229 0 0
Ward	798 0 0

For villa-residence, for Mr. W. Routledge, Eastbourne. Mr. E. A. Bressley, architect:—

Harding	23,500 0 0
Crabb	3,387 0 0
Dalby	3,280 0 0
Stephenson	3,200 0 0
Forster	3,180 0 0
Harrison & Son	3,100 0 0
Carter	3,085 0 0
Tomkinson	3,071 0 0
Hewell	2,987 0 0
Blackman	2,871 0 0
Hill	2,849 0 0
Valley	2,759 0 0
Cable	2,750 0 0
Peaseless	2,685 0 0
Skinner	2,633 13 1

For St. Peter's School, Folkestone. Mr. S. S. Stallwood, architect:—

Dunk (accepted)	21,023 0 0
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TO CORRESPONDENTS.

G. R. J. O. Telegram.—Mr. R. O. F. G. B. W. W. A. C. L. K. R. Y. A. B. C. T. C. R. O. R. B. R. W. A. C. L. K. R. Y. A. B. C. R. B. Mr. R. B. & S. J. S. G. H. R. J. R. W. A. C. L. K. R. Y. A. B. C. L. K. R. Y. A. B. C. H. M. A. F. C. J. S. H. (we are forced to decline recommending. Various communications on the subject in the Builder may be referred to.)

N. (an answer was given last week)—M. T. (in type)—T. B. (in type).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.]

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Great Fire in Thames-street.—Letter from Messrs. James Nicholson & Co., respecting their CHURCH'S SAFE:—"207, Upper Thames-street, London, 30th October, 1871. Gentlemen.—In reply to your inquiry we have great pleasure in informing you that the Iron Safe which so faithfully preserved our books during the late fire at our premises, is the same one that defied burglars in the year 1855. We think no more conclusive testimony of its quality could be required. Giving you full liberty to publish this statement, we are, Gentlemen, yours most obediently, JAS. NICHOLSON & CO.—Messrs. Chubb & Son, 57, St. Paul's-churchyard, London."—[ADVT.]

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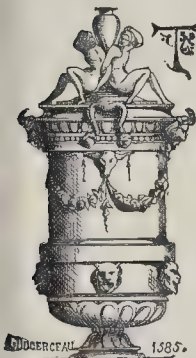
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WANTED, a good active MAN, as CARPENTER and JOINER, bearing a good character, who will have to act as FOREMAN in absence of master.—At Green, J. at Luff's 13, 17, Slough.

The Builder.

VOL. XXIX.—No. 1501.

The Study of Greek Architecture.

THE essential principle of trabeative architecture, is, as we have seen, stability secured in virtue of direct down-pressure; and it has also been said that this is a principle which is largely relied on of necessity, even in structures where arcuation might be thought entitled to reign not only supreme but exclusively.

As the Gothic

architects pressed their favourite principle of construction more and more uncompromisingly, their works became at last, to all appearance, essentially organic systems of arches, superior and subordinate, including and included, and admitted no vertical member that was not in direct relation to a rib or a groin, no flat surface of any extent that was not ostentatiously declared irresponsible for support, by being either perforated or transparent. But even so, the expression of repose that is indispensable for sublimity and beauty, was only obtainable, like the material fact of ultimate stability, by making manifest the predominance of downward over oblique pressure, and display of the subjection of all tendency of thrust to rigorous service,—service with zealous alacrity no less than energy it may be, but service still. This regulative predominance of direct pressure at last only failed to be complete,—the most satisfactory expression of repose to be achieved, because science had not guided to its last condition, and the refinement was never reached of allowing, in construction, for the apparent deflection of vertical lines, by disturbing contrast with the ever present curves. The law of trabeative architecture is patent and avowed throughout every Gothic work in vertical pier, and shaft, and buttress, and their horizontal courses; for our present purpose it is needless to insist further on its abundant latent applications in decorative but not unimportant details and positions, where a seeming arch is in truth only a pierced and moulded lintel; it were the very pedantry of system to denounce such fitting concession to the motive that on the occasion is justly paramount, as a licentious incongruity. Let this, too, be a secret that everybody knows, and that carries gracefulness by being not too consciously concealed.

Therefore it is that when either the origin or the principles of the art of which trabeation is so universal an element are in question, we revert inevitably to those Greek, and especially to those Athenian examples where it appears in its purest,—that is, in its most absolutely unmingled form, of the highest refinement in study and design, and most elaborate workmanship,—we revert above all to the Parthenon. This building has the double—the cumulative claim to our attention,—that in its perfection it was the highest achievement of Greek architecture;

and now, ruined as it is, it is that of which we have the most complete and satisfactory series of measurements. It were not easy to say what sacrifice of cherished possessions of antiquity,—recovered inscriptions or monuments mighty or minute, alike so constantly rather curious than of any serious importance, the world would not be justified in making, if it could purchase back at such a price, from one of those charred and crumpled rolls of Heroulanum, half the authentic information and promise of instruction that has been secured for us at first hand by the timely survey of Mr. Penrose.

The building is a construction of blocks of Pentellic marble most accurately joined and fitted; cement is entirely dispensed with, and all contiguous surfaces, the vertical as well as horizontal, are in the closest contact, having been ground together to the smoothness of polish. In some cases the eye, not to say the fine edge of a knife, fails to discover the joint; and to centuries of such contact under pressure it seems due that actual cohesion has taken place between stones of the stylobate, as tested by Stuart somewhat barbarously, and in some cases, at least, between drums of a column, which has been displaced as though it were a monolith, by a force that might have been expected to cause shifting of its parts. But it is the closeness of the vertical joints of the architrave stones that most excites the admiration of those who are best able to appreciate the difficulty of the feat.

Dowels and inserted cramps run with lead are freely employed wherever they can be concealed, and gave increased assurance against the worst consequences of abnormal violence that might be well apprehended in a region not unknown to earthquakes. Otherwise the stability of the structure is visibly announced as exclusively dependent on the strength and well-proportioned mass of its materials, their accurately worked and alternating joints and consecutive covering and downpress. The utmost force of expression is obtained by strictness at once and simplicity of the constructive rule. The superposed masses of the columns and the alternating courses of both stylobate and entablature speak for themselves; and the inclined roof slopes at so open an angle as to suggest no requirement for stay or counterpoise. A rise that very little exceeds 1 in 4 is far too slight to generate that irritant, though unrecognised, uneasiness that will affect us at a steeper pitch, and is due at last to a suggestion of tendency of tiles to slide, to drop, or to drag and dislocate their attachments. The roof lies a dead weight upon its vertical supports, as absolutely as the shaft of the column presses only downwards and directly on its base.

The joints of the stylobate and architrave, fine as they are, are not, nor were they intended to be, quite imperceptible; and have value,—those of the latter especially,—in their indication of the imposing masses employed by the builder, and the simple truth of his masonry. The blocks that form steps and stylobate break joint degree above degree; and the columns, set accurately over joints of the top step, lock all below. The columns themselves have only horizontal joints, and are formed of drums, of which the heights are variable, but variable within limits, and in successions that certainly were not decided at random. It is sufficient to refer to the columns of the Madeleine and of the Bourse at Paris, in illustration of the ill effects of study neglected at this point, or study that goes wrong. There still remains an opportunity for a student to render good service at Athens, if there are those who still care to go thither as

* The temptation is too great not to pass this word without inserting a gem of lexicography. It was indicated by a friend, and deserves a conspicuous setting. Richardson's Dictionary, in s. "Pent,"—Penthouse,—Pentlike." "The pillars of this temple are cut out of a quarry of marble, called *pentlike* marble, and they were squared, *papirine*, as thick as long: these I saw at Athens."—North's, "Pindarch," p. 88.

students in the track of not unworthy predecessors, by taking accurate measurements of the heights of all the drums of adjacent undisturbed columns. A more exact determination of a principle might be thus arrived at. From the materials before us in the example of a single column we may observe an avoidance of principle of any rule of sequence that can be readily detected by the eye; pairs of drums of equal height are eschewed,—indeed it is much if any two of equal height are to be found in the same column; but the irregularity is tempered in several ways,—no drum is double the height of any other; none exceed in dimension a lower semi-diameter, or fall below an upper semi-diameter of the column; larger and smaller drums, but still varying in degrees of difference, follow on in pairs; and in the example given we seem to find that out of the eleven drums of the total, as many as four pairs—three of them consecutive—have an identical joint height.

The divisions of the architrave fall above the columns, and are themselves covered accurately by superimposed triglyphs. This is "harmony" of masonry in the original technical sense of the Greeks; and when it is neglected, the most promising design in the manner of the Greeks incurs the disgrace of dishonesty and discord. The offence is slightest, because at least not shameless when a central block is dressed into a voussour with horizontal soffit, and leans either way by oblique but undisguised joints, on others that ride saddlewise on the columns; though better than this it were to sacrifice the horizontal line, and turn an honest arch at once. But when an architrave stone is shown suspended by unexplained construction over a void, with vertical joints that bely the most familiar of all natural laws, we have the offence of a misplacement architectural that may, indeed, be no worse nor more confusing than misplaced aspirates in a serious argument, but that is, at least, as damaging a solecism to whatever happiness in art can only co-exist with culture and refinement.

The treatment and details of the Doric entablature have no necessary dependence on the colonnade, which we have recognised as a secondary amplification of the idea of a Greek temple. If we revert to the simple naos of masonry, not too wide for the span of a timber beam, simple or compound, we find the first requirement of the walls to prepare them for receiving a roof, is that they should be surmounted by a course of blocks of their full breadth, and so long as to bond those below and distribute equally the coming superincumbent pressure. This is the function of the structural wall-plate,—the motive of the architrave which, as in the Temple of Artemis Propylea, crowns the walls all round, and is emphasised by a slight projection. Whether the wall-plate be regarded as of timber or of stone makes no difference to the argument at this stage; at the next, we come unequivocally upon timber beams laid transversely, across the naos, edgewise, for the sake of combining stiffness and lightness, and exposing ends upon the side-walls, less wide than high.

Pausing here, we have to remark a critical difference in the developed aspect of the structure, on front and flank. On flank, the course above the architrave consists of narrow ends of beams, with void intervals between them. On the front and back, the last beams that show ends at flank lie along over the architrave, and present a continuous surface. The flank now exhibits the motive of the Doric frieze, with alternate triglyph and metope; and on the front we see the motive of the Ionic of Attica. A suggestion of motive may incur the irregularity that belongs to the accidental but artistic development works, above all things, symmetrically; and the architectural requirement

of disciplined repetition and uniformity is sufficient to account for the ensuing separation. The Doric style adopted and elaborated the interrupted frieze of the flank, and carried it systematically round the front and end. Another style, the Ionic of Greece proper,—for of the Asiatic variety more is to be said,—exhibits as exclusive a preference for the frieze as continuous.

True it is that no example is preserved in which the triglyphs of a Doric order are or were the actual ends of beams spanning naos or peristyle; so neither can we produce an instance in which the metopes were left open; but we have the best assurance from literature (Euripides, *Iph. T.* 113) that such was at times at least the case. The derivation of these details from carpentry may stand well enough on its own merits, and is confirmed beyond the need by other examples yet to come. As the buildings are constructed, and in the case of a peristyle, marble beams much smaller than the triglyphs represent take a sufficient bearing above the frieze at the back; the incongruous intimation of the external frieze is here out of sight, to say nothing of its original significance having become but shadowy, and the enhanced height of the entablature at the back, is readily accepted as expressive of shelter by a curtain screening the driving rain or slant sunbeam.

In the remarkable bed-mouldings of the Doric cornice, traditional descent from pure carpentry becomes on a little careful consideration very manifest, and may furnish what has long been wanting,—their true elucidation. As we follow the sequence of simple trabeation from below upwards, we find that the vertical joints of the triglyph and metope should be broken by the strong projecting cornice that in its turn would have its joints, wheresoever they occurred, over their central line. But for the cornice itself, as the final cornice, no reciprocal cover from above or bond of incumbent weight remains. Another security has therefore to be resorted to for stability and weight by combining the parts of the cornice among themselves, and this it appears to me certain was originally effected by framing and mortising below. The broad inclined tablets, therefore, set with studs or guttæ, on the under side of the cornice, I regard without hesitation as representatives of flat plates or tongues sunk into grooves on either side of a joint of an original cornice of timber, and left projecting to cover the under side of the joint above the centre of a triglyph. The guttæ, always arranged on either side of the central line, represent ends of the studs or wooden pins that fastened the free portion of the plate to the cornice segments, and thus secured the plate, and contributed, with the hold of the mortise, to give solidity to the frame.

The mutules are currently explained as representing the rafters of the primitive wooden entablature, but such representation is a condescension. In no instance have they proportions that answer to a section of any reasonable rafter,—and in no case has their slope any correspondence, or the semblance of it, to the slope of a roof above. The solidity of the Doric cornice in itself precludes any responsibility on the part of members of the proportions of the mutules, for bearing weight. The architect who transferred the motive from timber to marble construction, regulated and multiplied the recurrent detail with no regard to the number or seats of his actual cornice joints, and set them usually, though not universally, over void metopes as well as triglyphs, concerned alone for their symmetry with the divisions of the frieze, and the bold accentuation they supplied for his unbroken horizontal line above.

In the temple of Bassæ, of which the records, as published by Professor Cockerell, are only second in value to those of the Parthenon, the joints of the cornice stones are covered by a course above them, on which the rafters take their bearing; and these stones have at the same time the function of the old wooden mortise. In the earlier temple at Egina, the foot of the rafter stops against a stone which is let into the cornice stone from above, and seems to represent a vertical tenon or stud.

Vitruvius (iv. 3) derives the details of the triglyph from tablets that he assumes to have been nailed as protections for the exposed ends of the beams. We may with more plausibility interpret these sinkings and chamferings as the provident treatment of the end of the beam itself. The transverse section of a timber beam exposes a face of concentric circles, or segments of circles, of alternate harder

and more open grain. The spongy intervals are liable to more speedy decay,—moisture would lodge in the curved hollows, and be absorbed into the tubes of the wood. Vertical groovings broke the continuity of the retaining ledges, and favoured descent of the wet; while the increased superficies obtained would promote rapid and complete evaporation. The particular form of the grooves is easily derivable from simple duplication of the chamfer of the external angles.

The fillet of the architrave probably began, or at least ended,—it does not much matter which,—as representative of a bead protecting the junction of architrave and frieze; with respect to the guttæ tablets, it is open to be argued again, that they in the same way represent small tablets covering the foot of the triglyphs, where these were supposed to be notched into the architrave.

But the view I prefer is, that here too we have trace of an application of the wooden tenon, or key to the architrave joint below a triglyph, on the same principle as was applied to the cornice joints above them. The stone architecture thus, that carefully covered up its own obligations to the metallic cramps, that were inserted most liberally between all contiguous blocks where concealment was possible, retained unconsciously a testimony to the franker contrivances of primitive wood construction.

It is only at a decidedly late epoch, when every opportunity for ornament was too eagerly snatched at, that an equivalent of the mutule was added to the already overcharged cornice of the Corinthian order,—itself an elaborately ornamented form of the Ionic. But the peculiarities of Ionic in its earliest and simplest form are traceable even still more plainly than the Doric to elementary arrangements of carpentry; this, however, as a subject that is susceptible of much more exact elucidation than it has hitherto received, must be reserved for separate treatment.

It is remarkable that the historical analysis of the Doric order should lead us on the one hand so unequivocally to timber construction, and on the other certainly no less so, to the architectural precedents of a country like Egypt, in which timber has no part at all. We are not called upon to lay overmuch stress on the so-called Proto-Doric columns of Beni-Hassan; there is scarcely more correspondence here than is constantly due to independent application of similar means to similar ends, but the agreement in respect of more arbitrary details of treatment of the Greek and Egyptian capital is much more significant. The agreement, again, of the primeval Doric cornice, as it is represented on archaic painted vases, with the Egyptian cornice,—its accuracy of representation certified, moreover, by the architectural façades of such tombs as that of Nerebia, must be accepted as conclusive for the international reaction. On the vase of Ergotimus, in the Museum of Florence, we see a small Doric naos of Thetis, of which the entablature is crowned less by an imitated than by a transferred Egyptian cornice, and abundant repetitions might be cited. But whatever the Greek borrowed, whether from an alien nation or a contrasted style, he completely conquered, assimilated, and remodelled with fresh and forcible variety. No innovation for an end that enhanced beauty or compassed propriety was too abrupt to startle him,—and, indeed he seems to have recognised that only by abrupt reversal of long-sanctioned custom, was an art sometimes to be roused from torpor and restored to progress. It was in this spirit that some innovating genius in vase-painting made the grand interchange between the colours of the figures and the ground, and painted black ground to red figures, instead of black figures upon the original red ground. As daringly and successfully did some great unnamed designer, who recognised the beauty of the sweeping upright curve of the cornice of rainless Egypt, but its want of congruity with a northern climate, reverse its position, and transform it at a stroke by horizontal projection into the appropriate and characteristic sheltering member of the Greek entablature for all time.

The original determination of the qualitative elements of the Doric order and style cannot have been later than the sixth century B.C., and may not even have been so late as the commencement of the seventh: we see them defined with perfect distinctness, and very considerable beauty, in the most archaic Sicilian structures, but their ultimate refinement by quantitative—that is, by proportional—adjustments, was only

accomplished much later under the sky of Attica. Need there is not to derogate from the dignity of their origin by assumptions of a primitive "hint." A style of grandeur may easily have been developed long before timber was renounced as a material; the caken pillars that were preserved bound with iron, and sheltered with religious regard down to a late date, were remains of no unimportant structures. The very extent to which painting was demonstrably applied to marble structures, is best explained, not to say justified, by accepting it as in itself presumptive evidence of tradition from a wooden exemplar. In the Protodoric buildings of the vases, again, the columns are not only provided with plinths in accordance with Egyptian precedent, but have the slight proportions and wide intervals of spacing that are natural and suitable in a wooden structure; and in agreement with this the temple at Selinus that is proved to be the most ancient by the style of its metopes,—first discovered by Messrs. Angell and Harris,—has columns more highly proportioned and widely spaced than any of the others, that are not only of later but manifestly of much later date.

THE PRESIDENT'S BUDGET OF HOME AND FOREIGN NEWS.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

At the opening general meeting of the Institute, on Monday evening last, whereas, amongst other incidents, the portrait of Sir William Tite, M.P., painted by Mr. Knight, R.A., was presented, the president, Mr. T. H. Wyatt, delivered an address. Omitting a few introductory observations, we print it *verbatim*, as of great general interest:—

Since I had to address you at the opening meeting of last year, we have lost three Fellows,—Mr. Hardwick, R.A., Sir James Pennethorne, and Mr. Charlesworth, of Manchester; and two of our honorary and corresponding members, viz.—Monsieur Duban, of Paris, and Signor Ignazio Gardella, of Genoa, have passed away.

Of Mr. Hardwick I can but speak with much personal regard. He was my master: I spent four years with him as a pupil while he was engaged on the St. Katharine's Docks and the Goldsmiths' Hall; and if, at that time, the opportunities for studying the artistic part of his profession were hardly within reach of the architectural pupil (instead of being sown broadcast before him, as they are in the present day), I had at least the opportunity of seeing and studying most abundantly the practical part of my profession; and I never can feel sufficiently grateful for the habits of business and of punctuality which he inculcated, and for his constant teaching, as to the high position our profession should occupy, and the necessity for an honourable and unswerving line of conduct in all who followed it. The architectural publications of the day have so well described Mr. Hardwick's professional position, his works, and his appointments, that I need only bear my testimony to their accuracy, and repeat these words from one of those papers as faithfully describing his character:—"Personally, Mr. Hardwick, notwithstanding severe indisposition of a very painful kind, was active and energetic. He had a generous, quick nature; and there are many now recollecting good deeds and kind assistance rendered in a very unostentatious and hearty manner, of which the world suspects little. He was a man who personally merited the whole of that very general confidence which was placed in him by persons of all stations; and his cultivated intelligence, his high sense of honour, and his upright, straightforward conduct, have done not a little to reflect credit upon the profession to which he was proud to belong."

Gentlemen, this time last year, I could not resist the opportunity of paying my meed of praise to the way in which the late Sir James Pennethorne had carried out the "London University," in Burlington-street. I ventured to foreshadow the honour which was subsequently bestowed upon him by his sovereign; and I expressed an earnest and sincere hope, that he might long live to enjoy his repose and his laurels. That wish has not been realised! and this able, kind-hearted, and unassuming architect has passed away from us as tranquilly and peacefully as his life had been spent. I rejoice to think that this Institute had publicly borne its testimony to his merit and his high character, by presenting to him not only the Queen's gold medal, but a special medal "to

mark their sense of his ability, courtesy, and frankness, and of the skill and intelligence he habitually brought to bear upon complicated and difficult questions of a technical nature." It must be a source of pride and solace to his family to remember how he was honoured by his sovereign and by his profession, and esteemed by all who knew him. The architectural journals of September describe fully his career and his works. I think I may promise that a memoir of each of these distinguished architects will, ere long, be read at the Institute, and I venture to say, "*Requiescant in pace*."

Mr. Charlesworth, of Manchester, was born in 1832, and died comparatively young. He was a pupil of Mr. Isaac Holden, and when a youth but twenty years of age, he entered the office of Mr. Speakman, whose partner he became in 1862. In conjunction with that gentleman he executed the following works:—St. Catherine's Church and Schools, Collyhurst; St. Paul's Church, Southport; the Manchester Shipping Offices, the Clarendon Club, the Mansfield and Bow Chambers, &c. He had remarkable facility as a designer of Italian work specially; and many of the warehouses in Manchester, and mansions in the neighbourhood, attest his powers as an artist, and show a large amount of invention and refinement. As a Gothic architect, his work, though excellent, was perhaps not so original. The design submitted by Mr. Charlesworth, with his partner, Mr. Speakman, took the second prize in the competition for the Manchester Townhall.

Monsieur Duban, of Paris, one of our honorary and corresponding members, died at Bordeaux, in September, last year, when the cloud of misfortune and discomfiture was hanging so densely over his country. Her subsequent troubles have prevented, until lately, the removal of his body to Paris, and a complimentary funeral, which his architectural friends and *confidés* in this city were anxious to realize. That wish has been accomplished, apparently with every success, and I cannot do better than read to you a very interesting letter which Professor Donaldson has done me the honour, as your president, to address me; it so clearly describes this interesting though melancholy ceremony:—

"Nice, 14th September, 1871.

"Mr. President,—I regret that from various circumstances with which I need not trouble you, I have been prevented giving you the details of the ceremony which took place this day week in Paris, in connexion with the lamented death of our Honorary and Corresponding Member, M. Duban, at Bordeaux, last year, and the anniversary of which has been observed with great funeral pomp, and the transfer of his body to the 'Cimetière du Mont Parnasse,' near the Invalides. You are aware of the invitation sent by M. César Daly for members of the Institute to be present, and, in consequence, Mr. George Alexander and myself arranged to go over, and I observed there also Mr. Phénix Spiers. The service took place at the Church of St. Thomas Aquinas, the monastery of which has for a long time been occupied by the fine museum of artillery. I was appointed to be one of the pall-bearers, with Messrs. César Daly, Duc, Leon Vaudoyer, and Baltard (Honorary and Corresponding Members of our Institute), and other friends of the family. Mr. Alexander was, with great courtesy, seated in a prominent place amongst the general mourners. The mass was conducted with music, and then the *cordeils* left and proceeded to the cemetery, the body on a bier, and the pall-bearers on foot, and four carriages with various members of the family and mourners. Arrived at the tomb, a short conclusion of the service, similar to ours, was read by the priest, and the coffin deposited in the tomb, which, however, is merely provisional, as it is intended to erect a more important one. After the priests had retired, MM. César Daly, Baltard, and Vaudoyer, read very appropriate discourses, reviewing the talents, personal character, and works of the deceased, now and then diverging into observations upon the present state of our art in France, which they seemed to consider as not satisfactory; and deploring the introduction of a wild caprice of style, the absence of a sound leading principle of taste, and the prevalence of too luxurious, ill-regulated decoration. When these were completed, I claimed permission to say a few words, conveying expressions of sympathy on the part of the Royal Institute of British Architects, and the desire of our members to show how sincerely

they took part in the loss, which the French School of Art in France has sustained, as well as all Europe; and I ventured to express the conviction that amongst the distinguished pupils of our late friend, and the eminent architects who survived him, there were men who would well sustain the prestige of their school of our art amongst the nations of Europe. My few expressions seemed to impress with lively satisfaction those who were present; and many pressed round me to shake hands and thank me for the interest taken by English architects in the loss of their eminent colleague.

Two days afterwards, M. César Daly and four other gentlemen, members of the committee who directed the funeral ceremony, called on us at our hotel, formally to express their satisfaction at the kindness of the English architects. M. Daly also read to us the very well conceived letter which he had just received from you, and said that they had all been highly gratified by that mark of kind consideration from the President of the Royal Institute of British Architects. All the proceedings, discourses, and letters are being collected into a separate memoir; thirty copies of which will be sent for distribution amongst the members of Council, &c.

Having to pass through Marseilles, I have, of course, called upon our venerable friend M. Coste (one of our hon. and corresponding members). He is now more than eighty-four, with his usual vivacity of spirit, love of art, and desire to maintain all his old friendships. He took a ride with me round Marseilles, and particularly made me visit the grand Musée of Fine Arts and Natural History, by M. Espérand-Dieu, a pupil of M. Vaudoyer, who has also built the striking church of 'Notre Dame de la Garde.'

The Musée is backed against a rocky hill, which has been out away to receive it. It consists of two wings, the one for the fine arts, the other for the 'natural history.' They are connected (being perhaps 150 ft. apart) by a receding circular colonnade on the first floor, having a central pavilion with a statue of Marseilles, and a large basin in front, the overflowing waters of which fall down on rocks or steps (like those of St. Cloud) to the very base, where there is a garden, with beds of flowers and trees. I think this is one of the most artistic compositions that I know in Europe. M. Coste has promised to ask M. Espérand-Dieu to send us photographs of his works; for I am sure that the Institute would be glad to elect him into their body.

I also engaged M. Coste to draw up for us a paper on the Turkish Mosque, distinguishing the peculiar arrangement and parts of those at Constantinople (formed upon a Byzantine type); those at Cairo and Damascus purely Arabic, and having also their individual dispositions for pilgrims, &c. He seems highly delighted with the idea, to which he above all men is so capable of doing full justice; and I have no doubt he will set about it, and it will be a very interesting contribution for our Transactions. He asked very particularly for his old friend and fellow-traveller in Egypt, Bonomi, and was glad to hear of his being in good health, and that I was connected with him at the Soane Museum.

I hope you will not be fatigued by my too long details of what has occurred; but such an incident as the funeral of M. Duban is a rare occasion, the only like one being when M. Fontaine was buried, and when I also said a few words. I have thought that it would interest you and the members to know what took place.

Believe me, dear Mr. President,

Very faithfully yours,

THOS. L. DONALDSON."

Gentlemen, I have sought to give some interest to my otherwise dull record of our proceedings, by grafting upon it, and making part and parcel of it, this very interesting communication from our valued friend and colleague. Independently of the clear description it gives of a ceremony that must always have a melancholy interest, and which at this moment must have a special one, as indicating a sort of coming to life again of our intellectual and accomplished French confrères, it has a peculiar value in my eyes, for it leads me to hope and believe that the umbrage which Professor Donaldson took at some of our proceedings during the last session has passed away; that he now acquiesces in having for a moment contemplated a slight to him, and that we may hope for a revival of that pride and interest in the Institute which for so many years he has shown without stint.

Our Hon. Secretary for Foreign Correspondence, Mr. Cockrell (who, I am happy to think, is fast recovering from a very severe illness), will, no doubt, at no distant period, prepare a paper on M. Duban's life and works. I shall only remark that the architect of the façades of the "Beaux Arts" (especially the old one), and of the restorations of the Château de Blois, and of the houses of the Count of Portales, in the Rue Tronchet, of the works for the Duc de Luyne, at his Château at Chevreuse, should always hold a high place in our esteem. His public professional position was not as high as it should have been; politically he was not fortunate: he opposed Napoleon III. when President of the Republic, and on his succeeding to the throne, M. Duban was dismissed from his position as architect of the Louvre, and from the superintendence of the works on the southern façade, which were then under his charge; but the Salon Carré and some of the other important rooms in the Louvre were also works of M. Duban.

Gentlemen, I need hardly remind you of the change that took place last session in our secretarial offices and arrangements; and most assuredly I would say nothing that could revive any controversial feelings; but, as one who had to bear a large share of the obloquy which in some quarters was thought to attach to this act, I think I may, in justice to myself, appeal to the members present, and ask if the Institute has lost in energy and usefulness by the change; or if, individually, members have received less courtesy and assistance from the officials of our society under the new *régime* than they did under the old?

I have been asked by those who take a deep and special interest in the "Architectural Benevolent Institution" to remind the members of our Institute of its strong claims upon their aid and on their generosity, not only on our members, but on those of the whole profession. Though our numbers are now "legion," and may be counted by hundreds, instead of units, as in the good old days of monopoly, I find there are only 256 architects subscribing to this fund, and out of that number only 150 members of this Institute. This is not a satisfactory or creditable state of things, and contrasts very unfavourably with the action of the civil engineers in a similar work of sympathy. It is a subject which specially deserves the interest not only of this Institute, but of every architect throughout the land. We all know the vicissitudes of a professional life,—the fluctuating nature of our practice,—the struggles which attend an unsuccessful career, and even the misfortunes which sometimes await in mature age on those whose early prospects seemed so promising. There is probably no one in this room who cannot call to mind some instances of disappointed hopes, narrowed means, and even urgent necessity amongst members of our fraternity. And there are many instances we know nothing of,—instances of men whose lives have been blameless, but unfortunate, and who are year by year reduced to that most distressing form of need,—the need which craves, but dares not beg relief. Although we number 519 Fellows and Associates, only 153 are subscribers to this professional society. Do not let this reproach exist any longer. The president, Mr. Sydney Smirke, has but lately made an earnest appeal in favour of that society, which is in urgent need of funds. Its working expenses are reduced to a minimum. Its annual receipts from subscriptions and investment amount only to 235*l.*, and last year 214*l.* were disbursed in charity; and there is but a small balance in hand. It is not only architects themselves who seek its aid, but too frequently their widows and orphans, who need a helping hand. The dictates of ordinary benevolence, no less than the claims of professional brotherhood, ought to secure for this excellent and well-administered charity our support and co-operation. If we could secure another 100 or 150 subscribers, or if some would double their present subscriptions, the boon would be great. Gentlemen, this is not the place for a charity sermon, but I have a strong presentiment that I shall not have appealed to our profession in vain.

I find, on referring to the address which I had the honour of reading to you this time last year, that I indulged in certain Utopian dreams of union and fusion, and of a "single united and powerful body." They were at least innocent, and may have reminded some of you of the old saying that "*new brooms sweep clean*." Your

broom has, however, gained age and experience since then, and is not so hopeful of realising all he dreamt of; but I venture to think that a useful first step towards uniformity, at any rate, has been realised in the "Conference" we held last session. Crude and incomplete as may have been many of its arrangements, we have learnt experience, and we have at least called forth an interest amongst our professional brethren in the United Kingdom which, if well directed, and guided with patience and judgment by the administrative body of this Institute, will most assuredly bring forth good fruit ere long. Members will remember that it was decided last year to renew the "Conference" in June next, and that special committees were appointed to consider the important subjects of professional charges, architectural competitions, and the employment of surveyors. The existing committee of the Institute on "professional education," has been requested to continue its labours, so as to have that matter fully discussed and disposed of at the Congress of 1872. The three special committees have had appointed gentlemen to act as their secretaries, so as not to interfere with the general duties of Mr. Eastlake. From each of these gentlemen I have received notes, stating that one or more preliminary meetings had been held, and that a series of inquiries are being made; and that now, on the termination of what may be called the vacation, the committees will reassemble for work. I need hardly say how important it is that the members of the Institute should all co-operate; and should forward to the several secretaries (whose names have already been made known by a circular) any suggestions or facts which their own experience may have called forth.

The country members who accepted our invitation took much interest in this experiment, and seem to have been gratified at the result, as is evidenced by the cordial vote of thanks they passed to your council for having brought them together. It must not be that our metropolitan body of architects are behind their provincial confederates in a work from which the latter anticipate "so much benefit to the profession."

The new "Metropolitan Building Act" does not seem to have made much progress during the last Session. It was read a first time on the 10th of May, and, if my recollection be correct, the Building Act promoted by the Liverpool authorities was thrown out in Parliament, some of its clauses having been considered unduly stringent and uncalled for, interfering very tyrannically with the rights of property.

It will, I feel sure, be gratifying to many present to hear that the school recently opened by the Royal Academy for the special study of architecture (and of which our member, Mr. Phénix Spiers is the master), is making steady progress; and, considering that it has been but recently established, Mr. Spiers is satisfied with the result. The annual number of architectural students admitted during the last ten years, has averaged eight or nine per annum; there is every probability that in December next, for the coming session, the number will be doubled. It seems most desirable that the course of study now instituted at the Royal Academy should be commenced in the earliest stage of a pupilage, by those who have entered it as probationers (a knowledge of design not being necessary for this purpose). Mr. Spiers would thus have a better chance of effecting good in the student's career, and of assimilating our system more nearly to that of the Beaux Arts in Paris. Mr. Spiers has lately been to Paris to study the operation of the system adopted at the "Beaux Arts," and at "l'École Centrale," in that city, with a view to reporting to the Council of the Royal Academy on this important question. From the interest now taken by the members of that body on the subject of architecture, I cannot but anticipate satisfactory results.

I have amused myself this autumn with cutting out and collating the various letters and articles that have appeared in the public papers, on the subject of the "Law Courts," and a more painful bewildering array of criticism I cannot conceive, or one more likely to paralyse and destroy the powers and energy of the architect. Can there be a more painful instance of the disappointing way in which our great public competitions are conducted? of the unsatisfactory nature of the tribunal to which designs so submitted are to be subjected? or of the perplexing

nature of the official control now exercised over our public buildings? I need not now dwell on the protracted and unexpected nature of the actual selection. Mr. Street had passed the ordeal of legal criticism, for if we may take a leading legal journal as our authority, "his plans and arrangements leave nothing to be desired." He had escaped "Scylla" in the person of that awful and much-dreaded Odile (Mr. Ayrton) only to be dragged into Charybdis, and engulfed by the Chancellor of the Exchequer (Mr. Lowe); and as though that fate were not enough to crush Mr. Street, he is now threatened with that most dangerous of all tribunals, "Parliament," a mixed jury of 658 members, of whom probably six may know something of the matter on which they are supposed to pass judgment! And then it is suggested that the "wheel of fortune" should have one more turn, and a new competition be originated, to go through the same protracted and useless routine! Gentlemen, if such a proposal should be decided on, which I can scarcely believe, I do trust that our profession will not have sunk so low, or be so lost to a sense of its own honour, as to permit any member of it to enter on such a competition.

I am well aware that this is said to be a land of liberty, where every one (qualified or not) enjoys the presumptive—not to say presumptuous—right to express his opinion on any given subject, and I can therefore understand that men like Sir Edward Cust, Mr. Denison, Mr. Cavendish Bentinck, and Mr. Alfred Seymour, who are supposed to have given consideration to the subject of architecture, and Mr. Sydney Smirke, who is known to have done so, should take an interest in the matter, and express themselves freely, if not wisely. And I can even understand such professional criticism as Mr. Ferguson passed on Mr. Street's proposal to vault his great hall, and on his elevations, though I much deplored its tone and severity. I claim the right personally to criticise Mr. Street's design, and to express regret that the Straud front is so broken up into various and perhaps disjointed parts, so long only as I do so without personality or violence; but what can justify from any architect (in speaking of the works of others of his own profession) such a trade of self-sufficient abuse as that contained in Mr. Welby Pugin's letter of the 9th of September, in speaking of Mr. Currey, Mr. Scott, and Mr. Street? Where is the "*esprit du corps*" of our profession, when such flagrant violations of etiquette are tolerated? Amongst the various letters that have been published on this vexed question, I was much struck with this passage in one of them:—"There are people in the world who are so well satisfied with themselves, and so full of their own perfection, that they are constantly endeavouring to bring everybody up to their high standard, by offering publicly their gratuitous criticisms, opinions, and advice." Strong men are to be feared, "and the wisdom of softening their anger is apparent." It may be so, but I trust that Mr. Street will not waste his valuable time in so useless and thankless an attempt.

Since I addressed you in November last, the Albert Hall has been completed and opened, and has, no doubt, added to the effect and usefulness of the International Exhibition. There seems to be a difference of opinion as to its acoustic qualities; but there can, I think, be none as to its internal effect being grand and impressive, and we certainly may congratulate ourselves on having one of the finest music-halls in Europe.

In London, Mr. Scott is bringing to a close his interesting restoration of the Chapter-house at Westminster, and his monster hotel at the St. Pancras Station; and the works under his charge for the Home and Colonial Offices, in Downing-street, are in full vigour.

The Post-office, in St. Martin's-le-Grand, has made great progress during the summer, and will assuredly add materially to the convenience of that department, if it do not to the embellishment of the City; but it would be unfair to pass any decided criticism upon its architectural treatment until the building is completed and the scaffolding removed. This work has been the subject of Parliamentary and literary criticism of a severe nature, and I will only express the hope that no professional jealousy will be allowed to interfere with a just estimate of its merit.

The works at Burlington House are again in full progress, after much loss of time caused by the failure of the original contractors. Let us hope for an early completion of this group; for, until the three sides now in progress are finished,

the completion of the central, or Royal Academy block, cannot, I understand, be undertaken.

These, I think, are the principal public works now in hand in London, exclaiming from my list some very large and impressive churches, either just finished or in progress, such as the parish church of Kensington, by Mr. Scott; the churches of St. Chad and St. Columba, at Haggerstone, by Mr. Brooks; St. Jude, South Kensington, by Messrs. G. & H. Godwin; and St. Augustine, South Kensington, by Mr. Butterfield.

Bearing in mind that all these churches are erected by voluntary subscriptions, and that in several cases their cost is very large and their decoration abundant, surely no charge can be brought against the present generation of illiberality or want of zeal in such matters. And these works are in one city alone; whilst in many parts of the United Kingdom works of a similar importance and cost are in progress (I know not where to get a correct list). In Ireland, where it might have been supposed that recent Parliamentary legislation would have damped all church-building ardour, we find Mr. Street entrusted with the restoration of that glorious old church in Dublin (Christ Church), to be done at the sole cost of Mr. Roe, jun. (a noble twin sister to the restoration of St. Patrick's, undertaken at the expense of Mr. Guinness). He has also to erect a church in the North of Ireland, for a nobleman, without reference to its cost. These are surely healthy signs.

I spoke last year of the works of restoration going on in our cathedrals, and I gave an abundant list. This year I shall only say, that there is no falling off in the interest excited by these great works. Some are making good progress; others more leisurely, but not less surely; and fresh works of reparation have begun in others. But, gentlemen, I am happy to say that the liberality and energy of our countrymen do not exhaust themselves on cathedrals and churches: hospitals, infirmaries, and asylums, all tending to relieve the sufferings of our fellow creatures, are being built by dozens (amongst which I may mention the new Royal Infirmary at Edinburgh, by Mr. Bryce, as probably the most important), and town-halls and exchanges, and museums and galleries, are in progress in many of our large towns, all tending to bear witness to the wealth and energy and prosperity of our great country. Whilst we congratulate ourselves on such signs of prosperity and vitality, do not let us shut our eyes or close our hearts to the misfortunes and sufferings of other countries in matters specially interesting to us as architects.

I spoke last year of the bitter struggle that was then at its height between France and Germany. We could but deplore it, and hope for a speedy termination to such misery; but we could not forget the aid and grief that has fallen on Paris as a city: we could not foresee that her own sons and daughters would raise their hands against her glorious buildings, which had been respected and spared by her enemies; or imagine that French men, and French women, would be so lost to every feeling of pride and civilisation as to destroy wilfully, and in cold blood, monuments that were the glory of their fathers and the envy of their neighbours! But we may have much faith in the energy and elasticity of Frenchmen, if not in their judgment and dignity; and ere long we shall undoubtedly see the restoration of these fine monuments. The façade of the Tuileries is not, I hear, to be retained or restored in its whole length, but the present centre, or clock-tower, is to be connected with the two end pavilions, "by removing the immediate ruins, and by substituting for them a mere curtain, either a colonnade or a series of open arches like those of the new Louvre." As a mere *coup-d'œil*, and irrespective of any question of history or archaeology, I believe the gain will be great. Gentlemen, we have sought to aid materially this nation, once our bitter foe, and latterly our friend and ally, in her moments of suffering and depression; let us now wish her "God speed" in her day of revival.

Nor is it France alone that should call forth our aid and sympathy! The great nation across the Atlantic, to which we are closely allied by ties of blood and language—a nation

"Who speak the tongue that Shakespeare spoke,
The faith and morals hold which Milton held,"

but just recovering from that desolating, bitter civil war, which would have annihilated any other nation with less energy and endurance—has, in her great Western territory, undergone such a visitation from fire as hardly ever before

fell upon a people! It has witnessed not only the almost complete destruction of that wonderful city Chicago, and the suffering and loss of life that must have ensued, but such a series of inland fires, destroying whole districts and settlements, and life and property, as can hardly be imagined. It is true that to the world of art the losses bear no comparison with those of France, but it must be a bitter grief to the inhabitants of Chicago, to see their great public buildings, which they had so recently raised with pride and hope, "giving of their best," in money and in skill, swept away like tinder. There is, however, a vitality and resiliency, so strangely bound up in the American character, that we shall assuredly see, in an incredibly short space of time, this city rebuilt, and the public buildings replaced, even on a grander and more perfect type; for I believe there are architects in America who are quite capable of turning to good account this sad opportunity of proving the progress that has been made of late in their profession.

It is a pleasure to think that the appeal which has thus been made to the sympathy and aid of Englishmen has been heartily met; and our response cannot, I believe, fail to remove prejudice, and to draw closer together two great nations, whose common origin and mutual interests should render mistrust or war impossible.

It may not be uninteresting now if we turn for a moment from the vanquished and the suffering to the triumphant and the prosperous—to Germany, and see what progress our profession is making in that country, and what important works she has in hand. Knowing that my brother (Sir Digby Wyatt) was about to have a holiday and make a tour in Germany and in Austria, and having confidence in his quick observant eye, I requested him to make some memoranda of the important public architectural works in progress which he might see, so that I might have them to lay before you on this occasion, knowing that they could not fail to interest the members. He has kindly done so, and I think you will agree with me, that they give a very hopeful and valuable account of the progress of architecture in those countries. He tells me that during the past year the anxieties and expenses connected with a state of war have almost entirely checked the undertaking of new works at Berlin; but it has seen the completion in that city of some structures of considerable interest, particularly in the technicalities of building. The new "Rath-haus," or Town-hall, is a structure upon which vast sums have been lavished, and an effort has evidently been made to rival the magnificence of the now destroyed Hôtel de Ville at Paris. The general effect is not commensurate with the expenditure; but the beauty of the oak carving, of the terra-cotta, of the ironwork, and of the ornamental floors generally, reflects the highest credit upon the present condition of the building-trade in Prussia. What is, perhaps, most to be admired in the Town-hall at Berlin is the magnificence of the carved walnut ceiling in the hall, where the magistrates hold their meetings. What is most to be regretted is the sombreness of many parts of the interior, and the vulgarity of the stained glass, which adds to the gloom. Although not so ambitious, the new Finance Ministry building is much more satisfactory. Its façade, which recalls some of the Pisan and Florentine buildings of the end of the fifteenth century, displays a great propriety of parts and much elegant detail. The new Mint, which is an immense structure, somewhat resembles the Ministry of Finance in its style, but is less conspicuous in bringing together its leading features. Much regularity and almost severity of general style is marred by eccentricities here and there tending almost to caricature. There are certain great consoles, with figures of miners executed in a quasi-romantic style, which quite distract the attention of the observer from all the adjoining architectural detail. They are neither strictly ornamental nor functional, and they furnish an illustration of the bad effect of that struggle to retain a sort of Medieval comicality which not unfrequently disfigures otherwise clever designs in our own country. These buildings are all of brick and terra-cotta, and manifest that there is no deterioration in Berlin in the use of such materials since Schinkel designed his original and admirable "Ban Akademie."

At Vienna the value of a year of peace shows itself in the completion of many architectural works of the highest merit. A more noble boulevard than that constructed upon the old

line of city defences cannot be imagined. The magnificent "Franz Joseph" Caserne, with its great exercising-ground and its town-gate opposite to its central mass, is certainly the most skillfully-designed barrack in the world: simple in its parts, these parts are so brought together and contrasted as to form a grand and effective composition; and it shows, in the hands of a truly accomplished architect, how much grandeur may be obtained in structures of the most utilitarian kind. The new Opera-house is about the handsomest Renaissance building in Europe, and is no less admirable in its external effect than well suited in every particular for its purpose. The "Votive Church," as a Gothic structure, is very elaborate, and beautifully executed. There is, however, a certain "cast-iron" hardness in its details: it is too florid, and illustrates the bad effects which the over-adoration the Germans have bestowed upon the open-work spires of Cologne Cathedral have occasionally led to in that country. As a general feature of the noble new street-architecture of Vienna, there may be remarked the frequent use of external gilding and polychromy, sometimes obtained by actual painting, and more frequently by the contrast of variously-coloured terra-cottas and other materials. Many of these structures reflect the highest credit upon our honorary and corresponding members Ferstel, Schmidt, and Hasenauer, all of Vienna. At Dresden, the foundations for the magnificent structure which our Honorary Contributing Fellow Professor Semper has designed to replace his *chef-d'œuvre*, which was, it may be remembered, destroyed by fire, are making slow but steady progress.

At Brussels, the great works commenced by the "Belgian Improvements Company" are beginning to show themselves. It is singular, however, that in this thriving city there does not appear to be manifest the same anxiety on the part of the public to occupy the vacant land in good positions which is shown at Vienna; and it is also to be regretted that the tendency shown by many of the great buildings now in progress, or recently completed, in this city is towards heaviness of form and redundancy of ornament, rather than to that purity and severity of style which characterised in so high a degree the great work of our honorary member, M. Duc, at Paris, the Palais de Justice, which even in its ruin resembles a magnificent fragment of the best days of Imperial Rome.

There are few towns upon the Continent which show more conspicuously than Loipzig the value of the association of art with wealth in the improvement of a city. There the combination of architecture with landscape gardening is most successful; and the placing of the fine theatre in connexion with its elegant *cafés* and other buildings, looking over a piece of ornamental water, with viætas, judiciously planted, produces an effect of novelty no less than beauty. The villas of the rich merchants are not only comfortable, but frequently beautiful; and it is a happy circumstance to recognise the skill with which architects abroad succeed in this combination. To some extent, no doubt, this result is obtained by the establishment of museums, in which the luxurious wants of the rich citizens of former ages were supplied by contemporary art-workmen. In almost every town on the Continent such museums are now accessible to architects, art students, and workmen; and although we must rejoice in the extended development of institutions such as the South Kensington Museum, the Crystal Palace, the Architectural Museum, the Meyer Institution, at Liverpool, and some others in this country, it is to be regretted that there are still many large centres of industry and of population, such as Birmingham, Leeds, Sheffield, &c., very inadequately supplied with such opportunities for study.

Such, gentlemen, is the budget of "Home and Foreign News" which I have thought it my duty to lay before you.

Co-operative Engineering Project in Sunderland.—A conference of trades delegates has been held in Sunderland, to discuss a scheme for the establishment of a co-operative engineering and ship-building factory in that port. Mr. Grace occupied the chair, and after some discussion it was resolved to appoint a provisional committee of seven to consult a solicitor, draw up articles of association, and arrange for a public meeting. A number of shares were taken in the room.

FLEMISH GALLERY IN ST. JAMES'S STREET.

AN addition has been made to the Fine Art Exhibitions of London by the opening of the large rooms in St. James's-street, so well known as the former site of Crockford's, for the display of a large and valuable collection of high-class Continental pictures, by Messrs. P. L. Everard & Co. Upwards of four hundred oil paintings, with a small number of water-colour drawings and sketches, fill the noble apartments of this building, the chief fault of which is, that as they were not originally intended for a gallery, the light is defective. In the present season, the November fogs are so thick as to demand the utmost amount of window or skylight surface, and even then the London atmosphere does cruel injustice to artists. In spite of this, however, it is impossible to pay a visit to this collection without pleasure. Even in the two or three days during which the rooms have been privately or publicly accessible, many a canvas has been marked with the word "sold": the vernacular English being employed instead of the symbolical red star.

There are, of course, exhibitions and exhibitions; and it would not be difficult to run up on our fingers some couple of dozen collections offered to public notice under this name. But the St. James's Gallery has a character of its own. We do not remember ever to have seen, with the exception of galleries of a rank that may be called national, so large an assortment of equally good pictures. For it must be borne in mind that this is not an educational establishment, or a display, like that of our Royal Academy, intended to aid and to foster the rising artist, and thus to display all the presentable pictures that the walls will hold. The selection is made, in this instance, with a commercial aim.

The picture which, while somewhat open to criticism on purely technical grounds, is entitled in our opinion to the primacy, as at once realistic, highly imaginative, and suggesting thoughts deeper and more profound than can be shadowed on any canvas, is the "Star of Bethlehem," by J. F. Portaels. It is a large canvas, with three figures towards the left-hand corner, a bit of composition that would be intolerable but for the poetic sentiment awakened by it. The three figures are no other than the semi-mythical kings, Caspar, Melchior, and Balthasar. The lonely rolling landscape before them represents the Holy Land by night. In the far western distance tower the walls of Jerusalem, and the glittering porches and terraces of the Temple of Herod. High in the heaven above, lighting the path with a golden clue, blazes a mighty comet. The travellers have seen His star in the east, and they are rejoicing again to behold it, as they draw nigh the hill country of Judea, with exceeding great joy. It is an admirable picture.

The same artist has given us another, and very different subject, to which also,—*post* the November light,—we are disposed to award a high rank. A beautiful dark-haired and dark-eyed woman,—a Venetian, we rather think,—is seated in a throne-like chair, in an attitude that recalls Reynolds's favourite portrait of Mrs. Siddons as the tragic muse. But that muse,—beautiful as she is,—has always seemed to us to be the portrait of an actress,—a noble actress, it is true,—but no muse. Here we have the very muse of Jealousy herself; an impersonation for which we seek elsewhere in vain; one which, once seen, cannot readily be forgotten. She clenches her delicate left-hand in the passion of the moment; and the fan in her right hand, which hangs over her chair, though outspread, gives the idea of a dagger. A rich edging of lace calls attention to the finish of the drapery. The very high merit of this work is indisputable.

Charming alike in conception, in composition, and in execution is No. 306, by S. Liezenmayer, "The Empress Maria Theresa smothering the Infant of a Peasant Woman." The poor mother faint almost to death, seems hardly aware of the relief thus administered to her child. The perfect modesty, true maternal tenderness, maternally beauty, and imperial dignity of the unwonted nurse are such as to leave little ground for criticism. The delicacy of the flesh tints is such as to show rare taste on the part of the artist, as much for what he has hidden as for what he has painted. A court lady looks on in some amazement from behind tropical-looking foliage, that produces the effect of embroidery.

Leon Y Escobura, a Spanish artist, is, we

believe, a pupil of Meissonier. With much of the wonderful minuteness of his master he combines high merits of his own. His sense of, and power over, colour is of a high order. Witness the "Master out" (47), where a jester in a crimson suit is enjoying the good wine left on the table, seated in his lord's chair. It is not often that such depth and breadth of colouring are blended with so great a command of subtle physiological experience. "Preparing for Parade" (37) is a companion picture, lighted up by the blue scarf. In another room is (185), "The Spy," a very truthful and powerful picture of military life in the sixteenth century. A sort of council of war, consisting of the officer in command, a legal accuser, and a young nobleman, probably the owner of the château,—sit at a table. Guards stand by, and the attention of the whole party is earnestly fixed on the spy, who stands in arrest before them, evidently disguised, in his red garments, evidently lying most circumstantially, not trembling, but not altogether comfortable. The contrast of the faces, all under the influence of the same eager attention, is masterly. Not far from No. 47 is "The Last Glass," which a trooper in felt sombrero and red doublet is pouring from an old Flemish jug of blue stoneware. The eyes of this man are directed rather above the liquor which he seems to try to squeeze forth,—the only point of a questionable nature in the picture.

Let us turn from this—for we can but jot down two or three of the gems of a large collection—to No. 17, by Jan Verhas, entitled "Tis he, Mamma." A sturdy little boy has just had the misfortune to overturn a jardinière, containing a dwarf palm and a splendid scarlet lobelia-like plant, which lie in ruins on the floor. The culprit has ensconced himself in a corner between an old corner cupboard and the wall, but is pointed out by a treacherous little *déla-tesse*, with a doll in her arms, who is eagerly indicating the boy's whereabouts to the approaching, but invisible parent. The pathos of the little face is tell-tale to a degree. With a composition of nursery incident like this, comes into strong contrast the life, motion, and vigour of the "Timber Raft on the Rhine." Grey, thick sky—almost like our own at the time of writing, is flecked by storm-avoiding birds, while the navigators lean heavily on their oars, and the long train of rafts seems to drift before our eyes. We have then (45 and 46) "A Calm on the Coast of Holland," and "A Moonlight View near Havre," both by H. Gudin, that are gems of delicate landscape-painting. F. R. Unterberger, in his "View of Posilippo, near Naples," has bathed the distant cone of Vesuvius in a glow of such golden and purple haze as recalls the very dream of the climate. The cold grey of the foreground intimates that the illuminating sun is very near the western horizon. Peasants are dancing the tarantella, much as those of Posilippo do in the life—only the peasant-girls of the painter are clean, which, if less picturesque, is more agreeable than the life. Close by, another Italian scene, "Demanding the Toll," where a bridal procession is stopped by a chain of flowers drawn athwart their path, is instinct with life, down to the tiny shouting vagabonds in the extreme distance: one of those incomprehensible structures, half-bridge, half-buttress, crosses the road, and frames the gay group of the bridal party. Hard by, is a morning view of Venice, by Ziem, a brilliant landscape, with the Custom-house and the dome of the Church of Santa Maria del Salute glittering like silver. The unusual pearly purity of the entire scene we can only explain by supposing that the painter got up early enough to catch such a view of Venice as is unattainable by those of us who keep English hours in Italy,—a general national mistake.

We must close the Italian notes by adverting to the portraits of Mazzini and Garibaldi, each of whom might be thought to be the very vainest human being on earth, if it were not for the other. Mazzini is very like; Garibaldi is over-idealised. The picture is better than the portrait. We had all but omitted to note one of the finest ideal portraits on the walls—perhaps the finest,—"Torquato Tasso in Prison," by Louis Gallait (146). The sorrowful head of the poet is in shadow, but bright sunlight streams through the barred window of his prison on his delicate and exquisitely drawn hands, and throws a network of gloom on a bright patch on the floor. Behind, a boy, in Carmelite monkish dress, brings in the prison fare.

Some of the paintings on the walls would demand more applause if they were the only

specimens of the artist. But when we see the same subject repeated and re-repeated, however good and however well handled, we begin to tire. "Flowers of Sorrow," by J. Emile Saintin, is a beautiful portrait of a fair girl in mourning, with a wreath of *immortelles* in her drooping hand, contrasting with her black dress. The delicate outline of the arms, shown through a thin transparent black gauze, of which we will not dare to attempt to give the fashionable name, is very charming. But when we see the same fair girl sitting in another picture, we feel ungratefully neglectful of her charms. What can be said, then, of a veteran like Verboeckhoven, who, in his seventy-sixth year, has been travelling in Scotland to paint sheep, for the life-like delineation of which he is indeed a master, but it reminds one of *toujours perdrix*. The fleeces of this artist's sheep are positively of wool, and his conception of ovine life is perfect.

We have several works by Roybet, with whose name the visitors to the International Exhibition of 1871 will be familiar. With much power, both of expression and of colouring, that artist lays on pigment as if it were pitch. In "The Page" (No. 194), in which, though there is almost as much spare room as in one of Mr. Orchardson's pictures, there is a capital dog, a live cockatoo, but failure in the principal action,—the dog is not pulling. No. 363, "Pages and Parrot," awkward enough in composition, is splendid in its contrasts of colour.

Cabanel's "Solitude," a beautiful figure of a girl in a wood, was at South Kensington. But a finish worthy of Ferburg himself—the very opposite pole to the *impasto* of Roybet,—is that of H. Van Hove. The charming figure in white of "The Visit" (112), is a pleasant souvenir with which to take leave of an exhibition of great merit.

ARCHITECTURAL ASSOCIATION.

THE first ordinary meeting of the session 1871-72 was held on Friday evening, the 3rd of November, Mr. Rowland Plimbe, president, in the chair. Nineteen new members were elected and four proposed. The reports of the various classes were then read, eliciting in several instances practical criticism from the body of members present. The general report of the Association, the treasurer's report showing a healthy finance, and the report of the class of design (thirty-seven members, 167 designs submitted in all), were successively adopted; also that of the class of construction (fifty-four members), that of the elementary class of design (twenty-six sketches submitted on one occasion: average, twelve), the report of the surveying class (twelve meetings in the spring, instruction out-doors and in-doors, twelve members), and that of the water-colour class (under Mr. P. J. Nafel, fourteen members), were also approved. The librarian stated that over 1,000 entries of books taken out were made in the last session; called attention to the "Brown Book" of the Association as containing a complete catalogue, and stated that it was intended to broaden the library by obtaining duplicates of works much in request. The "Sketch-book" has completed its fourth volume; a complete index up to June, 1871, has been published. The undertaking is paying its way (138 subscribers at the present time). The prize offered by the committee for the best design for a title-page for the fourth volume has been adjudged to Mr. G. Vials. The architectural art classes held at the Architectural Museum have been only moderately successful; arrangements have, however, been made to carry on the classes to, it is to be hoped, a more prosperous future: the first meeting was to be held at half-past six p.m., on Tuesday, November 7th. The prizes for the last session were carried off by members of the Association; for figure-drawing by Mr. W. T. Hensman; the antique, Mr. H. Gaye; architectural ornament, Mr. T. Hallows.

The president then read the usual address appointed for this meeting,—reviewing the work of the past year within the Association, and in matters architectural generally; treating of the existing topics of interest and debate, and indicating his view of the course for the immediate future. The conference of architects at the Institute might, he said, be considered a thorough attempt to bring about a good general understanding between all members of the profession; apparently a considerable step in itself towards realising that common action in aid of which the Architectural Alliance has subsisted some years, loyally supported by the Associa-

tion and several country societies. He hoped that the conference this year would have some directly practical result. As to the ownership of architects' drawings, he thought it might be concluded from the present state of the question, that architects would give up the contract drawings when demanded of them, suggesting that the copies in the hands of the clerks of works might often conveniently be deemed the contract drawings, the architect having attested copies. In this way he could reserve to himself any drawings valued as in themselves works of art, and retain also intact his own notes and memoranda. On the subject of the custom of practising as architect and surveyor, it seemed to him,—at any rate, for the younger members of the profession who could devote ability and time to the work,—that taking out quantities gave an opportunity for, indeed necessitated, so thorough a study of a building that a client's confidence was thereby frequently increased, and the great harm avoided of the architect and others regarding his work as that of artist alone: in matters involving any special business difficulty, people have been known to wish "to employ a good practical surveyor and not an architect," a feeling that he would hope might hereafter be groundless. When the quantities were not accepted as the basis of the contract, it would be well to have two surveyors, according to the usual custom,—the architect to represent the client, and an independent surveyor to act on behalf of the contractors, the quantities then being only for the guidance of the contractor.

The conditions for building contracts lately issued by the Institute, he considered valuable in themselves, a specially important step in the right direction being the adoption of the principle of the decision of technical issues by experts. By acting thereon it will be impossible even to imagine, years hence, such a case as that in which a barrister-referee, with counsel, witnesses, and all requisite apparatus, found two days' investigation advisable, "in order to find out the exact nature and use of a Norfolk latch." It seemed to him desirable that young architects should keep strictly to the usual rates of payment, not offering their clients a saving in professional charges, but the greater attention to all the details of works that can be given by younger men. After alluding to the subject of competitions, and the urgent need of a general code of regulations, also to the various important new buildings completed and carried on in London and the neighbourhood; to Chicago and precautions against fire; to the advantages to the young architects of to-day of the most intelligent class-journals,—he concluded the general topics by mentioning that ten passed candidates in the last preliminary examination, seven were members of the Association, and he hoped that the lists of the class of Proficiency and that of Distinction would bear the names of several of their members after the next examination. Turning to the internal work of the Association, the president made suggestions as to the manner in which the facilities for study could best be used, indicating the purpose of each class and its place in the general scheme, taking occasion to mention a travelling studentship for members of the Association, of which more would hereafter be said. It might be considered fairly progressing towards being formally announced. In conclusion, he trusted that the session would be marked by an earnest prosecution by the members of studies, which, training their natural abilities, would, in honourable toils, make their lives useful to others, and he hoped, pleasant to themselves.

A vote of thanks to the president and remarks by different members terminated the proceedings.

TAUNTON AND THE TRUTH.

THE readers of the Somerset County Herald will remember, as well as the readers of the Builder, the controversy that was provoked when we dared to state that "the Tone was one elongated cesspool," and that typhus existed in Taunton. Patience, however, is a virtue, and the public advocate who is conscious that he has spoken the truth has only to wait a little to see the full corroboration of all the charges he may have made. The above-mentioned paper, which is in general an impartial and well-considered organ, thus bears out the views we advanced some months since on more than one occasion respecting Taunton and its river:—

"The river Tone is poisoned and poisonous by means of the sewage poured into it. Its waters are too sluggish and

too pasty" to be looked on with pleasure. From Tangier to the sinuosities of Firepool it creeps along thick, brown, and congested—a brewery for diseases born of mire and miasma. Can nothing be done to remedy this? Cannot the Board of Health effect something in the way of purification of the much-injured river? This is not the age of miracles. A poisoned river creeping in close proximity to our habitations will as surely keep up a supply of fever patients as sound follows stroke. Prevention is better than cure. Paying a doctor and keeping up a hospital for the poor, while we foster the very evil that gives his most trying duties to the one and taxes the resources of the other, is as wise proceeding as it is to stand ready with a trowel and a bit of mortar to plaster up a rent that an artilleryman is making wider and wider with each fresh discharge of shot and shell. We must get rid of the foe itself in order to make good our progress in repairing the havoc caused by him. The river must be purified if the people of Taunton are to enjoy the inestimable blessings of health."

We trust that the Local Board of Health, some of whose members are rather impatient of hearing the truth, will now set about doing what they have so long neglected.

PROPOSED SHIP CANAL THROUGH THE ISTHMUS OF PANAMA.

Sir,—I see this long-talked-of project is likely to be brought prominently before the public, as Mr. W. H. Webb, the well-known shipbuilder and mail contractor, of the United States, and Mr. Body, chairman of the Central Transit and Ship Canal Company of Nicaragua, arrived at Liverpool on the 17th of October, with the mission of moving the maritime Governments of Europe to take part in the scientific investigation for a ship canal through the American Isthmus, and guaranteeing its neutrality when made.

About the year 1849 or 1850 Mr. Squier was sent to the Isthmus by the United States Government. He went up the San Juan River to Lake Nicaragua, a distance of about ninety miles, which river in its natural state he reports as singularly unfitted for navigation, being encumbered by rapids, projecting rocks, and contortions of the stream.

Lake Nicaragua is a noble expanse of water, being about 110 miles long and sixty miles broad, well adapted apparently, without engineering efforts, to float upon its waters vessels of the largest size. Twelve miles from the upper end of Lake Nicaragua is Lake Managua, fifty miles from the Gulf of Fonseca, upon the Pacific side.

The line the United States Government held most in favour was from San Juan to Lake Nicaragua, 119 miles; across the Lake and Rio Lajas, 56 miles; from Rio Lajas to Brita, a port on the Pacific, by canal, 20 miles; making a total of 195 miles.

This canal was proposed to be 79 ft. broad at top, 17 ft. deep, and 50 ft. broad at bottom; it would cost 9,000,000*l.*, and take ten years to complete.

In 1852 an English company proposed making a canal between the two finest bays in the world, viz., Boca del Joro, on the Atlantic, to Golfo Dulce, on the Pacific, a distance of seventy miles, and an extremely healthy locality.

Col. J. W. Adams advocates the Tehuantepec route, 135 miles in length, in preference to any of the other twenty-six routes, the Darien route being scarcely practicable, as it requires a ship tunnel miles in length. Caledonia Bay to San Miguel Bay is only forty-eight miles. The route through the Chiriqui Lagoon and Rio David is fifty-two miles.

Lieutenant Salbridge and companions wrote from Peza, interior of Darien, this year, saying they had discovered a practicable route from the Atlantic to the Pacific, where the greatest elevation did not exceed 300 ft., this route being by the Atrato river, an affluent of the Gulf of Darien, 200 miles from Aspinwall. This river was found to be a deep, sluggish stream. The "divide" between this and the Jazura river emptying into the Gulf of San Miguel on the Pacific Coast, was not very wide, though 50 ft. higher than was supposed, yet as a barrier not nearly so formidable as heretofore believed. The rivers and gulfs on either side are all favourable for the accommodation of the fleets of all nations purposing to pass from one ocean to the other.

From almost the first discovery of America, a ship canal through the Isthmus was seen to be almost a necessity; but further acquaintance with the locality revealed the continuance of the mountain chain of North America through the Isthmus into South America, which might not be inaptly termed the backbone of the American continent. This backbone has effectually prevented the interoceanic communication being carried out. But although a small tract

of country, it seems to be very imperfectly known, especially in the interior; and it is possible a gap may be discovered in the mountain chain, or a point where, if a ship tunnel were requisite at all, the distance through would be shortest; or if these two conditions should not be satisfactory, a locality might exist where the rock would be softer, or a line of geological fracture might be found through the mountain chain. It is probable the subject will be thoroughly ventilated now, but it will be necessary to explore every square mile to arrive at correct conclusions as to where is the best point to cross from one ocean to the other.

We may assume, should an inter-oceanic canal be made, that the adjoining country would get cleared and populated; and it would be vexatious to find, when the interior of the Isthmus became better known, that a canal might have been constructed by a different route, at half or a quarter the cost.

In conclusion, I would suggest, should such a stupendous work be put in hand, it would be both humane and profitable for the persons most interested to provide and organise the most perfect accommodation, upon sanitary principles, for the workmen employed at the canal. If a workman be unwell or ill, remove him at once to a well-appointed hospital, situated in the most healthy accessible spot in the locality; or, what would be better, instead of one large hospital, several small ones, as that would allow more chance of stamping out any contagious diseases.

Whether deserving of it or not, the Panama Railway has the reputation among working men of having cost a white man's life for every yard lineal of the railway, and I have heard say for every foot of railway. If the canal is put in hand, do not let it have such a reputation.

HENRY TURNER.

ECCLIESIASTICAL DILAPIDATIONS ACT. SURVEYORS.

Gloucester.—Mr. A. W. Mabery has been appointed for the district comprised in the registry of Gloucester; and Mr. T. S. Pope, of Bristol, for the district comprised in the registry of Bristol. Tables of fees for architects, surveyors, registrars, and secretaries have been settled.

Durham.—Mr. Robert J. Jounsen has been elected for this diocese.

DRAINAGE AND WATERWORKS.

Thetford.—The Corporation of Thetford having been requested by the authorities of the Priory Council to construct in their town a proper and efficient system of drainage and waterworks, have obtained the services of engineers to give plans and specifications for the works, showing the probable cost to the town of their construction, and the best and cheapest method of carrying them out. The first engineers called in were Messrs. Gottie & Beasley, of Westminster, who made a survey of the town in the early part of this year, and estimated the cost at 10,000*l.*, which estimate was subsequently reduced. Considering their scheme too elaborate and expensive, the Corporation applied to Mr. A. W. Morant, C.E., to make a survey, and give estimate and plans for the construction of the proposed works. Mr. Morant did so, and estimated the total cost at 7,350*l.* Some prominent members of the Corporation still being of opinion that it would be advisable yet to have the opinion of other engineers, next applied to Messrs. Church & Son, Messrs. Russ & Minns, and Messrs. Whitaker & Perrett; and the results have just been laid before the Local Government Board. The plans are elaborate, and the reports of Messrs. Whitaker, and Messrs. Russ & Minns, give in full detail the cost both of the drainage and waterworks, as follows:—Messrs. Whitaker & Perrett's estimate, 7,490*l.*; Messrs. Russ & Minns', 7,907*l.* That of Messrs. Church & Son is a trifle less than either of the others, being only 6,910*l.*

Portsmouth.—The local Board have resolved to utilise their sewage, and an offer by Messrs. Russ & Minns, of London, has virtually been accepted. The following are the principal terms:—A lease of twenty-five years, the rent to commence on the 29th of September next. For the first five years the lessees are to pay 500*l.* per annum; second five, 600*l.*; third five, 700*l.*; fourth five, 800*l.*; and the remaining

period, 1,000*l.* The system thus proposed to be adopted is for irrigation, and large tracts of land a few miles from Portsmouth will be put under the system. It is also said that many thousands of acres will be now reclaimed from the sea.

Bradford.—The town council, it is stated, has, in all, spent 970,000*l.* in securing a water supply for this town.

MY FIRST NIGHT IN VENICE.

'Twas my first night in Venice, as I leant
On one of her carved balconies, and mark'd
The golden twilight fade to purple night;
And then I watch'd the heaving sea below,
And listen'd to the musical soft splash
Of the cool waves against the marble plinth
Of the long line of stately palaces,
Whose portals open on that shining street
(Star-paved at night, but glittering in the day
With rich mosaic of a thousand hues),
The liquid highway of her "Grand Canal."
I thought how that same tide had ebb'd and flow'd
Through the long course of centuries, and
These lovely "stones of Venice;" and I thought
Of many a pageant proud, and glittering show
Of festive joy, whose golden hours had pass'd
The yielding wave, and left no trace behind.

And now, before me in the deep dark sky
The moon shone forth in peerless loveliness,
Making that dazzling pathway in the waves,
Whose mocking beauty has no strange a charm;
And oft and oft its glittering silver track
The sharp-beak'd gondolas sped swiftly on,
Their sable hearse-like forms in that weird light
Looking like phantoms of the old dead past,
But that the hum of voices, and the ring
Of merry laughter, and the flash of lamps,
Told of the joyous occupants within.

Dark 'gainst the moon-lit sky before me rose
The old "Dogana's" tower, and massive walls,
Recalling a those proud and busy days
In Venice' glorious story, when her marts
All merchants sought from far, and to her ports
From East and West all navies trim'd their sails,
Eager to pour their treasures at her feet.

And then I turn'd my eager, wondering gaze
Where two proud domes and lofty minarets
In tranquil beauty stood, 'twixt night and day,
Sleep'd in a mellow light,—the noble church
To "Mary of Salvation" dedicate,—
Pallid as a ghastly work, all fair without,
And rich in fairest gems of art within;
When, lo! there seem'd to issue from its gates
A long procession of immortal men,—
Of painters, sculptors, architects, renown'd,
The masters of the grand Venetian school,
Who into canals, marble, and dead stone
Breathe'd their impassion'd soul, and left behind,
In thousand forms of beauty, which still live,
An unexhausted legacy of wealth
To their beloved Venice, far beyond
What commerce ever lavish'd at her feet.

These are her dowers now, and these to see
Come travellers from strange lands, whose very names
Were as a upstart when she was in her pride,—
And I rejoiced that it had been my lot,
An humble pilgrim from a far-off land,
To gaze upon her loveliness, and say,
"I have seen Venice!"

But hereupon a smartish, shrewd-faced man,
With aptitude for business in his eye,
Woke from a nap,—stept on the balcony,—
Look'd at the moon,—suff'd his thrice, then drily said,
"Sir, you've been out a pretty longish time,
I guess you've nosed some few smells hereabouts."

2.

SCHOOLS OF ART IN VICTORIA.

We have received from Mr. Samuel H. Roberts, of Melbourne, some interesting statements as to the schools of industrial art already established in the colony of Victoria, and other results of the movement for the practical education of the rising workmen. These include the second annual report of the largest school in Melbourne, showing a very right appreciation of the importance of the work.

The other colonies are also awakening to the value of technical education. The New Zealand Government has voted 5,000*l.* towards it, and schools have been established in Sydney and other parts of New South Wales.

LIVERPOOL MAIN SEWER VENTILATION.

THE main sewers and drains of a town should be so constructed and ventilated as to convey away all sewage as fast as it is passed into the sewers, and so disperse the gases of decomposition externally unobscuringly, and all house-drains should be ventilated outside of the house, so as to prevent any sewer-gas entering.

The Corporation of Liverpool has paid to Drs. Parkes and Sanderson the nominal sum of one hundred guineas for their recent report on the sanitary state of that town; and, at the town council meeting last week, passed a vote of thanks to the doctors for their able report. Messrs. Parkes and Sanderson, in this report, point out serious defects in the sewers of Liverpool, and they recommend improvement, espe-

cially in main-sewer ventilation. The corporation, we are satisfied, will pay the doctors the highest and most gratifying compliment by at once proceeding to give effect to their recommendations. The main sewers of Liverpool are not at present sufficiently ventilated, as we have long since shown. Many of them are very foul with deposit, but if they were entirely free from sediment, consisting of putrid decomposing matter, full ventilation would be necessary. Drs. Parkes and Sanderson will have reported in vain, and the corporation will have paid their hundred guineas and their compliments in vain, unless they improve and ventilate the main sewers as soon as possible.

APPOINTMENT OF THE LIVERPOOL BOROUGH ENGINEER AND WATER ENGINEER.

THE special committee appointed to consider the applications for the above office made the following recommendation to the council:—"To appoint Mr. George Frederick Deason borough engineer, water engineer, building surveyor, and gas inspector, subject to the approval of the Home Secretary, the office to be held during the pleasure of the council, at a salary of 1,000*l.* per annum, upon the terms mentioned in the report of the general and Parliamentary committee on the duties and terms of appointment of principal officers, dated 23rd August, 1867 (so far as the same have not been subsequently varied)." In the council the recommendation was carried unanimously.

NEW OPERA HOUSE, PARIS: CAPITAL OF COLUMN.

IN connexion with the illustrations of the Paris Opera House already published in this journal,* we publish a drawing of a capital of a column under the staircase. The number of the volutes and the acanthus-leaves is the result of constructive necessities, and they are wrought with considerable grace and liveliness.

However much opinions may differ about the merits of the Paris New Opera House, there can be but one as to the originality of its design.

SAXON SEPULCHRAL MONUMENT IN THE CHURCH AT WHITCHURCH, HANTS.

THIS highly interesting monument was brought to light, a few years since, during excavations in connexion with the reparation of the church at Whitchurch; and, thanks to the good taste of the vicar, the Rev. W. M. Dudley, it is now preserved in the church, and rendered accessible. The same respect should be shown to all monuments of the long-departed, which have once found footing in sacred edifices; but, too frequently, when the direct and immediate influence of the dead has passed away, their monuments are neglected, and get displaced for others, in their turn, at some future time, to give way to the necessities and interests of the day. Benefactors to churches and to mankind, the noble, the regal, the eminent in science, art, and literature of the past, have but scanty monumental remains. From the days of the Romans until long after the Conquest, where are we to find inscribed monuments such as this, now for the first time made public? Estimate the population, compute the few visible evidences of their existence, and then the faintest notion may be formed of the annihilation of the sepulchral memorials which no sanctity of place has sufficed to preserve.

The total height of the stone is 1 ft. 10 in.; width, 1 ft. 9 in.; breadth at top, 7 in.; at base, 10½ in.

In a recess, and remarkably like some of the late Roman sepulchral monuments in general aspect, is a bust of what seemed at first, in deficient light, to be intended to represent the lady whose name appears; but Mr. Waller, who accompanied me on a second visit, on a bright day, at once detected the cross upon the nimbus, which decides, with the Book of the Gospels in the left hand, that it is the Saviour, under whose protection the tenant of the tomb beneath rested. The back is decorated with a rather elegant foliated design.

On the sides, and carried over the top, runs the inscription as follows:—

† HIC CORPVS FRITHVRGAVE REQVI
ESCIT IN PACE . . SEPVLTVM

(Hic corpus Frithburgae requiescit in pace sepulchrum.)

The fourth letter in the third word, a dot with a circle, has been found in at least one Roman inscription as equivalent to the Greek *th*; and here, no doubt, it stands for the Saxon *ð*, or *dh*. The *AV* are ligatured, the *V* inverted over the *A*. My friend, Mr. Thomas Wright, in a note, remarks,—"Frid, in *A. S.*, means peace; and the name Frithburg, Latinised in form Frithburga, means the pledge of peace." It is one of the common and very poetical class of names given by the Anglo-Saxons to females; so that this inscription sounds as if it were that "the body of the pledge-of-peace reposes in peace buried"—a bit of a pun. It is an interesting little monument, and, as you say, an evident imitation of Roman.

Its date may be assigned to the ninth century, or possibly to the earlier part of the tenth; but my friend, Mr. Haigh, is inclined to place it earlier. It is almost or quite useless to speculate on the person here recorded. She was evidently a lady of rank or eminence; and Whitchurch and its neighbourhood, as appears by the great census taken by order of the first William, were possessed by wealthy and influential people.

To Mr. C. S. M. Lockhart, I am indebted for the friendly information which made me acquainted with this rare monument; and to Mr. Waller for the drawing executed in his peculiarly faithful style. C. ROACH SMITH.

THE CITY BANK, SYDNEY, NEW SOUTH WALES; AND OTHER WORKS.

THE City Bank in Sydney, of which we give a view, is now completed, and is an ornament to the locality. It has a frontage of 51 ft. to Pitt-street, and 167 ft. to Fowles-street. The style is Italian, with a picturesque freedom of detail. The Pitt-street elevation has a projecting porch crowned with a cornice and a balustrade to the principal entrance. The elevation also is surmounted by a cornice and balustrade. The principal façade, which is of Sydney freestone, is embellished with several ornate devices in stone carving. The banking-room is 56 ft. by 46 ft., with a height of 21 ft. The counter, which consists of raised panels divided by carved lion-head brackets in pairs, faces the entrance and divides the space allotted to the public from that occupied by the officers, while over it are three arches extending across the room, and supported by groups of Corinthian columns. The ledger-keepers' desks occupy a position to the left of the entrance.

The floor of the public-room is paved with mosaic tiles supplied by Mr. Tornaghi. The ceiling is panelled and embellished with mouldings. Parallel with the counter, and immediately behind the tellers, are series of desks for the note-sorters, exchange-clerks, book-keepers, accountants, bill-clerks, and minor offices. Over this portion of the room is a central glass dome about 20 ft. in diameter, and rising some 10 ft. above the level of the ceiling. The stained glass of the dome is the work of Mr. Falconer. The manager's office is at the back of the banking-room, and is approached by a passage at the right-hand side of the counter, which also conduits to the corridor and staircase behind the banking-room, these being separated from the latter by piers and arches. Attached to the manager's office is a waiting-room. The board-room is situated on the upper floor immediately over the entrance, its dimensions being 45 ft. by 22 ft. The strong-rooms, three in number, call for special remark. Their walls are all within the bank, and are fireproof, being stone-faced and vaulted with thick brick arches. The principal strong-room is placed on the level of the banking-room, and another of good size is situated over it on the level of the upper floor, perfect dryness being thus ensured. The clerks have accommodation in respect of lavatories, cloak-rooms, &c., and provision is also made for the residence of one of the principal officers of the bank, as well as quarters for attendants. Fire-hoses supplied by separate 2-in. pipes from the city mains are in readiness for instant use on each floor, and command every portion of the building.

Mr. G. A. Mansfield was the architect, and Mr. Alexander Dean the contractor, the masonry having been executed under a sub-contract by Messrs. R. & W. McCreddie.

The same architect has recently completed a large warehouse and paper stores for the *Sydney Morning Herald*, in O'Connell-street. They occupy a frontage of 63 ft., the depth being 101 ft. The front of the building is executed with steam-pressed bricks and stone dressings. The style is Gothic, adapted to modern street architecture. The interior dimensions of the stores proper are 93 ft. by 39 ft., the remainder of the frontage being occupied by the dwelling-house for the storekeeper, and a carriage entrance, which conduits to the stables, mail-carts, and carriage-sheds at the rear. Within the entrance to the first floor, there is a loading bay, and immediately above it there is placed an American hoist, so that the bales of paper or other material can be readily rolled from the dray into the lower store, or lifted into the upper. The contractors were Mr. R. Ganthorpe for the brickwork and masonry, and Mr. B. Mahoney for the carpentering.

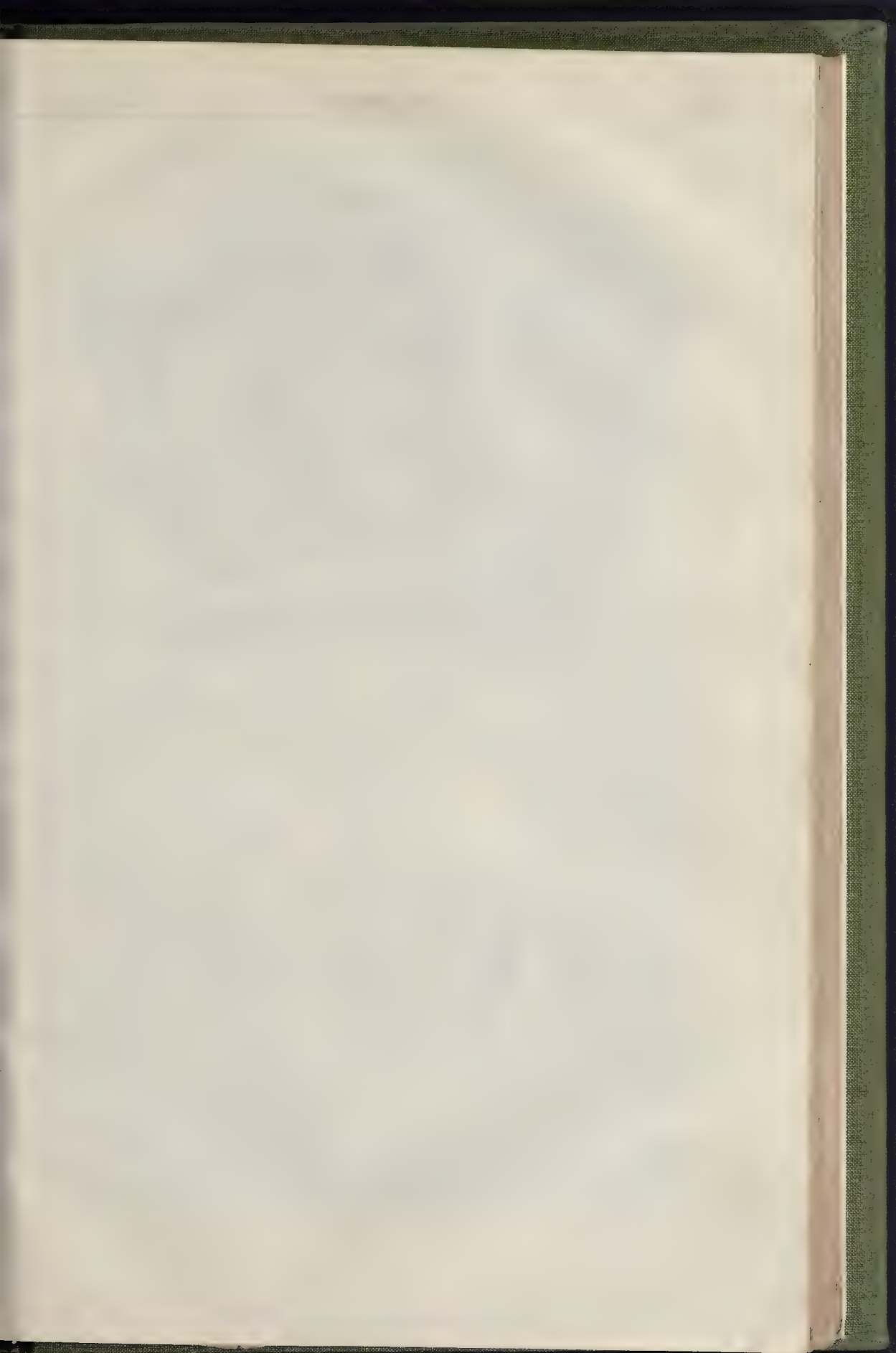
A commodious school-house, also from Mr. Mansfield's design, has been commenced, adjoining the Congregational Church, Pitt-street. The front portion of the building, which is three stories in height, will contain on the ground-floor an infants' school-room, 29 ft. by 23 ft., with passages on either side, leading to the rear of the church, and to the large school-room at the back; and at the north-western corner is a room, 12 ft. by 7 ft., for the superintendent and secretary. The first and second stories over these will contain ten class-rooms, some of which may, in case of need, be adapted as a residence for a chapel-keeper. Six of these rooms are 13 ft. 6 in. wide by 10 ft. 6 in. long; the other four are 18 ft. long by 12 ft. wide. The back portion of the land is occupied by the large school-room, which is 65 ft. long by 28 ft. wide, with gallery 15 ft. wide extending across one end. It is estimated that this room will seat 400 persons comfortably. The front elevation will be composed of steam-pressed bricks with stone dressings. The amount of Messrs. Gawthorne & Chapman's contract is over 2,800*l.*

Good progress is being made with St. Mary's Cathedral, and some extensive warehouses of ornamental character have been built, from the designs of Mr. Thos. Rowe.

The new town-hall gets on apace. The existing contract embraces all the wall masonry of the business and ceremonial portion of the building to a height externally of 56 ft., taking in pinnacles, turrets, and other decorative features which surmount the parapet, together with one story in excess of that height. One-half of this contract is completed, and has been carried out under the superintendence of the city architect, Mr. F. H. Wilson. The portico is structurally completed. It is lofty and imposing, flanked by a colonnade. The stylobate is of wrought and rubbed blue-stone, imported in its undressed state from the Victorian quarries. Massive stone lintels span the openings, and form the framework, or setting, for deeply-recessed coffers, panelled, moulded, and enriched, and all of solid stone, like their surroundings. A few steps forward, through the principal entrance, formed in walls of immense thickness, we come into the entrance-hall. This is octagonal in form, the floor vaulted beneath, and the ceiling, so to speak, vaulted or groined overhead. These and the walls, detached columns, and other features, are of wrought stone. The walls of the entrance-hall will virtually form the stepping-stone from which the clock-tower will spring to a height of some 150 ft., hence the walls are of great thickness. In the centre of the vaulted roof, or cover, there is an octagonal opening some 8 ft. across, looking upward at present into space. This, surrounded by a stone balustrade, flanks a gallery of communication between the principal corridor and the balcony over the entrance colonnade or portico. A geometrical stone staircase will start from hereabouts, and conduct to the professional offices, contractors' and record rooms, &c. Three large openings in the vestibule to the hall will admit to a spacious concert-room. The contractors are Messrs. Kelly & M'Lloyd.

It will be judged from what we have said, that our fellow-countrymen in Sydney are alive and well. They cannot over-estimate the interest the mother country feels in their successful progress.

* See pp. 846, 847, ante; and vol. xxviii., p. 465.





PARIS NEW OPERA HOUSE.—*Capital of Column under Staircase.*



SAXON MONUMENT AT WHITCHURCH, HANTS.



THE CITY BANK, SYDNEY, NEW SOUTH WALES.—MR. G. A. MANSFIELD, ARCHITECT.

PROPOSED IMPROVEMENTS IN THE METROPOLIS.

At the last meeting of the Metropolitan Board of Works a report was presented from the Works and General Purposes Committee recommending that the Board do apply in the next session of Parliament for powers to carry out several improvements, as follows:—An improvement from the western side of High-street, Shoreditch, to Old-street, at an estimated net cost of 270,000*l.*, exclusive of works; an improvement from the eastern side of High-street, Shoreditch, adjoining the Great Eastern Railway, on the north, to the Bethnal Green-road, at the estimated net cost of 300,000*l.*, including works; an improvement from Old-street to New Oxford-street, at an estimated cost of about 850,000*l.*; the widening of High-street, Shoreditch, at an estimated net cost of 164,000*l.*, including works; the widening of the Edgware and Harrow roads, at an estimated net cost of 100,495*l.*, exclusive of works; the widening of the thoroughfare from the Wapping entrance of the London Docks to Little Tower-hill, at an estimated net cost of 162,671*l.*, exclusive of works; the widening of Newington Butte, near the Church of St. Mary, at an estimated net cost of 8,500*l.*

Mr. Rantze, in moving the adoption of the first recommendation, mentioned that the late chairman, Sir John Thwaites, had said that taxation had reached its limits; but since then the circumstances of the Board had materially changed. The rating, when the late chairman expressed that opinion, was 5*d.* in the pound; but recent legislation had empowered the Board to raise money, and to spread the charge for these improvements over a number of years, so that posterity should bear its proper share of the burdens for the benefits it would receive. The rating had diminished to 4*d.* in the pound, and in future the assessment would be only 2*d.* in the pound. What they had done in the past in the way of improvements was mainly done in the City of London, as they felt that the City needed their attention more than the outside of the metropolis. The new street in the City would cost two millions of money, and what the Works Committee then desired to do was to effect improvements without the City. Having pointed out the advantages that would be derived from these improvements, Mr. Rantze concluded by remarking that the Works Committee had bestowed great pains and attention in trying to arrive at a right conclusion. He moved the adoption of the report so far as related to the improvements in Shoreditch and to the Bethnal Green-road.

Mr. E. J. Thompson seconded the motion, and after a long discussion it was agreed to.

The other recommendations of the committee were then put *seriatim* and agreed to.

THE OXYHYDRIC LIGHT.

The Crystal Palace has been lighted with the oxyhydric light already alluded to in our columns. In the transept two gasoliers at the foot of the orchestra were lighted with this light, and two with gas; on the stage of the theatre one of the large candelabra was likewise lighted in this way, and the other with gas. The gas-lights in both cases looked yellow and dingy. The oxyhydric lights were soft, steady, and brilliant, eclipsing the gas completely. The light is said to be also a commercial success, which remains to be seen. The oxygen, it is said, can be made at a commercial price; indeed, actually costs in the production no more than 3*s.* per 1,000 cubic feet; not that it will be sold at that price; and, moreover, it is admitted even by doubters, that it saves 50 per cent. of ordinary gas, which leaves an equal price for the oxygen as for the usual gas. The oxygen is obtained from the atmosphere. The common gas-light takes the oxygen it needs from the air, and the gas engineer spreads out the flame of the gas jet into "bats' wings" and "fish-tails," and other extended forms to enable it to seize as much oxygen as possible. The new light gets its oxygen pure instead of diluted. The new light, as now produced for household purposes, is perfectly conical, like a candle flame, and quite as steady; its coolness is such that the globe in which it burns may be handled with ease, and the hand held at $\frac{1}{4}$ in. over the flame without inconvenience. The oxyhydric light is not new, strictly speaking; but the present modification of it is stated to be so, and is French. Two Russian engineers are the agents in England.

The apparatus in which the oxygen is manufactured has been constructed in the basement of the Crystal Palace. Into two cast-iron retorts, three parts full of manganate of soda, heated to a "cherry red," by the furnace which surrounds them, atmospheric air is pumped through a series of tubes which pass through the fire, and thus secure its reaching the retort well heated. The air is allowed to flow in for about five minutes, during which the oxygen that it contains is absorbed by the manganate of soda. Then the air-pipe is closed, and superheated steam is turned into the retorts. The steam abstracts from the per-manganate the oxygen which it has absorbed from the air, and when allowed to escape into a condenser, carries with it this gas. In the process of condensation the steam of course resumes its original form of water, and the oxygen thus liberated passes to the gasometer. For the purposes of illumination it is necessary to combine the oxygen with the ordinary gas, and this is effected by having a double set of pipes, ending in twin pipes (or one pipe divided into sections), in the gasoliers, which allow the two gases to mix exactly at the point of inflammation, and produce the bright white light already described. The oxygen enters by perforations surrounding the central jet of ordinary gas. This light, it is stated, may be obtained by the consumption of even less than one-half the quantity of gas now consumed. The daily papers state that besides the economy of consumption, it is claimed for this combination of gas that, "its combustion is so perfect, that in the process no carbonic or sulphuric acid is given off." This is a preposterous claim. The more complete the combustion, the more thoroughly will the carbon and sulphur of any gaslight be converted into carbonic acid and sulphuric acid, which just are carbon and sulphur completely combusted.

The Galet Theatre in Paris has for some time been lighted by means of this gas, or combination of gases, the brilliant effects of which, as exhibited externally, were familiar to most loungers on the Boulevards little more than a year ago; and experiments upon a large scale are now being tried in Vienna, Brussels, and New York, with a view to its general introduction into those cities.

THE MEDWAY GAULT BRICK AND CEMENT COMPANY.

The Medway Gault clay fields, on the banks of the Medway, in the parishes of Barham and Aylesford, containing about 57 acres of deep beds and thick strata of blue Gault brick clay, from which are manufactured the well-known Barham Wirecut Gault bricks, and which is specially adapted for the manufacture of Portland cement, are well known. These Gault bricks were largely used in the construction of the high-level sewer, the Thames Embankment, St. Thomas's Hospital, and many other important works. Our advertising columns show that a company is being formed to manufacture these bricks, taking to works and extensive plant that already exist; also to produce Portland cement in large quantities. We happen to know that some very honourable people are connected with the undertaking, and we feel perfectly safe in commending it to the attention of our readers.

OPENING OF QUEEN VICTORIA STREET, CITY.

The new street connecting the Thames Embankment, on the northern side, by a broad thoroughfare from Blackfriars Bridge to the Mansion-house, with the heart of the City, was opened on Saturday last. The new street, as most of our readers are aware, has been constructed by the Metropolitan Board of Works. It completes an improvement, portions of which have been previously opened in sections during the last three years. The entire improvement extends from the Houses of Parliament to the Mansion-house, and connects by a commodious thoroughfare the two centres of legislation and commerce. Its western portion, formed on the land reclaimed by the Embankment of the Thames, extends from Westminster Bridge to Blackfriars Bridge, a distance of $1\frac{1}{2}$ mile, the roadway for the entire distance being 100 ft. in width. The eastern portion, which is that named Queen Victoria-street, extends from Blackfriars Bridge to the Mansion-house, and is about two-thirds of a mile in length, and 70 ft.

in width, except for a short length of about 80 yards between Great Trinity-lane and Cannon-street, where the width is only 50 ft. This portion, heretofore known as New Earl-street, and formed many years since as an instalment of a then projected thoroughfare from Blackfriars Bridge to the Mansion-house, but at the time not further proceeded with, detracts from the convenience and architectural effect of the new street.

The frontage of the north side of Queen Victoria-street has been made to range with the frontage of New Earl-street on the same side, with a view to the attainment of this object at a future day. The western portion of the improvement, extending from Westminster Bridge to Blackfriars, now known as the Victoria Embankment, was opened for its entire length by the Prince of Wales in July, 1870, and of the remainder (Queen Victoria-street), a length of 300 yards at its eastern extremity, from Cannon-street to the Mansion-house, was opened to the public in October, 1869; a further portion, from Blackfriars Bridge to St. Andrew's-hill, a length of 220 yards, in January last; and a further length of 200 yards, in continuation to Bennett's-hill, in May last. The portion just finished, from this point to New Earl-street, and which completes the thoroughfare, is 330 yards in length. This piecemeal opening of the street has been necessitated by the delay in constructing the Metropolitan District Railway, which passes under its surface from St. Andrew's-hill to New Earl-street.

FLOODS IN INDIA.

SIR,—By the last Indian mail, I received a letter from a friend of mine in Oude; in this he gives some account of the extraordinary floods that have occurred there during the past "rainy season," which goes to show that these floods, which we have heard so much about, were not confined to the North-West and Punjab alone, but extended throughout the province of Oude, and that North Indian railways were not the only sufferers. My friend says:—

"We have just been having most awful floods,—days and days of incessant rain,—not common rain, but in perfect torrents,—and the distress it has caused, and the lives that have been lost by the falling of houses and drowning is very dreadful to think of. The old men, with white beards, stroke them, and say, they have never seen such floods. Hundreds of men, women, and children have had to stay in the streets, without food or covering at all, except the wet rags on them."

My friend then goes on to state that the damage done to some of the public works is very great. Many of the bridges on the "Pucka" road from Lucknow to Fyzabad are entirely washed away (some of these bridges being large ones built upon wells sunk 40 ft.), and so great is the damage done to this road that all communication between the two places is out of.

He goes on to state that the works of the Oude and Rohilkund Railway have suffered heavily; that in places the works have been entirely washed away; and that probably there is as much work to do on some sections as when they commenced the works three years ago. These disasters probably account for the slight fall in the shares of this company.

C. NAMRASS.

REOPENING OF ST. GEORGE'S, HANOVER SQUARE.

This celebrated metropolitan church has been re-opened for divine service, after having undergone extensive alterations and repairs. The interior stood in great need of an overhaul, and for that purpose advantage was taken of the season when families are usually absent from town. Mr. Benjamin Ferrey was employed as architect, and the contractor for the works was Mr. B. B. Sapwell. The sum which the committee had decided on spending was about 1,200*l.*; but having once entered upon the task, the churchwardens found that sum insufficient, and the entire cost was about 2,000*l.* The height of the pews has been much reduced. The pew doors have been still further reduced, consisting now of only the lower panel, surmounted by suitable carved scrolls. At the same time the old canopy over the pulpit has been removed, and the reading desk cut down to more moderate dimensions. The effect is enhanced by enlargement of the lower windows, so as to admit more light to the body of the church, and dispel some of its superfluous gloom and dinginess without introducing any-

thing like glare. The colour of the pews is a dark brown, and contrasts with the mild light colour of the walls, the ceiling, and the pillars. The ceiling panels are a light grey, with cream-coloured styles and white enriched moulding, divided by a cinnamon stripe. The carved fruit and flower decorations behind the communion-table, and the fluted columns on either side, have been retouched with gold. The picture of "The Last Supper," and the stained glass windows above, have also received some attention. The organ at the opposite end of the church, and the royal arms in front of the gallery beneath, have had a little fresh gilding and painting. The front of the gallery has been covered with crimson velvet, and the entire body, but not the entire gallery, of the church has been furnished with new crimson cushions. The panels of the pulpit in the cleaning have been found to be insalid, and are now fully exposed to view.

IRON SHIPS.

SIR,—I was recently shown over the works of an iron cask and can manufacturer. I was most interested in the atmospheric test that each can and cask, when submerged, underwent. If bubbles arose it was rejected. I was informed that power, sufficient to burst open the weakest plate, could be applied, or to detect faulty welding, riveting, &c. Sir, could not this principle and power be adopted to test iron ships previously to every voyage, even when loaded. I am acquainted with their behaviour at sea, and have examined fore and aft some of our largest iron craft. I see no obstacle to the above being used to guard them from disasters arising from undetected oxydized plates: it may save some from the fate of the old *Megara*. R. T.

THE BIRMINGHAM SEWAGE QUESTION.

AFTER four days' debate, the town council of Birmingham has decided between the competitive schemes for the disposal of the sewage of the borough. The plan of the Public Works Committee was to utilise the sewage on an irrigation farm. The Sewage Inquiry Committee proposed an alternative plan. The council rejected the former plan, and adopted that of the Sewage Inquiry Committee, by a majority of 33 to 23 against the advocates of sewage farming, and in favour of the Inquiry Committee. The leading features of the scheme adopted, as our readers may recollect, are the interception from the sewage of excrementitious and noxious chemical matter, and its purification by filtration; the gradual abolition of middens and the substitution of a new privy system; the imposition of a rate on occupiers in respect of water-closets connected with the sewers; and the experimental adoption of the Rochdale and Manchester systems.

THE NEW MARKETS AT KIDDERMINSTER.

THE new cattle and vegetable markets, constructed from the plans of Mr. J. H. Moore, the borough surveyor, have been opened without any civic ceremonial. These markets have been erected at the public expense, under the authority of the local Board of Health. The situation is central, and forms a nucleus to the leading thoroughfares of the town. The main entrance is from the Worcester turnpike-road, on the east. On the north the markets are bounded by Caldwell-row, and on the south by a new street, as yet unnamed. The northern side of the markets is enclosed with a dwarf wall and palisades, and the south by a wall. In the cattle-market there are pens for 1,400 sheep and 250 pigs, together with standings for 95 cows (exclusive of a covered shed to hold 15) and 80 horses. The vegetable-market is capable of containing 250 carts, with horses, allowing a superficial space for each horse and cart of 14 square yards, and there are 18 brick-built and slate-covered sheds, paved with bricks, for the storage of fruit and vegetables. There is also stabling for a large number of horses, including stalls, loose boxes, harness-rooms, &c., together with large cart-stores, for the use of the horses and carts used in the cleansing of the streets.

The entrance-lodge and gates are in the Elizabethan style, having a frontage of 60 ft. to the Worcester turnpike-road. The house contains a dwelling for the superintendent, and offices for market and weighing-machine tolls. The ma-

chine is one of Avery's best, capable of weighing 10 tons. The principal entrance-gates, which are 13 ft. wide, are of cast iron, with four cast-iron columns, 9 ft. high, with dwarf pillars and lamps on the two centre ones. There are also two side-gates, for foot-passengers, the larger gates being, of course, reserved for cattle traffic. Water-mains, with branch supplies and taps, are provided for watering the closets, and are ready for connexion with the waterworks now in progress, as well as the necessary outlet for drainage into the sewers. The markets are in the form of an irregular square. The contractors are Messrs. Goodman & Burmore, builders; and the amount of the contract, 1,895*l*. The whole stands on about 2 acres of land.

INTERNATIONAL COMMUNICATION: CONCRETE.

SIR,—We have now just completed five first-class houses, five stories high, built entirely of Portland cement concrete; the roofs of outer offices, area and front door steps, balcony landings, paving, and the water-tanks now containing between 600 and 700 gallons of water, we have successfully cast of that material, in the roofs 2½ in. in thickness and the shape of the curb.

As I have now had considerable experience in the use of concrete, I can testify as to the value of that material for building purposes, and consider it well adapted (both as regards cost and strength) for constructing a tube or tunnel under the Channel.

The plan I propose is to make the tunnel to ascend towards mid-channel, and the approaches at either end to be of sufficient grade to give impetus to carry the train well past the half.

In carrying out this construction, I should build in 10 ft. or 12 ft. lengths, and lay down in the centre of roadway one or more iron pneumatic tubes, which could be used as drains until the tunnel was completed; iron bolts for securing the metals could also be bedded in at the same time.

My plan of shield and centreing is simple, and expressly adapted for using concrete; the workmen being inside instead of outside of centre, would enable me to drive a tunnel with safety either through clay or sand.

The rolling stock for this railway might be of a lighter description, wider metals used, and wheels so constructed that rubber tires could be introduced with advantage.

A stationary engine at either end of tunnel would be sufficient to pump in air, work the pneumatic tube, and pump out the water if necessary.

To give the details of this plan, with proposed sidings and method of bringing the train up the incline at each end of the tunnel (without stopping to attach an engine, would occupy too much of your space; but should the foregoing suggestions be worth consideration, I shall be happy to supply drawings of the shield and centreing, and further explain my mode of operation. R. H.

THE ASPHALTE PAVEMENTS IN THE CITY.

A REPORT to the Streets Committee of the City Sewers Commission upon granite and asphalt pavements by Mr. Haywood, C.E., engineer and surveyor to the Commission, has been printed and issued.

The general conclusions of this report are as follows:—

Firstly.—That asphalt carriage-way pavements afford much convenience and comfort to the traffic, and to the inhabitants of the streets in which they are laid, and that they lessen the labour of horses and the wear of carriages.

Secondly.—That with great cleanliness and reasonable care during frost, asphalt pavements are, for the general traffic, as safe as granite; but that shortly after slight rain, and just before dryness ensues, in streets of much traffic, or when not kept clean, they are more slippery than granite, but that the duration of these periods of slipperiness is but short.

Thirdly.—That great cleanliness is essential to them; that they can be kept cleaner than any other class of pavement; that the cost of doing so is not much more than that of cleaning other streets; and that, with proper cleanliness, street-watering is unnecessary.

Fourthly.—That an asphalt surface can be laid and repaired as quickly as granite, but

requires finer weather for its proper execution; that when done, the work causes less inconvenience than granite; that less surface need be taken up for repairs over openings, but that the cost of the repairs will be greater than that of granite.

Fifthly.—That the durability of asphalt will be less than granite, but in what degree there is no experience in this country to show.

Sixthly.—That the first cost of asphalt is about the same as granite, but that the maintenance will be more expensive in streets of large traffic, and will vary according to the character of the road and the traffic over it; and that generally, therefore, asphalt will be more expensive than granite pavements.

Seventhly.—That asphalt will be less expensive than macadamized roads where there is much traffic, and is free from the inconveniences of macadamized surfaces.

Eighthly.—That with present experience it is not advisable generally to lay down asphalt in carriage-ways having steeper gradients than 1 in 60.

Ninthly.—That asphalt is adapted to all streets having suitable gradients, excepting those in which special or exceptional trade or business is carried on, and where it may be difficult to maintain a high state of cleanliness.

To avoid misapprehension, Mr. Haywood states that he has referred mainly to the compressed asphalt of the Val de Travers. His general conclusions are, therefore, only strictly applicable to that material, and but partially to the liquid asphalts of the same company, and to those of the Limmer Company and Mr. Barnett. The report also applies exclusively to carriage-way pavement.

This report, which contains the opinions of the manager of the General Omnibus Company, and others who ought to know, appears to settle the question of the relative safety of asphalt pavement as regards the fall of horses. It is stated that, on the whole, fewer horses fall on it than on the granite pavements; and although the falls are more frequent just after the pavement has been wet with rain, and before the waste has been washed off by more rain, it must be remembered that granite, too, has its own disadvantages as to slipperiness at certain times; and in the case of the asphalt, the remedy is practicable, either by sweeping while dry, or by hose, or by rain itself, when damp.

OPENING OF THE

MIDLAND RAILWAY COMPANY'S COAL DEPÔT AT WALWORTH.

ONE of the largest coal depôts in the metropolis was last week opened for business. This structure, which has been erected by the Midland Company alongside the London, Chatham, and Dover line, near the Elephant and Castle, Walworth, for their coal traffic from Derbyshire, Leicestershire, Nottinghamshire, and other counties, is 460 ft. long and 92 ft. wide, in addition to a large space occupied by its junction with the main line of the Chatham and Dover Company, and covers an area of more than one acre in extent. It is built on 200 strong wooden piles, which have been sunk into the ground to a depth of 25 ft. below the surface; the eastern margin, alongside of which the coal will be delivered, being supported by twelve iron columns, upon which a strong iron girder runs the entire length of the floor level above. Two lines of railway on each side of the area of the depôt run parallel with the main Chatham and Dover line, connected with which there are twenty-three longitudinal lines extending across the entire area of the depôt. About midway of the siding immediately adjoining the Chatham and Dover line, there is a large turntable, supported from beneath, in addition to the piles already named, by a circular mass of solid brickwork filled in with concrete, the foundation of which is 15 ft. deep. From this turntable the coal-trucks are conveyed on to the cross or longitudinal lines, and to the shoots beneath, by a steam traverser permanently placed upon the depôt. The shoots, which are forty-six in number, in twenty-three bays, containing two in each bay, are sufficiently large to hold about seven tons of coal each, the average contents of a coal-truck. Spacious as is the depôt just opened, the intention of the company is to extend it still further northwards to about two-thirds of its present length, when it will occupy an area of nearly two acres in extent. This

extension will be at once proceeded with on the company getting possession of the land.

The cost of the works (exclusive of the land), which have been executed by Mr. George Wall, contractor, of Kentish Town, is 80,000l.

COMPETITION.

School Buildings, Worcester.—It is announced by advertisement that the time allowed to architects to send in plans for the erection of school-buildings in Worcester is extended from November 30th to December 31st, 1871.

CONSTANT WATER SUPPLY.

Sir,—The pin-hole system is objectionable, as it necessitates storage, or waste of time to the consumer in obtaining it from the pipes. I have given this matter my consideration, and have invented an apparatus whereby waste is prevented,—that is, any quantity of water can be obtained by the consumer, without delay and without stint; but directly the water is wasted the supply is cut off, and obtainable again by means of a lever. This apparatus cannot be tampered with by the consumer, and, as I now have it fitted up, forms a trough.

You, no doubt, know that this city, Exeter, is beautifully watered, yet the water question has been discussed here for some time, our local Board demanding a constant supply from the water company. We have most excellent water; but there is no doubt that it becomes foul by storage in cisterns. This should be altered; but how, and in what way? Water pumped, stored, and filtered by a company makes it become a manufactured article; therefore a fair price must be expected for the quantity supplied: on the other hand, water is necessary to keep man alive. It is not a luxury, but a necessity, and must be obtained pure for life and health. Then, what is to be done? Give every one as much pure water as he requires, but prevent wasting. It is no use saying a man consumes so much water a day. You may as well say every man drinks so much beer a day. It may average so much. There is the folly of allowing each man so much water. One has more than he requires, and another has not enough. Every person does not consume alike; then, why measure alike? Some persons are very clean, and require water for bathing, washing. These persons are generally provident. Others scarcely touch it, for water does not suit their palate; and as for washing themselves, that is rarely done. Considering all points, it is clear the only protection a water company should have is against waste. The supply should be plentiful, for which no one should begrudge payment. P.

THE SEWAGE FARM AT MERTHYR TYDVIL.

THE system of purification adopted on the land below Treacrythi is not the usual irrigation, but a scheme devised by Mr. J. Bailey Denton, the engineer appointed by the Court of Chancery, which he calls intermittent downward filtration. Twenty acres of land have been parcelled out into four panels of equal areas. The whole piece has been drained to a depth varying from 4 ft. to 7 ft., the drains serving the double purpose of collecting and carrying off the subsoil water and the sewage-water. The surface of each parcel has been carefully prepared for the equable distribution of liquids. The sewage, after being turned on to the land, is left to find its way, by percolation or filtration, to the drains beneath, the theory being that in its passage through such a depth of soil, by the time it drops into the drains it has become thoroughly purified, all its offensive solids being left behind, and the noxious elements held in solution being decomposed and absorbed by the decaying power of the soil, of which the sewage is thus made the inessential fertilizer. There is said to be an entire absence of odour in walking round the beds on the farm. The crops now growing—turnips, mangolds, cabbages, caryops, Brussels sprouts, broccoli, and winter greens are described by visitors as being really of magnificent growth. Many of those present tasted the water after filtration through the soil: it has a strong chalybeate flavour, and certain indications of the presence of iron; but

Dr. Paul, who has already analysed it, says in effect that it would be a boon to the Londoners if they could get drinking-water of equal purity.

THE SOUTHBOROUGH SURVEYORSHIP.

THE Local Board of Southborough being in want of a surveyor, the chairman, at a recent meeting stated that there were no written applications for the office, but Mr. Frederick Gallard had intimated his willingness to take it at the same salary and on the same terms as his cousin, the late surveyor,—viz., 80l. per year. Mr. W. H. Wright, architect, of Tunbridge Wells, had offered to undertake the office for 50l. He did not think they ought to expect to get one for less than 50l. Mr. Wright would engage to attend at Southborough two or three times a week as occasion might require, and would always keep a clerk at his office in Southborough, so that he might be at all times communicated with. If they elected Mr. Wright, they would be choosing a man who was thought efficient. It was resolved that Mr. Wright's offer be accepted, subject to three months' notice.—Mr. Skinner remarking that he did not like holding up his hand for 20l. a year additional expense to the ratepayers.

THEATRICAL.

At the Haymarket "The Rivals,"—always put up here when a break occurs or a new piece has to be waited for,—drew good houses, showing that there is still an audience for our old comedies when decently presented. The *Bob Acres* of Mr. Bookstone is a piece of acting of which we shall tell our grandchildren by and by. Mr. Chippendale's *Sir Anthony* is also a thoroughly artistic performance, and Mrs. Chippendale is a very good *Mrs. Malaprop*. Since then, "She Stoops to Conquer" has been going very well, though only moderately well played. The lessee still remains the *Tony* of our time, notwithstanding the very clever personation given by Mr. Brough at the St. James's some time ago, and carries the house with him uproariously. Miss Robertson's *Miss Hardcastle* is an agreeable performance, but wants light and shade.

Drury Lane.—Why does Mr. Phelps, in "Rebecca," continue to exclaim night after night "In the name of He that made us all"? He must surely know better. Mr. William Warren, too, in the part he plays so admirably well in "Apple Blossoms," at the Foyeville Theatre, says, "That was me." He would not say it off the stage; it is probably written for him, and so he says it. The use of "me" for "I" and "he" for "him," disfigures nearly every piece that is produced.

St. James's Theatre.—The alterations here to fit it for the French plays, have been carried out under the direction of Mr. Walter Emden. The dress-circle has been transformed into private boxes, tastefully decorated.

BUILDERS' BENEVOLENT INSTITUTION.

THE twenty-fourth annual dinner in aid of the funds of this Institution took place on Thursday evening, the 2nd inst., at Willis's Rooms, King-street, St. James's. Mr. George Plucknett, of the firm of Cubitt & Co., and treasurer to the Institution, presided, in the unavoidable absence of the President, Mr. Joseph Taylor, of the firm of Messrs. George Smith & Co., and there was a large attendance of the members and representatives of most of the building firms in and around London, the guests numbering about 200. The usual loyal and patriotic toasts having been duly honoured, Captain Bird, of the Victoria Rifles, responding to that of "The Army, Navy, and Volunteers," with which his name was coupled;—the Chairman, in proposing the toast of the evening, "The Builders' Benevolent Institution," urged the company present to subscribe to the funds of the charity to the utmost extent of their power, for the money would not be wasted. He had for a long time actively co-operated with those who conducted the working of the society, and he knew that everything was managed in the very best and most economical way, and in a manner conducive to the general welfare of the Institution. There were now forty-six pensioners on the funds of the Institution, and though, on the whole, the Institution had progressed satisfactorily since its establishment in 1847, it now strongly appealed to the building and kindred trades for increased support, on

the ground that it was not able to accomplish all that could be wished. At every election four or five poor old applicants were obliged to be sent away because the funds of the Institution were not sufficient to allow of the election of all the candidates. The elections only took place half-yearly, and six months was a long time for those who were seventy or eighty years of age to be put off; to say nothing of the fact that some of the applicants had to wait five years or more before they were elected. He therefore asked the building trade to do its duty to the Institution, for he held that, next to one's own family, it was a man's duty to endeavour to do something towards providing for those of his own calling who had not been so fortunate as himself. A few months ago his (the chairman's) old partner, who had been a liberal contributor to the funds of the Institution for many years, was on his death-bed, but he thought of the Institution, and left it a legacy of 500l.

Mr. G. Bird, the late treasurer, in proposing the toast of "The Chairman and Treasurer," said that the Institution had always found in Mr. Plucknett a first-rate treasurer and a great friend to the charity. He had also, at a very short notice, undertaken the duties of Chairman that evening, and had fulfilled his position with great ability. He (Mr. Bird) regretted, however, that many of the old friends of the charity were not present to support Mr. Plucknett. The Institution had not progressed, in his opinion, so satisfactorily as the Chairman considered it had. He had hoped that by this time they would have had a building fund of at least 5,000l.; not that he wished to see the Institution building almshouses or a workhouse, for he considered that, in most cases, it was a mistake to erect such buildings. However, he occupied the position of Master of the Bricklayers and Tyers' Company of London, and there was a proposition now before the Court of that Company to give an almshouse or two to some of the most deserving of the recipients of the pensions given by this Institution; and if the friends of the Institution would support the scheme, he thought that, with the assistance he should be able to give as Master of the Company, it would be carried out. Many of the old building companies of the City were very poor, and were fast dying out. His own company was a poor one, and had not much to give away, but it had very comfortable almshouses at Ball's-pond, and he thought that, with very little difficulty, some of these might be made available for a few of the poor recipients of the Institution's pensions.

Mr. Thomas Piper, in responding for "The Patrons, Vice-Presidents, and Trustees," said he took a more satisfied view of the progress made by the Institution than Mr. Bird did, remarking that the only disappointment he experienced that evening was caused by the absence of the excellent President of the Institution, Mr. Joseph Taylor. He was glad to hear what had fallen from Mr. Bird with regard to the Bricklayers and Tyers' Company and the Institution; for he felt convinced that the old guilds and companies would have their lives prolonged and their usefulness extended by co-operating with more modern institutions in the cause of charity and other good works.

Mr. Rogers next proposed the toast of "The Architects and Surveyors," coupled with the name of Mr. James Barnett.

Mr. Barnett briefly acknowledged the compliment; and then, Mr. A. G. Harris, the secretary, announced subscriptions and donations to the extent of 369l.

VALUATION OF HOUSES.

Sir,—Will some of your readers inform me a safe percentage to deduct from the annual rental of a house (in estimating the value for mortgage, &c.) to allow for ordinary repairs, and also painting, &c., every three and seven years, as usual, covenanted in lease? I find opinions differ in this respect very much. E. S. S.

A PARTY-WALL QUESTION.

"THE CRITERION."

AT Marlborough-street, Mr. John Bettys, of 222, Piccadilly, was summoned, before Mr. Knox, for unlawfully obstructing a workman employed to execute certain work in pursuance of the Metropolitan Buildings Act, 1865, upon the premises No. 221, Piccadilly, intended by Messrs. Spiers & Pond for a concert-hall and restaurant. We mentioned the case when it was first argued.

Mr. Knox, in giving judgment, said the facts of the case were simple enough. Messrs. Spiers & Pond were engaged in the erection of a certain building within the district. They became in this way invested with certain rights as against the owners of the adjacent property. They had settled with all save the present defendant. In a legal sense this was the case of a difference between the building owners and the adjoining owner. The Building Act gave certain rules which were to be observed by building owners and adjoining owners with respect to the operation of their respective rights. The Building Act provided that in case of such difference, each of the parties was to appoint a surveyor, and the two surveyors were to select a third surveyor, and between them they were to determine the right to do, or the time of doing, any work, and, generally speaking, any other matter arising under such difference. The meaning of the Act was usually clear. The difference had arisen, each owner had appointed his surveyor, but the surveyor on the defendant's behalf simply refused to join in the selection of the third surveyor, and so neutralized the working of the Act. The intention openly avowed was to delay the progress of the building, unless Messrs. Spiers & Pond would agree to a "general reference" in place of the reference provided in the Building Act. In other words, the defendant wanted compensation under heads for which he would

not obtain it under the Building Act, and as he thought he had Messrs. Spiers & Pond in a cleft stick, he directed his surveyor to do nothing, hoping in this way to drive the building owners into a compromise. This was an illegal and, as he thought, not a creditable proceeding. Messrs. Spiers & Pond had elected to try the case before him, under the 88th section, which gave the building owner the power to make entry on premises to effect works. They had sent a workman in who had confessedly been "hindered" and obstructed, and they asked the magistrate to impose the penalty of 10l. He was afraid he had no such power. The building owner must exercise his rights in the manner pointed out under the 88th section, and not otherwise. He regretted this was so, but he could not alter the law. The proper course, in his opinion, was for Mr. Evelyn to apply to the Queen's Bench for a mandamus, which was usually granted when there was a specific legal right, but no specific legal remedy. In the case of "Regina v. Goodrich" it had been decided that a mandamus would lie to two arbitrators to appoint an umpire under a Canal Act, which was on all fours with the present case. He must dismiss the summons, but he did so reluctantly, for he strongly felt that here there was a very improper attempt to defeat the plain provisions of an Act of Parliament.

LANDLORD AND TENANT.

SIR,—With reference to your report of an action for damage to a chandelier, because the attention of the landlord was drawn to the house being dilapidated generally and the ceiling specially, it may be useful to reiterate that,—A landlord is nowise, at common law, impliedly liable to a tenant touching repairs, although premises are in such a condition that they cannot be occupied, or, it may be, have fallen down, or are blown up, or burnt; while the tenant must still pay rent until the due termination of his legal holding. Neither is a tenant free to execute essential work and deduct the cost from rent accruing due to his landlord, even where the latter has agreed to do repairs, and neglected them; the remedy against him then being by action of assumpsit, or for breach of contract, or, if founded on stipulation in a deed, for breach of covenant. So Cole, in "Woodfall," observes:—

"There is never any covenant or promise implied at law on the part of a lessor of a house or other premises reasonably fit for habitation, nor that the house will endure during the term, nor that the lessor will do any repairs whatever. Even where the premises become in a dangerous state for want of substantial repairs, and a landlord has notice to that effect, there is no implied obligation on his part to do any such repairs."

It is never, under any circumstances, implied at law that a tenant may quit, if repairs are not executed; for, as Lord Wensleydale laid down,—
"When parties mean that a lease is to be void on account of unfitness of the premises for the subject for which they are intended to be used, they should express their meaning."

E. L. TARBURCK.

A BUILDER'S ACTION.

KIMBERLEY v. DICK AND WHITE.

THE defendants in this suit, of which we gave a report some time ago,* are Mr. William Wentworth Fitzwilliam Dick, M.P. for Wicklow, and Mr. William White, the architect, of Wimpole-street; and the suit arose out of a contract entered into by the plaintiff, who is a builder at Banbury, to erect a mansion for Mr. Dick at Homewood, in the county of Wicklow. It appeared that in the beginning of 1866 Mr. Dick decided on building the mansion in question. He consulted Mr. White, who prepared plans and specifications, from which he considered that a mansion could be built at a cost not exceeding 15,000l., including everything, and he gave a guarantee to that effect. The plans and specifications were approved by Mr. Dick, and put into the plaintiff's hands, and he, without having, as he alleged, sufficient time to work out the quantities, signed a tender, and afterwards, in June, 1867, entered into a contract for the due execution of the work, according to the plans and specifications, to the satisfaction of Mr. White, at the price of 13,600l. There was a clause in the contract referring all questions as to additional works and variations of the plan to the arbitration of Mr. White, whose decision was to be final. The plaintiff proceeded to build the mansion, but soon, as he alleged, discovered that the actual quantities were greatly in excess of those taken out by Mr. White, upon the footing of which he made his tender, and on this and other grounds he filed his bill, praying a declaration that, in addition to the contract price of 13,600l., he was entitled to be paid by measurement and value for all quantities of work actually executed by him beyond the quantities included in the original estimate, which he alleged to be wholly inadequate. Mr. White, on

the other hand, denied the existence of any liability to the plaintiff, except under the contract, and refused to certify for the additional work; while Mr. Dick contended that he had agreed with Mr. White that the mansion was to be built for 15,000l., including everything, and offered to pay that sum upon receiving the architect's certificate, but nothing more.

Mr. Southgate, Q.C., and Mr. Begg appeared for the plaintiff; and Sir Richard Bagallay, Q.C., Mr. Jessel, Q.C., Mr. W. Pearson, and Mr. Cosens-Hardy for the defendant.

The Master of the Rolls, on the 3rd inst., after stating the facts of the case, said that he was of opinion that the materials supplied to the plaintiff on which to base his tender were extremely meagre, and that sufficient time for consideration was not given to the plaintiff when he signed the contract, he being very ill at the time. He was also of opinion that Mr. White was Mr. Dick's agent for all purposes connected with the contract, without any limitation as to price, and the circumstance of the agreement as to price between Mr. White and Mr. Dick not having been communicated to the plaintiff rendered it impossible for the defendant to insist upon the arbitration clause, inasmuch as under it Mr. White had a direct personal interest in keeping down the total cost to 15,000l. After perusal of the evidence, his Lordship thought he should be inflicting undue injury on the plaintiff if he left him to his remedy at law. The accounts were too complicated to be disposed of at law, except by a reference, which his Lordship asserted, from experience, to be the most dilatory and expensive of all tribunals. His Lordship then directed an account of all works executed by the plaintiff under Mr. White's direction, and not included in the contract, and adjourned further consideration.

DESCENDING FLUES.

SIR,—Can any of your readers oblige me with any information upon the proper construction of a descending smoke-flue, or give the particulars of a stove which has, from personal experience, effectually answered this purpose. In this case, the stove to be placed about 30 ft. from the chimney, and I wish to avail myself of the horizontal smoke-flue for warming purposes; but as the stove must be on the same floor beneath which the horizontal flue will be formed, there must, of necessity, be a descending flue of about 3 ft. at the back of the fireplace.

I have invariably found some difficulty with horizontal smoke-flues, unless the fire is placed well below the flue; but probably some of your readers, who are better versed in the difficulties connected with descending flues; and if so, doubtless many others besides myself would be obliged if they will make it known. B. A.

THE SEWERS OF ST. GEORGE'S, HANOVER-SQUARE.

THE Surveyor of St. George's (Mr. H. T. Tomkins), in obedience to instructions, reported to the St. George's, Hanover-square, Committee, on Tuesday, that there were in the parish 298 manholes in sewers without ventilators. Mr. Walker asked him if he considered there was any danger of explosion from accumulations of gas in these manholes, as he understood a writer in the *Builder* to infer. The surveyor replied that a man going along the sewer would for safety hold the candle near the bottom, and if due precaution were observed, no accident could take place. The men had printed instructions on this subject. If the gas in a manhole accumulated, it would be detected at once by the smell. Referring to the case of a man who was injured by an explosion of gas in a sewer, he said he believed it must have occurred through carelessness. The man, it appeared, had written to the Gas Company for compensation, and the company, believing the gas had accumulated in the sewer, denied their liability, and referred him to the vestry. The clerk, in answer to a question, said he did not remember an accident of the kind before. The surveyor stated further that now, when a manhole is built, a ventilator is placed on the top of the brickwork. The committee then passed on to the next business, without entertaining the question of compensation.

THE RIGHT TO OPEN A GATEWAY ON TO A PUBLIC WAY.

DEAN V. THOMAS.

THE question raised here was one of great importance as to the right of owners of land abutting on a public way to open doors or gates into it. The parties are neighbours, and the place in dispute is a narrow lane running between their land. The lane had been used by the public for half a century, people going up and down it, though rarely, as the place was in a rural district. The defendant had lately opened a gate from his land into the lane, and the plaintiff, as the owner of the soil, complained of this as an unlawful encroachment.

The case was tried at the last Surrey Assizes before Baron Bramwell, and it was found that the plaintiff was the owner of the soil in the lane, and that the lane was a public highway. On this point the jury returned a verdict for the defendant, holding that any one whose land abuts on a highway has a right to open gates or doors into it at pleasure.

J. J. Brown, Q.C., moved, on the part of the plaintiff, to set aside this verdict, arguing at some length that the public were limited in their right to use the lane, and could only go up and down from end to end, and that the defendant had no greater right than any other abuttor.

The Court, however, were from the first quite clear that this view could not be sustained, and that it involved a downright absurdity. Suppose, said the Lord Chief Justice, that I dropped in the lane from a balcony, and took my horse over it in hunting, should I be a trespasser? It was manifest, and, indeed, it was admitted, that this would be so according to the common law; and the plaintiff, surely, said the Lord Chief Justice, this would be contrary

to common sense. Is a gentleman a trespasser who jumps over his park wall into the road? There was no trace here of any limitation of the ordinary right of the public on a highway, and that was to go over it in any direction, and to open gates into it at pleasure. This was too clear to be disputed. The rest of the Court concurred, and the application was refused.

ORANGE PEEL: A HINT TO THE POLICE.

THE usual season for accidents to limb and life from orange-peel on the pavement is now commencing, and will last till next June. If cards were printed and distributed to each shop and stall keeper by the police, with something like the following words on them,—
"Please do not throw orange-peel on the pavement, as it is dangerous," the people who now, *without thought*, do throw it on the pavement, would abstain from doing so. The cards might be about 8 in. by 7 in., and should be placed at all shops and stalls where oranges are sold, especially at stalls. W.

CHRISTCHURCH, HANTS.

CANNOT you go to Christchurch, Hants, and get the good folks there to do something in the way of lighting and drainage? I think they have about seventeen lamps in the town, and I do not think they light them. The sewage runs down in a storm-gutter open to the street, and it,—smells.

The fine old church attracted me to the place, and I was much struck with the miserable appearance of many of the so-called cottages,—wretched old thatched hovels they are. No wonder if Christchurch gets fever or small-pox. Wake up, Christchurch!

CONSTANT READER.

THE TRADES MOVEMENT.

London.—A large meeting of bricklayers has been held in London for the purpose of taking measures to again obtain the standard rate of wages, namely, eightpence per hour, which, during the depression of the last two years, has been reduced to various prices.

Miscellaneous.—We need not follow the spread of the nine-hours movement and its adoption in the engineering, iron foundry, and other branches of business in various parts of the country. Suffice it to say that employers seem not only to grant the nine hours freely everywhere, but to vie with each other occasionally in doing it.

A National Trades Council.—A special meeting of the men of the various trades, convened by circular, was held on Saturday evening, at the George Inn, Blackfriars, for the purpose of establishing an Amalgamated National Trades Council, to watch over the interests of the various trades in matters arising between capital and labour. The chair was taken by Mr. Wheatley. After a long and animated discussion, it was resolved that a National Trades Council be elected for the country, the principal object being to obtain the nine hours generally; that a provisional committee be appointed from that meeting to issue circulars to the shops and branches of all trades, asking them to appoint a representative to watch over their interest in the council.

Strikes in Saxony and Belgium.—Work has been suspended at Chemnitz in twenty of the larger factories. The number of workmen who have struck amounts to about 6,500. The men demand a reduction of the number of hours to ten, with 25 per cent. extra for overtime. The *Liberté*, a Belgian Socialist organ, publishes a despatch from Ghent, stating that the strike of the workmen in that town is becoming general. A body of 3,000 men has paraded the town.

MONUMENTAL.

Status of Rev. R. Hall, at Leicester.—A colossal marble statue by Mr. Birnie Phillips, of the Rev. Robert Hall, has been unveiled at Leicester, in the presence of a large concourse of spectators. The statue is of white marble, on a pedestal of polished Scotch granite, the figure being 9 ft. high. It has been raised on an ornamental piece of ground known as the Oval, on the New-walk.

Status of a Workmen's Friend in Belgium.—The Belgian journals give an account of the inauguration of the statue of John Cockerill at Seraing, one of the most important industrial centres near Liège. The whole population was astir. The burgomaster, and the members of the

* See p. 490, ante.

communal council, went to the landing-place of the steamers to receive the ministers of justice, interior, and public works, who came to be present at the solemnity. At noon an enormous crowd occupied the square of the Hôtel de Ville, in the middle of which stood the statue of Cockerill. The burgomaster there delivered an address, in which he represented the inauguration of the monument as a glorification of honest industry. The minister of the interior also declared that the commune of Seraing, in paying its debt of gratitude to Cockerill, had only interpreted the feelings of the whole Belgian population. The statue was then unveiled, and a cantata by M. Radoux was executed by 400 singers and 100 instrumentalists, and the ceremony terminated with the firing off of the workmen and a visit to the tomb of Cockerill.

CHURCH OF ST. BOTOLPH, BISHOPSGATE.

The chancel of this church, under the direction of Messrs. Newman and Latimer, churchwardens, has just been cleansed from its dirt and whitewash, and painted and decorated.

The ribs of the groined roof have been gilded, and a scroll pattern in oil and colours, stencilled alongside each rib, the spandrel panels being painted a French grey, and studded over with gold fleurs-de-lis. The panels and stonework round the east window have been marbled, and the mouldings round the same gilded. The ribs of the arches are also marbled, and the caps gilded. The walls between the pilasters on each side have been stencilled in oil and gilded. The chancel arch is painted, and has a honey-suckle pattern stencilled on the face; whilst on the offer-panels, in the soffit, the flowers have been gilded solid, with a maroon background, and the mouldings round the panels gilded.

The painting and decorations were executed by Mr. G. S. Pritchard.

CHURCH-BUILDING NEWS.

Kingston.—The new chancel aisle of Christ Church, Surbiton Hill, has been opened for public use. The aisle corresponds in design with the one on the northern side of the chancel, and has been built at the sole expense of Mr. J. T. Marshall, of London. The enlargement of the edifice rendered it necessary that the power of the organ should also be increased; but the work, which was undertaken by Mr. Hedgeland, of London, has not yet been completed. While these alterations were going on other improvements were made in the church, the expense, we presume, being borne by the congregation. There is now a new entrance on the south-west side of the building, a porch having been erected at a cost of 280*l*. Then the roof of the church has been painted and decorated, the colours being in harmony with the red bricks of which the church is built. The pulpit has been removed a little from its former position, and now stands close to the steps, leading from the nave up to the chancel. On the other—northern—side of the chancel is the reading-desk. The organ is being put up in the new aisle, and somewhat obstructs the view of the new painted window inserted in the eastern wall. The paintings on the upper part of this window represent "The Ascension," and on the lower part "Scenes of our Lord's Life after his Resurrection." Communicating with the new aisle is a new vestry, 12 ft. by 11 ft., one door of which leads into the garden attached to the vicar's house. In the south aisle has been placed a new window, the gift of Mr. Lavers (Lavers, Barraud, & Westlake, London), the painting on which represents "The Annunciation." The architect for the new chancel aisle, which has cost 780*l*, was Mr. C. L. Luck, of London; and the builder, Mr. Samuel Simpson, also of London. The painting and decoration of the roof of the church, which have been carried out by Mr. Lavers, have cost 400*l*.; and the estimate for the enlargement of the organ is 442*l*.

Hanley.—The new chancel of St. John's Church, Hanley, has been opened with appropriate services. The chancel is built of brick and stone, and is Early Decorated. The end is made apsidal for the reception of the communion-table, and the east window, which is of three lights, is filled in with painted glass from the window of the old chancel. Stalls are provided for the clergy and the choir. The chancel, which is lofty, has on the south side a vestry, and on the north side an organ-chamber. The

floor is paved with encaustic tiles of Gothic design. In the altar space are inserted the emblems of the four Evangelists, and the riser of the step to the altar bears the words, "This do in remembrance of me." In the remaining space within the altar-rail are inserted numerous ornamental tiles, emblematic of Our Saviour and his Crucifixion and Passion. The space between the choir-stalls is filled with plain coloured tiles in the form of a cross, and bordered with other tiles representing song-birds amidst foliage. Mr. W. Palmer, of Hanley, was the architect, and Mr. Matthews, of Hanley, the builder, while the tiles were from the works of Mr. Robert Minton Taylor, of Fenton. Messrs. Bolland & Stringer, of Hanley, are enlarging and rebuilding the organ. The total outlay on account of both chancel and organ will be about 900*l*., and before the opening services upwards of 200*l*. was required.

Portbury (Bristol).—The restoration of the chancel and nave of this church being completed, re-opening services have been held there. The work of restoration was set on foot about eighteen months ago by the vicar, the Rev. E. O. Tyler, the edifice being then in a very dilapidated state. About 2,000*l*. have been expended, in all,—1,300*l*. in the restoration of the nave, and 700*l*. in that of the chancel, which has been nearly rebuilt, at the expense of the Ecclesiastical Commissioners, in whom the great tithes are vested; the execution of the necessary work being superintended by their architect, Mr. Christian. The contractor was Mr. J. W. King, of Clifton. The chancel has a new oak roof, of circular ribs, with carved cornices. The old reredos and arading have been cleaned and restored; and the walls near the communion-table have been decorated. The roof of the nave is of pitch pine, the style of the old roof being retained, as has also been done in the chancel. The outside lead covering of the chancel and nave has been replaced by stone tiles. The stonework of the nave has been painted, and the freestone pillars cleaned. Carved open benches of pitch pine have been provided for the nave, and oak choir-stalls and screen for the chancel. The cost of the restoration so far has been quite met by funds obtained or promised. There is urgent need of the aisles and porch (in which there is a Norman arch) being restored without delay. About 2,000*l*. will be required for that purpose.

Downham.—The parish church has been reopened, after restoration. The restoration occupied seven months. The church consists of a large nave, chancel, and tower. The nave and chancel have been entirely rebuilt—the former in Kentish rag, with inner walls of brick, and the latter of iron stone, found in the old walls, intermixed with flint,—while the tower has been repaired in various details, and has had new battlements supplied. An old oak porch, at the south entrance, has been made use of, the timbers having been re-worked and new traceries put in. Interiorly, layers of plaster no longer conceal the proportions and adornments of the building. One result of this clearance has been to open the tower into the nave, as it was when the church was first erected. The tower arch, which has thus been exposed, is a simple pointed one, and an oak screen, with drapery, now occupies the place of the old obstruction. In the roof of the nave, which is an open one, all the old timbers are shown, and the chancel has been newly-roofed in oak boards and panels. Benches and stalls have supplanted the high-backed pews, those in the chancel being formed of mixed oak and chestnut, and those in the nave of English oak, grown near the rectory. All have decorated ends, those in the nave having been carved by the daughters of the rector, and those in the chancel by Mr. Barfield, of Ingatstone. The nave is paved to a pattern in Peake's Staffordshire tiles, and the chancel is paved with Godwin's encaustic tiles. The pulpit and font are both in Caen stone. The former is a gift of the Misses Evans. The reredos consists of five arches, in Caen stone, with marble panels, the central panel having affixed to it a cross of red Devonshire marble, and a shelf of the same material running the whole length. The lectern, which consists of a metal standard with wooden reading-desk, ornamented, has been purchased entirely with the pence contributed in offertory by the poor parishioners. The arch of the credence-table and sedilia, which are placed under the south window of the chancel, is formed from stones which were discovered in the old walls, and which had evidently, in remoter days, belonged to the position to which they have been

restored. The windows in the chancel, four in number, are now all of stained glass, three of them being new and the fourth a memorial window. The east window is the gift of the five daughters of the rector. It is in three bays, the central one bearing a representation of our Saviour upon the cross, and the outer ones the figures of St. Mary and St. John, tracery being introduced above. This window has been supplied by Messrs. Clayton & Bell, while the two others were obtained from Messrs. Powell. The work has been carried out in accordance with the plans and directions of Mr. Street; the builder being Mr. Hammond, of Great Warley, and the joiner Mr. Enfield, of Billerica. The total cost has been about 1,700*l*.

SCHOOL-BUILDING NEWS.

Kidlington.—New schools have been opened here by the Duke of Marlborough. The new buildings occupy a central position in Kidlington, very nearly upon the site of the old schools with which Bishop Field's name has always been associated, but they are of a more imposing character, and, of course, being erected in accordance with modern ideas, are more commodious. With the large play-grounds they occupy a considerable area—the land being a present from the rector and fellows of Exeter College. The total cost has been close upon 1,300*l*. Mr. C. Buckeridge, of Oxford and London, was the architect; and Mr. Walters, of Oxford, the contractor. The schools are built of stone, with dressings of Bath stone, the roofing being of red tiles, surmounted by a bell-turret. There are three large rooms for girls, boys, and infants, respectively, with class-rooms adjoining. The girls' room, occupying the centre of the building, is the largest and loftiest. The room for the infants is distinct from it, but the boys' room, by the removal of a partition, can be thrown into it, affording accommodation for meetings, concerts, &c. The woodwork of the interior of the roof is open to view. The lighting is ample, and suitable provision has been made for warming, ventilation, and sanitary accessories.

Halifax.—The corner stone of St. Mary's Church day and Sunday schools, Lister-lane, has been laid. Mr. Michael Stooks, of Upper Shilden Hall, near Halifax, built St. Mary's Church, which is situated in Lister-lane, and he has since given 1,000*l*. towards the new schools, which are to be in the Gothic style, harmonising with the church, to which they are adjacent. They have been designed by Mr. C. F. L. Horsfall, of Halifax, and are estimated to cost (including the ground), 2,800*l*., affording accommodation for upwards of 600 children.

Slaughter (Gloucestershire).—An infant school and class-room, with boys' and girls' porches, have just been completed at Lower Slaughter. The dimensions of the school are 25 ft. by 16 ft., with class-room, 12 ft. by 10 ft. The walls are built of the West rough warm-colored stone, with dressings of the Farmington freestone. There is a bay window in the gable end next the high road, the object being to emphasise this part, and to give additional space inside the room. The windows have stone mullions and transoms, and there are stone copings to the gables. The roofs are constructed with open timbers, boarded at the back of the rafters, and varnished (without any staining). A bell-turret, with apirelet, covered with oak shingle, rises from the main roof (the latter covered with stone slates). The whole expense of the work (upwards of 500*l*.), has been defrayed by Mr. C. S. Whitmore, Q.C., recorder of Gloucester. The same gentleman also rebuilt, at his own cost, some five years ago, the parish church of Lower Slaughter, from the designs of Mr. Ferrey. The architect of the school buildings recently completed was Mr. Edmund B. Ferrey. Mr. Albert Estcourt, of Gloucester, was the contractor for the works.

Elland.—The Hamerton Testimonial School, in connexion with the National School, has been opened. The erection of this school had been rendered necessary by the continued increase in the number of children requiring educational facilities; and in October, 1870, the works were let. The architect was Mr. T. H. Rushworth, of London; Mr. S. Redihough, of Elland, the builder; Mr. Samuel Jagger, plumber and glazier; Messrs. Hutchinson & Smith, plasterers. The land was given by Lord Mexborough, and the school has been designated "The Hamerton Testimonial School," in honour of

Mr. John Hamerton, an inhabitant of Elland. The style is Gothic, with pointed windows, and will accommodate 218 scholars. The total cost, including fittings, &c., will be about 900l.

Barwell.—New schools are now being erected at Barwell, Leicestershire. The memorial stone was laid on the 19th ult., by Mr. Albert Pell, M.P. The buildings will be of brick, with stone dressings. Accommodation will be provided for 230 children. The architect is Mr. F. B. Osborn, of Birmingham; and the contractor is Mr. J. F. Simpson, of Leicester.

Books Received.

Papers on Subjects connected with the Duties of the Corps of Royal Engineers. Contributed by Officers of the Royal Engineers. New Series. Vol. XIX. Jackson & Sons, Woolwich. 1871.

LIEUT.-COLONEL HUTCHINSON has delayed the publication of the annual volume of professional papers, edited by him, this year, in the hope, he tells us, that information concerning special engineering features in the late war would have been forwarded to him. Only one such communication had, however, been received when he resolved to wait no longer. This is a description of the passage of the wet ditch of Lunette 52, at the siege of Strasburg, by the Prussians in 1870, by Colonel Lemex, R.E., V.C., O.B. Another volume, to be especially composed of the expected papers bearing on the war, is to be issued at an early date.

Concerning the paper detailing the passage of the ditch at Strasburg, there are fourteen in the present collection. Lieut. Denison, R.E., has sent a description of a landing-stage, erected at Drake's Island, in Plymouth Sound, for hoisting heavy guns, with an explanatory drawing of it. The height from the rocky beach to the platforms in the casements is about 48 ft.; hence this task was not so simple as it might appear. It was executed in three weeks, however, at a cost of 167l.

The editor communicates a description of the construction of a concrete bridge over the Metropolitan District Railway, already described in the *Builder*, illustrated by a drawing from the pen of Mr. Johnson, the engineer of the railway in question. The third paper is an interesting account of the demolition of the *Leichardt*, a full-rigged ship of 700 tons burden, that was run down while lying at anchor at the Nore, in November, 1869. Lieut. Jekyll tells the story of the exploit well. The sunken ship was blown up by the aid of gun-otton.

Lieut. Fraser, R.E., furnishes notes on the mode of driving the Mont Cenis Railway tunnel, which are accompanied by a table of progress drawn up by M. Sommeiller, the directing engineer at Turin. Lieut. G. E. Grover, R.E., contributes notes on fire-bricks that are likely to be useful to young officers. The essential qualities of a good fire-brick, he says, are,—*infusibility, regularity of shape, uniformity of composition, facility for cutting, strength, and cheapness*, and with like insight he examines the merits of the fire-bricks of the various districts, and gives the constituents of different kinds. He also gives the result of experiments made in the Royal Arsenal to test their cracking and crushing weight.

The sixth paper is on "Defensive Reform," by Captain A. Parnell, R.E. This relates to land defence by means of fortification, artillery, musketry, sorties, and mines, and is accompanied by diagrams showing the general arrangements of the proposed method. Lieut. A. B. McHardy, R.E., follows with notes on the nature of clay. The cylindrical stone lewis, invented by Sapper Wm. Hughes, 27th company, R.E., is described by Lieut. Waller in the eighth paper. This contrivance consists of three pieces, with a shackle and pin, whereof the centre piece is flat, with a projecting wedge on either side, and pierced with a hole in the head for the pin to pass through; and the side-pieces are semi-cylindrical, with hollow grooves to correspond with the wedges of the centre. The advantages claimed for it are, that it need never be taken to pieces; that it is safer than the rectangular lewis; and only a labourer is required to bore the hole in it. Lieut. English, R.E., in a paper on the resistance of armour plates, with a wise foresight, endeavours to supply a means of calculating the effects that would be produced by an extension of the weight and velocity of armour-piercing projectiles, with a view to ascertain the neces-

sary increase in thickness and cost of the plates that will be required to withstand such further improvements in them. The next contribution is not so strictly professional, although the author, Col. Graham, V.C., R.E., O.B., treats his subject with reference to its military capacities. "Railway iron must come into extensive use for field engineering purposes, such as repairing bridges, strengthening earthen parapets, constructing temporary bomb-proofs and magazines," ponders the colonel; so he has set himself to calculate the transverse strength of railway iron when used for purposes of construction. He also suggests the adoption of some simple formulae for field calculations. The Prussians in their entrenchments before Metz roofed some casements with railway rails placed close together and covered with earth; and he doubts not but that we shall hear that further use has been and will be made of this material.

Another paper gives an account of the trial at Shoeburyness of an experimental gun-shield which embodied all the latest improvements, and was 12 ft. long and 8 ft. 2 in. high. A battery was placed at 200 yards from it, and three muzzle-loading rifled guns brought to bear upon it. At the end of the first day's firing the shield preserved its entirety, and showed no signs of penetration or yielding; but some additional rounds on subsequent occasions did not leave it so scatheless as to make us feel too secure.

Canal Commission: Letter to the Honourable the Secretary of State, from the Canal Commissioners, respecting the Improvement of the Inland Navigation of the Dominion of Canada. Ottawa, 24th January, 1871.

THE Governor-General of Canada issued, at the close of last year, a Royal Commission to inquire "as to the best means of affording such access to the sea-board as may best be calculated to attract a large and yearly increasing share of the trade of the north-western portion of North America through Canadian waters, as well as a thorough and comprehensive improvement of the canal system" of the Dominion, with a view to such a comprehensive improvement of the canal system as will enable Canada to compete successfully with the United States for the transit trade of the great Western country.

The letter and voluminous evidence now before us form a kind of preliminary report, which is to be followed up by the report proper of the Commissioners. The letter is signed "Hugh Allan, Chairman; C. B. Gowdwin, D. D. Calvin, P. Garneau, Alexander Jardine, S. L. Shannon, and Samuel Krefer, Secretary."

The volume is accompanied by a sectional sheet of comparative profiles of the several lines of navigation, existing or proposed, between Sault Ste. Marie and tide waters, via the Welland and St. Lawrence Canals, the proposed Ottawa Canal, and the Georgian Bay Canal, 704 ft. over tide-water level at Lake Simcoe.

Without attempting here to criticise the special route recommended, we bring this volume under the notice of our readers as one of national importance, not only to Canada, but to England as well.

VARIORUM.

"Intuitive Calculations. By Daniel O'Gorman. The twenty-fourth edition, corrected and enlarged by J. R. Young. London: Lockwood & Co. 1871." A twenty-fourth edition of a work needs little recommendation from any reviewer. The present edition is considerably enlarged by Mr. Young, who was formerly Professor of Mathematics in Belfast College. The volume professes to give easy and compendious methods of performing the various arithmetical operations required in commercial and business transactions; together with full explanations of decimals and duodecimals, several useful tables, and an examination and discussion of the best schemes for a decimal coinage.—"Borough of Salford: Sub-Committee's Report to the Salford District General Purposes Committee. Salford Steam Printing Company." This report consists mainly of the report of the surveyor, Mr. Bowden, C.E., to the sub-committee, on three separate plans which he has prepared on the interception of the sewage from the river Irwell in the Salford district. The surveyor recommends the carrying out of the first of these plans, comprising the construction of a sewer which will intercept and carry off the sewage and ordinary rain-fall from the whole of the dis-

trict, with provision for discharging storm-water by means of the existing outlet sewers. The scheme will involve a total length of 7,147 yards of sewer, at an estimated cost of 14,495l., besides 725l. for reconstructing subsidiary sewers. The other schemes would cost 27,518l. and 26,384l. respectively.—"Past and Present; or, Social and Religious Life in the North," by H. G. Reid (Edmonston & Douglas, Edinburgh), consists of a number of sensible and agreeably-written essays. It includes, under the title "Dwellings for the People,—Co-operation," an interesting account of the Edinburgh Co-operative Building Company. According to the engraved view of the workmen's houses built by this company, which serves as frontispiece in the book, the party-walls do not go through the roof, so that if one were burnt the chances are that all would follow.—"The Educational Places of Amusement in London" (Hogg & Son), has a good motive,—"to draw the attention of the working classes to the profitable way in which they may spend their holidays;" but it is insufficiently done, and the cuts are simply atrocious.

"Tom Hood's Comic Annual for 1872" (80, Fleet-street) has some amusing stories and laughable cuts. It is quite up to its own mark.—"The People's Magazine" for November includes an interesting popular account of the Moabite Stone.

Miscellaneous.

Heating the Conservatory.—Heating by means of gas is understood at present by comparatively few amongst the many amateurs who might be advantaged by it. Only in the neighbourhood of towns is this mode of obtaining heat available, and it is in the urban garden for the most part where gas-heating is most required. The subject may be disposed of in a general way for the comfort of such as prefer a summary to any argument, by the remark that a plant-house may be heated with gas in a most efficient and cleanly manner, and the heating apparatus will occasion less trouble in management than any kind of apparatus requiring any other kind of fuel. But the conditions of success in this business are somewhat narrowly defined, and a mistake at any point may result in disasters, or, at all events, in a failure so complete that it will be needful to undo all that has been done, and begin again. One of the most important conditions of success is to apply the system to plant-houses of comparatively small size. As a matter of fact, the greatest conservatory ever constructed could be heated by means of gas to perfection, but the cost of gas is necessarily high, and when we have to deal with a large house it becomes a sheer waste of money, and a most extravagant waste, too, when gas is employed. It is a question, of course, what is meant by the term "comparatively small size," and we should be disposed to draw the line for practical purposes between houses larger and lesser than about 40 ft. in length by 10 ft. or 12 ft. in breadth. The kind of structure for which gas is best of all adapted is the so-called "conservatory" which is usually attached to the town residence, the length and breadth and height of which rarely give so large a cubical area as the ordinary low-roofed plant-house, 40 ft. long by 10 ft. or 12 ft. wide, which we have instanced as the largest structure to which gas-heating may be applied conveniently.—*The Gardener's Magazine.*

Uxbridge.—A new building has recently been erected for Messrs. Grimsdale & Sons, of Uxbridge, by Messrs. Passnidge & Sons, of the same town, from the designs of Mr. C. J. Shoppee, architect. It has been designed for ground-floor offices only, in order to meet Messrs. Grimsdale & Sons' requirements, and comprises a clerk's office, with entrance-lobby, facing the street, and in the rear, set back from the main building, a principal office, lavatories, &c. The materials used for the structure are red pressed Leicestershire bricks, relieved with dressings of Box Ground stone, red Mansfield stone shafts to the windows and doorways. The panels under the windows are filled in with Pether's patent ornamental red bricks, which have also been used in the string-course, apex of gable, &c. The roofs are covered with the old plain tiles, which were retained for that purpose, relieved with bands of new red ornamental tiles. The ridges were manufactured by Cooper, of Pinkney's-green, Maidenhead; the eaves, gutters, and down-pipes are of Messrs. Walter Macfarlane & Co.'s manufacture.

Transfer of Columbia Market to the Corporation.—A ceremony of an interesting character took place at Columbia-market on Friday last week, on the occasion of the transfer of the building by the Baroness Burdett Coutts to the Corporation of London. The Lord Mayor and Sheriffs, in their official robes, the former attended by the City Marshal and the Sword and Mace Bearer, were received in the central hall, which was laid with red baize. The Markets Committee had already assembled. The Baroness Burdett Coutts arrived shortly afterwards, and was received at the entrance by Mr. Bontems and a deputation of the Markets Committee, by whom she was conducted into the hall, where the ceremony of transferring the market took place. Her ladyship was accompanied by the Earl of Harrowby, Mr. Francis T. B. Money, Lady Augusta Parlett, Mrs. Brown, Mrs. General Gascoigne, the Hon. George Waldegrave Leslie, the Rev. E. B. Owen (rector of Boroughbridge, Yorkshire), Sir James Lidesait, Sir Travers Twiss, and others. The Earl of Harrowby, addressing the Lord Mayor, at Lady Coutts's request, read an address on her behalf. The company then sat down in another chamber to a *déjeuner* provided by the Markets Committee. The Lord Mayor presided, and there were about fifty persons present. Towards the close of the meeting Lady Burdett-Coutts expressed the pleasure which it had given her to construct a centre of industry in that neighbourhood, and to link her name to that of the municipality. She proposed "The Health of the Ancient Guilds of the City of London," coupling it with the name of Colonel Sir W. A. Rose. On leaving the market Lady Coutts was enthusiastically cheered.

Memorial of Fidelity in a Dog.—At the last meeting of the Edinburgh town council, it was announced that, at the request of the Baroness Burdett Coutts, Mr. Brodie, R.S.A., has designed a memorial fountain, intended to commemorate the story of "Greyfriars Bobby,"—a dog which, if we rightly remember, haunted the grave of his master in Greyfriars churchyard. The design, as described in the *Scotsman*, is that of a fountain, 7 ft. in height, to be worked out in a beautiful red granite, obtained from Westmoreland. The base of the fountain is in the form of an octagonal basin, 3 ft. in diameter, to be constructed of axed granite. This basin, standing only a few inches above the ground, is intended to afford a drinking place for Bobby's canine relations. From its centre rises a cylindrical column of polished granite, 2 ft. high and about 20 in. in diameter, terminating at the top in a moulding, on which rests the principal basin of the fountain. This is of circular shape, and modelled after a well-known form of Classic vase, its diameter being between 3 ft. and 4 ft. A second column, 18 in. high and 12 in. in diameter, rises out of the upper basin, and supports a bronze sitting figure of Bobby, which forms the apex of the structure. On the lower column will be placed a bronze plate, recording the well-ascertained facts of the dog's history, without the fictitious embellishments; while the upper column will bear, also in bronze, the arms of Baroness Coutts and those of the city of Edinburgh, together with suitable inscriptions. The site which has been spoken of for the monument is the edge of the pavement at the corner of George IV.'s Bridge and Candlemaker-row.

Proposed Cottage Hospital at Ledbury.—A large and influential meeting of the resident clergy and gentry has been held at the Court House, Ledbury, to consider the expediency of establishing a cottage hospital there. Earl Somers presided. The object was strongly advocated by his lordship, who called attention to the numerous similar institutions throughout the country, especially in neighbourhoods which were at a great distance from county hospitals. He also showed, from the opinions of gentlemen connected with cottage hospitals, that the larger institutions were not in any way injured by the formation of the smaller; also that, generally speaking, there were better treatment and greater benefit derived in the smaller hospitals than in the larger, instancing as such, that whereas one in every three cases of amputation performed in the larger institutions proved fatal, only one in nine proved fatal in the smaller. His lordship stated that about 150l. would be required to establish the hospital, and the yearly expenses would be about 100l. A committee, consisting of Mr. Michael Biddulph, M.P., and a number of clergy and gentry, with Earl Somers as president, was formed.

The Animals' Asylum.—In reply to "Inquirer," the Brown Institution is being erected in the Walworth-road, near the Nine Elms Station. The institution will consist of three blocks. The first is for the accommodation of the animals under treatment and observation, and consists of a five-stall stable, and five other rooms for animals, a dead-house and post-mortem room, a stove for cooking the animals' food, and a hayloft. Connected with this is a dog-kennel, which is semi-detached from the main building. The second block of buildings is devoted entirely to scientific purposes, and may be called the pathological laboratory. It is built in two stories, the upper of which contains five apartments, which will be entirely devoted to the scientific investigation of morbid processes. They comprise a chemical laboratory, a private laboratory for the professor, a room for keeping apparatus in, and a separate room for gas apparatus, beneath which, and communicating with it by a trap-door, is another room to contain a furnace and sulphuretted hydrogen apparatus. The third block of buildings (which was purchased with the ground) consists of two ordinary dwelling-houses.

An Elaborate Milestone.—A new and somewhat novel milestone,—a reminder to the wayfarer,—has been recently erected on the road between Shipston and Stratford-on-Avon, near the new lodge leading to Easington Park. The memorial is formed of a double cube of hard stone, forming the base of an ornamental cross, which surmounts the whole. The sides are paneled, and on the west and east bear the arms of the Bishop of Worcester and Shirley of Easington. On the south is the following inscription:—

"SIX MILES
To Shakespeare's town, whose name
Is known throughout the earth;
To Shipston 4, whose lesser fame
Boasts no such poet's birth."

On the northern face is:—

"Ox mea lex."
"After Darkness, LIGHT;
From light hope flows,
And peace in Death,
In Christ a sure repose."
"Spes, 1871."

Round the base of the cross, which rises angularly from the weatherings of the pedestal, are similar sentiments in Latin. The whole has been designed, and the expense borne, by Mr. E. P. Shirley, of Easington Park.

The London Water-Supply.—The report by Dr. Frankland, F.R.S., of the results of his chemical examination of the waters supplied to the metropolis during last month has created considerable excitement among the ratepayers and local bodies in various parts of London. Although Dr. Frankland attributes the bad quality of some of the waters to the recent heavy rains and consequent flushing of sewers, which might be taken as an exceptional cause, the ratepayers and local bodies are about to take action in the matter. In view of the probable impure condition of the water supplied during the winter season. Especially in those districts supplied by the Chelsea, Southwark, Grand Junction, and Lambeth companies, has alarm been felt with reference to the quality of the water delivered by them, which Dr. Frankland, in his report, stated was "so polluted by dissolved organic impurities as to render it undesirable for human consumption." In South London there has existed for some time great dissatisfaction with the water supplied to the public, and the aspiration for a guaranteed supply of pure water is likely to be opened forthwith.

Exeter Cathedral.—The middle compartment of the reredos will be provided by Dr. Blackall, in memory of his great grandfather, Bishop Blackall; and the two side compartments will be furnished by Chancellor Harington. The Chancellor has contributed 4,000l. in a lump sum, and besides that and the two reredos compartments, which will cost some 850l., he has erected the east window in the lady chapel, at an outlay of 600l. and also gives the holy table, the communion-rails, and the litany-desk. Mr. Edwin Forde, the chapter clerk, presented a carved stone pulpit, at the cost of about 400l.

The Cattle-Trough in Piccadilly.—The Vestry of St. George's, Hanover-square, has called on the Drinking Fountain Association to remove this trough, so unwisely placed opposite the new end of Park-lane. The danger it causes is considerable.

A Substitute for Wood Engraving.—The new mechanical agent, the "jet of sand," has as yet only exhibited a fraction of its possible applications. The latest adaptation its inventor has succeeded in developing into practical efficiency is to a peculiar process of replacing the art of wood-cutting. The few experiments conducted in this direction in America have promise of success. The process consists of bringing upon a suitable matrix a photographic copy of the drawing or engraving which it is desired to reproduce. This is then passed beneath the sand-blast, and the cutting thus obtained. This is finally subjected to the electrotyping process, and any desirable number of copies thus produced. The same invention has been successfully applied to the decoration of marbles and other stones for ornamental purposes. For this purpose the blocks are protected with an open design of sheet-iron, or of sheet-rubber, and the steam sand jet directed upon them from a convenient distance.

Mont-Gothard Tunnel.—The treaty concerning the Mont-Gothard Tunnel has been signed at Berlin by Prince Bismarck, Count Lauray, and Col. Hammer, on behalf of Germany, Italy, and Switzerland. It stipulates that the Northern Confederation shall furnish a subvention of 20,000,000 francs. Of that sum 10,000,000 francs are already offered by Prussia, the Grand Duchy of Baden, and various railway companies. The finances of the empire will therefore only have to furnish a subsidy of about 10,000,000 francs, and there is no doubt that the Reichstag, to which the treaty has to be submitted, will vote the necessary funds. The 20,000,000 francs subvention that Switzerland has undertaken to provide are also covered. The works of the new line will commence in the spring.

Working a Tramway by Steam.—At Edinburgh a steam train has made a successful trial on the horse-tramway just opened between Haymarket and Leith, a distance of several miles. The *Scotsman* says that although it was the busiest hour of the day, and traffic was at its greatest, tramway cars, with young horses fresh from the country constantly passing, no horse was frightened, nor were the bystanders annoyed by steam or smoke. The whole journey of a little over six miles was performed in fifty minutes, including all stoppages. The average speed maintained, exclusive of stoppages, was about nine miles an hour, and, it is said, might as safely and easily been at the rate of twelve.

Lightning Conductors.—A means for increasing the inductive effect of lightning conductors has been introduced in the United States. It is called the Equilibrium Disk, and consists of a cast-iron star about 40 lb. weight, which has seventy-two horizontal and vertical rays or discharging points. This disk must be buried in the ground at a depth usually of 6 ft., where constant moisture may be anticipated. The conducting rod being then fixed in the central hole by a copper ring or wedges, the instrument is ready for use; and, by reason of the number of discharging points in the disk, is believed to be more efficient than the ordinary conductor.

The Arithmeticon.—*Approxos* of Babbage, a calculating machine, invented by M. Thomas (de Colmar), Paris, is in use at the India Office, General Register Office, Somerset House, and various observatories, and insurance offices. The instrument has lately been simplified and improved. With this machine, it seems, a number with eight places of figures can be multiplied by eight figures in eighteen seconds; sixteen figures can be divided by eight figures in twenty seconds; and a square root of sixteen figures can be extracted, with the proof, in less than two minutes, the results being obtained with mechanical accuracy.

Gift to the National Gallery.—Sir Richard Wallace has presented to the National Gallery the well-known picture by Terburg of "The Congress of Manster," bought by his father, the late Marquis of Hertford, some years since, at Prince Demidoff's sale, for 7,350l. Sir W. Buxton had offered 7,000l. at the sale, on the part of the National Gallery authorities, and then retired from the bidding.

Society of Painters in Water Colours.—The private view of the Winter Exhibition of sketches and studies by members of this society will take place on Saturday, the 18th inst.

Maidstone.—The foundation-stone of the new church of St. Faith, Maidstone, has been laid. The new edifice is designed by Mr. E. W. Stephens, of Maidstone, and will accommodate about 620 persons. The whole of the sittings will be free. The cost of the structure will be about 5,000l. The church is to be erected on the site of the ancient chapel of St. Faith, which is believed to date back 600 years. The edifice will be built in the Early Decorated style of architecture, and comprise—Nave, 68 ft. by 30 ft. 6 in.; north and south aisles, 68 ft. by 13 ft. 6 in.; chancel, 30 ft. by 26 ft.; with organ-chamber, vestry, and tower, 22 ft. square, which will at some future time be surmounted with a spire, rising to the height of 170 ft. from the ground level. There will be two entrances to the church, the principal one being under the tower, and 7 ft. wide, the other entrance at the west of the north aisle. The sittings will be entirely free and unappropriated. Messrs. Clements & Wallis, of Maidstone, are the contractors.

The Society of Arts.—On November 15th, the opening address will be delivered by Lord Henry G. Lennox, M.P., chairman of the council. On succeeding Wednesdays, papers will be read.—“On the Present State of the Through Railway Communication to India,” by Mr. Hyde Clarke; “On Tramways and their Structure, Vehicles, Haulage, and Uses,” by Mr. W. Bridges Adams; “On Sewage as a Fertilizer of Land, and Land as a Purifier of Sewage,” by Mr. J. Bailey Denton; “Observations on the Esparto Plant,” by Mr. Robert Johnston; and, “On the Study of Economic Botany, and its Claims Educationally and Commercially Considered,” by Mr. James Collins. A course of Cantor Lectures, “On Vitreous Colours and Pigments,” will be delivered by Professor Barff, M.A., during the session.

The New Railway Viaduct at Penzance. The new viaduct at Chyandour is nearly completed. Trains will run over it into the Penzance Station. The plans as well as the works themselves, have been carried out under the direction of the engineer of the West Cornwall portion of the line, Mr. J. D. Sherif. In its course, running east from the main line over Obyandour River, the rails, says the *Cornish Telegraph*, are fixed on woodwork, laid on granite piers. Farther east, the viaduct is built of timber, bolted together.

Exhibition in Moscow.—The two-hundredth anniversary of the birth of Peter the Great occurs on the 30th of next May,—i.e., the 11th of June, according to our reckoning,—and the Russians intend to celebrate it by opening a great Polytechnic Exhibition in Moscow on that day. All nations are invited to contribute; and it is understood that manufacturers and others in this country are already preparing for it. The Russian Steam Navigation and Trading Company undertake to forward goods, freight free, and the railway companies carry, at reduced charges, all goods intended for the Exhibition. A committee in aid is sitting at the Society of Arts, John-street, Adelphi.

Ancient Remains.—In the course of the works in progress in connexion with the restoration of the choir of Bath Abbey, the workmen have come across a massive column of the old Norman Abbey, similar to those found below the floor in the other part of the building. Near this spot another discovery has been made, that of a vault which it is thought not improbable may prove to be that where Bishop Oliver King was buried. Uncertainty has always attached to the burial-place of this prelate, whether in the Bath Abbey, or the Chapel Royal Windsor.

The New Foreign Cattle Market.—Active progress is being made in the formation of this new market at Deptford for foreign cattle, &c.; and the contractors are to complete and give over the market to the City Authorities on December 16th. Three landing-stages by the river side are erected, spacious cattle and sheep lairs are being made, and the new foreign cattle market will be opened for the reception of stock and for public business early in January next.

The Value of Land in London.—The piece of ground at the corner of Queen Victoria-street, Mansion House, has been let by the Metropolitan Board of Works for 5,500l. a year, which, according to the *City Press* (we do not ourselves know the exact quantity), is equal to about a sovereign per square foot. Capitalising this at thirty years' purchase, we get as the price per acre for the freehold, 1,306,800l.

Warming Railway Carriages.—A plan is being tried now on the Rybinsk-Bologoe line, in Russia, for heating passenger carriages. The experiments on a third-class carriage have been successful, only it is hoped that the loss of heated air may be made less than at present. The heater is outside the compartments, and the heated air is pumped in by means of cylinders and pistons taking their motion on the axles.

The Institution of Civil Engineers.—The possibility of distributing letters throughout the metropolitan districts by means of pneumatic agency, instead of by foot-carriers and postal carts, will engage the attention of the members of this society on Tuesday evening next, the 14th inst., when a paper by Mr. Carl Siemens is to be read and discussed, on “Pneumatic Despatch Tubes: the Circuit System.”

Fall of a Spinning-mill.—While all hands were employed at Everleigh Spinning-mills, near Stockport, on Wednesday, a portion of the building which is being enlarged gave way, and fell into the blowing and cotton rooms. Several hands engaged there rushed to the windows, and escaped by them, except a boy, who was buried in the brickwork and killed. A bricklayer shared the same fate, and two other men were seriously injured.

Palatial Barracks.—The “palatial barracks” at Allahabad, which cost more than 200,000l., have been definitely pronounced so unsafe that the 104th Regiment, according to the *Times of India*, have been ordered to vacate them at once. The men went under canvas.

Surveyor to St. Bartholomew's Hospital. Mr. Hardwick has resigned this appointment, and there are, of course, several candidates for it. Prominently among them are Mr. Frederick Marriable and Mr. Anson. Mr. W. J. Gardiner is also in the field.

The Guest Hospital, Dudley.—At Dudley, the Earl and Countess of Dudley have opened a new hospital, built at a cost of upwards of 30,000l., the gift of the Earl. The endowments consist of a donation of 20,000l., left by the late Mr. Joseph Guest.

Institution of Surveyors.—The first ordinary general meeting of the session will be held on Monday, November 13th, 1871, when the President, Mr. Richard Hall, will open the session with an address. The chair to be taken at eight o'clock.

Derby.—The foundation-stone of the new church of St. Anne, Derby, has been laid. The proposed erection will be of a larger size than that already in use. The site is in Whitecross-street, given by Mr. W. Mundy, of Markeston.

TENDERS

For alterations and additions to a warehouse, Watling-street. Mr. Herbert Ford, architect:—
Lawrence & Son £1,842 0 0
Hill, Keddell, & Waldman 1,809 0 0
Conder 1,770 0 0
Brown & Robinson 1,720 0 0
Henshaw 1,687 0 0
Myers & Son 1,617 10 0
Brass (accepted) 1,455 0 0

For stables at Liverpool, for the Liverpool Tramway Company. Messrs. Francis H. Fowler & Hill, architects:—
Lowry & Co. £14,450 0 0
Henshaw 14,244 0 0
Jones & Sons 12,965 0 0
Parker & Son 12,090 0 0
Haigh & Co. 11,998 0 0
Holme & Nicol 11,968 0 0

For the erection of St. John's Schools and master's house, East Dulwich, Surrey. Messrs. Henry Jarvis & Son, architects:—
Higgs £3,330 0 0
Shapley & Webster 3,263 0 0
Brass 3,227 0 0
Downs 2,998 0 0
Tarrant 2,940 0 0
Gammon & Sons 2,941 0 0
Marsland & Sons 2,910 0 0
Henshaw & Co. 2,850 0 0
Shepherd 2,830 0 0
Thompson 2,770 0 0

For alterations and additions to Vernon Chapel. Mr. J. Goodchild, architect. Quantities supplied:—
Collins £515 0 0 Extra depth.
Bayes & Ramadge 498 0 0 8 12 0
Hill & Sons 498 0 0 15 0 0
Pak 443 10 0
Bridgman, Nubal, & Co. 411 0 0
Woodward 425 0 0 10 0 0
Bowley 357 10 0
..... 357 10 0

For roads, &c., on the Magdalen Charity Estate, Hastings. Messrs. Jeffery & Spiller, architects:—
Bridland £285 0 0
King 250 0 0
C. & H. Hughes 232 16 0

For alterations and additions to school at Blackley, near Manchester. Mr. J. Sherwin, architect. Quantities supplied:—
Plaskett £686 9 0
Davison 582 0 0
Warburton 532 0 0
Winter 510 0 0
Wilson 498 0 0
Thompson 479 0 0
Wade, Brothers 473 0 0
Herd (accepted) 472 0 0

For Boys' Industrial Home at Bisle, Surrey (second group of buildings), for Mr. W. Williams and the Committee. Messrs. Habershon & Brook, architects:—
Shearburn £6,483 0 0
Newman & Mann 5,778 0 0
Manley & Rogers 5,930 0 0
Carter & Son 5,647 0 0
Harris 5,475 0 0
Perry & Co. 5,249 0 0
Wood 5,100 0 0
Haynes 4,597 0 0

For works to houses, Balaise-gardens, Hampstead. Mr. W. Thompson, architect:—
Bird £820 0 0
Fild 820 0 0
Nightingale 791 0 0
Allard 693 0 0

For new warehouse for Mr. H. Horne, St. Mary Axe, City. Mr. T. G. Clarke, architect:—
Fild £2,200 0 0
Crabb 2,149 0 0
Stanes & Sons 2,148 0 0
Nightingale 1,995 0 0
Carter 1,970 0 0
Freedy 1,865 0 0
Kilby 1,823 0 0
Henshaw 1,875 0 0
Kings 1,854 0 0
Brown 1,779 0 0
Tarrant 1,743 0 0
Meritt 1,743 0 0

For two houses at South-place, Knightsbridge, for Capt. Sterling. Mr. J. P. Sanders, architect. Quantities supplied by Mr. Poland:—
Steel £12,465 0 0
Fild 11,900 0 0
Stimpson 11,475 0 0
Foster 11,377 0 0
Newman & Mann 11,368 0 0
Sharlington & Cole 11,233 0 0
Cowland 10,990 0 0
Brass & Sons 10,954 0 0
Brown & Robinson 10,570 0 0
Henshaw & Co. 10,290 0 0
Adamson & Sons (accepted) 10,125 0 0
Macey (withdrawn) 9,790 0 0

For cottages at Wimbledon, for Mr. H. W. Peck, M.P. Messrs. George & Vaughan, architects:—
Townsend £1,316 0 0
Adamson & Sons (accepted) 1,264 0 0

For the erection of a school at Bennington, Herts. Mr. T. T. Smith, architect. Quantities by Messrs. Wilds & Son, Hertford:—
Lawrence £627 18 0
Castle 593 0 0
Raymer 580 0 0
Willis 584 0 0
Warner (accepted) 561 0 0

TO CORRESPONDENTS.

Leads School Competition.—Correspondents are inquiring if anything has been done with regard to the above competition.

R. A.—A. H.—J. M.—H. & F.—J. P.—W. R.—R. H.—& B.—C. F.—W. R.—H. F.—G. S. F.—W. T.—J. H.—A. P. H.—M. & L.—R. F.—R. N. & W.—R. A.—R. E.—J. R.—F. T. D.—C. & S. S.—On Early Brickwork (in type).—Buildings for Music (in type).—On Charities (in type).—Ancient Records of St. Michael's, Cornhill (in type).—T. G. O. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

NOTICE TO SUBSCRIBERS.

Advertisements cannot be received for the current week's issue later than **THREE o'clock, p.m., on THURSDAY.**

NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to “The Publisher of the Builder,” No. 1, York-street, Covent Garden. All other Communications should be addressed to the “Editor,” and not to the “Publisher.”

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The Builder.

VOL. XXIX.—No. 1502.

The Behaviour of Cements and Metals in
Conjunction.



N the course of the inquiry now going on as to the loss of the *Megara*, repeated reference has been made to the use of brickwork and Portland cement in filling up between the ribs of iron vessels, and to the protection of iron by means of cement; and this has served to recall doubts we have long entertained as to the safety of bringing metals into conjunction with Portland and other cements.

At a meeting of the Institution of Civil Engineers in 1865, when Mr. Grant's first paper on "The Strength of Cement" was read, Mr. G. Dines, in the course of the discussion which followed, said he feared that Portland cement had a corrosive effect upon iron; therefore when cement had to be

in contact with iron, he always used Roman.

Mr. Scott Russell, in reply to this, said Portland cement had been extensively used in the insides of ships to preserve the iron from corrosion; and after eighteen years' use he had seen Portland cement dug out of an iron ship, when the red-lead paint and the skin of the iron were as sound as on the day they were put there.

Mr. H. Mandalay thought this fact appeared to show that the cement had not been in actual contact with the iron, as it was protected by the red-lead paint to the extent, probably, of two or three thick coats. The caution raised with reference to the effects of Portland cement in contact with wrought iron had been made upon the supposition of a fact which did not appear to exist.

Mr. Scott Russell suggested that the inference to be drawn from Mr. Mandalay's observation would be that, wherever cement was used with iron, the iron should be painted with red lead.

Later in the discussion, Mr. F. J. Bramwell said, a question had been raised with respect to cement placed in contact with iron, which turned out to be a question of cement upon oil. He might say, that having occasion to form a deck upon a floating dock, which deck he did not wish to be combustible, so as to be in danger if a hot rivet fell upon it, nor to be liable to rot if temporarily immersed in water in a tropical climate, and which therefore did not admit of the use either of creosoted or of unprotected timber, he had made every inquiry he could as to the behaviour of Portland cement concrete in contact with iron, and he was then having prepared a Portland cement deck, 3 in. thick, but he was afraid that experiment would not settle the question at issue, because, after all, it would

only be cement upon oil, all the iron having been steeped in oil when hot.*

Soon after this discussion had taken place, a piece of stout iron piping was bedded part of its length in mortar-brickwork and the remainder in cement-brickwork; but whether it was Portland or Roman cement we are unable to state positively. Within the last two days we have examined the pipe, and find that where the cement was used the iron is destroyed and full of holes, while the other portion of the pipe remains as sound as it was at first.

We give this fact for what it is worth, and do not wish any general inferences to be hastily drawn from it. It may be that particular conditions are requisite to lead to this result or that certain precautions will prevent it. At any rate, however, it inoculates the necessity for inquiry. Probably a special examination of one of our iron-clads in which cement has been used would not be out of place.

Touching the preservative power of a coat or two of red lead, we should not be very sanguine, and for this reason. In a certain set of houses the external wall forms the back of the cistern, and the front and sides are of wood. The wall is rendered with Portland cement to form a flat surface, and the lead lining is dressed over cement and wood alike. We have recently examined several of these cisterns, and find that while the lead on the wood front and sides is perfectly sound and good, the lead on the cement has been entirely destroyed, and, indeed, is so changed in character that, from sight alone, it would be difficult to say what the material is.

These facts certainly show that further inquiry in the same direction is necessary, and should be instituted immediately.

THE ANCIENT RECORDS OF THE PARISH OF ST. MICHAEL, CORNHILL†

WHEN the Great Fire was raging in 1666, and making for St. Michael's, Cornhill, with its fury unspent, some thoughtful soul remembered the parish records that had been carefully hoarded in that edifice for two hundred years and more, and carried them out of danger. The fire came on quickly, and burnt the nave and chancel of the church to ashes, and so gutted and weakened the tall proud tower, or so damaged the steeple, as one of the parishioners wrote in the minutes of the vestry, that the sole surviving portion had to be taken down and rebuilt in the next century. The fabric thus ranks as one of Sir Christopher Wren's churches; but the records have a much wider interest; for they date from the reign of Henry VI. They were placed in a chest provided by the churchwardens shortly after the fire, and have been well cared for ever since.

Within the last few years it has happened to Mr. James Alfred Waterlow to be elected and re-elected to serve as churchwarden, and he, fascinated with the charm of the old writings committed to his care in that capacity, has now obtained the consent of the vestry to permit him to print selections from them. His attention was drawn to them, in the first instance, by a desire to trace out the original trusts under which property is held by the parish, with a view to a proper disposal of the revenue from the parish estates. He tells us he was not altogether successful in his search; but in the course of it he found so many entries of general parochial interest in the churchwardens' account-book that he resolved to print it. He has limited his undertaking to this volume, with the miscellaneous memoranda written on fly-leaves of it, with the exception of some extracts from the proceedings of the vestry between the years 1563 and 1607. Not grudgingly, but with the

* Mr. Grant's paper, with an abstract of the discussion issued by the Institution, forms a very valuable pamphlet. A report of "Further Experiments," by the same author, has been quite recently published, and is also valuable.

† The accounts of the churchwardens of the Parish of St. Michael, Cornhill, in the City of London, from 1456 to 1608, with Miscellaneous Memoranda, contained in the great Book of Accounts, and Extracts from the Proceedings of the Vestry from 1663 to 1607. Edited from the originals by William Henry Overall, F.S.A. Printed with the consent of the vestry, for private circulation only, by James Alfred Waterlow, churchwarden.

lavishness of a cheerful giver; for over and above the exact wording of these writings, he has given facsimiles of three special pages. The first facsimile is the front page of the Book of Accounts, with its small diamond-formed lettering and bold heading in black letter; the second is a fanciful initial letter, commencing the accounts of 1556, consisting of three dragons; and the third a rough pen-and-ink drawing of the ancient tower, which some thoughtful custodian appears to have made as a remembrance, and under which is written "This representeth the symyltude of thold steple (A) D^m 1421;" and in the preface Mr. Overall has quoted later entries in the vestry book, which tell us the fortunes of the edifice after the Great Fire; given as extracts from the registry, added an inventory of the armour from the Ward Records; shown us a list of the rectors; and told us the inscriptions upon the bells. Finally, Mr. Waterlow has rendered an account of the charities and properties of the parish, which are of considerable value.

Stow, the Elizabethan antiquary, dwells with minute care and detail upon St. Michael's, Cornhill. His father and mother, grandfather and great-grandfather, lay buried in its churchyard; hence his feet were enchain'd, we may be sure, when he visited it for his Survey. His grandfather was thinking of "the litell grene churchyard of the paryshe church of Seynt Myghel in Cornehyl" when he made his will, for he directed that he might be buried there, "betwene the crosse and the church wall, nigh the wall as may be by my father and mother, systers and brothers, and also my own children," he wrote, particularly. And so Stow lingered about the old place, treading reverently, and set down all that he could think of about it. "And here a note of this steeple," he wrote in 1603, "as I have oft heard my father report, upon S. James' night, certaine men in the loft next under the belles, ringing of a peale, a tempest of lightning and thunder did arise, an uglier shapen sight appeared to them, coming in at the south window, and lighted on the north; for feare whereof, they all fell downe, and lay as dead for the time, letting the belles ring and cease of their owne accord: when the ringers awok to themselves, they found certayne stones of the north window to be rayssed and scat, as if they had been so much butter printed with a Lyons clawe; the same stones were fastened there again, and so remayne till this day. I have seen them oft, and have put a feather or small stick into the holes where the clawes had entered three or foure inches deepe." The first entry of the churchwardens in the year 1563 was, "Receyved for the buryall of Mystrys Stowe iij^s iij^d," which Mr. Overall thought likely to be a record relating to the wife of the old antiquary, but he has since found her burial registered in the Church of St. Andrew Undershaft, and concludes this passage refers to his sister-in-law.

The churchwardens' accounts consist of charges, receipts, and discharges. The charges are the sums gathered among the parishioners at the festivals, All Saints, Christmas, Easter, the Nativity of John the Baptist, and the "feste of Saint Michell tharavagell." Sometimes "Alhalowe-day" is substituted for All Saints, and sometimes Midsummer-day is added to the festivals. The receipts are for "berynges in the church and wawte." These entries run:—"1456. Item received of Thomas Hillard for the beryng of his wife in the chirohe vj^s viij^d. Item received of Edmund Rygon for the beryng of his wyfe moder in the wawte iij^s iij^d." And so on. The discharges are payments made with the church funds. The removal of gravestones before a burial and the replacement of them after are very frequent items of expense. The raker is paid "for a hole yer" pretty regularly, and he also receives extra pay for taking away the dust and rushes that he sweeps out of the church. Masons come and go; plumbers, too; smiths with "ironwork for ye gasses wyndows" or glass window; goldsmiths; Salmon's "wyf" who repairs the altar-cloths, albs, and amices; Nicholas Clark, who washes the surplices, altar-cloths, and towels; bookbinders, who bind, cover, and cleap "diverse booke of the chirohe;" Walpole, who scours the "leetyrme of laton;" a founder, who scours the four great candlesticks before the altar; Roribsy, who attends to the silver censors and scours the "seconde grote candlesticks;" carpenters, who mend "the pewes and doore," and sometimes put hinges on the "pyns;" painters, who clean the images of St. Michael and St. George, and hundreds of others, and they all get their claims settled, or as the old church-

wardens wrote it, discharged. Some of these humble little claims are very interesting, and yield curious information. We gather the wages of work-people from them in various reigns; and we see the constant care taken of the fabric in the frequent record of repairs and new purchases for it. There is scarcely a portion of the building but appears upon the pages of the account-book, and we have warrant, in the shape of entries relating to them, of many items in the church and churchyard that have now disappeared. There was a preaching-cross, for instance, in the churchyard, besides two crosses west of the church; for in 1559 there was "Paide for laieinge the steps about the pulpit in the chorcheyarde, xij^d." And again, in 1565, "Item. To Mr. Owthights, carpenter, for mending the pulpit in the chorcheyarde, iiij^d." There is word of its removal in 1578,—"Paide for mendinge of ye pillar where ye pulpit stode before, ii^d vj^d." There are several entries relating to the rood-screen; to images of Mary and John, on the rood-loft, besides references to others representing St. Michael and St. George, St. Christopher, the Virgin, and a Christ for the rood-cross, &c.; particulars of many vestments and vessels; notes of purchases of books and music, time after time, and billets, too, of prayers for the queen, in 1578. An hour-glass was bought in 1552, and another, with a wainscot frame, in 1576, which cost 6s. 6d., in 1582, to be removed, and was again removed in 1585. In 1595 there was "paide for the howe-glasse, viij^d," and in 1606 this superfluity was a fresh source of expense. There were three men employed on it this time,—"Paide to the joyner, to the turner, and to the smith, for a new brace, a pomell, and iron bolts, and a funnell for the howe-glasse, ii^d." The accounts show there were pews at a very early date. In 1457 there occurs, "Item. payd for an henge for Russes wyfes pewe, ix^d," and frequently after that there is mention of others,—the men's "pewes," the women's, the mayor's, Lady Stokker's, Master Stokker's, pews in the chancel, writing on the pews, making a new one for Alderman Hawes and garnishing it, and of fixing men who sat out of their own pews. It is pleasant to trace out that Rus, for whose wife's pew a hinge was so attentively purchased, was no other than Alderman Rus, the goldsmith, who founded a chantry in the church, and gave the tenor bell, which was named after him, "Rus."

Referring to the rate of pay in the different branches of the building trades, we may note its gradual rise in the following extracts, taken from the annual accounts at intervals. The change in the value of money, however, would have to be taken into consideration:—

1466. "Item payd to a mason for iij daies payng in the church, takyng ye day vijij^d, ij^d.
Item payd to a mason to pave in the said chyrche, by a day, vijij^d.
Item payd to his laborer the same day, vi^d.
1540. "Item p^d to ye mason in Graysons-strete for takyng down y^e altare, xvi^d.
Item p^d to hym for 3 daies and a halfe worke to pave where the altare was, xij^d.
Item p^d to another mason to make an ende when he could not come, & for to mende two chynce nyeys in the chorcheyarde, for one day, xi^d.
Item for laborer for 7 daies worke, ij^d, vi^d.
1580. "Paid for a daies worke to a bricklayer, xvi^d.
Paid for ij daies worke for a playsterer, iij^d.
1601. "Paid to David Blud, bricklayer, for 2 daies worke, att xviij^d p. daie, xvi^d.
Paid to W^m Price, laborer, at ix daies work att xij^d p. daie, ix^d."

The other trades prospered in the same fashion. In 1460, a carpenter was paid fourpence for half a day's work, in "emondyng of a pew." In 1556, a carpenter's pay was a shilling a day. In 1574, Thomas Markham, carpenter, received eight shillings for six days' work. Plumbers received a shilling a day in 1554. About this time there is an entry which shows the low ebb at which sanitary knowledge reposed, which accounts for the rapid spread of the plague,—"*Paide for emptinge of a pryvye in the barbers howse, being ix tonne, at xxi^d, xv^d.*"

It is to be noted that the accounts, which are very simple and sparse at first, get diffuse as years pass by. Bonts are entered as received from numerous chambers in the churchyard identified by letters of the alphabet. The patten-money begins to be accounted for. Money paid for the duty of the bells is entered in 1589. "A knill w^e ye Marye bell" cost two shillings and eightpence; while a knell with the peale cost eight shillings. Wives and husbands seem to have made a point of having a peal for each other. But when a child died, "a knill with ye small bell" sufficed, and this cost but sixpence. "Res of Mr. ffigge for one afternoons knyll w^e Rus

and the peales for his wyfe vijij^d." "Res of ye good man Wyther for a knill w^e ye small bell for his childe, vij^d." The bells were also a source of expense. Alderman Rus's bell was frequently under repair, and it was recast in 1587 by Lawrence Wright, and again in 1589 by Mr. Motte. About this time it was considered one of the accomplishments of the day to be able to ring a peal, and there was great interest taken in the new bell. "Paide to ye waytes of the cottle that took paynes to take the note of o' belles, and to goe to Mr. Motes to take the note of the new bell then cast, xvij^d." Spent upon a company (of) other musicians to take a further note of the same bell, xij^d. Among the miscellaneous memoranda, we may mention here, is a statement of the charges agreed upon at a vestry meeting upon All Hallows Day in 1521, the thirteenth year of the reign of Henry VIII. From this it would appear that a knell was of six hours' duration. When it was made with Rus, and there was a peal of all the bells to the dirge and mass, the charge was 8s. 8d. When the Michael bell was used, it was 7s. 6d. The charge for the Mary bell was 6s. There were less expensive knells, which lasted only for one hour, and included "pealles of all the belles to brynge the corse to chyrche," which graduated downwards with the size of the bell and the number of bells in the peal that brought the corse to church, from twenty-pence to sixpence. The passing-bell, which was the Mary bell, was charged fourpence an hour in the day-time, and eightpence an hour in the night-time. The sexton, however, was to have the profit of this bell, and not the churchwardens.

The accounts show us that the practice of exposing infants in the streets was in vogue in the fifteenth, sixteenth, and seventeenth centuries, as well as in our own. The churchwardens took the little waifs and paid for their maintenance for some weeks, when they disappear from their pages. We quote a few extracts relating to these cases:—

- "1564. Paide to the Goodman Hallye for a childe that was left in Sir W^m Harper's cottrye, xij^d.
1592. Item layed out in charge about y^e childe layed against St. Michels Chyrche, xxi^d.
1593. Item payd to my selfe William Hammon this accountant by order of a vestrie holden in this pise the 29 day of April 1593 to thende I should keepe maintaine and brage up orphan Mychael a foundlinge in this pise, and for that I shoulde for ever discharge the pish of her and to that effect to give my bond for the same, vij^d xij^d iij^d.
1608. Paid to Brownes wife for keepings of the childe w^e was left at Mr. Vanakers doore the laste winter and for clothes for the same childe, vi^d.
Paid for ij coates for the childe and for an oide sheet to make it smoothe, v^d vij^d.
Paid for hose and shoes for the childe, iij^d."

Among other items not concerning the fabric are the purchases of books from time to time. The most valuable volumes were chained to the brass eagle, but, for all that, a man stole the "Book of Martyrs" in 1607, for the vestry allowed ix^d for the expenses against him. The earlier entries are most curious:—"Item payde to St Will^m for v quyres of vellum of prykked song, ix^d ij^d," which sum was more than was usually gathered in the church at a festival at that date, 1466, and three times as much as the fee for an ordinary burial brought in. Was the prykked song some impassioned wail or outburst of praise of Sir Will^m's own composing, or only one of the Gregorian chants set out by his hand for the convenience of the choir? There was extra care of the musical portions of the services that year, for the next entry to this new music is, "Item payde for iij sconces for the quyre, xij^d." In 1474, the churchwardens paid Robert Clerke sixteen pence only "for prykyng of a messe in the chyrche boke." The expense of the account-book itself is mentioned. "Item payd to Colop for ij Bolles of pohenym to make with this boke, xx^d." Item paid for makyn and byndyng of the same Boke and for clappes, iij^d ij^d. Those who look over the contents of the brave old tome, in a word, cannot fail to be struck with its varied interest. The parishioners of St. Michael's especially have much reason to be pleased with Mr. Waterlow's undertaking, as well as the manner in which Mr. Overall has carried it out. If there be any, however, for whom old parochial details have no joy, we would refer them to the list of the property belonging to the parish, which will be, at all events, a source of satisfaction. Mr. Waterlow catalogues as belonging to St. Michael's, Cornhill, houses in Bishopsgate-street, at 155l. per annum; in St. Michael's-alley, at 105l. per annum; the Jamaica Coffee-house, let at 550l. per annum; houses in Cornhill, let at a total rental of 900l. per annum;

St. Michael's House, let at 577l. per annum; Farrer's rents, amounting to 10l. per annum; and the ground-rents of a dozen houses in Westbourne Park.

ARE STRIKES NECESSARY FOR THE PROTECTION OF WORKMEN, OR LOCK-OUT FOR THAT OF EMPLOYERS? *

WITH returning commercial activity the country has to deplore a fresh and extensive resort to strikes; greatly checking that full tide of prosperity which might otherwise flow, and preventing that hearty feeling of good-will and respect between class and class which is so necessary for general happiness and for political security.

That these violent interruptions to labour, with their counterpart lock-outs, are great evils, that they cause enormous loss and waste, that they tend to destroy habits of steady industry, and to cripple and drive away that very trade on which both workmen and employers depend, few will deny; but, unhappily, to many persons strikes and lock-outs seem, nevertheless, under certain circumstances, unavoidable, and therefore to be borne as best they may; but, for myself, I hold a very different opinion, believing that whatever transient effects they may produce, or seem to produce, they are no more essential to the admirable system established by the benevolent Creator of the world than are wars and pestilences. For what, by a law, as certain as that of gravitation, must result, without any joint action either of workmen or employers, when wages, as compared with the rates of profits, are too low or too high, or the hours of labour too long or too short? Assuredly, where wages are too low or the hours too long, all employers desirous of increasing their business (as which of them are not?) being stimulated by a state of things in which their profits are unusually great, will try to increase the number of their workmen by offering higher wages or a reduction in the time of labour, or both; while any employers who do not at first recognise the necessity for a change, will soon find, by the gradual secession of their workpeople, the absolute need of conforming to the acts of their neighbours. And what, also, must quickly be the effect of wages (again as compared with profits) being too high or the hours of labour too short? Men from other places, or even from other employments, will flock in and underbid their fellow-workmen; or the employers must close their works during part of the week; or capital will gradually be withdrawn from that branch of trade.

No doubt these operations require some time to come into full effect; and, no doubt, a rise or fall in wages, or in the hours of work, may sometimes be accelerated by a strike or lock-out. But at what a cost, both in money and feeling, is this mere anticipation brought about! A cost generally, if not always, far exceeding the gain. And if, as is frequently the case, the party insisting on the change makes a mistake, and the tendency of the labour market is in the opposite direction to that which they supposed, or is not to the extent which, in fixing their empiric rate of wages, they assume, then are this great expense and embittered feeling utterly in vain, and the erring party is doomed to defeat.

Let it also be remembered that every shilling of wages or profit which, by the cessation of work and the stoppage of machinery, is thrown away, is so much withdrawn from that fund on which workmen and employers alike depend, and, as far as it goes, must be a subtraction from the general rate of wages and profit.

What, then, if this reasoning be just, should be its practical application? An abandonment of all attempts artificially to regulate wages and hours of labour, and a willingness to leave the matter to the quiet but certain operation of natural law. But, it may be asked, while this may be wise if both parties will consent, what is to be done if one party refuses? Must not combinations of employers to lock-out, or *vice versa*? No, I venture to reply, any more than it is wise for a country to close its ports against free trade until other countries are willing to open theirs. I hold that while it is an error even in a selfish sense for workmen to strike, it is but to double the error and greatly to delay the abandon-

* By Mr. Frederic Hill. The discussion which followed the reading of this paper at Leeds is referred to on p. 819, ante.

ment of strikes and the whole system on which strikes are based for employers to look out.

To state yet more specifically the course which seems to me politic, in the case, say, first, of a strike, I believe that the wisest action on the part of those employers to whose works the strike extends would be at once to yield to the demand, if such course impose a smaller loss on them than would a temporary stoppage of their business; and that the only requirement which they should refuse to accede to is one to bind them to continue a stated rate of wages or number of hours of labour indefinitely or even for any long period; so that they may be at perfect liberty to make a change whenever men come forward to offer better terms.

Should a case arise of an employer being evidently selected as a victim on whom it is attempted to impose a rate of wages very different from that in general use, and inconsistent, therefore, with the state of the labour market, with the intention apparently of frightening other employers into the adoption of a similar unreasonable demand, surely it would be wise, on the part of the employers generally to uphold the intended victim by financial aid, and thereby to defeat the plot.

And the converse of the course I have suggested in the case of the employers I would advise in that of the workmen when there is a threatened look-out. I would say to the workmen—"Yield to the employers' demand rather than throw up your work and be idle; but at once bestir yourselves to learn what wages other employers in the same trade are giving, and what hours of labour they require; and if you find you can better yourselves by engaging at some other factory, go there; or if for a time there be no vacancies in your own trade, and you can get better wages than those offered to you at some other employment, make a temporary change (such as a large number of workmen at Newcastle lately made), and wait until matters have righted themselves and your former situations are again open to you on terms in tolerable accordance with those generally given elsewhere."

In exceptional cases I need not advise workmen to adopt the course recommended to employers, seeing that such sustentation is their ordinary practice.

Such a course of proceeding is in unison with that which long experience has induced our country to adopt in relation to all other commodities, and I see no reason whatever for an exception in respect to the commodity of labour. Bakers do not combine to keep up the price of bread, and consumers do not combine to keep it down; and most persons must now agree that all such combinations would be both futile and mischievous; and thus the law, which is but the expression, in the long run, of public opinion, has ceased to interfere in the matter.

If workmen and employers had really opposing interests, the difficulty of bringing about a general and lasting peace between the two classes would indeed be great,—perhaps insurmountable; but, as maintained in a lecture on the subject which I had the honour of delivering about a year and a half ago, the opposition of interests is only apparent, and, on careful examination, vanishes. For supposing, as I then did, a number of workmen and employers to meet together to agree upon a scale of wages, is it not clear that one and the same scale would best serve the real interest of both parties; namely, that most in accordance with the actual state of the labour market? For suppose that either party succeeded for a time in obtaining a deviation in its favour, what must be the result? If, on the one hand, the scale were placed too high, a motive would be offered to men to come in from other works; while the employers would have an inducement to transfer part of their capital to other concerns where profits were not unduly depressed. And thus, in the end, the workmen, instead of being benefited by their supposed success, would really be injured. And so, on the other hand, if the scale were placed too low, the men would straightway have a motive for seeking employment elsewhere; the obvious effect being to render part, at least, of the invested capital unproductive, to the obvious injury of the employers. If, therefore, it be demonstrably true that even in the matter of wages workmen and employers have the same interest,—in other words, that both parties must be injured by any deviation from the market rate,—then, as already implied, the cost of every contest proceeding on an opposite theory must be utter waste; and great becomes the responsibility of

every one who throws obstacles in the way of those friendly meetings of workmen and employers, in which facts and opinions may be fairly and freely discussed, with a good prospect of just views being ultimately attained. As evidence of such sincere desire, seconded by tact and temper, can achieve in this way, I need only refer to Mr. Mundella's success in establishing Boards of Conciliation at Nottingham and elsewhere, and to the long periods of peace and harmony of which these Boards, where formed, have proved the harbingers. Had such a meeting taken place at Newcastle,—an expedient the adoption of which this Association's committee on labour and capital tried in vain to procure,—I cannot but think that the strike there might soon have been brought to an end; indeed, Mr. Burnett, chairman of the Nine-Hours League, in his last letter to the *Times*, expressly declared that had there been such a meeting, the late unhappy strike would not have taken place.

That the improvement in trade warranted an increase of wages, and that the employers were ready to make such increase, is evident by Sir William Armstrong's letters in the *Times*; so all that had to be done was to commute this increase in money for a decrease in the hours of labour,—a decrease which, as shown by the experience of Sunderland, was very likely to prove, by the act of the workmen themselves, merely nominal.

Sir William Armstrong states that such a decrease, if real, would diminish profits in a much greater degree than would a corresponding increase in wages. If this statement be correct, the first thing, in a friendly conference, would have been to point out to the men that that large loss would not be confined to their employers, but would inevitably extend to themselves. But other modes of meeting the difficulty might have been considered; perhaps, for instance, one which has, in some sort, its analogue in the Post Office,—viz., increasing the number of workmen by one-third; so as, without any disturbance of established hours, to admit of every workman having one day in ten holiday, an arrangement which might, perchance, have proved quite as acceptable to them as an hourly decrease in the ordinary day's labour. The system of relays might also have been considered, and both the terms recommended by Mr. Mundella and those which were ultimately adopted.

That some satisfactory adjustment might have been effected at Newcastle by a friendly conference between the workmen and their employers is rendered more probable by the result of the proceedings at Mr. Stephenson's great works, where resort was had to direct and frank communication, by which considerate and wise course the disastrous strike was, as we know, averted from an important and extensive establishment.

Let us, however, rejoice that, at last, the strike has come to an end,—the termination having, I believe, in no small degree been brought about by the exertions of three members of the Committee on Labour and Capital,—Mr. Mundella, M.P.; Mr. Walter Morrison, M.P.; and Mr. Pease. The great thing was to enable each party to get out of the false position in which, if the view I have taken be correct, it had placed itself. The precise terms of agreement are, in my opinion, of little importance; for, at no distant time, natural law will make the balance right, even if for a time it be wrong. To this law, as one to which workmen and employers must yield, Sir William Armstrong refers in his letters to the *Times*; but what was wanted was not a mere speculative recognition, but a faith, of which the adherent was ready to give practical evidence.

Before quitting the case of Newcastle, I think it well to advert to a statement in one of Sir William Armstrong's letters, implying that, by a reduction in the hours of labour, workmen may command payment at a higher rate; seeing that by this course the number of workmen is, in effect, diminished, with a corresponding diminution of competition. Such a view I hold to be an economic error, and one of great practical importance, both in the groundless fear it creates (as in the present instance) in the minds of employers, and in the false hopes it raises among workmen,—hopes to which may be attributed some of the most mischievous regulations of certain of the trade-unions; such as restriction in the number of apprentices, and the exclusion from employment of men not brought up to the particular trade.

That an immediate result of a reduction in the time of work might be an increase in the rate of wages, I do not deny; but I maintain that

such a result would be of short duration, owing to its tendency to draw workmen from other places and from other occupations, and to the check it would give to consumption and to the employment of capital. Even supposing, for a moment, that all the effect could be thrown on the consumer (which, of course, is impossible), and that the workmen could receive higher wages than the market rate, without diminishing the employer's profit or driving away capital, every workman should remember that he is himself a consumer; and that if a reduction in hours, or rather in the quantity of work performed, could, without loss to the workman, be adopted in one employment it could be adopted in all others; and that such change would be succeeded by a general enhancement of prices. And thus, in the long run, he would be no gainer.

That a rising or falling amount of profit, and the state of the labour-market, are felt to be the ruling facts on which a rise or fall of wages must depend, is shown by the constant reference to this matter in the discussions to which strikes and look-outs give rise.

The idea that wages are fixed, not by any natural law but by the will of the employer, is, I hope, for the most part, discarded by intelligent workmen; though, as shown by experience, such want of power, on the part of the employer, is no obstacle to the voluntary performance of those acts of benevolence which personal intercourse, and the possession of superior means, always suggest to a kind heart; while, on the other hand, such acts should, in fairness, be taken as free gifts, and as good offices of man to man; and should not be distorted, as to the Parisian workman's vision, into a mere instalment towards the discharge of a large debt.

There is, indeed, a school which maintains that, instead of capital being labour's mainpring, it is its unaided produce; some zealots going even so far as to denounce capital as labour's enemy. But I am sure you will agree with me in opinion that every such rhapsodist is either a mere class-flatterer, or else grossly ignorant of the subject on which he presumes to declaim; an observation strictly applicable to the compounders of that document, so replete with ignorance and folly, which has lately been addressed by the International Society to the people of Switzerland, but to which I trust the Swiss are too intelligent to give ear.

It is a striking fact that in Paris, where, as we know, these false doctrines are rampant, nothing but the capital thus attacked had kept its very assailants alive; since, during the siege, production was entirely suspended, and there was nothing but capital to live upon.

If, then, all attempts to force up wages are, at best, but labour in vain, are there no ways in which, without force, the desired end may be attained? Many, I would reply, As is now generally admitted, everything which, by adding to knowledge, developing intellect, or improving character, renders a man a better workman, must, sooner or later, enable him to earn more money. Again, much would be done to increase the potency of labour, and, therefore its marketable value, by a more general substitution of piece-work for time-work. But, beyond all this, the amendment in the law of partnership (at which this association so long laboured) has opened new resources of great value. The arrangement, now made practicable, under which part of a man's wages shall rise or fall with every fluctuation in profit, instead of waiting for adjustments by fits and starts, though as yet not adopted, I fear, to any great extent, is one which, for the welfare alike of workmen and employers, we may hope to see brought into general use; since, by the motive which it creates, in both parties, to promote, by diligence, punctuality, thrift, and invention, the success of their joint undertaking, it must tell powerfully in causing an augmentation of that fund on which, at all times, both parties depend, and in which, under such arrangement, workmen have a direct share.

Should this arrangement become at all general, any employers not adopting it would carry on their trade at a disadvantage; as they would not be able to offer wages equal, in effect, to those given by others; and their workmen, therefore, would gradually leave them.

A yet further improvement, made practicable by the new law, is the establishment of industrial partnerships,—a subject on which Professor Jevons has given us so much information,—and which, as we know, is, however slowly, forcing its way into adoption.

If, instead of contests tending to mutual destruction, workmen and employers would labour for the attainment of these good and practicable objects, how much more wisely and profitably would they be engaged! It would, I believe, be a moderate computation to estimate the joint loss caused by the late strike at Newcastle, at 15,000*l.* a week, or, for the whole period of nine-teen weeks, during which the strike lasted, at more than a quarter of a million sterling; and how far might the sum thus thrown away have gone towards enlightening the whole country on the subject under review, and towards bringing into general use the first, at least, of the two great improvements I have just named!

This task was undertaken by a committee appointed by the Social Science Association; a task which two distinguished members of that committee, Mr. Mundella, M.P., and Mr. Brassey, M.P., with whom has been associated Mr. Apple-garth, well known as an able advocate of the rights of labour, are, at this very time, engaged, at a generous sacrifice, by visits at Newcastle and elsewhere, in actively performing. And if the committee's exertions have been crowned with only moderate success, I venture, as a member of that committee, to assert that the fault has not been theirs, but is to be found in a want of that financial support which is essential to their extended action, and which, indeed, unless quickly yielded, must cause a cessation of their labours. While even millions of money have been thrown away in useless contests, much less than a single thousand is all that has been placed at the disposal of the Committee on Labour and Capital to aid it in its exertions for preventing all contests whatever.

In conclusion, let us hope that a practical people, like the English, will not allow matters of such momentous importance to drift about as chance may direct; but that either by the organisation which this Association has brought into action, or by some other, they will make a vigorous effort to weed out error, and implant truth; so that gradually, yet surely, for waste and comparative poverty, may be substituted thrift and increased wealth; and for discord, harmony.

GOTHIC AND RENAISSANCE CHURCH RESTORATION.

WHEN the history of church and temple architecture comes to be written without thought of anything but the mere facts, and their obvious inferences, what a very curious and somewhat unintelligible history it must be. If the precise mode of conducting ceremonies in the old Parthenon could be come at—and what a pity it is that it cannot,—if the defined use of every part of that structure could be discovered, we are quite sure that not a single stone in it would be found to have been put up for nought. Every part of it, both inside and outside, and its decoration, must have had its proper use and significance, and certainly would never have been there at all if it had had none. So of every heathen temple probably in existence, from Egypt to India. But now-a-days, as the world has grown older and wiser, things are altered: churches and chapels are built, and being built and decorated as well, every day, and having parts attached to them for which those who are to make use of them have no need, and who do not know what to do with these strange additions to the bare and actual requirements of the time and circumstances. Some old forms and arrangements have been copied and brought into existence, and made to add, as it is thought, to the architectural and artistic effect of the structure. What was a useful and artistic necessity in the old building, or model, is in the modern copy of it simply an artistic necessity. Nothing can possibly be stranger or more worthy of a little thoughtful consideration, and we have been led to it from the seeing lately one or two of the City churches now in course of "restoration," as it is called; a chapel now building, with a tall bell-tower attached, but without any bells to fill it, or apparent usefulness or practical purpose, and from the sight—a lamentable one—of the Morning Church in St. Paul's Cathedral, now in course of restoration, or whatever other work may be considered best descriptive of what is going on in it, or being done to it. This is modern architecture in practical working, and it would seem to go some way to prove that a really modern architecture, or architectural restoration, does not exist, but only a mode of copying blindly, or the

following blindly, a something or a somebody gone before us, but passed away. The "restoration" of an old Gothic church would seem to be, to a certain extent, a straightforward sort of work, and to consist simply of undoing all that the last century did in it. Galleries are pulled down; all the close pews are condemned; the walls and roof are well scraped, and white-wash and yellow-wash got rid of, and the bare wall-surface is made visible; the old pulpit, reading-desk, and clerk's desk come down; the quaint communion-table makes way for a more imposing piece of church furniture; and, in short, by the time all is done, no one going into the building could possibly know it for the same structure; it all looks so new and dainty! This is called "restoration," i.e., the church is restored to what it may be supposed to have looked like four or five centuries ago. What a surprise it would be to modern restorers, if but some old church could be discovered, and exhumed from the dust of centuries, and exposed to modern view, with everything in it just as it was left, after some morning "function." What would be done with it, could it be "restored?" and what would become of its furniture, vestments, and books?

But far different is the fate of a Renaissance or Italian City church. For some time, as all know, no one seems to have thought of restoring any of this style of architecture church: they were all left to go on in their own old-fashioned way, so that any man going into a City church went literally and truly into the house of his fathers; nay, the very voices in it seemed of the past, and to come almost from the grave, all looked and sounded so old and dusty. But the spirit of modern improvement and reasonableness has at length entered them, and they are now in active course of what is still called, even when applied to them, "restoration." But this restoration is, strange to say, nearly or quite opposite in character to that adopted in the case of an old Gothic church. Everything is reversed. The walls of the Gothic building are carefully and thoroughly scraped of their coatings of wash, and the bare stone brought to sight; but the walls of the Renaissance church are as carefully and thoroughly coated two and three times with almost solid plaster wash, so thick and heavy and opaque, that the whole surface becomes of one uniform tint, and by no possibility but by breaking it away can it be told what the walls are made of, whether of brick, plaster, or solid stone: the very workmen employed to do the work sometimes cannot tell you what the walls are made of. The quaint church of Allhallows the Greater and Less, in Upper Thames-street, remarkable for its wooden roof-screen, and the "restoration" of which is just completed, exemplifies this; for not only is the whole of the interior of the church coated over in this solid and decorative way, but the whole of the outer porch, and solid stone tower as well, is covered up out of sight with it. It all looks like a bran-new chapel of the very latest possible build. Why should this be, if the stone surface of the Gothic church is a something to have, and to see that we have it, why not the stone-work of this poor Italian building? Stone is stone wherever it is found, and surely it is as good to look at as common coloured plaster. But so it is, and it serves to show into what an odd state, things artistic and architectural have fallen. The ceilings, of course, of these churches are similarly treated, and so thickly sometimes is the whitewash put on, that the ornamental details, small mouldings, and small foliage, are almost hidden away altogether by it; all character and modelling is, of course, thus destroyed. It seems, indeed, a thing not a little strange that the work in a Gothic roof should be so carefully cleaned of its wash and coatings of any kind, and the workmanship of it brought to light, while the very same details of ornament, when in a different style, should be as industriously covered over. Professor Cockerell, before he commenced the painting of St. Paul's, began his work by "yellow washing" in good solid coats the whole of the stonework of the north-east aisle, of course to the almost total destruction of the ornamental details of it, and it was the seeing this deplorable effect of it that probably led him to the yet more fatal expedient of painting the rest of the cathedral—more fatal because harder to scrape off!

We have said that everything is reversed; the Renaissance restorer is the very reverse of the Gothic restorer. Take the woodwork, for instance, the pews, and pulpit, and desk, and communion-table. In the Gothic church, as all know, it has,

been the custom to do away with all closed pews, and even a society exists to protest against them, and they have been made to give way to open benches—not always of the most comfortable kind; but in the City church restorations, these pews have been wisely, when the character of the church is taken into account, retained; but instead of all paint and varnish being carefully and industriously cleaned off, wonderful to say, in some instances, the wood-work, though of dark-coloured good oak, has been painted and grained in imitation of light-coloured oak, and in those instances wherein the real natural wood has been allowed to show itself, the whole of it has been so thickly covered with coats of thick varnish, that it is almost impossible to tell what the wood is, or whether it is wood at all, or only some patented composition, so effectually is the real nature of the natural substance hidden away by the artificial polishing. Wood and workmanship alike go almost out of sight under it.

Has not everything architectural to be yet commenced anew, and is it not a thing for the future to find out the beauty of every natural substance, stone, wood of all kinds, and even metal? Nothing can be more dangerous in the hands of the thoughtless than varnish. Like gunpowder and sharp knives, it is a good thing in its way; but give some people an unlimited supply of either, and fearful damage must come of it. In more than one of the City restored churches we could name we will defy anybody to discover the wood under the thick coatings of varnish with which it is covered. But, why varnish good dark oak-wood at all? Is it not better to let the natural material show itself? And if there be any practising architect who asks for a way to add to the plain natural beauty of the newly-wrought wood, we can point with confidence to a common briar-root pipe as an example of it. A little oil and elbow-grease are only needed to bring out all the markings and colour of the finest or the very plainest of natural woods. Does it not seem a pity that the great problem of architectural and artistic restoration should not be better understood, and that before any more churches are restored, or before St. Paul's Cathedral, which is destined to go through this process, is finally given over to the experimentalists, some public art-body, as the Institute, should not report and perhaps advise upon the modern system.

We must not, even in this slight notice of Renaissance restoration, omit to notice what would seem to be a sort of generally-received restorer's axiom, for we see it everywhere,—we allude to the system of painting—where all else is left bare,—the architrave, and cornice, and jambs of stone doorways. We speak of this more especially because of the recent painting in this way of the finely-designed small doorway in the north-east aisle of St. Paul's. Why so treated, it being out of the way of visitors and sightseers, it would be hard to say, or what motive there could be in singling it out for painting, and thus throwing it out of the Cathedral harmony. Another fine doorway in St. Paul's treated in this poor way is the doorway in the south transept leading into the vaults or crypt, a singularly unfortunate spot to pitch on for such bright and new-looking work; for no one expects a crypt filled with coffins and dead men's bones, to look new and smart. Such a place must be dismal, and look old and time-worn, and one would have thought that the doorway into it from the body of the church might have been led to harmonise with it, and allowed to remain as it was, and to look old and quiet, if but by way of prelude to the solemn place it led to. But we live in practical and business-like times, and cannot be expected to see poems in architecture!

THE WINTER EXHIBITION BY BRITISH AND FOREIGN ARTISTS, IN PAUL-MALL.

THE French Gallery, in Pall-mall, has long been a favourite with the public. Its central and accessible position, its comfortable, not to say luxurious, furniture, and the taste that is usually evinced in the selection of its contents, have well earned this partiality.

The Exhibition of the present winter contains 208 pictures, chiefly illustrating subjects of quiet domestic genre. The Munich and Düsseldorf schools, rather than those of Flanders and of France, furnish the greater portion of the contents; although English pictures are hung side by side with German paintings on the walls. We have, moreover, the somewhat unusual

feature of the illustration of English scenery by German artists.

The first picture (remembering the former contents of the room) that calls for attention is from the easel of Alma Tadema. We have before this had occasion to remark with regret how far this able and original artist has been seduced from the finish of his earlier works into a rough and hasty touch, suggestive of pot-boiling, and hostile to true fame. The present little picture, entitled "Pottery Painting" (No. 67 in the catalogue), occupies an intermediate position between the works at which the artist has laboured and those which he has scamped. It is, there can be no doubt, deeply imbued with the classic spirit that yet lingers around the lovely margin of the enchanted Campanian Bay. Time rolls on, and races follow one another; but climate remains unaltered; and the effects of climate on habit and on æsthetic development are even more potent than those of blood. It is impossible to pass the summer in the delicious retreats within sight of the ruined walls of Pompeii without finding an intelligent sympathy awakened with the ancient classic life. To look upon the paintings representing the flower-crowned banquets of the Romans as they fade upon the walls of Pompeii, is a very different thing from regarding the same works when carefully protected in a museum. It is thus by taking counsel of the *genius loci*, by studying the inherited forms and unchanged habits, of the semi-Greek *passos* of Southern Italy, that such artists as Alma Tadema have been able to step backwards for 2,000 years, and to bring us face to face with the sensuous, leisurely life of imperial Rome. In the present instance, we are invited to enter the *delicium* of two painters of the Sicilian or Nolan vases of the third period of stilted art. A man is seated before a work-bench or table, deeply intent on the figures which he is delineating on a black-lustrated vase. A fellow-worker, by his side, sister or wife, has just stepped back, with the gesture so characteristic of the studio, to observe from a more distant point of view the effect of her own minute labour on a similar vessel.

Contrast with the memory of imperial luxury the province of European civilisation—the material for the future organisation of Teutonic Europe—in the blue-eyed, rosy-cheeked boy entitled by his portrayer, A. Piot, "Life's Sunshine." The blonde is, perhaps too carelessly painted,—although the effect is not aimed at concentrating attention on his face. It is a face that few would soon become weary of seeing beaming on their walks, or still better, vaulting and shouting through park and garden. Opposite, or rather parallel, to this fresh and life-like child, hangs the face of the ex-Emperor of the French,—a portrait which was taken in 1868 from life, several sittings having been given to the painter, A. Yvon. The artist, however, cannot be acquitted of the design of having considerably idealised his subject. The nose, in especial, is much more finely and sculpturally cut than the flesh-and-blood feature which it represents. Photographs—abominable as they for the most part are—yet give certain physiological indications to those who know how to use them, and thus become silent, but merciless critics of court, or courtly, painters.

Turn, again, from the examination of features which, if rightly traced, should indicate a capacity that considers craft, dissimulation, and waiting upon circumstances to form the main elements of statesmanship, to the representation of blundering perplexity in Mr. Nicol's "Perplexed" (2). We know the man of old,—we have seen him keeping school; we are tired to death of his frequent intrusion on our walls, yet there he is—alive, and not to be mistaken,—Paddy perplexed. Mr. T. Faed, bracketed (as usual with Mr. E. Nicol, gives a sprightly Irish maiden (the misty mountains behind whom are sadly smudged) to whom the catalogue has attributed the unusual task of "Keeping a' her Elves together." Bwae would be more intelligible.

Mr. Dicksee's "Miranda" (72) is a gracefully drawn, pleasingly coloured representation of a very charming girl. The combination of cultured power in the forehead, and of the softer feminine qualities in the mouth, whether actual portrait or idealisation, is characteristic of the finest type of the Celtic blood. But the admiration due to Miranda has its edge taken off when we recognise her portrait, in another *pose*, under the name of Sylvia. When will painters learn that, however parsimonious Nature may be,—as far as their experience goes,—of beauty, it is a great mistake to feed their ad-

mirers on *réchauffés*? Monsieur Saintin gives a very touching view of a Parisian home in 1870,—a beautiful young woman, in deep mourning, trying to warm her chilled heart by a stove, somewhat audaciously introduced, pictorially considered, in a luxuriously-furnished chamber. The face is very lovely, and the figure, with its white skin gleaming through the transparent crape, is charming. But we miss the same lady twice in Mr. Everard's gallery. This constant repetition shows a woefully poverty-stricken genius.

Mr. Long has seized on a very tell-tale incident of Spanish ecclesiastical life in his quaintly-entitled, "Agape" (92),—the love-feast in question being composed of chestnuts coquettishly doled out by a brown and sassy peasant-girl to two chorister-boys, one in crimson, and one with his red gown covered with an alb, on the steps of a cathedral. One little rogue is evidently assuring the proprietress of the dainties that he is dying of hunger, such being the phrase proper to the occasion. The expression of the countenances is also very good in "Good Counsel" (181), by the same artist, in which a worthy priest is impressing on a young woman, who has been brought to his abode by her mother, the danger attendant on her giving heed to the contents of a letter, sealed and stamped with a coronet, which she holds in her hand. It is pretty clear, from the young woman's face, that she is not disposed implicitly to follow the counsel of the ghostly father.

From the atmosphere of the French *Grand Seigneur*, we pass to the more healthy and homely tone of the home, as regarded by a German artist. Carl Hoff gives us, in his "Unexpected Return," one of those scenes of domestic genre with which the photographs that fill the windows of German shops are making us very familiar. A cavalier enters unexpectedly an old-fashioned dining-hall, and is welcomed with a warm embrace, by a tall and graceful woman—lover or wife, while the party round the table look on in surprise. The mode, however, by which this sentiment is expressed on the different faces is identical; an old man—perhaps an ousted lover, and a younger sister, opening their mouths in precisely the same manner. It would be of service to Mr. Hoff to study the mastery way in which the same passion is made to dominate such widely different pathognomic expressions by the masterly touch of Escostra.

Mr. Burgess, haunting as usual the doors of Spanish churches, preaches a neat and appropriate sermon on the words, "Blessed are they that remember the poor and needy" (194). But somehow we seem to have heard it before. Mr. Burgess would do more justice to his genius if he would travel for a time in some totally different scene,—say Norway or the Fiji Islands. Artists of power like his do themselves cruel injustice when they harp continually upon the same string. Paganini on canvas is simply odious. There is a good deal of space to let in L. Jimenez's representation of "Spanish Courtesy" (81); the historic incident of Raleigh's cloak translated into modern Castilian in favour of two flirts for whom it seems a sin to spoil broad-cloth. But the picture has a motive and a "go." There is also much power,—rather, to use a cant phrase, suggestive than actual,—in the "Door-keeper," No. 66, by De Nittis, a richly-robed Nubian leaning on the wall of a *loggia*, with his back to the sunlight. "The Horse Market, Constantinople" (13), by A. Rosini, is a very delicate and lively representation of life by the banks of the Golden Horn.

LEICESTER AND ITS AUTHORITIES.

THE local government authorities of Leicester have thought proper to take some exceptions to our remarks upon its sanitary state, and the evils from which the townspeople, with others, suffer in consequence. This appears to have been done through the pen of Mr. E. L. Stephens, their surveyor, and published in the local press.

Our facts are at the outset represented as "distorted statements, written with a view to alarm the public;" and so on. Notwithstanding this dissent, however, the Board's statement is singularly corroborative of our observations. It is true no reference has been made to our views upon the disgusting state of the River Soar, fouled by the Local Board's sewage, nor to the evil practice of sanctioning a sewage-tainted water supply. Hence we infer that they tacitly agree with us—indeed, the facts are patent to any one visiting the locality "with nose and

common sense;" and as to the foul condition of the public water supply, the authorities now have the fact officially before them.

Recurring to our representation that choked sewers can be counted by the dozen, the Borough Surveyor is made to "deny that a fourth of that number can be found;" and in the same sentence he confirms us, saying "there are, and always will be, many, which are occasionally partly filled, and have to be opened and cleaned out; this arises from the fact that the small summit sewers—that is, the starting end of the sewers—receive no flushing force from the sewage turned into them, which, on leaving the yards, contains a large proportion of heavy matter in suspension, which is deposited in the sewers named." Just so. In the first place, the usual intemperance given that a sewer requires cleansing arises when the house-drains refuse to act from the sewers having become choked, when the drainage backs up into the yards and cellars; therefore, as the sewage cannot flow away, to all intents and purposes that sewer is choked, for if it were not completely stopped, the fluid of course would escape; "and this must be patent to any ordinary mind."

Mr. Stephens is instructed to say that this stoppage arises in the small summit sewers—that is, the starting ends of sewers. Here is news indeed for Leicester, although the stoppages are by no means confined to the "starting ends;" for we must explain what, no doubt, the surveyor considered unnecessary,—perhaps judiciously. As a matter of fact, we question if a single street within the whole town can be found without these small summit sewers; and as a fact many streets contain more than one such sewer, and a few probably half a dozen.

Any denial on the face of this, that not a fourth of a dozen choked sewers can be found, taken with the surveyor's admissions, is an insult to the intelligence of the town.

There is another fact that the people of Leicester may be obliged to us for mentioning, viz., that for something like two consecutive years a portion of the corporate staff, averaging from six to sixteen men, were incessantly employed cleaning out choked sewers, and,—what is most remarkable,—there remained at the expiration of that period a larger known number of uncleared sewers (from fifteen to eighteen, we believe) than were upon the list at the commencement. This arose, as is readily understood, from the choking operation being more rapid than the cleansing one, whilst information was repeatedly furnished of fresh stoppages. At the moment we are unable to give the cost of this kind of repetition work, but, from an official return now before us, it appears to have been for three months a shade under 90l. for manual labour, and this was by no means the heaviest quarter.

The total number of sewers opened and cleaned out last year, from having ceased to act in the capacity for which they were constructed, in other words being choked, was nearly, if not quite, one hundred. Moreover, a few days since we heard from those employed through the Local Board in this class of work,—therefore as likely to know as Mr. Stephens,—"Why, sir, there are scores of them just about stopped up, and we shall have them all upon us at once!" We could give more information upon the state of these imperfect sewers and other delinquencies, but withhold it for the present, so that the authorities may have an opportunity of rectifying them instead of vainly attempting to question facts. At the same time it may be worth mentioning that if improvement is desired in this direction, then there must be no more miles upon miles of sewers constructed in a haphazard style of workmanship and disregard of gradient.

Miles of sewers, thrown together without mortar and cement, as they have been in Leicester, do not speak much for the intelligence of those concerned; neither can the Local Board expect other than indifferent work when they give out contracts for 15-inch brick barrel sewers, 10 ft. and 12 ft. in depth, for the small sum of 4s. a lineal yard!

Well may the old sewerage contractors say, and with some show of truth, "that 5 cwt. of lime will do a mile of Leicester sewers!"

The borough surveyor attributes the stoppage of his sewers to the large proportion of heavy suspended matters in the sewage leaving the yards. We are not aware that house-drainage contains heavy matters in suspension, or, at most, but a trifle; and Mr. Stephens, or those who instruct him, ought to know that his statement

is not in accordance with fact, as they may easily prove. We are, however, willing to admit that whilst the primary cause of frequent stoppage is defective construction of sewers and imperfect gradients—much oftener, by the way, in many of these sewers than once in eight or ten years, as Mr. Stephens affirms,—this is accelerated by the useless waste of loose gravel in hiding the indifferent paving works, averaging a thickness of 1 in. to 2 in., and a great deal of it undoubtedly washes into the sewers through the street-gullies. The local Board believe that their sewers are more perfectly ventilated than most towns. Supposing this were the fact, which we dispute, the state of the sewers demands it.

The truth, however, is that the surveyor's score of steam chimney exhausts are not arranged systematically; they are the shafts of factories and such places, selected indiscriminately, without any regard to the positions of the particular sewers they may be connected with, and are quite as likely to be at the lower ends as at any other point, where they are practically useless, so far as the ventilation of the upper portion of each sewer is concerned.

Our remark was this, and we repeat it, for Mr. Stephens has evaded the subject, "That there is no adequate provision for the ventilation and riddance of generated gases within them, for many districts are without a single ventilator!"

The surveyor's ideas of perfect ventilation are not in unison with the times. The age demands that every branch, main, and subsidiary sewer and drain shall be ventilated by external communication with the outer air in one place at least, and this at the upper extremity. If a proper attempt at ventilation had been made in such districts as King Richard's-road, the Hinckley-road, Sparkenhoe-street, Upper Kent-street, and their branch streets, together with the New-found Pool, the typhoid and other fevers that have been, are now, and more or less will continue to be prevalent, until the known remedy—ventilation—is provided in these several localities, which are amongst the best in Leicester, would in all human probability never have been known. The New-found Pool fever cases are notorious, and there is no hope of the place being free from complaints for any lengthened period of time, so long as sewer gas is permitted to flow into the houses, which, as a question of fact, has been ascertained to be the case at the rate of several thousand cubic feet a day within a single dwelling!

This is certainly ventilation with a vengeance, and has been perfect and certain in its action of producing disease and death!

The locality is known as one of the finest and naturally healthiest sites in Leicester; but the laches of the authorities and others have converted it into what we can term no better than a pest-pot, by running a long branch from a main sewer of the town, terminating at its upper end beneath the house floors, without any external ventilation whatever, producing results that the veriest tyro in the art of sanitation might have predicted.

The fever now prevalent hereabouts must not be considered as the last of its kind; for the insanitary conditions are highly favourable towards its growth and continuance. No doubt, the borough surveyor will tell us that the New-found Pool is a step beyond the municipal boundary; nevertheless, the sewers are a part and parcel of the corporate system, were constructed under the control and sanction of the local Board, and, we believe, by them. Hence, this authority is responsible, and such we hold it to be.

The reference in our previous article to the state of Cardinal-street, and its sewer without an outfall; to the gravel beneath being, in consequence, charged with sewage, from which the domestic water-supply is derived, Mr. Stephens confirms, alleging, in excuse, that Parliamentary powers were necessary prior to connecting this sewer with the town mains; but he gives no explanation of the grounds upon which the street and the houses were in the first instance permitted to be constructed, and afterwards inhabited, when they were quite unfit for the purpose, and, we believe, remain so to this moment. He, moreover, found it convenient to omit to say that Parliamentary powers were obtained some years ago for remedying the Board's oversight, and entirely disregards the heavy losses by sickness in the interval.

Mr. Stephens concludes his communication with, "I do not say that we are perfect, but I am sure we are in as good a position as most towns."

Here, again, hard facts are against him, as the Registrar-General has shown within the last few days. His conclusion, however, is beside the question, and the remark is full of mischief and peril.

This is a convenient sentence, often used by delinquent towns, and is most reprehensible. "That we are as good as our neighbours." A proper view to take is, "Are we as a community in as good a position sanitarily as we ought to be; and if not, then why not?"

Mr. Stephens is instructed to accuse us of making "distorted statements, written with intent to alarm the public." In respect to this, we re-affirm the strictures of our former article; the statements therein contained are fair deductions from observed and from known facts. On the abstract question of alarm, we are content that public opinion and time shall decide if there be not legitimate cause for it.

EARLY BRICKWORK IN ENGLAND.

It seems to me that Norfolk can show some of the earliest brick architecture in England, and I wish to know who first popularised it among us.

The ruins of Sir John Fastolf's castle, at Caistor-next-Yarmouth, show a brick tower, over 100 ft. high, at the north-west corner. Its probable date is 1430-40. Wymondham Abbey, in the same county, is said to boast of "one of the most elaborately-carved specimens of English brickwork."

An unnoted worthy, named Sir Andrew Ogard, is also closely connected with this subject.

Sir John Fastolf retained in his household a priest named Botoner, whose itinerary, under the name of "William of Worcester," dilates on the magnificence of this Sir Andrew Ogard. He is styled Baron of Dèville, Pays de Caix, Normandy; Baron Beaufort, Lord of the Castles of ow-Villers in Anjou, and of Merville, near St. Savory,—all in France. He is described as very wealthy, having "in London a store of French gold coin, packed in a chest, deposited in the house of Robert Whyttingham, amounting to 7,000 English marks;" and he had "as incomes from the dues of his castles, of fully 1,000l. sterling per annum." "Also, the said Andrew living eight years in England, kept up a chapel in his house, of priests, clerks, and choristers, every day sixteen, with four priests, at the expense of 100l. a year.

I cannot ascertain the place of his nativity. He is called an English knight, and was among the combatants at the battle of Verneuil, fought August 17, 1424, when Sir John Fastolf was made knight banneret. He is described as a French nobleman, who lived "eight years in England;" he is said to belong to a Norfolk family, but he had no patrimonial property there; and his name of "Andrew" smacks of Scottish extraction. He married Margaret, only daughter and heiress of Sir John Clifton, of Buckenham Castle, Norfolk. This Sir John Clifton is stated to have built the towers of Wymondham Abbey just before his death, in 1447; but his son-in-law and successor, Sir Andrew Ogard, is called the founder of the abbey, because he obtained the necessary license for that purpose from King Henry VI., and also a bull of confirmation from the Pope in 1448.

This marriage was fruitless, but, by a second wife, he left two sons, in infancy.

Sir Andrew was the builder of the old Manor House at Rye, in Hertfordshire, the gate-house of which, still standing, is of brick. It was built on license obtained by Sir Andrew and others from King Henry VI., "that they might impark the site of the manor of Rye, otherwise called the Isle of Rye; 50 acres of land, 11 acres of meadow, 8 acres of pasture, and 16 acres of wood; erect a castle there with lime and stone, make battlements and loopholes, &c.; have free warren there, and in the wils of So., wasted, Amwell, Hodson, Ware, and Wilsford."

The chronicler adds these particulars:—"The niter court at Rye ys 75 stepys yn length, and in bredt 60 stepys. The hede of the mote is 20 stepys."

Item. From the niter gate to the logge, paled and parked yn every side, ys yn length 360 tayllors yarde.

[The hall] contains, in length, 34 ft., and in width, 24 ft. Also, the enclosure contains 17½ rods in length, and 13 rods in breadth.

The length of one quadrangle of the principal court, facing the north, contains 28 rods. Also

it contains 39 rods in length on the eastern part of the manor."

It was valued thus:—"The granaries or barns, with sixteen horses and thirty cows, including stores of produce, 2,000 marks; the buildings of the inner court, constructed of brick, and the vaults and galleries, with the enclosure and appurtenances, to the sum of 2,000 marks."

Then follows a similar description, equally elaborate, of a second manor-house, which Sir Andrew built in the same style at Emmeth, near Walsch, but in Norfolk county; also of brick; he having previously purchased the manor for that purpose.

The date of Cardinal Morton's fine gateway at Lambeth is 1490; but Sir Andrew died in 1454. His death took place at his castle of Buckenham, when "he gave to the church of Wymondham Abbey fifteen copes of cloth of gold, of blue color, with the orphreys with his arms."

Rye Manor House appears to have reverted to Waltham Abbey, to whose monks the manor belonged. Emmeth remained in the family, and was possessed by his great-grandson, William Ogard, esquire, of Emmeth, who died s.p. Buckenham, with Wyndham, and all estates derived from the Cliftons, passed to a family named Knevet.

Have we authentic particulars of anything built in brickwork of earlier date? A. H.

RESTORATION OF CHRIST CHURCH CATHEDRAL, DUBLIN.

The preparatory operation at this cathedral is being got through with perfect safety up to this stage. The whole of the north wall of the nave is down, and the roofs of all are securely shored up.

Samples of masonry are exhibited at the works, from which a selection will be made, including rubble and coarse work, but possibly the former, with free stone dressings, will be adopted. Early in the ensuing year the work of rebuilding will fairly commence; and it is unlikely that any delay or suspension of the works will take place until the restoration contemplated will be completed.

In the restoration of St. Patrick's Cathedral, the sum eventually required to accomplish the work exceeded, by some thousands of pounds, the sum first estimated; but the late Benjamin Lee Guinness, with his wonted liberality, supplied the money.

It is not improbable that the entire of the works in connexion with Christ Church may greatly exceed the first calculated cost; but it is believed, of Mr. Henry Roe, as of Mr. Guinness, that the munificence of the former, if exigencies demand it, will be found on a par with that of the latter.

INSTITUTION OF SURVEYORS.

THE opening address was delivered by Mr. Richard Hall, president, at the ordinary general meeting of the Institution of Surveyors, on the 13th inst.

After dwelling at some length upon matters immediately connected with the working and well-being of the Institution, alluding in the course of his remarks to the many excellent and instructive papers printed in the Transactions of the Society during the past session, the president, passing to general topics, observed that there are signs that the growing disproportion between the population and the area of the soil may become a source of agitation on the part of those who hold that the possession of land is a necessary condition of individual happiness and independence; and, on the other hand, that its non-possession is a grievance attributable to bad laws and class legislation. Without trenching on political topics of this kind,—topics which cannot be too rigidly excluded from our discussions,—I may be permitted to say that the minute sub-division of the land in this country amongst the general community would probably tend to diminish the yield of the soil, and a loss would consequently result from such a course. The question of extracting from the soil the maximum of produce is one of the deepest interest to every one.

In the application to the land of the principles of modern husbandry; in the careful study and employment of the valuable aids which the science of agricultural chemistry is offering to the skilful farmer; in the redemption, by such means, of such areas of uncultivated land from absolute infertility; in the more energetic treat-

ment of wet and stubborn soils, by drainage and deep ploughing,—a task requiring capital, forethought, and patient waiting for advantages which are not immediate,—will be found a better field for the exercise of that philanthropic zeal which seeks the real benefit of all classes, than the raising of strained and exaggerated visions of universal land-proprietorship.

I may remark also that, on such questions as the system of transfer of property, the law of entail, and what is termed tenant-right, there is much popular misconception, which it would be well to attempt to correct by placing on record the actual facts concerning them.

The comparative merits of large and small occupations is also a matter deserving our careful consideration. The class of small hereditary tenants, which has fallen behind in the modern race of agriculture, is apparently undergoing a practice of rapid extinction, and there are various opinions as to the probable effects of this change. Many hold that the conditions of increased productiveness and successful husbandry are vastly improved by the absorption of small occupations, whilst, on the other side, it is contended that society suffers a loss by the disappearance of the classes referred to, who form an element of value in the stability of the country, by increasing the number of those enjoying a direct interest in the soil.

Bearing immediately upon the subject of tenant-right is that of the merits and demerits of leases, and the respective positions of lessor and lessee.

Among other general subjects occurring to me are such as the working of the Road Acts in country parishes, pauperism and the employment of labour in agricultural districts, dwellings for the farm labourer, rural water-supply, and the best method of dealing with sanitary questions in villages. All these, and many similar ones which will doubtless occur to you, are, I think, well worthy of attention, and will, I trust, give rise to papers.

Public opinion is, at the present time, strongly directed to the subject of the enclosure of common lands, and, as is generally the case with agitations of any kind, the movement is not entirely free from acrimony and a spirit of injustice towards those who, it is presumed, have infringed public rights. Vigorous efforts are being made to curtail the rights of lords and to advance the interests of the commoners, and Bills have received the attention of Parliament during the last session, having for their object the settlement of several disputes of the kind on a permanent basis. One of these, the Wimbledon and Putney Commons Bill, met with considerable opposition in committee. This Bill places the management and maintenance of the commons in the hands of a body of conservators, Earl Spencer, the lord of the manor, receiving, in lieu of his rights, a perpetual annuity of £2000, together with certain other minor equivalents. The annuity to Lord Spencer, together with the expenses incident to the preservation of the commons, are to be provided for by means of a graduated rate of 6d., 4d., and 2d. in the pound rental, leviable upon houses situated within certain defined distances of the commons. Another similar dispute, which has led to long and expensive litigation, has found its solution within the last few weeks. I refer to the well-known case of Hampstead Heath. During the last session a Bill was carried through Parliament authorizing the Metropolitan Board of Works to purchase of Sir John Mayson Wilson and his successors the rights which he claims, in fee simple, over the manor. The Board is authorized to raise, for the purposes of the Act, the sum of 75,000*l.*, and the amount agreed to be paid to Sir John Wilson, in consideration of his claims, is 45,000*l.* The Board will have the sole maintenance and management of the heath for purposes of public recreation.

Speaking on the subject of the utilisation of the sewage of towns, Mr. Hall said,—The conditions affecting the adoption of any particular system of sewage treatment in different towns, are so varied as to justify local bodies in a good deal of their hesitation in embarking large sums of money in costly works, which may, after all, have to be superseded by others of quite another kind. The differences, also, between the several and rival systems are not so much in the cost involved in carrying them out, as radical differences on all points, so that the substitution of one system for another, which time may prove to be superior, would involve an almost total change in conducting agents and plant, as well as in the area and situation of the land required

for utilisation. That sewage may be profitably utilised under favourable conditions of supply, and when land can be secured suitable in character, area, and position, there seems to be little reason to doubt; but under no system does this prospect as yet seem to be so assured as to render an indiscriminating application of any of the methods of treatment desirable. Local prejudices, whether well or ill founded, against the proximity of sewage farms, constitute a very usual obstacle to schemes of the kind. Unfortunately it is commonly found that, by the very nature of the case, this difficulty is most serious in the populous neighbourhoods of those large towns, the sewage of which it is most necessary to deal with.

A vote of thanks was unanimously accorded to Mr. Hall for his address; the business of the evening concluding with the formal proposal and admission of new members and associates.

The Institution now numbers 3 honorary members, 189 ordinary members, and 64 associates, and includes in its ranks of members and associates a large proportion of the leading surveyors and land agents of the kingdom, as well as many barristers and engineers of eminence engaged in kindred branches of practice.

NEW SOUTH WALES SOCIETY FOR THE PROMOTION OF ARCHITECTURE AND ART.

On the 22nd of August last the inaugural meeting of this society was held in Sydney, when the Governor his Excellency the Earl of Baltimore, patron of the society, was present, and the president, Mr. G. Allen Mansfield, architect, delivered an opening address. In the course of observations on the good likely to follow the establishment of the society, the speaker said:—

The disadvantages which have arisen from the separation of the professions of the engineer and architect are too well known, and have been too often the subject of discussion, to need comment. Formerly every architect was an engineer, and every engineer was an architect. Sir Christopher Wren and Mansard were both architects and engineers, and Telford began his public career by building a church; and though the vast requirements of modern times in the construction of canals, bridges, and railways have unavoidably tended to the splitting up of the profession into two branches, the benefits which must accrue to each from a free interchange of ideas and comparison of experience are too obvious to admit of a doubt. Such a means of communion with each other this society will afford.

It has long been matter of reproach that in this the oldest of the colonies no successful attempt has hitherto been made to establish any bond of common interest amongst those engaged in the same calling,—that no united effort has been made to promote the best interests of the professions, and to provide means of mutual improvement or facilities for the education of our pupils. In the younger colony of Victoria such an institute has been established for some years. In England, Ireland, and Scotland there flourish a very large number of societies such as that we are now launching into existence;—societies that are found to do good work, not only in the advancement of professional skill, but in discussing subjects of general social interest, and bringing to the touchstone of scientific examination and practical test many of the great economic and sanitary questions of the day. Hitherto the absence of any such friendly intercourse amongst the architects of New South Wales has been productive not only of much needless professional jealousy, but of great individual loss in a business point of view.

It is, perhaps, not too much to assume that in founding this institution we shall be improving the position our profession holds in the estimation of the public; that by our united action we shall be enabled to effect many improvements in the manner of conducting our business, which are now sorely needed; that we shall be enabled to offer to our employers greater advantages than any we can now lay claim to, and that in those departments of art and science with which we are most familiar we may be able to do some service to the State. Not the least important part of our programme is that of affording means of instruction and improvement to the learners of our art. We look forward in due time to the establishment of a library of works of reference, of a museum of architecture and engineering, comprising models of construction, specimens of

building materials, of art workmanship, and other objects instructive and interesting.

Amongst other advantages I may remind you of the benefits we may hope to secure to ourselves and our employers by the framing of regulations to check irregular practices amongst builders, and the consequent protection of those who are conscientious and faithful in the execution of their work. I may refer also to the establishment of a fixed and uniform scale of charges for professional services, intelligible to our clients, and such as will be recognised by courts of law. To the preparation of a new and improved Building Act, of a practical and simple but comprehensive character, one which shall not only make provision for security against the ravages of fire, but shall take cognisance of some of the leading sanitary conditions necessary for the prevention of some sweeping plague which will otherwise one day decimate our citizens. Lastly, but by no means least, I will allude to the necessity of coming to some understanding amongst ourselves and with the public on the subject of "competitions," an evil which is every year assuming larger proportions, and a more pernicious form. I do not say that competitions are altogether an unmitigated evil, nor would it be possible, even if it were desirable, altogether to suppress them.

In a work of any great magnitude or of wide public interest it may be well to secure the best possible result by drawing upon all the available resources of professional skill, and selecting the happiest solution of the given question. The system, too, helps to bring unknown talent under the public notice, and creates a healthy emulation amongst the members of the profession. It is against the abuse of this system that we have to guard, and especially against the growing tendency on the part of committees and individuals to invite competitive designs upon the slightest and most trivial occasions. As applied to smaller works and buildings of the ordinary commonplace kind, the system is productive of no good to the public, is of an exceedingly mischievous tendency to the architect, and, in most cases, altogether fails to achieve the desired end of obtaining the best procurable design. This is the case, to a great extent, even when the competition is conducted with perfect fairness, both on the part of the promoters and of the competing architects; but when, as is too often the case, the promoters have prejudged the issue, or the competitors rely more on personal influence and on importunate solicitations than upon the merits of their design, the whole affair becomes a sham in all save the loss and injury inflicted on the unfortunate architects who have confided in the good faith of the promoters and the honour of their confrères. Owing to causes which I need not here dilate upon, and for which I hold the architects themselves mainly responsible, it has become the fashion of late to call for competitive designs for many buildings which by no means justify such a course. A paper of instructions is drawn up, and a dozen or more of architects are called upon to submit designs for that which could be far better planned by any one of them in the ordinary way of business; in that full and free conference with his employers, that interchange of thought and suggestion which is indispensable to the production of a really satisfactory plan, and the place of which can never be supplied by a bald list of rooms and dimensions. Fully to satisfy the requirements of his client, the architect must, as far as possible, place himself in his position, see out of his eyes, and, as it were, transfer himself, with his professional skill and experience, into the mind of his client, and for the time being effect what an Irishman might call a one-sided transmigration of souls. It must be evident to all that in a competition the architect can never be *en rapport* with his client. For the products of a dozen different brains,—each involving a certain cost in preparation, and no small expenditure of time and labour,—no further reward is offered (frequently far less) than would be paid to any one architect in private practice; out of the twelve competitors ten or eleven must be altogether out of pocket, and their time lost; and this process repeated, time after time, must in the course of every year show a heavy loss to the practising architects. I feel assured that it will be no difficult task to frame such a code of regulations for the control of competitions as will secure to the public all the advantages of which the system is capable, and at the same time will insure to the architect a fair remuneration for his labours.

Hitherto it would seem that I have confined my remarks almost entirely to the benefits which will accrue from the establishment of this society to the members of the professions. It will, however, I think, be readily conceded, that anything which tends to increase our knowledge, experience, and skill, will have a directly beneficial effect upon those for whom we labour. The influence of buildings, whether for good or for evil, is one which has a real, every-day, practical effect on every man, woman, and child in the community.

Setting aside for a moment the influence which beauty of form and elegance of proportion,—which even the fitness and appropriateness of very humble structures has on the mind as an unconscious art training,—apart from these, the healthiness and comfort of our dwellings, their convenience or their awkwardness, their lighting and ventilation, their freedom from dampness and from evil smells, are all matters of daily and hourly interest, alike to owner and to occupier.

The sanitary conditions of our towns and cities, the arrangements of their streets and sewers, are subjects of vital importance to every one; and their discussion and consideration by an organized body well fitted by education and practice to deal with such questions, must surely be of some service to the State. To how many of us has it happened to know of cases where fatal results have followed the neglect of the most simple and obvious precautions. In more than one instance in this city it has been the case that families have been suddenly stricken down, and some of their members carried off by some mysterious illness, whose origin has at last been traced to an untrapped drain or cesspit. If it be true, as so often boasted, that "every Englishman's house is his castle," it were well that that castle be not only contrived for the comfort and convenience of its owner, but that, as far as human skill and foresight can avail, it be fortified against the inroads of disease and death,—that within its walls there should be suffered to lurk no insidious foe in the shape of draughts and damp, to sow the seeds of rheumatism and influenza; no traitor in the form of poisonous gases and foul malaria, to steal forth at night, and introduce into the citadel death-dealing fever to slay the garrison. Nor will thought be thrown away in pondering carefully the improvement of our streets and mercantile edifices. "Sober and straightforward, and not uncomely, are the operations of upright tradesmen, so let their offices, warehouses, and shops be truthful, substantial, cheerful, and ornamental piles." A man will carry on his affairs with a healthier and clearer mind, surrounded by buildings such as these, than in such dens of darkness and negligence as those in which too often he is doomed to labour. It is to be regretted that in and around this city we see day after day arising structures which evince most painfully the want of some controlling hand capable of moulding them to a sightly form, and of arranging their plan so as to meet those requirements which are essential to their wholesomeness and comfort. The amount of money which is yearly thrown away on buildings so erected, must be very considerable—the misapplication of valuable space—the waste of material—or the equally injudicious economy of it—must, in money value alone, represent a loss far larger than would suffice to secure competent professional direction and advice. To my brethren of the drawing-board and the pencil, I would say that the remedy for this is, to some extent, in our own hands. Let us commend ourselves to the public by evincing the superiority of our works over those of the mere builder. Let us show that to his mechanical operation and rule of the thumb, we can superadd the charm of grace, of convenience, of strength, and of beauty, without necessarily increasing the costliness of the work; let us make it evident to each observer that wisdom in putting it together does more than quantity of material, and though there will doubtless always be many who will emulate the gentleman who was his own lawyer, and who established a certain reputation for his client, we shall find that in a business community the great majority will always be glad to avail themselves of good value for their money, if they can only be assured that in purchasing our services they will get it.

But far beyond all more pecuniary considerations, I would direct your attention to those higher views which the architect may legitimately take of the great influence and responsibility of his work. I would remind you that

it is our privilege to bear some humble part in building up the history of this great southern empire; that to us is intrusted the task of rearing those edifices which shall stand as records of the doings of our time, and shall in future ages serve as landmarks in the history of our country.

An exhibition of drawings and engravings was formed, to which free admission was given to the public on the following day.

PARIS.

Restoration of the Column of the Place Vendôme.—M. Thiers paid a visit the other day, accompanied by M. Baragony d'Hilliers, to the foundry where the restoration of the injured bronzes of the column of the Place Vendôme is being carried on. All the restorations had been completed, and the men were engaged in the preparation of a tablet to commemorate the restoration of the column, which it is said will be completed by next March. The statue of Napoleon I. is to be restored to the summit.

The Place de la Concorde.—The works for the repair of the monuments on the Place de la Concorde are being carried on rapidly, and will probably be terminated by the end of the month. The fountain nearest the bridge is entirely demolished, the parapet of the basin, the bronze tazze, and the tritons and sirens having suffered severely from the firing on the entrance of the troops. The statues around the square also received some injury during the attack on the barricades at the end of the Rue de Rivoli and St. Florentin. Scaffoldings are erected around those of Marseilles, Bordeaux, Nantes, and Lyons, while that of Lille, of which only the lower part remained, has its pedestal surmounted by a sort of hut to shelter the statuary engaged in restoring it. The stone balustrade around the Place had been also damaged, but is now completely repaired.

BIBLICAL ARCHÆOLOGY.

At the first meeting of the second session of the Society of Biblical Archaeology, held on the 7th inst., Dr. S. Birch, president, in the chair, Dr. E. Cull, F.S.A., read a paper contributed by Mr. Henry Fox Talbot, F.R.S., "On the Religious Beliefs of the Assyrians." It included a translation from an interesting terra-cotta tablet, one clause of which the writer interpreted as follows (it must be premised the whole inscription is a prayer on behalf of the king):—"And after the gift of the present days in the feasts of the land of the silver sky, the refugent courts, the abode of blessedness, and in the light of the happy fields, may he dwell a life eternal,—holy, in the presence of the gods who inhabit Assyria." The remainder of the paper was exegetical. Mr. R. Hamilton Lang, consul at Cyprus, read a paper "On the Discovery of some Cypriote Inscriptions." After stating that the credit was due to the Duc de Luyne of having proved the existence of a Cypriote alphabet, he enumerated the various inscriptions which he had himself discovered, and drew especial attention to one, a bilingual inscription in Phœnician and Cypriote, which he first discovered during excavation of the temple at Idalion. The alphabet, which had been compiled by the Duc de Luyne, consisted of eighty letters; but Mr. Lang felt justified in reducing that number to fifty-one, and exhibited an alphabet which he believed to contain all the Cypriote characters of which we are at present certain. In proceeding, he dwelt at some length, upon an apparent resemblance between the Cypriote and Lycian alphabets, and stated they were both derived from the same source, the Lycians having, however, engrafted upon the ancient forms a great many Grecian letters, while in Cyprus the character was preserved in its original fulness and power. Mr. Daniel Sharpe had endeavoured to prove that the Lycian alphabet was of Indo-Germanic origin, and so also might be the Cyprian. Mr. Lang alluded to the attempt which had been made both by De Luyne and Von Roth to read the Cypriote writing, especially as regarded a word which both gentlemen agreed in rendering "Salamis," and which they considered to be the key to the Cypriote characters. Mr. Lang, on the contrary, dissented from the reading upon the testimony of coins, and showed why he thought the word should be read as "king." The evidence of the bilingual inscription before referred to was dwelt upon in confirmation of this reading. A resemblance was further pointed out between the word translated,

"king," by Mr. Sharpe, in Lycian, and that proposed to be similarly read in the Cypriote part of the bilingual inscription. Many other points of interest were pointed out, and the writer concluded by observing that in it "we have a child lost long both to the sight and knowledge of the world, and he felt convinced that more extended research would prove that the pedigree of the founding was of more than usual philological interest and importance."

Mr. G. Smith then read a paper "On the Decipherment of the Cypriote Inscriptions," in which he detailed the discovery of the sounds of twenty other signs by comparison of various texts.

ELVEDEN HALL, SUFFOLK.

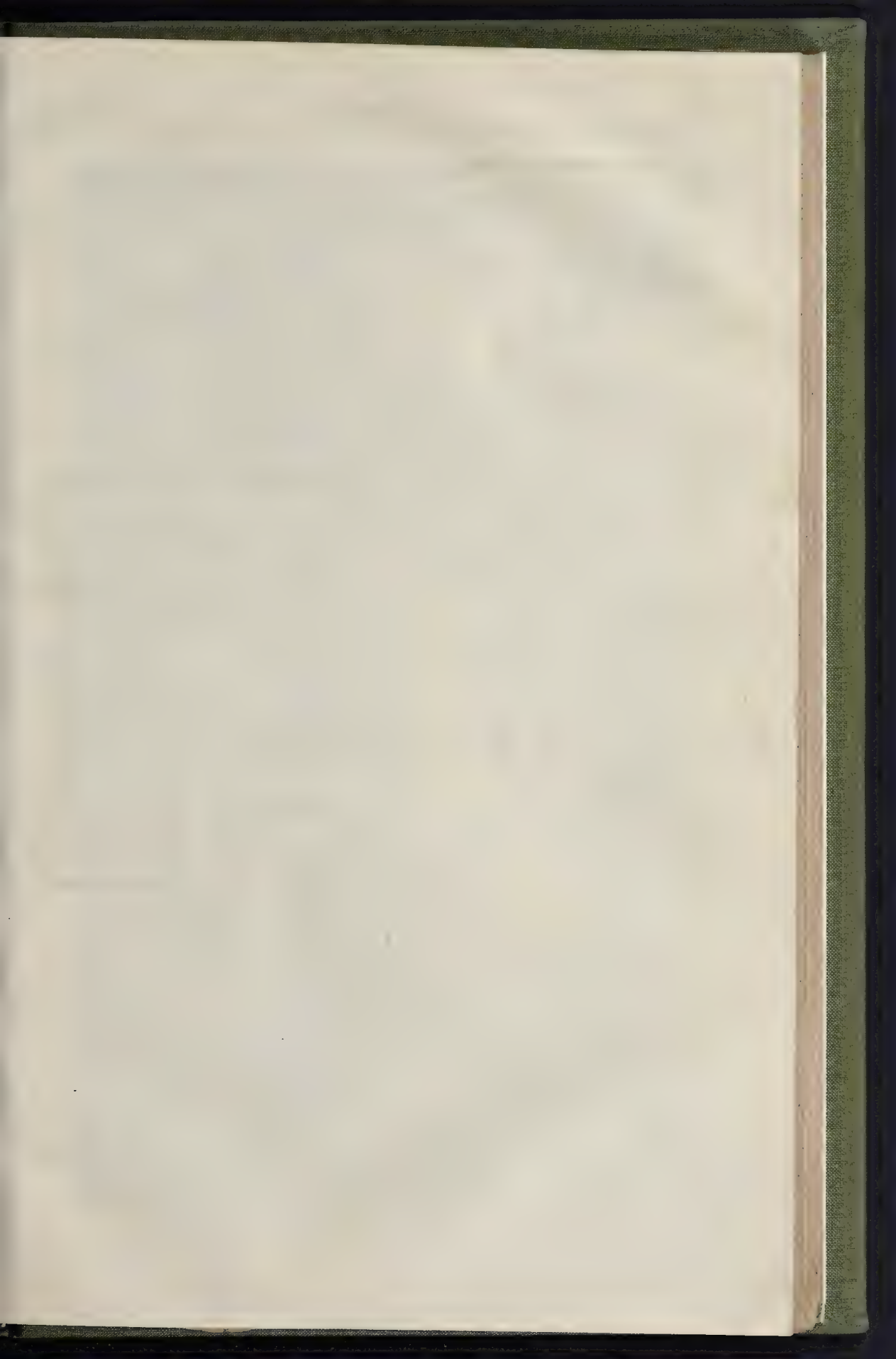
THE mansion of his Highness the Maharajah Duleep Singh is situated about four miles from Thetford, towards Bury St. Edmund's. The old house was interesting as being the residence of Admiral Keppel, first Lord Albemarle, whose monument is to be seen in the parish church, within the park. Lord Albemarle, being asked for information respecting Elveden, most obligingly answers—"It was, I think, about the year 1770, that it was purchased by Admiral the Hon. Augustus Keppel, second son of William Anne, second Earl of Albemarle, K.G. In 1782 the admiral was created a viscount for his naval services. Lord Keppel dying in 1786, bequeathed the estate to my father, William Charles, fourth Earl of Albemarle, who sold it to Mr. Newton, in order to purchase land in the neighbourhood of Quidenham."

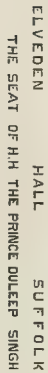
The former house had nothing interesting about it, being altogether devoid of architectural merit, having a flat and prison-like appearance, illustrating one of the worst periods of English architecture. The prince, who has strong sporting tastes, having disposed of the magnificent property, Hathorpe Castle, near Cirencester, which he had purchased of the Hon. Ashley Ponsonby, was fortunate enough to secure this, one of the finest shooting properties in the kingdom, to which he has since added the adjoining estate of Eriswell, making together some 17,000 acres. It is literally overrun with game of all kinds, and we are informed that some 12,000 head of game are annually shot on the estate, besides many thousands of rabbits on the warren.

Elveden is interesting at the present moment from the visit of H.R.H. the Prince of Wales, and a distinguished party, whose sporting exploits will no doubt be duly reported by our sporting contemporaries.

In 1869 the Maharajah commissioned Mr. Norton to add a wing to the building, which had, of necessity, to be designed in the Italian style. Before the completion of this wing, the prince determined to pull down the entire mansion, with the exception of two rooms, and it has since been reconstructed, and forms an imposing block of buildings, in red brick, with Ancaster stone dressings, some chalk from the estate being used for the internal walls. The works have been carried out, in the most solid manner, by Messrs. W. Cubitt & Co., Mr. Bush acting throughout as their representative. The architect's clerk of the works was Mr. G. Wall.

The main shell being completed, Mr. Norton had the gratification of being instructed to decorate the interior with pure Indian ornament, which he has been able to carry out by the aid of careful models prepared by Messrs. Cubitt, and by the study of Bourne's photographs, objects in the India Museum, and details obtained from a collection of native water-colour drawings, brought by the prince from Lahore and elsewhere. The decoration embraces marble inlays for floors, chimney-pieces, and so on, coloured cements, encaustic floors, specially made by Maw & Co.; ceilings and wall panelling, of most minute and elaborate Indian design, together with marble and iron grilles. The whole of the interior, with the exception of the princess's boudoir, the style of which is French Renaissance, has been thus finished, and Mr. Holzman, the decorator, is engaged in painting and gilding the hall and the various rooms in a similar style. The great drawing-room still remains to be decorated; and Messrs. Powell, of Whitefriars, are engaged in experimenting upon a peculiar style of decoration practised in India, by means of silvered convex glass. There are also some elaborate specimens of casting in iron. The office wing shown in the ground plan, with the water tower, still remains to be completed.







ELVEDEN HALL, SUFFOLK.—MR. JOHN NORTON, ARCHITECT.

ARCHÆOLOGY AND THE ASHMOLEAN MUSEUM.

ON the 7th inst., Mr. J. H. Parker, C.B., Keeper of the Ashmolean Museum, Oxford, delivered a lecture in the Museum, on the "Collections made during the Past Year, and on the Progress of the Study of Archæology during the same Period, and its Future Prospects."

The lecturer said,—"It was perfectly evident to him that archæology ought to be a necessary part of the education of a scholar and a gentleman. The elements of the science were so very simple, and so easily learnt, that a scholar ought to be ashamed to be ignorant of them. The minutiae of it might indeed be carried to any extent, and divided into many branches; but it was not necessary for the purpose of general education to enter into minutiae in this more than in any other science. In a general sense, archæology was the history of the fine arts,—that was, of architecture, sculpture, and painting or drawing from existing remains. It did not consist merely of what were called articles of *virtu*; it comprised much more than that. He was quite aware that to many persons the Ashmolean Museum was looked upon in the light of an old curiosity shop, or very little better, and he by no means wished to exlude curiosities from it. They attracted people who, when brought hither by curiosity, might stop to learn something better. Their Museum was not a large one, and they had not room for a large collection, but it was a very choice one; they had good specimens of several important departments of ancient art, and he wished to keep them up by additions, as far as their means would allow and opportunities offer. Many Oxford men were well informed in the different branches of archæology: each excelled in his branch, and such experienced archæologists, who had become keen observers by long practice, were frequently great travellers also, and had good opportunities of picking up at small sums many objects of interest and importance. He then went on to state that in addition to these, he had himself had the opportunity of picking up a few things in Rome during the recent excavations there; also a few things from the Etruscan cities, Volterra and Fiesoli. Besides other objects of interest, he brought from Rome specimens of the different varieties of building stone used there, with the names of the buildings from which they were taken; also a series of the brick stamps of the time of the early Empire, extending over the first three centuries. They bore different names and dates. These stamps were not to be found out of Italy. In Rome they were important, as giving a positive date to many buildings. Their use did not begin until the latter part of the first century. There were no stamps on the bricks in the time of Nero, the best period of brickwork. They begin in the time of Trajan, when the work is almost equally good, and they go on to the time of Maxentius, in the fourth century. He believed, in they were found also in the time of Theodoric, in the sixth, but he had not seen any of that period. He had also brought specimens of Roman terra-cotta heads of statues, &c. Although they had not space enough to hold any large quantity of such tangible objects themselves, good photographs of them were the best things for the use of the student; and he was endeavouring to form a chronological series of examples for the history of architecture, sculpture, and painting, or rather drawing from the existing remains in a series of photographs. Mr. Parker said that architecture had been his favourite study all his life. On this subject he felt perfectly at home, and he was sure that they could see in that room such a series of photographs for the history of architecture as they could see nowhere else, beginning with the Pyramids and temples of ancient Egypt, the earliest that they knew of, and including the brick Pyramids probably built by the Israelites. These were followed by later Egyptian buildings. They could thus better understand the objects of Egyptian art and sculpture, in which the Ashmolean Museum was unusually rich for its size. They had also the best photographs that were to be had of the principal buildings of Palestine. Of Greece and Pompeii they had an admirable series. The photographs taken last spring included the most recent discoveries; and they must remember that photographs were the only things that showed them the construction of walls. No drawing or engraving ever showed these. The lecturer pointed out various kinds of walls, and their difference of construction. For

the history of sculpture, he said, they had the principal subjects in each of the great museums of Rome,—the Capitoline, the Vatican, and the Lateran. They had also the busts of all the emperors and empresses; and for the art of drawing they had such a series as had never been formed before. The drawing was the same in each succeeding century, whether it was executed in mosaic or in fresco, and they had typical examples for each of the ten first centuries of the Empire, which was the same thing as of the Christian era. He then went on to explain other valuable objects with which the museum was enriched. Mr. Parker next went on to show the progress of archæology generally during the past year. It had been, he said, an eventful year in many ways, and the agitation caused by the demolition of the Dorchester dykes in the neighbourhood, had done good on the whole. The obstinacy and ignorance of a John Bull farmer prevailed against all the inducements they could offer. He was offered pecuniary compensation for any injury that might be done to his property by preserving them. He, however, declined to accept it, and consequently a chapter of English history had been erased for ever. Such ancient earthworks were often the only evidence they had of the existence of some important British city, or of some great battle. He adverted to the proposal made to Government for the appointment by them of an Inspector of Monuments, and said that they thought they had no right to interfere with private property, nor to spend money from the taxes. The Government was, however, willing to have inquiries made as to what could be done. The good that resulted from the annual visits of the archæological societies to different parts of the kingdom were next pointed out. With respect to the study of architecture, he observed that a general knowledge of the leading principles of it might soon be acquired. He advised all students of this science to begin backwards, and they could not have a better place for the purpose than Oxford. He observed that the student should begin with a modern building, and go backwards from one century to another, mentioning the buildings in this city that he should take in rotation, and remarked that he could see reason to rejoice at the change that had taken place in architecture. Mr. Parker delivered a second lecture in the Ashmolean Museum on the following day, taking for his subject "The Excavations in Rome during the Past Year."

SCHOOL BOARDS.

London.—On the motion of Mrs. Garrett-Anderson, it was referred to the Works Committee of the Metropolitan School Board to consider what sanitary arrangements should be observed in the construction of new schools to be erected by the Board.

Gateshead.—At the last monthly meeting of the School Board, the chairman said that the only business before the Board was with reference to the plans of the new schools that had been sent in. They had received, from about thirty different architects, some 235 plans, which were at present hanging on the walls of the town hall for inspection by the members of the Board. The plans would remain there for several days, to allow each member an opportunity of satisfying himself as to which were the best as far as he could. He himself had spent four hours a day for four days, and he was not at all prepared to make a selection. Some of the plans were very good, and some were unworkable. Alderman Brown thought if they could limit the number of plans to, say, fifty that day, they might be able to come to something like a final decision at another meeting. The Chairman thought they were not in a position to do that. The plans should remain a week longer for the examination by the members, and then he thought the public should be allowed to come in for a couple of evenings and a Saturday afternoon to inspect the plans. In the meantime the members would still go on examining the plans until the 16th inst., when the hall was required for some other purpose. After some further conversation, it was arranged that the plans should remain on the walls for examination until the morning of the 16th inst., when they would be taken down. It was also agreed that the public should be admitted to look at the plans. Archdeacon Prest was of opinion, from experience in such matters as selecting plans, that the present would be more efficiently per-

formed by three members of the Board than by the whole body. Ultimately this suggestion was adopted, and a committee was appointed to make a selection, but it was open to any member to propose an addition to the selected list.

South Shields.—Mr. Thomas Oliver, of Newcastle-upon-Tyne, has been appointed architect to the South Shields School Board.

Leeds.—At a meeting of this Board, on Thursday, the 9th inst., the report of the Building Committee was received and adopted. It stated that in answer to their advertisement for designs for school buildings, fifty-two sets of plans had been received; and the first premium was awarded to Mr. George Carson, architect, South Parade, Leeds; and the second to Messrs. Alexander & Hounman, architects, Stockton-on-Tees and Middlesbrough. Sir A. Fairbairn, as president, has had an interview in London with Mr. Forster and Sir F. Sandford, on the subject of building new schools in the borough. Mr. Forster stated, that he thought the Board should already have begun the erection of schools, as had been done in other towns. There had been some misapprehension on the matter, and Mr. Forster intimated that there was nothing to prevent the Board now beginning to build. A report was presented, recommending the erection of ten schools, for 5,400 children, the average cost of the buildings being from 2,000l. to 3,000l., and of the sites about 1,000l. each. It was suggested that the committee should be empowered to ask for a loan of 40,000l. to cover the expenditure, and the chairman proposed that application should be made to the Public Works Loan Commissioners for a loan to that amount; and to the Education Department for their sanction to the application. Mr. Ellershaw thought 40,000l. was more than was required, and proposed they should ask only for 30,000l., but the original motion was agreed to.

COMPETITIONS.

Bedford Corn Exchange.—The successful competitors for this building are Messrs. Ladds & Powell, London. The design was selected from seven sent in, and unanimously adopted by the Town Council.

Public Elementary Schools, Sharnbrook.—Eight designs were submitted in competition for this building (one of the first to be erected under the New Education Act), and that by Messrs. Ladds & Powell, London, was selected by the Board.

Hadfield.—In reply to a recent advertisement in the *Builder* as to a new church at Hadfield, upwards of 100 applications from architects were received, and 33 sets of plans were sent in. Ultimately, Messrs. Madland & Henry Taylor, of Manchester, were appointed the architects, without competition, by the unanimous vote of the committee. What about the thirty architects whose time and money were wasted?

Brampton.—The designs of Messrs. C. S. & A. J. Nelson, of Leeds and Derby, architects, who are at present engaged in erecting new workhouses for the Bramley and Wharfedale Unions, have recently been selected in a public competition for a new union workhouse at Brampton, in Cumberland. Accommodation is provided for 200 inmates, and the works are to be proceeded with immediately.

OXFORD SCHOOL OF ART EXHIBITION.

THE exhibition of works executed by the students of the Oxford School of Art has been held in their new room at the University Galleries. Although it was not enriched with the usual paintings generally lent for the occasion from South Kensington, and private collections, there were drawings of exceptional merit. The school has recently been removed to the basement of the building. The light is good, and there is as much available space as in the old room. There were some well-executed anatomical drawings, by the Misses Liddell, from the skeleton of the human frame. The composition of Miss Bessie Spier's group of objects of vertu, which has gained the second prize, is bold and effective. In landscape painting from nature, the Misses Spier appear to have it nearly all their own way. Miss Bessie Spier's sketches near Ballater, says our authority, the local *Journal*, seem to take us again to the mountains and woods of the north of Scotland, while those of Miss Charlotte Spier, taken in or near Oxford, still show us what charming bits of study can be made without taking a very long journey from

our homes. The last, and certainly not the least important class of work in the school, is that of design, in which Miss Frances Field, in the elementary stage, has gained the first prize with a very truthful study of the blackberry. Miss Florence Spiers carried off the second prize in the same subject. The designs for ferns, by Miss Charlotte and Miss Florence Spiers, are very clever, the former being a charming study from Powder-hill Copse, near Oxford. The fan of Miss Florence Spiers is a very pleasing composition of sprigs of the blackberry, arranged over a background of ferns, which, by contrast of colour and delicacy of tone, add a richness to the autumn tints, which are so cleverly painted in the leaves of the blackberry. A large number of persons visited the exhibition during the three days it was open.

HEATING CONSERVATORIES WITH GAS.

SIR.—In your last number you extract from the *Gardeners Magazine* an article recommending the use of gas for heating conservatories. The writer states that houses not exceeding 40 ft. long by 12 ft. wide may be advantageously heated in this manner. I am quite sure the writer recommends what he has never tried for himself. The cost of heating by gas is so great, that in none but the very smallest possible houses can it be used, except at a ruinous cost. The cost of heating by gas is six times that of coal, when all the products of the gas are allowed to escape into the house to be warmed; and the expense is twelve times that of coal when the products are all carried away, without being allowed to mix with the atmosphere of the house.

A house, 40 ft. by 12 ft. wide, of ordinary height (say 10 ft.), would cost 9d. per day of twelve hours, if heated by coke in a judicious manner; if heated by gas, it would cost 4s. 6d. per day, if the products of combustion escape into the house, or 9s. per day of twelve hours if the products of combustion are effectually carried off without mixing with the atmosphere of the house.

The products of the combustion of carburetted hydrogen, when allowed to mix with the atmosphere of a plant-house, are so destructive to vegetable life that no one would adopt, or, at least, would continue, such mode of heating; and I can speak, from a large practical experience, to the fact, that any person adopting, except on the most limited possible scale, where cost is of no importance, the plan of heating horticultural buildings by any system of burning carburetted hydrogen is doomed to disappointment and certain loss.

C. H.

REMOVAL OF RUST.

SIR.—I should be glad to be informed the readiest way of removing rust from metal goods. Also, if the plan mentioned by you some months back for rendering steel and other metals impervious to rust will do for printers' composing-sticks; or, would it be injurious to the hand.

J. W. T.

ST. PAUL'S.

SIR.—Will it surprise you to hear that the white marble columns of the organ-screen, now a porch, in St. Paul's, are in course of being painted in imitation of green marble? A.

VENICE.

"The smartish, shrewd-faced man,
With aptitude for business in his eye;"

—no doubt a very worthy and not unwise American sanitary reformer, rewarded for Slavkenbergian excellencies by "E." in "My First Night in Venice" (page 883 of the *Builder*),—would probably detect at once the elip as to the—

"Church
To 'Mary of Salvation' dedicate—
Palladio's glorious work. . . ."

A reference to the faithful "Murray" would confirm him in imputing it to Baldassare Longhena (born about 1602, died 1682), founded in 1631, after the abatement of pestilence. Andrea Palladio, born 1518, died 1580. Perhaps the nasal hero might go further, and brandishing other of his pocket-companions, assert that at the death of Scamozzi, in 1616, the architects properly called "masters of the grand Venetian school" had passed away, till they with much

complaisance visited in company a later not wholly unworthy work in view of "E.'s" inspection; and then proceed to recite the pointed language of the ever-delightful Forsyth as to the architecture of this church:—"Magnificent to be sure, and lofty and rich; but it runs into too many angles and projections, too many 'colleges of vantage,' both without and within. It spires into a pyramid from the very basement up to the cupolas; but those cupolas screen each other, and are shored up with vile inverted consoles."

At the end of that ringing sentence it would may be occur to a sober looker-on that, although one would wish to extract the dead flies from the ointment of the apothecary, some miscellaneous "forms" should by all precedents be permitted to swim in such liquid amber as "E.'s" enthusiastic song. AN ARCHITECT.

HOLBORN CIRCUS.

SIR.—Will you kindly give me a small space to call the attention of the City authorities to an improvement which might be made in the above. I mean at the landing for foot passengers in the centre of Holborn-circus, which is about 30 ft. in diameter, and is now only a station for beggars and idlers. It takes up all the best part of the roadway, and creates a great amount of delay and confusion in the traffic, and it is most difficult for drivers to go round it on greasy mornings.

By the Mansion House, the landings are only about 8 ft., which is quite enough, and the traffic here is twenty times as great.

I also understand that an equestrian statue of the late Prince Consort is about to be erected on the spot; and, if once done, it will appear disloyal to remove it as traffic increases, and it will become as great a nuisance as the statue of King William, near London Bridge.

I think it must be an oversight on the part of the improvement committee, after laying out so much money in building the Viaduct, to almost block up the approach to it.

ROBERT PERKINS.

WOOD-TURNING.

SIR.—I see you have taken notice of, as you may well call it, a small but interesting exhibition of articles in wood-turning, lately held in the Mansion House. I can practically say it was an important exhibition, for this branch of work has been very much neglected. Quality has been put aside for the quantity. There is no work so effective as turning for so small a price; but if care is to be taken with the work, such as copying from drawings and fitting templates for various purposes, we should have a better class of work than is generally done at present. Very few in the trade have an idea of working from a drawing when it is put before them.

I went with one of my men to the Mansion House, and we were not at all surprised to find so small a collection and quality of work. The Turners' Company has set a good example, but it would be better for them to apply to some of our most eminent architects and draughtsmen for designs in turning work which are required for various purposes, each candidate for the prize to be compelled to turn two at least from each drawing set before him, and that would give the trade a stir in the right direction.

T. G. OLLEY.

PROJECTION BEFORE THE LINE OF FRONT.

BRUTTON V. THE PARISH OF ST. GEORGE,
HANOVER-SQUARE.

This case came before the Vice-Chancellor (Malins) on the 14th inst. In August, 1869, the plaintiff, Mr. Wm. Courtenay Brutton, became the tenant and occupier of No. 12, Queen's-street, Mayfair, a corner house with a portico projecting into the street, and entered into a contract with Mr. Rudkin, a builder, to erect upon the portico, for 129l., a conservatory or glass building for flowers. On August 15th Rudkin commenced work by pulling down a wall upon the portico, which was about 3 ft. 6 in. in height, and 4 ft. in advance of the window, and on the 24th of the same month he put up the framework of the conservatory. On the

26th, some one on behalf of the Vestry called at the house, inspected the works, and took down the names and addresses of Rudkin and the plaintiff. The plaintiff therefore called upon the Vestry Clerk, and stated that if the Vestry had any objection to the proposed erection he should maintain his rights and fight the question, and that they should let him know before he paid his contractor, and proceeded further with the works. The vestry, however, made no communication whatever to the plaintiff until the following March. Before the completion of the contract Rudkin was taken ill, and the work was finished by the foreman on September 20, 1869. On the 4th of March, 1870, the vestry took out a summons against Rudkin, the builder, who had in the meantime sold his business and gone away to Australia, requiring him to appear before Mr. Knox, the sitting magistrate at Marlborough-street, on March 11, to show cause why the conservatory should not be pulled down. A copy of the summons was left at Rudkin's former place of business, and was afterwards, on March 10, brought to the plaintiff by Rudkin's successor. The plaintiff immediately communicated with the solicitors of the vestry, stating that Rudkin could not be found, and at his request the hearing of the summons was adjourned. The summons was ultimately heard on April 22, when the plaintiff attended, but the vestry objected to his appearing, and the summons, as he was not served, and the plaintiff accordingly instructed counsel to appear for Rudkin. After hearing counsel, Mr. Knox himself inspected the premises, and intimated his opinion that the building created no nuisance, but was rather an ornament. But as the builder was technically wrong, he, at the instance of the vestry, made an order upon Rudkin to pull down the conservatory, but stated he would willingly grant a case for the opinion of the Court of Queen's Bench as to the law upon the subject. From the illness of the plaintiff, however, and other causes, there was some delay in settling the case, and ultimately Mr. Knox signed the order, after which it appeared no case could be submitted to the superior court of law. The plaintiff then, having received notice from the defendants, that they would proceed to demolish his conservatory on the 3rd of August, immediately filed a bill in Chancery on the 2nd of August, and on the 3rd, obtained an interim injunction to restrain the demolition until the hearing.

The Vice-Chancellor said that it was a fair question which was the front line of the houses in the street, but, in his view, the portico must be taken as the front line. It was held, however, that on August 28 the vestry knew what the plaintiff was doing, and they should at once have taken steps, if they meant to do so. The counsel for the vestry admitted that on August 28 the vestry might have taken out a summons against the plaintiff. That showed that on that day the offence was committed, and on that day, therefore, time began to run against the plaintiff. The offence was committed for the purpose of the limitation of time, not when the building was completed, but when an intrusion was made on the proper space. The six months' time, therefore, expired on February 28, and the Vestry were too late. It was a singular circumstance that, had it not been for the accident of the summons being brought to the plaintiff, an order might have been made on Rudkin in Australia to pull down part of Brutton's house in London, without Brutton having heard a word about it, or having had any opportunity of objecting. It was almost incredible that such an absurd proceeding should be possible. It had been argued that the Vestry were right in proceeding against the builder, and that his liability remained for six months after the completion of the works; but the words of the decision were, "builder engaged in any work;" and here the builder was no longer the builder; he had gone away and been paid, and had no more connexion with the building. Where there was a known occupier, his Honour considered that he was the proper person to be served, although a builder might be employed, and might be served while so engaged, though not afterwards. The idea of destroying A's property on notice to B was irrational, and his Honour decided that the six months from the discovery of the offence having expired on the 28th of February, the summons against Rudkin taken out on the 4th of March was a mere nullity; that the plaintiff was perfectly right in coming to the Court of Chancery; and that he was entitled to a perpetual injunction against the Vestry, of whose proceedings his Honour could not approve, to restrain them from demolishing any part of his building, with the costs of the suit.

THE NINE-HOURS MOVEMENT.

SIR.—Your columns contain numerous reports of the nine-hours movement, but they seem to need some explanation.

Will some one inform us if workmen are merely seeking a reduction of the hours of labour, thereby giving up a portion of the hourly wages they now earn; or do they ask for an increased rate of wages for the diminished time, so as to lose nothing by it? If the latter, the question resolves itself into simply a demand for a rise of wages, so far as I can see; but I should like the matter to be clearly understood by the public generally. ONE PUZZLER.

UNSAFE LANDINGS.

At the St. George's, Hanover-square, Committee of Works, Mr. Tomkins, the surveyor, reported that he had communicated with several persons in the parish who had unsafe landings. Some of them had promised to get the landings repaired. The landings were in some cases over areas, and in some over vaults.

Mr. J. Morris thought perhaps the committee could compel people to inclose these dangerous landings. The surveyor said, in one case of a landing over a vault, he had received a letter from Mr. Lee, an architect, who had seen the landing in question. The letter was here read, and set out that the landing was not, in the writer's opinion, dangerous; and that, as the public walked over it, the parish were bound to do the necessary repairs.

Mr. Mitchell said, that in some cases people stood on these landings to look at pictures, and so forth. If the owners of these landings neglected to repair them, having been warned, he held that, in the event of an accident, they would be liable for the consequences. Mr. J. Morris suggested that the committee should pick out the most dangerous landing, and call on the owner to repair it. If he neglected to repair or restore it, he could then be taken on a summons before a magistrate. The clerk, in answer to a question, said, by law the owners of vaults had to repair them. In the cases of areas, Michael Angelo Taylor's Act would apply. The committee decided that the surveyor should, at the end of four weeks, report those persons who had failed to repair the landings as requested.

AN INCIDENT OF THE LORD MAYOR'S SHOW, 1871.

ACT I.

Sir.—Hard upon thirty-six years ago, two youngsters might be seen walking to the City at half-past seven each morning; they returned together when the day's work was done; they were the best of friends for years; they shared alike; if one could not eat his dinner, the other helped.

ACT II.

Years have rolled on "since they were boys together." On the 8th of this month a poor man stood amidst the crowd, to see his old chum pass in grand array, and wish him good speed. Recognition was one-sided. I know the outline history of both; but, sir, perhaps silence would be merer. May your young readers divine the cause, steer their bark aright, and avoid rocks of temptation and deluding quicksands in life's voyage.

B. T.

WARWICK WATER SUPPLY.

In consequence of the impurity of the water at present supplied to the town of Warwick from the river Avon, the corporation of that town, being the Local Board of Health for the district, have decided to obtain a purer supply elsewhere. Plans and sections for a proposed supply by gravitation to be obtained from Hasleley were submitted at the last meeting of the Board by the borough surveyor, Mr. E. Pritchard, C.E., the engineer for the scheme; when a report was also read from Messrs. Cawley & Newton, civil engineers, of Westminster and Manchester, expressing approval of the scheme as laid down by the borough surveyor.

It was resolved by the Board that notice be at once given of their intention to apply for an Act of Parliament giving them the necessary powers to carry out such project.

We may add that at the present time considerable engine-power is required in pumping the supply from the Avon.

REFORMATORY SCHOOL FOR GIRLS, MIDDLESEX.

An endeavour is being made to raise funds for the erection of a reformatory school for girls in the county of Middlesex, which we would gladly aid.

It appears that in the year 1853, the Court of Quarter Sessions induced the Government to pass an Act enabling the magistrates of the county to establish industrial schools for the reception of juvenile offenders. This resulted in the establishment of the school at Feltham for boys only, where upwards of 2,000 have been received—more than 75 per cent. having turned out well. After much discussion at Quarter Sessions, and unsuccessful appeals to Government to take the matter of female reformatory schools in hand, on the county day in April, 1870, it was resolved by the Court of Quarter Session that a sum of 6,000l. be contributed towards the establishment of a reformatory school for girls by the purchase of Fortescue House, Twickenham. Some doubt was felt by the county treasurer whether he could safely pay the 6,000l. in the manner and for the purposes specified; and a case being submitted to council, they gave it as their opinion that the Court had no power to purchase land for, and wholly to maintain, such a school. A mandamus was about to be applied for against the County Treasurer, to show cause why he refused to pay the money; but in the meantime the owner of

the land proposed to be purchased sold it to some one else, and so the whole plan fell through.

The difficulty appears to be that the Court of Quarter Sessions had no power to originate and wholly maintain industrial schools for girls; they have power, however, to contribute to the enlargement and support of such schools as may already exist.

It is now proposed, therefore, to endeavour to raise some 1,600l. in order to provide a building for the reception of about 30 girls as a beginning—and for this a certificate, under the 29th & 30th Vict., cap. 117, would be granted by the Government.

Then the Court of Quarter Sessions would have the power of contributing for the enlargement and support of such an institution as the necessity for the increased accommodation should arise. The sum of 743l. has been already collected, mainly from the justices themselves, and we hope it will not be long before the whole amount is raised.

Mr. Edmund E. Antrobus, F.S.A., who has given much time to the subject, has just now published a second part of "The Prison and the School," wherein a complete account of the endeavour is set forth.

THE PROPOSED HOLBORN VIADUCT RAILWAY STATION.

Sir,—In the interests of the shareholders and those of the public generally, I trust you will use your powerful pen for the purpose of protesting against the proposed erection of a railway station on the Holborn Viaduct, that shall exceed in size that at Charing-cross, Cannon-street, and elsewhere, whilst similar in character. Experience has proved that these huge, ungainly glass halls are not only a sore disfigurement to the metropolis—witness especially those named above,—but also from their very design and construction, a public nuisance, as retaining within their walls the smoke and vapour emitted by the engines. At the Blackfriars Station of the London, Chatham, and Dover Railway, I was informed by a guard that, whilst outside the air is perfectly clear, that station, though open at both ends, is often filled with so dense a fog as to render it difficult to observe the approach of advancing trains. If, then, this is the case in such a station as that described, how much intensified must the evil be where the terminus is walled up at one end by a huge hotel! The truth is, that these vast spans are a great mistake, and that the arrangement is most deplorable which allows of the engines discharging their smoke and steam into the open air. Nothing can be more admirable than the arrangements at Euston-square, where simply the platforms are amply protected by a continuous series of light and elegant glass sheds; and I do trust that the directors will adopt this plan rather than squander the shareholders' money in the useless erection of a station that shall be able, as its only merit, to boast of a larger span than the Midland Terminus, and be also a positive disfigurement to one of the finest streets in London. I would only add that if the shareholders will but count the cost of the two plans, and likewise estimate the public convenience afforded by each, there need be no fear as to the result.

Y. C. E.

AN OPPORTUNITY FOR BUILDERS.

In the borough of Barrow-in-Furness, house accommodation is now glaringly inadequate for the wants of the population, many hundreds of families being obliged to live in temporary wooden erections, owing to the impossibility of securing other residences. The Mayor of Barrow (Mr. James Ramsden), on his recent reelection for the sixth time, made use of the following remarks with reference to this subject, in the course of his address to the town council of the borough:—

"I cannot refrain from alluding to a want, the existence of which I have no doubt has been already recognised by the whole of the members of the Council. I am sure that every one has arrived at the conclusion that the house accommodation in Barrow is even at the present time wholly inadequate to the necessities of its population, and it cannot fail to have struck you that this deficiency will be far more severely felt as that population increases, and it must increase very rapidly to keep pace at all with the requirements for additional labour which the development of the various new branches of industry amongst us must give rise to. It must be borne in mind that not only have we to look forward to the influx of families who will be attracted by the employment offered to women and children

at the flax and jute mills, but that we must prepare for an equally large accession of residents or perhaps a still greater number, from the establishment of the ship-building and rolling-mills. I think we may, without exaggeration, congratulate ourselves that when these works are completed, Barrow will be enabled to boast that one of the largest establishments devoted to this branch of manufacturing industry within the United Kingdom is to be found here. I am speaking from a personal knowledge of the circumstances when I say that in these works all the latest and most perfect appliances for meeting every description of work which may fall within the scope of the proposed operations of the company will be found, and that it is difficult to assign any limit to the extent of the business which may be carried on in connection with the undertaking. But here again the all-important question of providing the requisite house accommodation for those who must necessarily be engaged to carry on these great works, forces itself upon our consideration. What with the labour needed for these works and those to which I have previously referred, as well as the increase in our population which must follow the commencement of active operations on the part of the Flax and Jute Company, there is little doubt that that within a period of something like five years the number of the inhabitants of this borough will be at least doubled. All these circumstances, it must be admitted, contribute to show most conclusively that there exists at the present time in the borough of Barrow, one of the most promising fields for investment in building operations ever brought under the notice of capitalists. I do not think that it would be possible to imagine a set of circumstances offering greater encouragement to builders and those who may be desirous of investing in house property. They have before them the very best security assurance that immediately houses are completed, they will be tenanted, and they may thus look with certainty for an immediate return upon their outlay, with the assured prospect of improved value in a progressive and flourishing town and port."

SUDDEN DEATH OF A DUBLIN ARCHITECT.

THE announcement reaches us from Dublin of the sudden death of Mr. John Bourke, a well-known architect. His death took place in the consulting-room of Dr. Hayden, Harcourt-street, to whom he went for medical advice. Mr. Bourke was the architect of the Mater Misericordiae Hospital, some additions to Phibsborough Catholic Church, and several public and private buildings. For many years he took much interest in the success of the Dublin Mechanics' Institute, and was generally liked and respected by his fellow-citizens, lay and clerical.

DESCENDING FLUES.

Sir,—In reply to the inquiry of your correspondent, "B. A.," the chief points to be observed in the construction of a horizontal smoke-flue, whether in masonry or in metal, are adequate capacity, perfect soundness, and suitably-placed soot-doors at both ends. The capacity must not be less than the area of the fire-bars; there must be complete exclusion of air and water at all the joints; and there must be due provision for rarefying the flue, as well as for cleansing. Besides this, the descending flue from the stove must be sound and carefully connected with the lower flue. Above all, the vertical flue must be a separate one, and of a length at least double that of the horizontal.

Of course, the details of construction must be left to the experience or the judgment of the tradesman employed, and would not be suited to your columns. But if it were necessary, we could refer "B. A." to very many practical instances of efficient descending stove-flues.

BENHAM & SONS.

Sir,—A correspondent asks for information about descending flues. In reply, I would inform him that the length of 30 ft. of horizontal flue, and a depth of 3 ft. of descending flue, will act if his upright chimney-shaft is not less than 30 ft. or 40 ft. high; and provided further that he has some contrivance for warming the upright chimney-shaft in the first instance. Unless this be done, his flue will not draw. If the upright shaft (or chimney) be warmed by other fire-places or stoves, no further heat will be necessary; but, if otherwise, some arrangement to warm the chimney by a small secondary stove, or by a large lamp, placed temporarily near the bottom of the "up-cast," is absolutely necessary. After the up-cast has been warmed, it will not require the heat to be continued. But the law which regulates the motion of aeriform fluids will not be fulfilled unless he first produce motion in the up-cast shaft.

By using his horizontal flue for warming any part of the building, he will reduce the ascending power of the up-cast shaft; but it does not follow that he will destroy its action, as this will depend on many circumstances too numerous to attempt to explain in a short paragraph.

C. H.

* London: Staunton & Son.

ACCIDENTS.

Fall of a New Factory near Stockport.—A fatal accident has happened at the Heavily Spinning Mills, Heavily. The mill is four stories high, thirteen windows long and nine wide. The east end, where the engine-house, mechanics' shop, and cotton and blowing rooms are situated, are, however, only two stories, and it was in adding two other stories,—the whole breadth,—that the accident occurred. Mr. Henry Barlow was the contractor for the brickwork, and the Berrenford Engineering Company supplied the iron beams, pillars, &c., the floor resting on arches. The erection had advanced nearly to a state of completion, the works having been hastened forward after a stoppage. All the hands, numbering 120, were at work at the time, when they were alarmed by the giving way of the portion of the two newly-built stories inwards, carrying away the cotton-room into the blowing-room on the ground floor, the engine-house portion having escaped. Several men were at the time engaged working at the brickwork, and also in fixing the ironwork. The ordinary hands instantly escaped from the mill, but it was found that a bricklayer had been carried with the rubbish to the bottom story, and falling upon a boy who was feeding the "scotch" with cotton, both had been buried beneath heaps of brick 12 ft. deep. The death of both of them must have been immediate. Many others were more or less injured.

Fall of Four Men from a Chimney-Stalk.—A fearful accident has occurred at Workington, Cumberland. A tall chimney-stalk is in course of erection there for the Mossbay Iron Company, and has now reached the height of 150 ft. Four bricklayers went to work at the chimney, and entered a cage at the side to be drawn to the top by means of a rope attached to an engine. At the height of 50 ft. the rope broke, and the four men were precipitated to the ground. One was killed on the spot, and the foreman of the party died shortly afterwards. A third had his thigh fractured, and received other serious injuries; and the fourth was much shaken.

Destruction of an Iron Church, Prestonville, Brighton.—The new iron church in Stanford-road, Prestonville, recently built, and opened for divine service only on Sunday last, has been totally destroyed by fire. Some children, who had been playing close to the church, collected a quantity of shavings and stubble lying about, and, having deposited them on the floor of a closet at the back of the church, set them alight. The fire thus kindled ignited, it is supposed, the woodwork of the closet, and this latter being contiguous to the vestry of the church, the flames speedily penetrated into the interior of the building, which, in spite of the prompt and vigorous efforts of the police, the Volunteer Fire Brigade, and the railway men, with their respective fire-engines, was in about an hour wholly destroyed. Most of the so-called iron buildings are formed with wood framings, and are of combustible character.

CHURCH-BUILDING NEWS.

Bengeworth.—The foundation-stone of the new parish church of St. Peter, Bengeworth, Evesham, has been laid. Some eighty years since a committee was formed for the purpose of restoring the old parish church, but it was decided to build a new church instead. The old edifice had been allowed to fall into complete ruin. The site for the new church is at the junction of the Badsey and London roads, and was given by Lord Northwick. The building is to be cruciform and geometric. It is to accommodate 700, about 300 free. The contract has been taken for 4,000*l.* to complete the work. The architects are Messrs. T. D. Barry & Sons, of Liverpool; and the builder and sole contractor is Mr. Hugh Yates, of Liverpool. The design has been prepared with special reference to the site, the tower and spire occupying the position most prominent, and forming with the nave and transepts a group on ascending the hill from Evesham. The tower will be 16 ft. square externally, and 52 ft. high to the cornice under broach of spire; the spire will be 71 ft. high. It is intended to re-hang the bells in the new belfry. The church will be built of stone, faced with coarse blue lias, and lined internally with Bath stone throughout. The windows will all be filled with geometric tracery. The east window will be of five lights, the west and transept windows of four lights, and those in the aisles of two lights. The clearstory will have tracery windows of two lights. The interior of

the church will be of suitable character, the roof will be of open timber with cross-braces, and circular ribs, having moulded and carved stone brackets under.

Didsbury (Lancashire).—St. James's Church has been re-opened, after having undergone important alterations. The church has been extended eastward by the addition of a new chancel 30 ft. by 19 ft., the old chancel being taken in and paved for a continuation of the nave, which previously was too short, and which is still further improved by the taking down of the camberstone north and south galleries. It is to be hoped they may soon be followed by the west gallery, and a more suitable place found for the organ. The new chancel arch is of stone, boldly proportioned; double shafts are ranged at the sides, with moulded octagon caps and bases, these carrying deeply shadowed arch and label mouldings, with carved boss terminations. The pulpit is of oak, hexagon in plan, with carved and traceried panels, and buttresses at angles, with cap mouldings bearing a memorial inscription. It has been made by Messrs. Sidebotham & Co., of Manchester, from the architect's designs. The reading-desk is also of oak, with open traceried front, and shaped and traceried ends. The side windows of the chancel are filled in with memorial stained-glass windows, in illustration of the following subjects:—Abraham offering up Isaac, the Good Samaritan, the parable of the Pharisee and Publican, Christ blessing little Children, and Christ teaching in the Temple. These windows are by Messrs. Lavers, Barrand, & Westlake. The east window is also filled with stained glass, removed only from its old position, and refixed. The reredos—a former gift of the present rector—has been refixed. A font-cover has been presented, the work of Mr. Skidmore, of Coventry, and comprises an oak top with the inscription, "Suffer little Children to come unto Me," round the edge, surmounted by a wrought-iron crocketed canopy, filled in on the sides with scroll-work. The wrought-iron standards to chancel-seats, as also the gas pendant, have been manufactured by Messrs. Hibbert & Co., of Manchester. The new chancel has been built by a lady, in memory of her mother; the other part of the work having been undertaken by the rector, churchwardens, and congregation. The contract for the whole was taken by Messrs. Clay & Sons, of Audenshaw, for the collective sum of 1,300*l.* Messrs. T. B. & E. Williams have done the carving, and the architects are Messrs. Horton & Bridgford, of Manchester.

West Bridgford.—The parish church is being restored under the direction of Messrs. Hine & Son, of Nottingham, architects. It has a nave, south aisle, and porch, chancel, and tower at west end, and was much dilapidated. The works consist in removal of wall plastering, and pointing the joints; new porch entrance and oak doors; repairs to decayed masonry and roof; partial rebuilding of chancel and piercing its north wall with an archway communicating with new organ-room and vestry. The roofs of these and of the chancel, are pitch pine, covered with brindled tiles. The floor of the latter is also tiled. The steps are of alabaster, worked out of some defaced monumental slabs found under the floor. The existing oak chancel-screen will be repaired and refixed. The old fittings are entirely cleared from the interior, which will be filled with other benches of pitch pine, on a new boarded floor. The work is being done by Mr. Young, of Lincoln, and the cost will be about 700*l.*

Whetton.—The church of St. John, Whetton-in-the-Vale, noted for its being an ancient specimen of the Gothic style, and for the fine peal of bells in the tower, has been re-opened after undergoing restoration. Before the alterations were begun, the stonework of the church was crumbling away by degrees, and the building gave indications of falling to pieces. The spire, as well as other parts of the building, had sunk considerably, and, in fact, the whole edifice showed visible signs of decay. It was ultimately resolved that extensive alterations should take place. Mr. J. Hunkinson, of Bingham, was deputed to carry out the building arrangements. On the outside of the building another stone has been employed, whilst internally, for economy's sake, a good deal of what remained of the old stone fit to use has been requisitioned. The inside roofing is entirely new. The old pews have been removed, and plain seats substituted, so that there is now ample accommodation for a large number of people. Those of the original beams which were still in a sound

condition have been used to make up the doors at the entrance, which appear to be quite new. A new porch has been added to the church. Formerly the old-fashioned stoves were the means for heating the place, but iron grates have been put in, and it is supposed to use water for heating purposes. The floor is paved with large slabs of stone. In the belfry the bells have all been taken down and reset with new and strong beams, the old woodwork being removed.

Gorleston (Great Yarmouth).—We understand that the committee recently appointed to undertake the necessary preliminary measures for the restoration of Gorleston Church, have engaged the service of Mr. J. T. Bottle, of London, architect, to make a survey of the edifice.

Alderbury.—The church here has been re-opened, after considerable interior alterations. The pews have all been removed, and open stalls substituted. The alterations have been carried out by Messrs. Bowdler & Darlington, Shrewsbury, under the supervision of Mr. Slater, architect. The old carved oak backs of the former pews have been relieved of paint and utilised in the present arrangements. Alterations have also been made in the church, which has been considerably enlarged, the altar-rails lowered, and the altar itself raised 18 in. upon two stone steps in place of the lumbering wooden machinery which occupied the place before. The floor has been relaid with encaustic tiles, as have also the floors of the aisles, which have been lowered about 6 in. as far as the chancel. The font has been removed near to the western entrance, and the church throughout will be warmed with hot-water pipes. A carved oak lectern has been introduced, and the old pulpit has been removed.

Leicester.—The new Church of St. Paul's, King Richard's-road, has been consecrated. The church has been built by Messrs. Osborne, Brothers, from the designs of Messrs. Ordish & Traylen, architects. The foundations are laid on the sandstone rock, all the superficial sandstone having been excavated centuries ago. The chancel is 43 ft. long by 21 ft. 2 in. wide, and 36 ft. high to the eaves. There is also proper space for an organ, but at present there are no funds for its erection. The nave is 91 ft. long by 31 ft. 4 in. wide, and 38 ft. 3 in. high to the eaves of the roof, increasing to 60 ft. to the ridge. The aisles are 83 ft. 6 in. long by 17 ft. wide, and 13 ft. 10 in. high to the eaves, extending to 28 ft. to the ridge. The church will well accommodate between 800 and 900 persons. It is in the Geometric style of fourteenth century. Mosaic glass for the windows has been made for the purpose by Mr. Evans, of Birmingham. The walls are of Mountsorrel granite, banded and interlaid with Derbyshire red grit stone, covered with Swithland gray green slating. Stone from Box and the Forest of Dean has been introduced into the quatrefoils of the clearstory and the side and end windows. The present effect of the building is marred by the stoppage of the tower (which is 21 ft. square) at the height of 62 ft., the apex of the roof.

SCHOOL-BUILDING NEWS.

Edgeley.—The foundation stone of a new school, in connexion with St. Matthew's Church, Edgeley, has been laid. The designs and plans were obtained from Mr. Crowther, architect, for a school to accommodate about 700 children, and to cost about 3,600*l.* The school is designed in the Early Geometric style of Pointed architecture, harmonising with the church. The site is a field adjoining the northern boundary of the churchyard, the western portion of the land being reserved for the erection of a parsonage-house, and the church, school, and parsonage will together form a group of buildings. The school comprises three apartments, viz., boys' and girls' school, each 52 ft. 6 in. long by 20 ft. wide; infant school, 65 ft. long by 20 ft. wide; three class-rooms, each 20 ft. long by 14 ft. wide, lat and cloak rooms, fitted up with lavatories, and entrance-porches. The school-rooms will have open-timber roofs, stained and varnished, and will be warmed by a system of hot-water pipes and coils below and above the floor, in combination with an arrangement for the ventilation of the building, on a plan suggested by Mr. Richard Sykes, and matured by the architect. The school and class rooms will be lighted by large and lofty windows, placed well above the floor, so as to leave ample wall-space below for maps,

drawings, and other educational appliances. At the eastern end of the school buildings is the master's house. There will be separate playgrounds for the boys and girls, provided with offices and adjuncts. The tender was let to Messrs. Neill & Sons, Manchester, for 3,400l. The school is expected to be ready early in the spring. Mr. Gallimore is clerk of the works.

Bristol.—A new school-room, erected at Dudley Port, has been formally opened. The building is capable of accommodating 500 persons. The cost, with the erection of a chapel, &c., as well, will be about 3,500l., towards which about 1,400l. have been realised.

Reigate and Redhill.—The chief stone of new Wesleyan day-schools has been laid here by the Mayor. The new buildings have already been commenced, on a plot of land at the bottom of West-street, Warwick Town. They are intended to accommodate 250 children, and the cost of erection, furnishing, the fee simple of the site, and other expenses, will amount to about 1,500l., of which, between 600l. and 600l. remain to be collected. The architect is Mr. Alex. Lander, of Barnstable and London; and the builder, Mr. F. Brown, of Redhill.

Cowley St. John, Oxford.—A large school for boys has lately been opened in this parish. It was built by Messrs. Castle & Co., of Oxford, from the designs of Mr. C. Buckenridge, architect.

Books Received.

A Treatise on the Resistance of Materials, with an Appendix on the Preservation of Timber. By DE VOLSON WOOD, Professor of Civil Engineering in the University of Michigan. Trübner & Co., Paternoster-row.

THIS book contains the substance of a series of lectures to a senior class in civil engineering during the past few years, on the Resistance of Materials. The chief aim has been to present the theories as they exist at the present time. The results of experiments are also recorded. The strength of beams of irregular forms, or other than rectangular, and the unreliability of theory in respect to these, are specially treated of. Some knowledge of mathematics is, of course requisite in the students, of this volume.

Examples of the Municipal, Commercial, and Street Architecture of France and Italy, from the Twelfth to the Fifteenth Century. Division I. Measured and drawn by R. ANDERSON, Architect, Edinburgh. Mackenzie: Paternoster-row.

THIS promises to be a useful work. During the last few years several volumes of Continental Sketches have been published, but as these have been almost exclusively devoted to ecclesiastical architecture, Mr. Anderson proposes to confine his to secular buildings. Apart from their value as suggestive subjects, we agree with the author in thinking that the rapid transformation most of the old towns on the Continent are now undergoing renders it desirable that some record of the many interesting examples of domestic architecture now fast disappearing be made. The volume is to consist of a selection of drawings from the town-halls, warehouses, shops, and dwelling-houses of the Middle Ages, still existing in France and Italy, and dating from the Twelfth to the fifteenth century. Commercial architecture is to be represented by a selection of drawings from the granaries, store-houses, and shops of France, and some examples of warehouses and shops of various dates from the old commercial towns of Italy. The drawings are to be uniform scales; the plans 16 ft. to the inch; elevations, 8 ft. to the inch; details, 2 ft. to the inch; and sections of mouldings, quarter of full size.

The examples in the division before us are from Cluny; Cordes, in Languedoc; Clermont, Montferand; Siena, Central Italy; Cremona, Northern Italy, &c.; and are very well drawn. The writing to the plates is fashionably illegible.

VARIORUM.

"Griffin's Shilling Manuals: Popular Science" familiarly illustrated: written and compiled by John Timbs. "One Thousand Domestic Hints: written and compiled by John Timbs." London: Griffin & Co., Stationers' Hall-court. 1871. Our readers do not require to be told who the voluminous Mr. John Timbs is. These two additions to the library produced by his industry and ability are useful, as all his gleanings and collections are; and in his pages many a hint and

suggestion, many an embryotic theory, and many a fact, of importance, is stored up that would otherwise have been lost to the public. The Manual of Popular Science before us contains a condensed record of recent researches on the sun and moon, stars and meteors, the earth, phenomena of life, sight and sound, inventions and discoveries. His domestic hints relate to the choice of provisions, cookery and house-keeping, new inventions and improvements, and various branches of household management.

"Mathematical Instruments: Vol. II. Optical Instruments. By J. F. Heather, M.A. London: Lookwood & Co., Stationers' Hall-court." This is the second volume of an enlarged edition, for the most part entirely rewritten, of a small work devoted to the construction, adjustment, testing, and use of mathematical instruments; this volume includes more especially telescopes, microscopes, and apparatus for producing copies of maps and plans by photography. The author was lately connected with the Royal Military Academy at Woolwich, and is well-known as an author.—We fully agree with the *Food Journal* as to the necessity for legislation in respect of adulterations:—

"Seeing, then, that the system of business so frequently pursued by retailers of articles of food is a dishonest one, as proved not only by evidence before a committee appointed by Parliament, but also by daily experience; seeing that the root of the evil is so deeply planted, and its branches so widely spread as to cause neither shame in those who are guilty of it, nor surprise in those who suffer from it; seeing, moreover, that hitherto no exposure on the part either of the press or medical profession has to any material degree checked its growth,—it is not to be regarded as one of those mysteries of which there are many in this country, that no member of the Government, an independent member of the House of Commons, no peer of the realm should have persistently brought the whole question of adulteration before the consideration of the nation."

"The Belgravia Annual" for the coming year, edited by Miss Braddon, is a more than usually good one, and includes eight full-page illustrations.

Miscellaneous.

The Sale of Scraps of Metal.—At the Marlborough-street Police-court, the other day, Mr. J. E. Hedgcock, engineer and machinist, pointed out a great hardship inflicted upon working men by the Act for the Prevention of Crime; and also asked advice in the matter. Mr. Knox read the 13th section of the appendix, which renders any person liable to a penalty of 5l. who purchases less than 112 lb. of lead, or less than 56 lb. of copper, brass, tin, pewter, or German silver. Mr. Hedgcock produced pieces of different metals,—copper, brass, tin, pewter, and German silver,—and stated that such pieces were purchased and worked on by men who purchased from 1 lb. to 100 lb., and having used what portion they required, brought the scrap back, and either wished for money for it or to be allowed the value in the purchase of fresh metal. As a person was not allowed to purchase it, a great hardship was inflicted, and a hardship of such a nature, especially to a respectable working man, that he had felt it his duty to come forward in the matter, being a guardian of the poor, and knowing what injury this was calculated to inflict on poor, hard-working persons. He wished to know whether he would be able to give fresh metal for old, without rendering himself liable. He had no wish to evade the law. Mr. Knox, after telling Mr. Hedgcock that it would be of no use trying to evade the law by taking back scrap-metal, and giving fresh metal for it, said the monstrous inconvenience to which such persons as Mr. Hedgcock had referred to must be put had evidently been overlooked in passing the Act. He had no doubt, however, that if Mr. Hedgcock and others were to sign a memorial and take it to the Home-office, Mr. Bruce, the Secretary of State, would do all he could to assist them.

Dante Road.—A number for last month of the *Italia Nuova*, a Florentine journal, notices with much satisfaction what it believes to be the only instance of any public place or thoroughfare out of Italy having received the name of the great Italian poet and patriot, Dante Alighieri, and rejoices that London should be the first city in the world to set this example. The locality alluded to is the wide road which has recently been opened between Newington-batts and Westminster Bridge, which the committee of the Metropolitan Board of Works, with much courtesy, at the request of Dr. Barlow, the Dantophilist, who at one time held this portion of the land over which the new road here passes, were good enough thus to name.

Opening of a New Drinking Fountain at Brighton.—The obelisk and drinking-fountain, offered a short time since to the corporation by Mr. Frederick Chatsfield, of the Marine-parade, have been erected and opened in the large open space in front of St. Peter's Church, at the expense of that gentleman. The work is in grey (Cornish) granite, from the designs of Mr. Robert Kierle, architect to the Metropolitan Drinking Fountain Association, by whom the fountain was supplied; the work of erecting it being carried out under their supervision by Messrs. Cheesman & Co., of Brighton. The base of it is circular, with a diameter of 18 ft.; the circle being divided into four quarters, a quadrilateral obelisk resting upon a moulded plinth rising from its centre, and the whole being 32 ft. in height. The point of the obelisk is surmounted by a light iron finial, below which (supported by brackets in keeping with it) are two lamps, which project from the east and west sides. On the east and west sides of the plinth are two jets of water flowing from lions' heads, with drinking cups on each side; the cups being reached by a flight of three steps. North and south are troughs capable of holding 500 gallons of water each, for the use of cattle and horses. To dogs, goats, and sheep, the water is supplied from the overflow-water of the cattle-troughs.

Memorial of Lord Faversham.—The cross and statue, erected at Helmsley, as a memento of the late Lord Faversham, has been formally inaugurated. The cross has been erected at a cost of over 1,000l., taking into account the gratuitous labour which the tenantry in many instances have bestowed upon the work. The design, by Mr. Gilbert Scott, is Gothic in style. From a substantial base rises a canopy, supported by buttresses terminating in crocketed finials, and crowning the canopy is a lantern, surmounted by a tapering spire, with crocketed angles. This fabric rests upon a series of steps, and is fenced round by an iron rail. Beneath the canopy is a marble statue, the gift of the family of the deceased nobleman, by Mr. Noble, sculptor. It is of Sicilian marble. Lord Faversham is represented wearing the robes of a peer of the realm, and in the attitude of speaking. The builder of the monument was Mr. W. Barton, of Helmsley.

Kildare Cathedral.—Active steps are being taken to restore the nave of the ancient cathedral of Kildare. The nave, as it exists at present, is a huge square box, without a single ornament or a particle of ecclesiastical character. On the left side a huge blank wall, without a window, runs the entire length. On the right, the place is lighted by three windows, of no-descript architecture. The church, or nave, has all the appearance of a neglected convalescent. That such a building should have been suffered to exist as the cathedral, among the graceful and picturesque ruins of the edifice raised by tasteful as well as pious hands, is a positive disgrace to the Protestantism of the diocese. Happily, with smaller means, there is now a more energetic spirit; and Mr. Street, now engaged in the restoration of Christ Church Cathedral, has given his opinion that the nave can be restored for 5,000l. Nearly 1,000l. have already been subscribed, and there is little doubt that in the diocese of Kildare alone twice that sum could be readily collected.

Proposed New Hall for Carlisle.—It is proposed to erect a new Public Hall for Carlisle. A suitable central site, with three fronts, can be obtained large enough to furnish on the ground-floor accommodation for 3,000 people. Deducting from this the space required for ante-rooms, &c., accommodation would be left in the large hall for some 2,000. As to the character of the hall, the idea of some of the committee is that the building should be one of general utility,—a sort of amphitheatre which would be used as an equestrian establishment, a theatre, for popular concerts, public meetings, &c., with a large ante-room, in which sales or dinners could be held. Such a building, it is estimated, could be erected for some 6,000l. or 6,500l. Of course, for this sum the structure would be plain; and if it should be resolved to make it ornamental, the cost would be much greater.

Antiquarian Works, France.—Amongst noticeable publications on the antiquities of France are an "Étude sur la Construction de la Cathédrale de Troyes," by M. Léon Pigotte; a volume on the "Monuments Celtiques de l'Alsace," by M. Max de Ring, published at Strasbourg in 1870; and a work on "Les Inscriptions Antiques de la Haute-Savoie," by M. Véron.

Metropolitan Board of Works.—At the general meeting of the Metropolitan Board of Works last week, a report was brought up from the Works and General Purposes Committee, stating that they had considered the memorial of the Lambeth vestry, praying the Board to apply to Parliament to modify or repeal the fourteenth section of the Thames Embankment (South) Act, which enacts that the expenses of maintaining the roadway, shall be charged on the vestry; and after giving a careful consideration of the statements contained in the memorial, with the fact that the northern embankment is a great thoroughfare between the Houses of Parliament and the City of London, and lying in the parishes of St. Mary-le-Strand and St. Martin's-in-the-Fields, which derived nothing whatever in the form of rating from the embankment, the committee were of opinion that it was not expedient to comply with the request of the Lambeth vestry. They urged that the embankment was only a street on the south side, and that the circumstances of the northern side were of an exceptional character to justify the Board in recommending its exemption from local taxation as a metropolitan improvement; while the other was an improvement only local, and should be maintained at the local expense. After a long discussion, the recommendation in the report was adopted.

Three "Lifter" Gas-Holders.—The Corporation of Manchester have just completed the construction of two new gas-holders, at a station in Portland-street, Newtown. The new holders are an extension of the Gould-street Works. They have three "lifters." Some doubt has been expressed as to the prudence of having the extra "lift," on the ground that the altitude and bulk of the holders would render them dangerous, in the event of a severe storm. However, those concerned in their construction have every confidence in their stability. They were commenced about two years ago, and the total cost has been 35,450*l.*, inclusive of everything. They will hold 2,192,000 cubic feet of gas, and the cost of storage is 16*l.* per thousand feet. The architects for the construction of the tanks were Messrs. Mangnall & Littlewood, of Manchester. Of the two tanks, the diameter of the large one is 155 ft., the diameter of the smaller one is 96 ft., and the depth of each is 32 ft. below the surface. The contractors were,—for the brickwork, Mr. James Rutherford, Manchester; for the masonry, Messrs. Ellis & Hinchliffe, Manchester; for the iron, Messrs. Walton, Mabon, & Co.; and the clerk of the works was Mr. Crowther. The works at Newtown and those in Gould-street contain now 4,442,000 cubic feet altogether, or 2,192,000 in the former, and 2,250,000 in the latter.

Sanitary Condition of Grimsby.—The borough surveyor, Mr. Joseph Manghan, has reported on the sanitary state of Grimsby, with special reference to the small-pox epidemic, under which it has been suffering. The removal of nightsoil had been very imperfectly performed, till the surveyor took the matter in hand and ordered proper arrangements to be made. The state of the drainage and water supply was seen to, and in 52 cases out of 150 the discontinuance of the ordinary use of the local water supply was recommended. In 19 instances the recommendation was adopted, while in the remainder no steps were taken to provide a supply from the water company, or improve the local supply. The mortality during the epidemic was lamentably great, and the disease attacked persons of all ages, but especially among children and young persons. Disinfectants were used in about 500 houses with manifest benefit, and also in various fishing-smacks and other craft.

Reading Architectural Association.—The second general meeting of this association was held at the Athenæum. There was a good attendance of members. The chair was taken by the President, Mr. Charles Smith. An essay on "English Gothic Architecture, historically and generally considered," was read by the honorary secretary, Mr. E. J. Shrewsbury, in which he showed the connexion of the changes in race and tongue with the changes in the art and science of architecture.

Proposed Market for South London.—A proposition for the erection of a market on the vacant ground belonging to the London, Chatham, and Dover Railway Company, near Brixton Station, is under the consideration of the directors.

The New Harbour Works, Anstruther.—Since the destruction of a portion of the new east pier, Anstruther, in Fife, by the storms in the beginning of the last month, advantage has been taken of the favourable weather to push forward the operations for the repair and better protection of the pier. The breach has been built up with concrete, but the portion of the parapet wall above the quay is not to be constructed at present, in order that the large concrete blocks which are to be laid down at the back of the pier may be got easier into water. The staging necessary for the laying down of these blocks has been so far erected, that some of them were got into the water at the end of last week. It is intended to deposit from 150 to 200 of these blocks at the back of the pier, and, as they weigh about twenty tons each, it is expected that they will go a great way in protecting the quay from the violence of the sea during a storm.

The New Railway Station at Maidenhead.—This new building has been opened to the public. The waiting-rooms are of considerable size. The platforms are of great length. The lighting has been carried out by about 100 gas-burners; the gas being supplied from the Maidenhead Gasworks. The authorities of the town have caused the approach at the junction of King and Queen Streets to be considerably widened, and also well lighted with lamps. Many of the better class of houses have already been let since the station has been in progress, and there is little doubt, remarks a local paper, that if builders could be induced to erect larger houses than those already built, tenants would soon be found to fill them, as there is scarcely a town on the Thames which receives more visitors during the summer months than Maidenhead.

The New Music-hall, Sheffield.—The workmen employed in the erection of this hall were invited by their employers to a supper at the Mail Coach Inn, West-street, Sheffield. There were present Mr. Clarke, the secretary to the Music-hall Company, who occupied the chair; Mr. Alfred Flotton, from the firm of Messrs. Flotton & Abbott, the architects of the building; Mr. Charles Houldsworth, the clerk of the works; Mr. George Longden (G. Longden & Sons, contractors for the masons' and bricklayers' work); Mr. Joseph Badger (Badger & Holmes, who are contractors for the joiners' and carpenters' work); and about seventy workmen employed on the building. The roof of the hall is now complete, and will be covered in before the end of the present month, so that the inside work can be carried on during the winter months.

Hayward's Patent Pavement Lights.—The ordinary description of pavement light allows the rays on entering to disperse equally in all directions, so that only part radiates upwards. In Hayward's patent light the reflecting face of each glass is at such an angle as to send the rays of light into the basement, in a direct line from the front. The cast-iron frame of this light is composed of a series of hexagonal recesses, into which the lenses are set, the surface of the glass being a little below the upper edges of the iron network, which presents a firm foothold. These lights can scarcely fail to come into extensive use.

New Market Hall, Whitechurch.—The top stone of the pinnacle of the new Market Hall has been laid. After the front facing St. Mary's-street had been erected, the local Board discovered that it projected too much into the street, and that if it remained as it was it would have an unsightly appearance, and be somewhat inconvenient. A special meeting of the Board was held, and it was decided that the then frontage must come down, and that it should be put some 3 ft. or 4 ft. back. At the last meeting of the Board they consented to pay Mr. Stringer the sum of 86*l.* to raze the then frontage and erect another.

Opening of the British Workmen's Free Institution, Sedgley.—The new building is in High-street, in front of the Temperance Hall. It comprises six large rooms, with other smaller places, those on the ground floor being for a free reading-room, coffee or smoke room, refreshment or waiter's room, with butler's pantry, and those upstairs for social and assembly rooms. All the rooms are approached by a central passage, laid with Minton's tiles. The hall was made use of for the opening ceremony.

Coggeshall Proposed New Town-hall.—Last week a meeting of the committee for the promotion of the proposed town-hall was held at the White Hart Hotel, Mr. F. U. Pattison, J.P., presiding. The proposed sites having been previously examined, the only available one was decided upon, being a corner formed by the conjunction of the Braintree and Kelvedon-roads. It was proposed that Mr. Pertwee, architect, of Chelmsford, should be asked for an estimate of the probable cost of the building. A sub-committee was formed who are to wait upon the principal gentry of the neighbourhood, to solicit donations to the fund.

Oxford Architectural and Historical Society.—The series of walks and excursions in Oxford and the neighbourhood will be resumed on the 18th inst., when Worcester College and the churches of St. Paul and St. Barnabas will be visited. On the following Saturday it is proposed to visit Balliol College and St. Mary Magdalen Church, and on Saturday, Dec. 2, Magdalen College. The first evening meeting this term was held at the Ashmolean Museum last week when Mr. James Parker made a few remarks on "The White Horse Hill," with especial reference to Alfred's battle on Ashdown in 871.

Lambourne Church Tower, Hungerford.—This fine old tower is considered to be in a dangerous state, and the bells are not allowed to be rung even for a wedding. A meeting took place last week, which was presided over by Lord Craven; and, after a long discussion, a motion proposed by Mr. Hippisley, "That the tower should not be taken down," was carried, and there the matter remains at present. It seems that the cost of rebuilding the tower would be about 2,000*l.*, and the parishioners do not see their way clearly in raising the amount.

The Alexandra Palace.—The failure of the outline scheme for opening the Alexandra Palace as a place of healthful recreation for the people is reported. An effort will doubtless be made to prevent the collapse of the undertaking, but the practical co-operation of the public, and especially of those who reside in the vicinity of the park, is necessary to bring the scheme to a successful issue.

The Chairmanship of the Metropolitan Board of Works.—On the death of Sir John Thwaites, the Metropolitan Board of Works decided to elect their chairman annually. Colonel Hogg's term of office has now all but expired, and the Board were to proceed to elect a chairman at this week's meeting. Since the colonel's appointment as chairman of the Board, he has been elected to represent Truro in the House of Commons.

Surveyor for Durham Diocese.—Mr. R. J. Johnson, who wrote his name so that a dozen people consulted could make nothing of it but *Johnson*, wishes it set right. We do so, and hope he and a thousand other gentlemen will in future take the trouble to make their signatures a little clearer than they have done.

The Aquarium at the Crystal Palace.—On Friday, in last week, a *soirée*, numerously attended by shareholders and their friends, was held in the tropical department of the Crystal Palace, for the purpose of celebrating the completion of the aquarium, already spoken of in the *Builder*. Professor Owen and Mr. Frank Buckland took part.

Library for Stafford.—Mr. Salt, the senior member for the borough of Stafford, has offered the free use of a range of buildings in the Market-place for the Salt Library, without any conditions, except that the county shall subscribe a sufficient fund to insure the maintenance of a librarian and other needful expenses. The cost of the building has been nearly 20,000*l.*

The Semaphore Westminster Bridge.—It is said that the signal lamp-post at the foot of Westminster Bridge having proved a decided failure, the Westminster District Board of Works have resolved to call upon Mr. Knight, its projector, to pull it down.

Projected Canal in the Line of the First Passenger Railway.—It is proposed to make a canal, for the use of small steamboats, between Liverpool and Manchester, thirty-three miles, at an estimated cost of 900,000*l.*

Cathedral of Bois-le-Duc.—The reference to view of exterior of this building given under our recent view of the interior should be *u* p. 107 in present volume, not to vol. xxviii, as stated.

New Swimming Bath for Hereford.—A new swimming-bath is about to be opened in connection with the public baths of the town. The building containing it was designed by Mr. Nicholson, and the contractor for the work was Mr. Gough, both of Hereford. The interior is lighted by means of four "stars" gasholders suspended from the ceiling, aided by three other triple gas jets at either end of the hall. There are sixteen dressing-rooms and fourteen "stalls" for the accommodation of bathers. The bath is 52 ft. in length by 23 ft. in width, and with a depth of water varying from 3 ft. 10 in. to 5 ft. 10 in. It is lined with glazed bricks and floored with red and blue tiles.

Convict Labour.—Pentonville Prison is about to be enlarged by the labour of the convicts alone. We trust the experiment will be well conducted, so that it may prove successful.

TENDERS

For new town-hall, &c., West Bromwich. Messrs. Alexander & Henson architects. Quantities by Messrs. E. C. & J. P. Sharp and Mr. W. R. Geen:—
Barneley & Sons £8,680 0 0
Parker & Sons 9,450 0 0
Matthews 9,480 0 0
Cresswell & Sons 9,367 0 0
Hilton 9,310 0 0
Horsley, Brothers 9,306 0 0
Jeffrey & Pritchard 9,260 0 0
Stockton & Sons 9,227 16 0
Garlick 9,136 0 0
Briley 9,000 0 0
Burkitt 8,900 0 0
Trow & Son 8,600 0 0

For market-hall, &c., West Bromwich. Messrs. Waller & Proude architects. Quantities by Messrs. T. C. & J. P. Sharp and Mr. W. R. Geen:—
Briley £5,795 0 0
Horsley, Brothers 4,942 0 0
Parker & Sons 4,680 0 0
Hilton 4,600 0 0
Jeffrey & Pritchard 4,448 15 0
Stockton & Sons 4,180 0 0
Barneley & Sons 3,839 0 0
Cresswell & Sons 3,820 0 0
Matthews 3,799 0 0
Garlick 3,670 0 0
Burkitt 3,600 0 0
Trow & Son 3,400 0 0

For public baths, &c., West Bromwich. Mr. E. Pinner, architect. Quantities by Messrs. T. C. & J. P. Sharp and Mr. W. R. Geen:—
Cresswell & Sons £4,750 0 0
Matthews 4,711 0 0
Parker & Sons 4,620 0 0
Garlick 4,409 0 0
Briley 4,403 0 0
Hilton 4,430 0 0
Jeffrey & Pritchard 4,380 0 0
Barneley & Sons 4,300 0 0
Horsley, Brothers 4,050 0 0
Burkitt 3,860 0 0
Stockton & Sons 3,657 7 0
Trow & Son 3,600 0 0

For library, &c., West Bromwich. Messrs. Waller & Proude architects. Quantities by Messrs. T. C. & J. P. Sharp and Mr. W. R. Geen:—
Parker & Sons £1,160 0 0
Cresswell & Sons 1,181 0 0
Matthews 1,135 0 0
Hilton 1,130 0 0
Briley 1,098 0 0
Jeffrey & Pritchard 1,080 0 0
Fisher 1,058 0 0
Barneley & Sons 1,030 0 0
Garlick 1,009 0 0
Stockton & Sons 977 7 0
Horsley, Brothers 950 0 0
Trow & Son 950 0 0
Burkitt 950 0 0

For the erection of a tavern, in Adam-street West, Edgware-road, for Sir Henry Meux & Co., Mr. F. Warburton Stent, architect:—
Kirk £1,680 0 0
Turner & Sons 1,498 0 0
Jackson & Shaw 1,485 0 0
Hill, Keddell, & Waldram (late) 1,440 0 0
Ebbes & Sons (accepted) 1,387 0 0

For villa residences, at Beckenham. Mr. Albert E. Gough, architect. Quantities by Mr. J. Turner:—
Wicks, Bangs, & Co. £1,540 0 0
Kelly, Brothers (too late) 1,443 0 0
Colls & Sons (too late) 1,307 0 0
Sharphington & Cole 1,368 0 0
Henshaw & Co. 1,300 0 0
Gammam & Sons 1,280 0 0
Thompson 1,260 0 0
Hammond 1,250 0 0

For new shops, &c., at Kingland, for Messrs. Packe, tidge & Newsham. Mr. J. Turner, architect:—
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Mey 1,198 0 0
Meston 1,171 0 0
Larko 1,176 0 0

For additions and alterations to Swift's Park, Crum- brook, Kent, for Major Alexander. Mr. George Trevellick, architect:—
Ennor (accepted) £208 0 0

For a mansion, to be built on the Kent House estate, Knightsbridge, for Louisa Lady Ashburton. Mr. Henry Clutton, architect. Quantities by Mr. Crocker:—
T. Aumon £18,273 0 0
Patrick & Son 17,989 0 0
Downs 16,880 0 0
Macey 16,007 0 0
Myers & Sons 15,468 0 0
Brace 14,945 0 0

For new offices, in Queen Victoria-street, for the Provincial Insurance Company. Mr. Moore, architect. Quantities supplied by Messrs. Arding & Bond:—
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Roberts 3,770 0 0
Grover 3,748 0 0
Hill & Sons 3,646 0 0
Colls & Son 3,537 0 0
Scrivenner & White 3,520 0 0
Merritt & Ashby 3,477 0 0
Gammam & Son 3,047 0 0
Lunford 2,890 0 0

For the enlargement of the Free Tabernacle, Notting- ham, for Mr. Varley. Messrs. Habershon & Pile, archi- tects. Quantities supplied:—
Pallant £4,900 0 0
Patman & Fotheringham 4,886 0 0
Johnson 4,760 0 0
Kirk 4,611 0 0
Cowland 4,390 0 0
Grover 4,376 0 0
Blackmore & Morley 3,990 0 0
Leatherdale & Son 3,907 0 0
Forest 3,871 0 0

For the erection of new store-shed for castings, for Messrs. J. & F. Howard, Britannia Iron Works, Bedford. Mr. John Usher, architect. Quantities supplied:—
Curwin £253 0 0
Foster 568 0 0
Corby & Son 651 0 0
Hall 649 0 0
Spencer 538 10 0
Howe 530 0 0
Carter 623 0 0
Moore 618 0 0

For stable buildings and front fence wall, for Mr. Hands, Moss Villa, Finchley-road. Messrs. Satchel & Edwards, architects. Quantities not supplied:—
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Saunders £373 0 0
Colls & Son 339 0 0
Hookley 310 0 0

For finishing three cottages, Lurke-lane Bedford, for Mr. Knibb. Mr. F. T. Mercer, architect. Quantities supplied:—
Moore £200 0 0
Macey 800 0 0
Mercer 585 0 0
Briley 579 0 0
Dunham 577 0 0
Francis 574 7 8
Carter 572 0 0
Corby 560 0 0
Hayes 567 0 0
Stears 542 7 0
Knight & Boston 536 10 0
Richards 533 0 0

For the erection of St. Stephen's Vicarage, Walworth- common. Messrs. Henry Jarvis & Son, architects:—
Higg £2,345 0 0
Ricker 2,338 0 0
Gammam 2,273 0 0
Colls 2,199 0 0
Downs 2,160 0 0
Tarrant 2,149 0 0
Marshall 2,068 0 0
Henshaw 2,005 0 0
Thompson 1,968 0 0
Thompson 1,965 0 0

For additions, at The Holywell, Shorelitch, for Mr. Lend. Mr. W. K. Williams, architect:—
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Style 290 0 0
Mear 289 0 0

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We are compelled to decline pointing out books and giving addresses. All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

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The Builder.

VOL. XXIX.—No. 1503.

The Sense and the Nonsense of the "New Social Movement."

IN the subject of what has for some time been referred to as the New Social Movement, the political press gives a tentative and uncertain sound. It is now several weeks since it leaked out, in a not very intelligible mode, that certain *pour-parlers*,—we fail to find an equivalent English word,—had taken place between some of the more thoughtful members of the working classes and a few of the peers, with a view to the careful discussion, and, if possible, to the alteration, of the chief evils afflicting the industrial portion of society.

In the absence at Vienna of the suggester of this investigation, Mr. Scott Russell, the usual series of partial disclosures and efforts to throw off the bugbear of responsibility, followed on the premature publication of the intended proceeding. Mr. Russell has now returned, and has addressed to the journals his own statement, both of what is intended and of the steps that have already been taken. Political traders, fearing lest the wind should be taken out of their sails, are naturally angry and uneasy. The men who have the courage to look social dangers in the face, from a practical standpoint, have been called quacks, deluded and beguiled by a spurious philanthropy. The expression is suicidal. A quack is not a person deluded and beguiled; he is a deluder and a beguiler. But better those beguiled by the promises of philanthropy, even if spurious, than those who shut their ears to all the claims of their fellow men.

To our own readers the subject is not new. It may be approached in our columns with the sense that neither party spirit nor fashionable cant is likely to tincture the language employed. And we believe that we are alone among the public writers of the day who have pointed out that the results of a patient and philosophic dissection of the social condition of England, such as De Tocqueville has applied to that of France and of America, would reveal elements of danger at which even optimists might stand aghast. The industrial effect of the steam-engine, commercially or financially considered, is an augmentation of the productive power of the country, to an amount that is indefinite, if not unlimited. But the effect of that great disturber of labour, in a social direction, has never yet been fairly faced or rationally discussed. It may be urged, and not without justice, that the good effects will be permanent, and the evil effects transitory. Just so. But when transitory evil effects attain a certain magnitude, they are called by the name of Revolution.

It is, of course, very easy to laugh at Mr. Scott Russell and his supporters. That it is

right so to do is another matter. From our point of view, nothing can show a greater absence of sound principle than such a crackling of thorns under a pot. Public gratitude is due to those who, gravely and seriously, bring under the attention of grave and serious men those points which are felt to be grinding social evils by a very large portion of the community. The wilder the projects of improvement (supposing them to be wild) the better service is done by withdrawing them from the stifling atmosphere of the nightly club to the open air of public discussion. Men familiar with the progress of invention well know how fondly an inventor clings to the pet child of his brain. He is ready to suffer martyrdom on its behalf. Indeed, he not unfrequently does suffer something equivalent to fine and imprisonment for his devotion to an idea. Take this man into the museum of the Patent Office. Show him, by evidence that he cannot gainsay, how the same idea has occurred to other men; how it has led to failure here, and to partial success there; and how all that remains uncertain is some detail of application, and you convert the dreamer into a worker. So it is with the political or social reformer. Bring his nostrum to the test of experience. Put his theory in plain English. Show him how old it is. Unearth its first expression in choice Greek, or in nervous Latin, or in a tongue older than either; show him who have adopted it,—under what circumstances, and with what result,—and then compare this historic teaching with the actual condition and circumstances of England in the nineteenth century; and you may convert the idealist—so only that he be honest—into a real benefactor of his kind.

With regard to the assumption that underlies the entire scheme, it is one extremely displeasing to a certain number of people. It is true that this number is very small; but then it has the ear of the public—or rather it has the exclusive hold of most of the places from which the public can be addressed. It is an assumption such as underlies the existence of the Social Science Association; and which has called forth vials of wrath from politicians of a party cast. It is the idea that it is irrational to commit the legislative treatment of the most delicate questions of social progress to the management of the House of Commons. That a senate composed, in its two chambers, of some thousand men, not a quarter of whom have any special, educated knowledge of the subjects on which they are empowered to make laws, and perhaps not a dozen of whom are gifted with the rare qualities necessary for a real legislator, should be able, by counting noses, not only to order *leges Angliæ mutari*, but to tinker the new enactments, clause by clause, appears, to many thoughtful men, to be a piece of savage barbarism. Change of law, according to the view of such men as we mean, should be effected in a very different mode. The general, well-considered desire of the great mass of the educated population of the country should be first expressed. In fault of a better system, this is, perhaps, not altogether impossible to be effected by our present parliamentary system. Supposing that an adequate majority of the representatives of the nation—say two-thirds or four-fifths—arrive at a resolution to the effect that a certain enactment is desirable, it should then be the function of a small and select committee—three, five, seven at the outside—to draw up in the plainest and most idiomatic English, the new canon of law. Such a mode of dealing with the subject would be worthy of an intelligent people, and consistent with such a legislative code as Bacon, nearly four centuries ago, blushed to think his country was without. A great clamour will resound from St. Stephen's when that piece of plain common sense is first fully brought before the public. And, as tending in this direction, the proposal for a quiet discussion between small represen-

tative bodies, of the great evils that press on the poor, has already begun to excite a certain clamour. Thus far, therefore, the new movement has a presumption in its favour among thoughtful and cultured men.

When we come down to the seven points, the decision of which forms the core of the subject, the importance of calm and profound discussion becomes still more evident. For each of these points may be approached in a different mode. It may be regarded either theoretically—and that after a red, a white, or a party-coloured theory,—or practically. It may be viewed as a subject for legislation or as matter for voluntary organisation. The mere reference to these different modes of treatment is enough to show that the policy of let-alone is not that of inscrutable wisdom.

The first want is one that commands itself warmly to the sympathy of the *Builder*. It is "the want of family homes, clean, wholesome, and decent, out in pure air and sunshine." Nothing can be more true. But how is this a matter for Legislation? In one sense, indeed, it may be so considered. That is in a negative or preventive point of view. It would be well for it to be rendered impossible for the Legislature to give great and irresponsible power to public bodies to appropriate large districts of territory, especially of city property. The sufferings caused by the enormous clearances that have been effected in London by the different railway companies, especially by that great contractor's line, the London, Chatham, and Dover, have been cruel. Not the very poor alone, but the humble middle-classes have been unnecessarily unhoused; and with what result?—to leave a large space of unoccupied building land in the very centre of the metropolis. To destroy rent, to waste space; in fact, to annihilate property to an amount which, if represented in figures, would be appalling. The protection required is not so much by, as against legislation. The benefactor required is not Parliament, but Associated Building Societies.

Again, as to No. 2. "The organised supply of wholesome, cheap, nutritious food." What does this mean? Is it the utterance of an Englishman? Does it mean that the State is to supply food? Is Parliament to set up a market? One thing has been done,—nor can we doubt that, all things considered, it has been wisely done. The market of the world has been opened to Englishmen. We have no longer taxes on the staff of life—on the main elements of human sustenance. Further progress in this direction is matter, not for agitation, but for fair and well-considered discussion. There is, for instance, the question of malt. There is the question of tea. A certain amount of national income must be raised,—unless we wish to go back to woad and to acorns,—for national defence, justice, teaching, governing. Where the shoe shall pinch is matter for consideration. Happily, it is pinching less every year. But this is no subject to be dealt with in the wholesale manner suggested by the phrase we have quoted. It is eminently a subject for statistical illustration. It affects all classes of the community,—by no means the industrial classes alone. The supply of food must always be carried on by a self-acting organisation, such as that which daily, without check or hindrance, supplies the wants of more than three millions of people in the metropolis. The proportion, indeed, of distributors and producers of food, is probably very ill-adapted to the utmost efficiency. The extra cost involved by the existence of a disproportionately large number of retail tradesmen and middle men is large. But it will hardly be contended that this is a point that can be touched by legislation. Still, it will have to be touched.

One thing then only we take, under this head, to have any claim to be considered as matter for legislative interference. And even

here, it is rather the administration than the power of the law that is at fault. This is a matter, too, in which we can, if we will, help ourselves. It is the punishment of dishonesty in tradesmen. It is the adulteration of food, whether by craft or by right. Let a sharp, searching, and judicious hunt be made after false weights, false measures, and false goods. Let randed sugar and shoddy cloth be no longer matters to grin at, but to go to gaol for. Let the law and its officers, and, above all, public principle and public indignation, do their duty here, and we may relegate the second point to the region of ordinary life;—not, however, to be there neglected.

We reach Utopia itself on the third point,—the want of leisure for the duties and recreations of family life! Of course, we all want leisure. What has the Legislature to do with it? To a certain extent we have recently made important steps in that direction. We have been compelled, unnatural as it may seem, to prohibit cruelty to children. We have abolished infant chimney-sweeps. We are endeavouring to rescue the poor young savage of the brick-ground. We are inspecting mines and factories. Wherever it is shown that tyranny exists, that the young and the helpless are forced to undue labour, the Legislature has stepped in—or will step in. More than that it is unjust to ask. Our great Christian holiday exists by law. Long may it so exist; but were it not of prescription, it could never be enacted. Men, too, are taking this point into their own hands, and that with no faltering grasp. Look at the London shops on Saturdays! Look at the engineers' strike! All that in a wisely-ordered State the law can do to protect leisure is, to prohibit tyranny—whether it be the tyranny that sends a boy up a chimney, or the tyranny that forbids the manufacturer to keep his wheels moving, and his costly machinery at work, for more than a fixed number of hours per week.

The fourth want specified is that of organised local government to secure the well-being of the inhabitants of villages, towns, counties, and cities. We are with those who maintain that some legislative action may be desirable in this respect, more especially for the unification of the innumerable local boards, vestries, and authorities of all sorts, that do not govern the metropolis. Still, to expect to remedy the whole evil lamented by direct legislation is to put the cart before the horse. The evil lies far deeper than to be affected by superficial treatment. The want is not that of councils, but of councillors. The extreme reluctance of the more educated and better qualified members of society to take part in local, municipal, or even national government, is not peculiar to this country. It is equally to be observed, and equally to be lamented, in France and in America. It has long been most palpably shown in England by the withdrawal of the higher names of finance and of commerce from competition for what used to be regarded as civic honours. How far it keeps the best men out of Parliament we are, perhaps, hardly aware. In France it has led, and threatens again to lead, to the establishment of a pure kakistocracy,—to the unrestrained seizure of power by the most ignorant, the most violent, and the most base. In America,—and notably in the municipal government of New York,—it has had the same results. In England, indeed, one of the results of the measure of last year for the establishment of a national education was the authorisation of a new set of local councils, of a nature not dissimilar to that indicated by the language of Mr. Scott Russell. What has been the result? Look at the London School Board! Look at the general movement throughout the country! It would almost seem that no competent man will devote his time to the gratuitous service of the public unless he has a hobby, a strong sectarian fanaticism, or a craze. Possessed by one or all of these demons, he comes to board or vestry, rather with the view of hindering the success of his rivals than with any hope of establishing his own schemes. "Partial education," says A., "rather than let B., C., and D.," and so on with the other letters of the alphabet. In the House of Commons we witness contemporaneously eager haste to succeed in a party struggle, and the dislike or inability to speed those practical measures of administrative improvement which every one admits to be requisite. It would seem as if the discredit thrown by modern ideas on the hereditary principle, as the great link between all classes of society, had led to a disintegration of

the social bond, for which the remedy is not easy to suggest. To suppose that this remedy is to be found in Acts of Parliament is to imagine, not that the people make the laws, but that the laws make the people.

A like confusion of ideas is evident as to the fifth point,—the want of technical teaching for the workmen. This is eminently a matter for masters and men to settle between themselves. It is not a subject to be dealt with by a Parliamentary vote. As to primary education, a great and long-delayed effort is now being made. Secondary and special teaching may be ordered, in its detail, by the several classes affected. Let our manufacturers and workmen look at the manner in which the German artisans are at once taught and trained. Let them observe what part the technical school plays in the organisation of the great workshops, or rather work-villages. Let them ponder on the great start in the race of life that is thus given to the German workmen; and then, let them not cry ignorantly and supinely to Parliament, but let them set their shoulders to the wheel. The industrial classes of this country are becoming fully aware of the importance of education. They are becoming aware that education is not comprised in the Catechism, the spelling-book, the copy-book, and the multiplication-table. Those masters and employers of labour who will now do their duty in this respect will establish a strong claim to the gratitude of the public. If the proper leaders of the movement fail to organise it, it will be organised without them, and to their lasting detriment.

Point No. 6 is the want of public parks, buildings, and institutions for innocent, instructive, and improving recreation. Here, again, the duty of the Legislature is plain, simple, and unquestionable. It is not now for the first time that we point out what that duty is. It is this,—to ascertain what are the public lands now existing; to secure their enjoyment by the public; to put on record a survey of their details; to render difficult, or impossible the alienation of those lands; and to give facilities, if such be needed, for the establishment of such subjects of common right. Not a penny need be asked from the national purse. An English Government is not to be asked to amuse the people. Rigidly let the public robber be restrained. Heavily let the injurer of public health be dealt with. But the criminal part of the question is that alone as to which any tribunal can be called on to interfere. For the rest we must help ourselves. Nor should it be forgotten that in many places wealthy men are making gifts of land to the public for this purpose. Legislation should remove all obstacles to such acts: legislation should make the way easier for the people themselves to obtain what is needed.

No. 7 is, the want of the organisation of the public service for the common good. It is a want, certainly; but can any one for a moment pretend that it is a class want? Is the slow, disjointed, and unsatisfactory working of a machinery which owes most of its awkwardness to our English love of liberty—to the fear of arbitrary power,—to the system of co-ordinate checks,—a great social wrong pressing upon the working man? It is mere drivel to say so. We fear to commit the management of our army to a soldier, lest he should manage it too well, and, as we think, too arbitrarily. The same fear cripples our navy. The contrast of our regulations, in these respects, with those of the one people that is plainly going ahead in national power, is extreme. The Prussian army is organized to fight and to triumph. It does both. The Prussian navy is organized so that responsibility is direct, well understood, and hampered by no conditions but the good of the service and the performance of orders. Consequently, we hear of no courts-martial on Prussian *Agamemnon*s or *Megaras*. With the rapid increase of population in Europe, and its augmenting pressure upon the geographical area, but one of two courses is possible for the future. Nations must be governed,—or not. The intermediate phrase,—the euphemism of their governing themselves,—if not a contradiction in terms, has become each day more and more plainly impossible. Impossible, that is to say, if to be effected by means of talk. Discussion is one thing, administration another. The two are deadly enemies. With every broadening of the basis of representation, the flood of idle chatter is augmented in its fury. Nations seem as though they were tending to the actual decision of all great points by the loudest popular clamour,—as in the Greek

assemblies, or as in the warlike concourse of the barbarian tribes that overthrow the Roman Empire. We hear a favourite leader on our shield, and let him guide us wherever fancy impels him.

Our great want is that of patient, earnest, and large-minded men, who will give time to public affairs, and direct that time to the attainment of practical ends, and not to the imagination of organic changes. For such men a wide field is open. Their rewards will be in their own consciences, and in the gratitude of their descendants: not in public applause, or visible honours. The discussion proposed by Mr. Russell may do great service, if it takes this form. But if the result of what is called a social movement, while it is only a social project, be to fix in the minds of the masses the idea that any legislation can redress the now specified evils, or that revolution, whether that of force or that of good-will, would do so by a touch, we have only added one more to the list of the delusions attempted to be foisted on an ill-taught and credulous public.

THE REVIVAL OF ECCLIESIASTICAL ARCHITECTURE IN GERMANY AND HOLLAND.*

THE great difficulty which exists of thoroughly understanding the modern architecture of foreign countries arises from the fact that it is next to impossible for any stranger to become well acquainted with the various causes which have influenced the building arts of those lands.

So, in speaking of the two schools of ecclesiastical architecture at present practising in Germany, I shall endeavour, as much as possible, to criticise them from their own stand-point, and not from an English point of view. I shall try to ascertain as well as I can what they are aiming at, and where they have succeeded in attaining the end they were striving after, and where they have failed. At the same time I shall bear in mind the fact that there are certain fixed laws which must never be broken, however styles may change or tastes vary.

Now I think every one will agree with me that the first of these immutable laws is that an architect must be acquainted with the style in which he is working. If, for instance, he is building in one of the Medieval styles, he must know pretty well what the old men would have done had they had the same wants and requirements to work for that he has. In other words, he must thoroughly understand the spirit of the style which he has taken up. And if an architect is building in a new or eclectic style, he must be thoroughly acquainted with all the elements out of which he is going to compose this style; and those elements will, of course, be the architecture of former times and different countries.

Of the two styles of ecclesiastical architecture at present in use in Germany, I shall speak first of the Eclectic or Munich style, because, by a singular contradiction, the Gothic or Medieval school is more recent than the Eclectic school. Had the reverse been the case, perhaps the result might have been more happy than it is at present.

Now, after making every allowance for difference of taste, and for circumstances which may have influenced it, I find it impossible to say a single word in favour of the Eclectic-Munich style, the "architecture for the future," as they have pompously named it. I say that it is not an architecture for the future, and simply for this reason: in the first place, it is not architecture at all; and in the second place, men who cannot compose an architecture for the present certainly cannot invent one for the future. Now let us for a moment see what this so-called Eclectic style is. Well it is a chaotic jumble of Romanesque, Third-Pointed Gothic, Italian, pure Greek, Indian, Chinese, Moorish, and Venetian Gothic, all heaped together, without the slightest considerations of necessity or propriety. Take, for example, the New Maximilian and the Maximilian Strasse, at Munich, or the Ludwig, Kirch, or any other building in the same style, of which, unfortunately, there are thousands; and what do we see? Badly-designed Romanesque windows, utterly devoid of all spirit of feeling, filled in with badly-designed, Third-

* By Mr. H. W. Brewer. Read at the meeting of the Royal Institute of British Architects on the 20th inst. Much information on the same subject, to which the *Builder* drew particular attention, with views of buildings referred to, will be found in our pages.

Pointed tracery, devoid of all elegance or grace; badly-designed Moorish parapets; badly-designed Venetian-Gothic crockets, crawling like so many fat slugs up meaningless sham gables. Added to this, an outline like two or three cigar-boxes, joined together, with one or two set up on end, all covered with a nearly flat roof, composed of great sprawling tiles, and the building faced with glazed carrot-coloured bricks. It is all very well to call this conglomeration of discordant elements a new and original style; but novelty may be of two kinds. A thing may be new, either because no one could have done it before, or because no one would have done it before. However, the worst feature of this style is not its artistic past, though that is bad enough, but its faulty construction. I have frequently seen the jambs of a doorway or window 10 ft. or 12 ft. high, all worked out of one piece of stone, only about 10 in. or 12 in. square, and this stone beam is set on end, and made to support a Gothic arch, the sides of which will again be composed each of a single stone, with a huge key-stone in the centre.

Then, again, imagine the absurdity of nearly flat tile roofs, in a country like Bavaria, where the snow is often 4 ft. deep, and lies for nine or ten weeks.

I am sorry to say that this style has carried everything before it in Germany. Invented in Munich (and unfortunately not patented), it has been introduced into Berlin, where it has perpetrated dire eccentricities; into Stuttgart, Hanover, Dresden, and Karlsruhe, in all of which places it has become a great Court favourite, and has been warmly taken up and pushed by the various *Ayrtons* attached to those Governments. Yes, gentlemen, you are not the only architects in Europe who suffer from *Ayrtanism*; for, I can assure you, you can form no conception of the extent to which *Ayrtonian* principles have developed in Germany, especially in Berlin. In fact, the interference of the German Government, particularly those of Prussia and Bavaria, has had a disastrous effect upon architecture in those countries. I will give you an example of this. When Zwirner died, the inhabitants of Cologne, the "Dom Bau-Verein," and the archbishop, all wished Mr. Stadtz, of Cologne, to be appointed architect to the cathedral. Now, Mr. Stadtz is a Cologne man, and knew every stone of the cathedral,—had, in fact, worked upon the building as a mason, in order to become better acquainted with his profession, and to have a perfect knowledge of that splendid church. Mr. Stadtz had also greatly distinguished himself by numerous fine churches which he had erected in the archdiocese. But, despite all remonstrances and advice, the great Prussian *Ayrton* forced upon the clergy and people of Cologne an architect who, of course, was a Berliner, and whose knowledge and feeling for Gothic architecture may be judged by the puny little terrace, with its pretty little pierced parapet, and its nasty little buttresses, which he has placed as a basement to this noble building, giving it a ridiculous resemblance to an elephant standing on a caterpillar's legs.

I will now leave the Eclectic-Munich style for the present, and speak about the Mediæval school of architects. The first really good Gothic church built in Germany was the work of an Englishman,—I refer to Mr. G. G. Scott's beautiful church at Hamburg. Before the commencement of that building, the Eclectic school and the Italian school of ecclesiastical art divided the field between them; Mr. Scott's church, however, was the commencement of a great reformation in ecclesiastical architecture. The Italian school died out at once, and a new school of Gothic architecture arose. There is, however, one fact which must be noticed, and it is this,—that although the Lutherans made the first move towards the re-introduction of Gothic architecture by the selection of Mr. Scott's plans for St. Nicholas's, Hamburg, they appear to have respected little, if any, profit from that movement; whereas the Roman Catholics, who were later in the field, have taken great advantage of the good example set them in ecclesiastical architecture by Mr. Scott. As a rule, the new Protestant churches in Germany are built in the Eclectic style, and the new Catholic churches in one or other of the Mediæval styles. There are of course a few exceptions to this rule; for instance, the new Protestant church at Bonn is in a kind of Gothic style, and the new Catholic church at Wiesbaden is in the "Munich-Eclectic" style. With regard to the churches built by "the architects for the future," the first thing

that strikes one is their extraordinary similarity. One would imagine that there must be a stereotyped pattern kept at Munich, from which they are all cast. The only difference observable amongst them is, that some of them have pinnacles, and some are without. They nearly all consist of one great flat nave, covered with sprawling tile-roof, an apology for a chancel, in the shape of a little apse stuck on at the east end (of course it is just as often the west end, as orientation is not observed), and a thin tower and spire over a porch at the opposite end. This tower is nearly always gabled on each face, and has a round-headed window and a rose-window on each side; sometimes the rose-window is above the long window, and sometimes the long window is above the rose-window. Iron is largely used for the window tracery and the roofs, and, in fact, wherever it can be used with impropriety and bad effect. Examples of this style of building are the Lutheran churches at Freising, Aschaffenburg, St. Goarhausen, Bingen, Ems, Limburg, Dantz, Landshut, Ludwigshafen, Muhlheim, Mainz, Donauwörth, &c. The new Lutheran church at Wiesbaden is one of the largest examples of a church in this style, and its size and solidity redeem it from the usual vulgarity of these buildings.

When I say that Mr. Scott's church at Hamburg commenced a new era in ecclesiastical architecture in Germany, I do not mean to say that it was by any means the first Gothic church built in Germany during the revival, for two rather interesting examples had preceded it,—the churches at Apollinarisburg, by Zwirner, and at An, a suburb of Munich, by Osmüller. The former, however, although the detail is pretty, and its decoration sumptuous and splendid in the extreme, is merely a costly toy; and the latter, although one of the most expensive churches ever built, is far from being a satisfactory building; like everything in Munich, it is simply a "specimen," and as such, of course, would never exercise the slightest influence upon the art of the country at large.

If you wish to find the school of real German Gothic architects you must not look for them in the capitals of the various German states. You search for them in vain at Berlin, Munich, Dresden, and Stuttgart; but you will find them in the provincial towns,—at Cologne, Aix-la-Chapelle, Paderborn, Hildesheim, Brunswick, Fulda, and Ratisbon, where they have learnt their art in the study of the noble minsters and parish churches of their native towns. Snubbed by the courts and governments, laughed at by their more successful rivals, the "men of the future," as so many antiquaries, and as being 500 years behind the age in which they live, completely shut out from Government work in a country where nearly every great undertaking is in the hands of the Government, they have had to seek for patronage from the town-councils and clergy of their immediate neighbourhood.

Amongst the architects of this school, whose works seem to me to approach nearest in spirit to those of the great Mediæval builders, I will mention the names of Mr. Stadtz, of Cologne; Mr. Guldenniggen, of Paderborn; Mr. Denzel, of Fulda; Mr. Denzinger, of Ratisbon. There are also two other gentlemen, whose names have unfortunately escaped my memory, whose works are to be seen at Hildesheim and Brunswick; nor must I omit to mention Mr. Kleinertz, of Cologne, whose superb decoration of St. Mary in the Capitol at Cologne, St. Godehard at Hildesheim, and St. Catherine's at Utrecht, are works of the very highest excellence in decorative art. Dr. Boek, of Aix-la-Chapelle, and Dr. Reichensperger, of Cologne, deserve also to be mentioned for their many admirable works upon Gothic architecture and church furniture; and Mr. Baurdi, of Cologne, for his attempt to restore stained glass to its proper use and character, in opposition to the gaudy and vulgar transparencies of the Munich school.

The chief works of Mr. Michel Stadtz, of Cologne, are the new cathedral at Lintz, on the Danube, an immense church, 400 ft. long and 200 ft. across the transepts. The nave has double aisles, and the choir, which is of great length, terminates to the east in an apse and chancel, with radiating chapels. At the west end are an immense tower and spire, 40 ft. in diameter, flanked by a baptistery and a mortuary chapel. The style of the whole is Middle Pointed, and the whole church vaulted in brick, with stone ribs. The work of building this immense church has been going on for some twelve years, and it is still far from completed.

St. Maritz, at Cologne, is another very

large and striking church, about 220 ft. long and 160 ft. across the transepts. It consists of a nave and aisles of seven bays, apsidal transepts, a choir of three bays, terminating in an apse pierced with two tiers of windows, and four apsidal chapels filling up the spaces between the choir and transepts. At the west end is a lofty stone spire, which is the poorest portion of the whole design, and anything but satisfactory in outline. Internally the whole church is vaulted in stone, and the main arches, triforium, and window-jambs are all richly moulded, and of the same material. This church is quite finished, and the windows are being filled with stained glass, which, though wanting in richness, is a wholesome protest against the Munich school. The altars are very simple, consisting merely of stone slabs, supported upon columns with carved capitals. The defects of this church are, firstly, the disagreeable outline of the tower and spire; secondly, the introduction of a badly-designed doorway into the apse of the north transept; and thirdly, the construction of the doorways themselves; for here the architect copied the Munich plan of making the whole jamb out of one piece of stone. There are also keystones to the windows; but as they are kept very small they cease to be objectionable.

Mr. Stadtz's church at Aix-la-Chapelle is similar in general arrangement to that at Cologne, except that here there is no western tower, instead of which there is an open lantern over the cross, and the transepts are square-ended instead of apsidal. The western front is the least successful portion of the whole design, and has a busy and fussy appearance; the arrangement of the gable, too, is far from happy. The interior of the church, however, is very striking; and the high altar, with its metal reredos and shrine, is a good example of modern church furniture. The side altars have painted triptich reredoses of simple design, but still effective.

The church at Muhlhaas is an equally large cruciform church, but is much plainer than the two former ones. It is not vaulted, but has a very simple king-post roof; the effect of the interior at present is rather bald. The spire, which is of slate, is far preferable in outline to that of Mr. Stadtz's Cologne church.

The churches at Kaevelar and Luppen are also large and important churches, but my time will not allow of my describing them, or the very numerous other ecclesiastical works of this talented architect. I must, however, mention his new building, called the "Karlsruhe," at Aix-la-Chapelle, as a good example of German Domestic Gothic. Like all Mr. Stadtz's work, it is Early Second Pointed.

The works of Mr. Guldenniggen, of Paderborn, are to my thinking the most satisfactory examples of modern German Gothic that I have seen; and, as Mr. Guldenniggen is a young man, great things may be expected from him. I am glad to say that he has been appointed diocesan architect to the Bishop of Paderborn, in which capacity he is restoring the fine cathedral of that town in a most skilful and excellent manner; in fact, I have no hesitation in saying that it will, when completed, be the most thoroughly satisfactory restoration in all Germany. I mention this restoration especially because it does not simply consist of restoring what was decayed or defaced, but of replacing features which had been entirely destroyed for many years. I should explain that the cathedral of Paderborn is a noble church, 360 ft. long by about 200 ft. across the transepts, and that the nave and aisles are of the same height, with every bay gabled laterally. Now, not only every one of these gables, but also the gables of the transept and the eastern gable (it is a square-ended church), had been destroyed or modernised about a century ago.

Mr. Guldenniggen has rebuilt all these gables in the same style as the cathedral,—that is to say, the style of the earlier part of the thirteenth century. They are every one of them different in design, and are singularly original and beautiful. The restoration of the interior of this fine church is only just being commenced.

A new school, a college, and several dwelling-houses in Paderborn, by the same architect, are all excellent; one of these houses was so picturesque and spirited that I could hardly have believed it to be the work of a modern German architect: it stands on the old ramparts of the town, and is only one of a number of houses he is building there. All these works are thoroughly local in character, which adds greatly, in my mind, to their interest.

Mr. Guldenspennig has also erected two remarkably fine churches in the neighbourhood of Paderborn. The first is at a place called Hoerde, and the other at Baderich; both are of brick, and cruciform in plan. The church at Hoerde has a lantern tower crowned by a spire over the junction of the nave and transepts, a nave of six bays, rather shallow transepts, and a well-proportioned chancel. Internally this church is vaulted throughout in brick with stone ribs. Stone is also used for the pillars and arches, while externally it is alone used for the window tracery and coping of the flying buttresses. The church at Baderich has a western tower and spire, flanked by low octagonal turrets (a regular Westphalian feature), a nave of four bays, transepts, and an apsidal choir. The church is immensely solidly built, and is internally lined with stone and vaulted throughout. It is a grave and solemn church, and as unlike the work of a modern German architect as it is possible to conceive. Both of these churches are Second Pointed. A small Romanesque church at Warbourg, and a domestic chapel at Weyer for the Baron von Brenken, are equally excellent examples of this gentleman's skill; and the designs for a new church to be erected at Laer, near Oberhausen, and constructed entirely of brick, show great originality and ability. Some farm-buildings and a grange for the Baron von Brenken are singularly picturesque and pretty. Mr. Guldenspennig does not appear to have done very much work, but what he has done is so excellent, so far above anything else that I have seen in Germany, that I cannot help expressing a hope that the Royal Institute of British Architects will keep an eye upon him, as I feel sure he is destined to do great things in the future.

Mr. Denzinger, of Ratisbon, is best known by his design for the completion of the exquisite cathedral church of that city. This design bids fair to be carried out,—in fact, the two lofty western spires, which form the most important portion of it, are already completed. They are graceful examples of open-work spires, and harmonise well with the magnificent façade to which they form so appropriate a termination. It is to be hoped that the open lantern over the crux of the cathedral will also soon be constructed. I cannot tell how far Mr. Denzinger has been influenced by ancient designs or drawings, but it seems to me that the way in which this octagonal lantern is set on its square base is capable of improvement.

Of the works of Mr. Denzel, of Fulda, I know only one,—the restoration of the Benedictine church in that town. However, there is much that is excellent in this restoration, and there is a greater knowledge of Gothic architecture shown in it than in most German restorations.

I have not yet spoken of the ecclesiastical architects of Austria, and it is scarcely within my province to do so. However, before concluding the few notices I have given of German architects, I should wish to mention the names of Professor Schmidt and H. Forstel, both of whom have taken an active part in the revival of Gothic architecture in that country.

The Votive Church at Vienna, by Forstel, was certainly the first Gothic church worthy of the name commenced in the Austrian dominions; and the Lazarist church at Vienna, by Professor Schmidt, is certainly a very satisfactory Gothic church. I cannot help thinking, however, that his churches at Weissgraten and at Fischerhoff, near Vienna, are less admirable, although the latter is certainly a clever and a not unsuccessful attempt to design a Gothic church with a dome; and his design for the new town-hall at Vienna is in a mixed style of Gothic and Italian that I venture to think is not an advance in the right direction, although it is vastly superior to anything of the kind that has been done at Munich.

Of course, there are several other Gothic architects in Germany who have done good things, and whose names, either from a want of knowledge of their works, or from want of space, I have been obliged to omit.

But, as a rule, the German architects, with the exception of those I have named, seem like men speaking in a strange language when they attempt to build in the Gothic style. I must now leave Germany, and say a few words about the Dutch revival.

Twenty years ago there was no such thing as ecclesiastical architecture in Holland of any description whatever; both the Protestant and Roman Catholic churches consisted of four walls, with a pepper-box at one end and an altar or

reading-desk at the other. In order that you may the more fully understand how the revival was brought about, it is necessary that I should say a few words about the different religious bodies in Holland. By the last census, taken in 1865, religious bodies in Holland were divided as follows:—Protestants of the Geneva Confession, 1,942,387; Roman Catholics, 1,234,486; Remonstrants, about 100,000; Lutherans, about 50,000; Jews, 150,000; and about 8,000 Jansenists, or members of the Church of Utrecht. The clergy of the Dutch Church and the Roman Catholic Church are both allowed an income by the State, and a very small sum is granted yearly to keep the churches in tolerable repair,—that is, to keep them from falling down.

Now, about twenty years ago a revival of Gothic architecture commenced amongst the Dutch Roman Catholics, which for enthusiasm, boldness, and liberality has certainly had no equal in Europe. Whether we regard the great number of churches, their completeness, or the important dimensions of many of them, it seems marvellous that they could have been erected by a people numbering little more than one million. Nor has the movement been confined to building new churches only, for nearly all the ancient churches and cathedrals that have remained in the hands of the Roman Catholics have been or are undergoing a thorough restoration. The cathedrals of Maastricht and Roermond are being excellently restored by Mr. Cuypers. St. Catherine's, at Utrecht, originally the Carmelite church, but now the Roman Catholic cathedral, of that city, has undergone a thorough restoration by Mr. Van der Brinck, and has been most beautifully decorated by Mr. Kleinertz, of Cologne, and fitted up with a fine set of carved oak stalls, sedilia, bishop's throne, altar, and pulpit by Engleberger, of Aix-la-Chapelle. The cathedral of Bois-le-Duc, the most magnificent ancient building in Holland, is also undergoing a thorough restoration. This superb church has been not inaptly called the Dutch Cologne, and it bears a remarkable resemblance to its great German prototype. During the last century, however, every window in the church was deprived of its tracery. This is being carefully and well restored. The yellow wash with which the interior of this noble building is bedaubed is also being removed, and I wish this was all I was obliged to say about this well-intentioned, but not altogether judicious restoration, for I think every lover of art, however Gothic may be his sympathies, must regret the removal of the fine Renaissance roof-screen. And the new high altar and bishop's throne are too small and insignificant for this fine cathedral. Then, again, the restoration of the sculpture in the great north front is careless and incorrect. The architects are Messrs. Hesseman & Venne-

mans, of Bois-le-Duc. The ancient churches of Venloo, Boxtel, Sotard, and Rolduc, and St. Walberg at Arnhem, are being admirably restored by Mr. Cuypers; and, lastly, the beautiful church of Our Lady at Roermond, the finest example of Late Romanesque and Transitional styles in Holland, is being thoroughly restored and completed by Mr. Cuypers. The restoration includes the building of the four towers and spires, which were only carried as high as the roof, or had been destroyed. I should mention that there has been great controversy about the dome of this church. Many persons consider that Mr. Cuypers ought not to have retained it in his restoration. He, however, maintains that the dome is at least as old as the commencement of the sixteenth century, and in all probability was then only a restoration of an earlier one of similar form. I should mention that all the designs for the restoration of this church have received the approbation of M. Viollet-le-Duc. With regard to the works of restoration carried out in the churches belonging to the Dutch Calvinists, little need be said. The church at the Hague has had a cast-iron spire and pinnacles added to its tower, and the whole of its exterior has been neatly plastered. The grand cathedral at Utrecht has had two new galleries in the form of the boxes of a theatre erected in its superb transepts, while its forlorn but graceful choir is still unoccupied. A pretty little doorway which led into the cloisters has been "repaired;" that is, the sculpture has been removed from its tympanum, and its place filled in by a representation in stone of a neatly-bound Bible surrounded by rays. Some Gothic windows of a highly original and purely nineteenth century pattern have been inserted in the sacristies. The great church at Gouda is having its west front nearly restored in stucco. The great church

at Rotterdam has been embellished by the addition of plaster quoins. The noble tower of the great church at Breda is being patched up; but the fine lantern over the crossing was destroyed some ten years ago. The beautiful monument of John of Nassau in this church has fortunately been restored by Mr. Cuypers; but the church itself is in a condition that is simply disgraceful. The nave alone is used, and the transepts and choir are allowed to go to ruin their own way. When I was there I saw a clothes-line suspended across the transepts, upon which was displayed the week's washing of the pastor and his family. I remember to have seen the same remarkable display of ecclesiastical vestments in a similar position at Bergen-op-Zoom.

The first really successful new church erected in Holland was Mr. Cuypers's church at Wyck, near Maastricht. It was only commenced some fifteen years ago. It is a fine sample of cruciform church, consisting of a nave and aisles, transepts, and a deep chancel, terminating in a three-sided apse. There is a lofty tower and spire at the west end. The entire length of the building is 163 ft.; width across the transepts, 91 ft.; height of nave, 62 ft. to the vaulting, which is of brick, with stone ribs; height of spire, 221 ft. The whole church has been recently well decorated. The altars, stalls, and other furniture are remarkably good; the same, however, cannot be said for the stained glass, which is not satisfactory.

Of Mr. Cuypers's churches, the most remarkable for completeness and decoration are those of Vechel and Eindhoven.

The church at Vechel consists of a nave and aisles of six bays, transepts, a deep choir, terminating in a chevet, with five radiating chapels, two of which are triangular in plan, the others being all apsidal. The whole church is vaulted in brick, with stone ribs. Brick is also the material used for the walling. The columns are of grey granite. The style chosen is thirteenth century, and the dimensions are as follow:—Entire length, 245 ft.; width of nave and aisles internally, 72 ft.; nave, in the clear, 32 feet; height to vaulting, 72 ft.; height of tower and spire, 283 ft. The church contains eight altars, besides a baptistery and mortuary chapel. The vaulting is supported externally by flying buttresses, and there is an open triforium over the main arcades. Now, the whole of this large church is decorated, not only with arabesques and patterns, but with decorative pictures of the highest excellence. The decoration and pictures were both executed from sketches and cartoons, prepared by Mr. Cuypers and his pupils.

An equally remarkable church is that of Eindhoven, which consists of a nave and aisles of five bays, western towers and spires, transepts, a chancel, with a prettily-arranged chevet, and three apsidal chapels. The length of this church is 237 ft.; width over transepts, 114 ft.; width of nave and aisles internally, 71½ ft.; nave, in the clear, 33 ft.; height of nave to brick vaulting, 71½ ft.; height of spires, 244 ft. The interior of this church is really superb. The whole is a mass of decoration and painting. The portions of the building which are not painted are carried out in buff, not black, brick, arranged in bands and patterns. All the decoration is on a dead-white ground. Below the windows and in the blank spaces above the altars are conventional arcades, filled in with decorative paintings, executed in a very severe style, consisting simply of strongly-drawn outlines filled in with very flat washes of colour, the whole being kept in an exceedingly light key, and entirely devoid of shadow. Bands of white are also used amongst the brick-work, and the general effect of the interior has a kind of opal hue, which is wonderfully charming. Everything in the building is decorated with colour; even the stone altars and the parlooses of the choir, which are amongst the most charming designs for church furniture I have ever seen. All the windows are filled with stained glass, into which a great quantity of pure white glass is introduced. I had no idea, until I saw this church, of the immense value of whitewash in decoration.

Mr. Cuypers's churches at Breda, Oudenbosch, and St. Willibrord, at Amsterdam, are even larger than those I have already mentioned. The church at Breda consists of a nave and double aisles, 100 ft. wide over the whole, transepts, a deep chancel, and three spires. The total length is 216 ft., and the height of the spires 235 ft. It is a much plainer church than those already described, and not so satisfactory in design. The large practical triforium is also a mistake.

The church at Oudenbosch is Romanesque in style, and very plain; it is at present only as high as the clearstory, but promises to be a very striking building. Its dimensions are,—length, 260 ft.; height to ceiling of the nave, which will be flat and boarded, 65 ft.; height to apex of octagon lantern over crossing, 220 ft.; nave, 40 ft. in the clear. This church will offer a magnificent field for coloured decoration, as the windows are very small and there are great unbroken wall-spaces. This church is entirely of brick.

The church of St. Willibrord, at Amsterdam, is only just commenced; when completed it will have five spires, double aisles, transepts, and be over 300 ft. long.

At Sneek another church is now building, which will be 210 ft. long. The churches at Alkmaar, Bodgraven, and Klobduren, are all large and important buildings.

Mr. Cuyppers's churches have at first a singular appearance to an Englishman on account of their excessive nationality; they are very square in composition, very regular, and much more plain externally than such buildings are with us. Then they are all built of brick, with stone very sparingly used; then there is a lightness of construction which strikes an Englishman as being peculiar; but when one comes to examine them and compare them with the ancient Dutch buildings, one is bound to acknowledge their thoughtfulness and thorough common sense. Of course a church built with heavy columns and thick walls would simply sink through the soil in Holland, and the more lightly a building can be constructed and the less material used in its construction, the more durable it is. I am sorry to say that the other Dutch architects who have taken up the Gothic style of architecture have not been so successful in their work as Mr. Cuyppers, for although Mr. Weber, of Roermond, has built a very complete church at Maesricht, with a great stone roof-screen, containing two altars in it, a sacramentshuutje, 3 ft. high, a complete set of stalls, and all other ritualistic requirements, it is not on the whole a good church. Mr. Van der Brinck has built many new churches, some of them nearly as large as those already described; but they are rather well-intentioned attempts than successful buildings. Mr. Van Solda has built a vast number of churches: Helmond and Kelemen, for instance, are of great size,—over 200 ft. long,—and have a striking outline, but are ruined by their architect not understanding Gothic detail.

Mr. Margerij, a pupil of Mr. Cuyppers, has built a very creditable church at Rotterdam. It is a large cruciform building, but must be considered a copy on a smaller scale of Mr. Cuyppers's church at Veohel.

A few examples of the Eclectic school are to be seen in Holland, of which, perhaps, the least objectionable are the Roman Catholic cemetery church and a new Protestant church at Rotterdam. Fortunately, however, the Dutch have set their faces against eclecticism, and the Roman Catholic churches are nearly all built in the Gothic style, while the new Protestant churches which I have seen are in the genuine old conventional style, or the more objectionable churchwarden's Gothic of eighty years ago.

In this paper I have spoken strongly against eclecticism as practised in Germany; but I do not wish it to be understood that I am speaking against eclecticism in the abstract. Were I to do so, I must be simply raising my voice against the inevitable; for, if architecture is to have a future, and if there is to be a new style, that style must be more or less eclectic. But what I do protest against is men who, without understanding the architecture of the past or present, attempt to invent an architecture for the future; and I feel convinced that those gentlemen who, for many years past, have laboured so hard to become thoroughly acquainted with the architecture of past ages, are doing far more to found a new style than those who, discarding all the experiences of their ancestors, try to evolve a new style out of their own imaginations. Those who have gone before us have left us three great styles of architecture,—the Greek, the Gothic, and the Renaissance. They are to architecture the primary rays of light. The Gothic, with its golden excellence, is the yellow ray; the Greek, with its pure beauty, is the blue ray; and the Renaissance, with its gorgeous splendour, is the red ray. Time alone can combine these rays and make them daylight in the dawn of a real architecture for the future.

Mr. Street said that he knew little about

modern German architects, as he had always found the works of their forefathers so much more interesting, and to his mind there was something repulsive about modern German works. However, he was willing to admit that the works of Mr. Guldenpenning were singularly good and greatly superior to any other modern work in the same country. He could not help thinking that this, to a great extent, arose from the fact which Mr. Brewer had pointed out; viz., that Mr. Guldenpenning was a locally-educated man, and had studied in such a good school; for certainly the cathedral at Paderborn was a building which was more free from the usual faults of German architecture than any other church he knew of. Mr. Street also spoke highly of the works of Mr. Cuyppers, whom he had always regarded as an architect of great talent and ability combined with that modesty which is one of the signs of a true artist. Sir Digby Wyatt corroborated Mr. Brewer's remarks upon the Munich-Eclectic School. Mr. Waterhouse, Mr. Dawson, Mr. Goldie, and Mr. P'Anson took part in the debate; and the chairman (Mr. Wyatt), in thanking Mr. Brewer for his valuable paper, remarked that it was gratifying to find an amateur expressing such correct views and showing such a thorough knowledge of architecture.

SCHOOLS OF ART AND OF SCIENCE.

Oxford School of Science and Art.—The annual public meeting for the distribution of prizes to the successful science and art students in this school, has been held in the Townhall, Oxford. The Vice-Chancellor, chairman of the committee (Dr. Liddell, dean of Christ Church), presided. The Vice-Chancellor, in the course of his remarks, said that Mr. Ruskin had bestowed 5,000*l.* as an endowment for the master of an Art School for Oxford, which fund he proposed to place in the hands of Dr. Acland and himself to be bestowed hereafter according to rules and under conditions to be drawn up, and he hoped that very shortly this would be brought to bear. If they had a little patience they would find the advantages to be very great, and he hoped to live to see them in full operation. In fact, young persons of the present day had advantages of all kinds in the way of culture of every description which those who, like himself, came into the world a great many years ago, he was sorry to say, knew nothing of. He hoped that those who heard him would endeavour to persuade those who had any taste for these things to take advantage of what was now offered. All had a certain amount of taste. Let them endeavour to apply it—to cultivate the hand and the eye, to learn the beauty of form and colour, and so to elevate their minds and lift themselves to diviner and nobler aspirations than could be afforded by mere sensual and animal enjoyments. Dr. Acland said he never came to that platform to speak in reference to any scientific subject without thinking of the mighty changes which had come over this place in the last twenty-five years. The first time that he appeared in that particular spot, just twenty-five years ago, was to give a scientific lecture; and he was told that if he presumed to mix up the citizens of Oxford and sciences, he would fail in Oxford as a professional man. Now, he found himself upon the same platform with the vice-chancellor of the university, advocating the same cause. The Rev. R. St. John Tyrwhitt and other speakers followed, and the prizes were distributed. The meeting was largely attended, and great interest was manifested throughout.

Nottingham School of Art.—The annual meeting of the members of this school has been held in the Exchange Hall, the Right Hon. Lord Belper in the chair. Mr. S. D. Walker read the annual report, of which the following is an extract:—

"The honours gained by the students during the past year were quite as satisfactory, if not more so, than in any former year. There was a marked increase in the number of students. The Government examination held last year, 248 students (201 males and 47 females) presented themselves for examination. They worked 372 papers, of which 69 obtained marks for excellence and Government prizes, and 118 obtained certificates for proficiency,—total, 157 successful papers. The general work of the school had been quite up to the usual standard, and in April last the whole of the year's work were forwarded to London for inspection. There were 220 works sent up in the advanced stages, and 1,303 works in the elementary sections of instruction,—total, 1,523 works. In some of the higher stages of instruction, the works were better than in any former year, owing to some of the students having continued their studies for a sufficient length of time. The honours gained by the 'National

Art Competition' this year have been very satisfactory, and as regards the gold medal awards, the results have been greater than in any previous year. The Nottingham school is now the only provincial school of art in the United Kingdom that has gained gold medal awards for five consecutive years. The two gold medals for this year were obtained for designs for lace curtains, by William Butler, a draughtsman of Messrs. Heymann & Alexander's, and by G. F. Turton, a draughtsman of Messrs. Ward & Cope's. He was glad to say that the above firms were manufacturing curtains from the gold-medal designs of their respective draughtsmen. The remaining national awards were obtained for flower drawing from native designs in colour, and for wall decorations, relief designs, architectural drawing, and designs for lace. The school has obtained twenty free 'Art Studentships,' which admit the holders to all the classes of the school for one year free of charge. It has also obtained thirty-three Government prizes. Advanced works by the students were selected by the Government examiners for the public exhibition of the national competition at South Kensington Museum."

The head-master, Mr. Rawle, gave the following comparative table in course of his report:—

Name of School.	No. of Students.	Gold Medal.	Silver Medal.	Bronze Medal.	Queen's Prize.	Total Award.
Nottingham	409	2	...	3	8	13
Edinburgh	684	2	1	3	3	9
Leeds	1,164	1	...	...	...	3
Manchester	300	...	3	6	4	13
Birmingham	1,168	...	...	4	5	9
Dublin	513	...	...	2	3	5
Sheffield	558	...	...	...	...	2
Newcastle-on-Tyne	393	...	...	1	1	2
Leeds (two schools)	361	...	...	...	1	1
Liverpool	1,101	...	...	...	...	0
National Art School (Kensington Museum)	895	2	6	13	16	37

Mr. Walker said from various schools of art to which he would refer, they would see that the Nottingham school did not receive due support. In the Nottingham school there were 503 students, and the annual subscriptions were 150*l.*, which was equal to 6*s.* per head. Burslem, 203 scholars, 210*l.* subscriptions, or 20*s.* per head; Cork, 240 students, 200*l.* subscriptions, or 17*s.* per head; Dudley, 85 students, 167*l.* subscriptions, or 40*s.* per head; Hanley, 155 students, 154*l.* subscriptions, or 20*s.* per head. Considering the importance of the school of art to Nottingham, he calculated that the annual subscriptions, instead of being 150*l.*, ought to be 500*l.*, in proportion to the other towns he had quoted.

OPENING OF THE NEW WING, STOCKPORT INFIRMARY.

THE new wing recently added at the south end of the Stockport Infirmary, expressly for infectious and contagious diseases, has been opened.

The design and plans were prepared by Mr. Allen, of this town; and the contract for the work was let to Mr. W. H. Brown, also of this town. The first stone was laid by Mr. Sykes on the 23rd of June, 1870. The work was completed within the specified time, but other alterations and improvements being needed, the opening was deferred until the entire institution had been put into thorough working order.

The wards of the new wing are completely isolated from the old building, from which they are approached by a covered passage leading from the principal corridor. On the ground-floor, facing Wellington-road, are the day and sleeping rooms of the male convalescents, the latter providing accommodation for four beds. The rooms are large, airy, and cheerful; and contain all the fittings usually to be found in such wards. All the beds are of iron, fitted with a stand for medicine, &c., and over each is suspended a simple contrivance, by means of which weak patients may raise themselves in bed. On the same floor, at the corner of the building, are the female convalescent wards, fitted up with three beds. In the nurse's kitchen are a kitchen range, hoist, cupboards, well filled with crockery, shelves, sinkstone, with hot and cold water, and every convenience; and opposite is the nurse's bedroom. This apartment being situated in the centre of the group of rooms on the ground-floor, the nurse will at all times be within call.

At the back of the building, overlooking Francis-street, is the women's small-pox ward, 20 ft. by 14 ft., and containing four beds. Both this and the floor above are well supplied with baths, lavatories, &c. Two flights of steps lead to the upper story. Over the women's small-

pox ward, in a room of nearly the same dimensions, is the men's small-pox ward, in which are the same number of beds. Two windows on each side furnish ample light, and, when open, will give a thorough current of air. At the corner of the building, over the female convalescent wards, is the women's fever ward, containing eight beds, and measuring 26 ft. by 22 ft. It is lofty, and lighted by four windows. The men's fever-ward, three windows in length at the front of the building, and an equal number at the back, measures 24 ft. by 20 ft., and in it are eight beds. All the walls are plastered.

The old building has now a hoist, manufactured by Messrs. Wren & Hodgkinson, of Manchester, whereby patients with broken limbs or heavy weights of any kind can be raised or lowered. The erection of this and the porter's lodge, &c., were let under a second contract to Messrs. Meadows, of Heaton Norris.

THE FALL OF A NEW FACTORY NEAR STOCKPORT.

THE inquest on the bricklayer, killed by the fall of the Heavily Mill at Stockport, has been held before Mr. Johnson, coroner. The evidence was voluminous and somewhat technical. Several solicitors attended to protect the various interests involved. The questions raised were whether the accident had originated with the premature removal of the centres from one of the arches, or the imperfect position of the skewbacks, the feet of which acted upon the feet of the arches and let them down.

Mr. John Whitaker, the Stockport surveyor, who had been directed by the coroner to make a professional examination of the mill, was one of the witnesses called. He said the new mill had been erected on the old portion, the latter being two stories high, and built at the same time as the old mill. Upon this old part two additional stories have been built, making it four stories. The bricks used in the new erection are very fair in quality; they are seconds and chequers. The masonry is also good, and the brickwork is fairly set. The quality of the iron also seems fair. The strength and proportion of the principal beams appear to be right. The mill is 100 ft. 6 in. long. Taking the south side of the mill the width is 48 ft. 9 in.; there are three rows of pillars 10 ft. apart from centre to centre. The beams are 1 ft. 8 in. deep in the centre; from the bottom flange, 10 ft. by 24 ft., from the top flange, 5 ft. by 14 ft.; web, 14 in. thick. They were placed along the length of the building. The beams on the northerly side had a 24-ft. bearing, and the remainder about 18 ft. On the easterly side there are counter beams, placed transversely from the other beams, and going into the east gable wall. The beams to which these were attached were not stronger or of different pattern to the other beams. At the other end—the old gable—the beams were tied to skewbacks, placed longitudinally against the eastern gable of the old mill, and from the flanges of these skewbacks, arches were sprung. The skewback was 10 ft. in depth on right plate, except where the rods were; there they were 15 in. deep. The height was fully 12 in. thick, the face of the sole plate or flange was 4 in. wide, and under the plate 14 in. thick. There was no back flange to the skewbacks; but there are a few at the south end which are not disturbed. A space of 4 in., or half a brick, had been cut out of the old mill to receive the skewbacks; they had not been fastened or screwed to the old wall, and from 2 in. to 3 in. of space was left behind them ungrouted to the old wall. The tie-rods were placed at the top of the skewbacks, about 16 in. from the bottom flange. Four of them were in the long bay and three in each of the others. The rods were fastened, as usual, with cotter pins at the top of the skewbacks. In consequence of the sole-plate not sitting against the old wall, they were not, in his opinion, able to resist the pressure of the arch. They "canted," or "came forward," the top being held fast, whilst the bottom went into the cavity towards the old gable wall. The effect of that upon the arches would be to cause them to sink in the crown, thereby weakening the arch and rendering them unsafe. Three of the 14 ft. lengths would become deflected from this cause. The arches were necessarily taken out, and the centres put under again. There was a 14 ft. length taken out of the arch on the north side to prevent its falling at once; they had not keyed it; but the skewbacks were pushed back by lengthening the rods, before they commenced building up the sides. The adjoining beam, from his information, had not been stayed, while these operations of rebuilding were going on. It consequently broke laterally, pulling down the arch next to the east end, the other injuries following which are now apparent. These beams were calculated to bear a vertical pressure of 1½ tons, supposing the weight was equally distributed over it; but laterally it would not sustain six tons' pressure. There would be about six tons from both pressures upon this beam when it broke. It would be likely to break with a lateral pressure of six tons, supposing it was not stayed at the gable end. Had it been stayed, it would have been converted into a vertical pressure. I think the tie-rods were too high or canted, and consequently gave but little strength. The lower they were placed, the more strength they would give to the building. It was an element of weakness to fasten them at the top. There was no reason why counter-beams should not have been let into the wall. Had there been no space behind these skewbacks, there would have been less liability to an accident of this kind. The fastening of the skewbacks into the old wall in the lower stories makes them more firm. There is no reason why that plan should not have been adopted in the new building. The evidence was volunteered that such was the case in the old mill, and that the skewbacks had back flanges. The cause of the accident is the injudicious way in which the skewbacks had been formed and placed, being too high, and not being placed close up to the wall. The 14 ft. of brickwork (11 cwt.) which had been taken from other arches, and placed upon this fallen arch, would be hardly 3½ tons, taking each brick with mortar at 7 lb., and the weight being equally distributed, the lateral strain would be only about 1 ton; and the vertical pressure about half that. The gable end of the wall has gone out—but not 6 in. The cause had been a thrust or lateral strain from the old

gable towards the east end, affecting, in fact, the whole fabric.

On the part of Mr. Barlow, the contractor, another witness named Ralph Littler, who was employed as a brick-setter at the new mill, at the time of the accident, was called. He said, while standing on the new wall on the top story, he heard a crack, and saw a beam breaking about a yard from the end near the pillar. Saw the place in the wall cut to receive the skewbacks before the accident, and saw the skewbacks after they had been fitted in. The height from the floor would be about 14 in. from the back of the old wall.

At the conclusion of the evidence, the Coroner proceeded to ask the jury, and to review the evidence given. In doing so he said they would now dismiss from their minds any imputation of criminal neglect to any person. It was quite clear by the evidence that the centres of the arches having been removed, they had given away while the skewbacks were being replaced. The question which suggested itself was whether, in the contradictory evidence, there was a vacuum behind the skewbacks instead of being close up to the back wall, according to the opinion of Mr. Whitaker. It would appear that that did not touch the wall by 24 in.; the consequence of this would be that they had been forced inwards, caving outwards at the top or head, thus, through the tie-rods depressing and deflecting the arches, which were then unsupported or without stays, and had such a lateral strain upon the adjoining beam that it broke, and the melancholy results followed, including the death of this unfortunate man. They had heard the opinion of Mr. Whitaker, a scientific witness, that the fastening of the tie-rods to the top of the skewbacks was rather an element of weakness, and of no great strength. He thought such a conclusion was obvious to all. No doubt to some extent, that lateral pressure, to which he had alluded, was accelerated by the vertical weight of the loose materials placed on the top of the arch which had fallen, and which no doubt disturbed to some extent the equilibrium of that part of the structure, being at the time insufficiently stayed. Had transverse beams to the wall been adopted, this accident could not have happened. It was certainly to be regretted that works of this magnitude and importance to human life should have been left to parties either incompetent or incapable to look after their safe execution; for, if it could not be disguised that had this mill been completed upon the principle it was intended to be, and filled with people to work the machinery, the first vibration motion might have been a fatal one, and the bringing the whole fabric to the ground, and perhaps destroying the lives of all who might be in it. In the present case there does not appear to have been anybody on the ground to look after the work, and it is not probable that, or, in all human probability this inquiry would not have been necessary. He would not discuss the advisability or otherwise of these skewbacks, but his own view of the subject was that they were a fatal error. It was difficult to foresee that this accident might give rise to some litigation. With that the jury had nothing to do—they did not even offer any opinion upon that point. The only real question for their consideration was, whether the cause of the death of John McDermott; and whether the beam did or did not break in consequence of the in sufficient staying of the arch, while being taken down and rebuilt, for the same admitted the cause of the accidental falling of the mill.

The jury, acquitting all parties of criminal neglect, confined themselves to the simple verdict that the death of the deceased had been caused by the accidental breaking of one of the iron beams, which had been insufficiently stayed, and the adjoining wall of the arch was being rebuilt, and which fell owing to some lateral pressure and strain.

A BACKWARD STEP IN BIRMINGHAM.

THE Corporation of Birmingham has published notices for a new sanitary Bill for that town, which, if passed into an Act with clauses as suggested, will be reversing sanitary progress as established in most of our large towns. Sewers, in old days, were only used for surface waters and overflows from cesspools; fines were levied if these sewers were appropriated for water-closets. In London about 700,000 water-closets now empty their contents into the drains and sewers. At Leamington, a not distant neighbour of Birmingham, some 10,000 water-closets are drained by the sewers; and so of most sewered towns. Sewers and drains are, in fact, made for the special purpose of draining houses and all other premises within their area. This is the true work and duty of town sewers and house drains; and as the cost of main sewers is defrayed out of the rates, all rated persons have an undoubted right to the fullest use of the sewers they have been made liable for: householders and manufacturers both have vested interests in the sewers they have paid for, and if they tamely suffer the Sewers Committee of the Town Council to enact the following clauses they will deserve to suffer the penalty:—

"To prohibit persons from making new communications with the sewers and drains of the Corporation without their consent, and to empower the Corporation to demand and take rates or payments in consideration of such consent, and to make other provision in relation thereto."

To prohibit persons within the borough from discharging or allowing to pass into the sewers or drains of the Corporation any sewage, filth, filthy water, refuse, or other slaughter-houses, cattle markets, animal, cow-houses, and stables, or any refuse from the works of German-silver manufacturers, galvanizers, wire-drawers, and manufacturers of tinware, and other works, and to empower the Corporation to demand and take rates or payments in consideration of such consent, and to make other provision in relation thereto."

To authorise the Corporation to levy a special rate or charge upon the owners and occupiers, or owners or occupiers, or any domestic, factory, or workshop, or any other works, lands, and hereditaments, within the borough, having a water-closet or privy, or water-closet or privy in communication with the sewers or drains of the Corpora-

tion, and to make provision for the recovery and application of such rate or charge."

It must not be assumed that the members of the corporation of Birmingham are unanimous as to the advisability of such clauses being enacted. The fact is, the old working committee was in favour of the most complete and perfect system of sewerage, drainage, and sewage irrigation; but a new talking committee has talked the working committee out, and themselves in. This committee has compiled an able report, but has managed to read it backwards. It has collected facts, and adopts a theory directly the contrary. Well, the book is a fact creditable to its industry. The deductions from it are fallacies so transparent that we should have thought a child might have more readily seen the true conclusions. The committee is, however, an example of the old distich, that

"He that complies against his will
Is of his own opinion still."

We are sorry for Birmingham, and yet the blundering attempts of this committee which has caused these notices to be given, are so monstrous that we feel satisfied the ratepayers will veto them sooner or later.

ART STUDY IN AMERICA.

THE Americans are taking up the whole art question, both as to education and galleries, with their usual energy. They seem to understand the question of organisation in educational matters perfectly, and it is surprising how, at very little cost, a subject of study can be introduced into every class-room in a city, and the necessary instruction given to every teacher for its adoption. In the city of Boston, with a population of 250,000, when once the law is passed to include drawing as a subject to be taught to every child who goes to school, it forthwith arranges that the teachers, about 1,000 in number, all adults, shall at once be taught the subject themselves. And at present, without any difficulty or confusion, or sacrifice of the children's school-time, all the teachers are receiving lessons in drawing at the normal school, by the public instructors under the direction of Mr. Walter Smith. The verbal and practical lessons thus conveyed, at once find their way into every class-room in the city. They only now need text-books of the highest class to have drawing taught as systematically as all the other subjects of education. Then there will be a competency for the schools of art, and the evening drawing classes, prepared to go to them by choice, and with all the rough work of beginning got over. Mr. Walter Smith, as State Director of Art Education, has to co-operate in carrying out the law that in every city of above 10,000 inhabitants, free evening drawing-classes shall be established. This it is hoped will be done during the coming winter. They want good examples and skilled teachers: the opportunity and desire appear to exist.

THE NEW KEIGHLEY WATERWORKS.

THE new and enlarged water supply system has made some progress in construction. The reservoirs are two in number. There is one at Ponden, and another at the Water Sheddies. The one at Ponden is called the "Compensation Reservoir," and is constructed for the purpose of supplying water to the manufacturers in compensation for the streams which feed their mills, but which will soon be taken from them and diverted to and concentrated in the reservoir at Water Sheddies, on the Lancashire hills. This second reservoir will be devoted entirely as a store for the supply of the inhabitants of Keighley with water for domestic purposes.

The Ponden reservoir is situated in a gully or ravine at the junction of two valleys. The reservoir is supplied by nature with embankments on all sides but one. The trench at Ponden is upwards of 200 yards in length, and 16 ft. wide, and a depth has been reached at one point of 63 ft., the average depth along the whole trench being 59 ft. At present there are fifty men employed upon it, and since April two engines have been kept going night and day, pumping the water from the bottom. The total number of men engaged on the work is 150. A number of men are engaged in piercing a hill-side in search of clay, which has been found. When the foundation is obtained along the trench, then the work of puddling will begin. The entire area of ground which the reservoir

will occupy will be about forty-eight acres. It will be about 65 ft. deep at the deepest part, with an average depth of 50 ft., and will accommodate 210,000,000 gallons of water. To provide for floods and the consequent excess of water, a bye-wash will be constructed, and will form part of the mason work of the embankment. It will be 220 yards long, and 120 yards of it have already been constructed. The shoulder of the hill on the east side has been scooped for a considerable distance down the proposed route of the bye-wash, but in consequence of the sandy nature of the soil and the repeated landslips which have occurred, it has been found necessary to construct stone props. By this bye-wash, the surplus water will be carried down into the river Worth.

The Water Sheddles reservoir, which is rather more than a mile distant from Ponden, was commenced about the middle of August. It lies in a valley resembling in several features that of Ponden, and is fed on all sides by rivulets formed by a combination of springs. An embankment of somewhat less dimensions than the one at Ponden will be required, and when the puddling is commenced at Ponden, the sinking of the trench here will be at once begun. About thirty men are engaged upon it in clearing a bye-wash and in making preliminary arrangements. When the puddling in the Ponden reservoir is advanced a stage, the number of men at the Sheddles will be considerably increased. This reservoir—the "domestic" one—is estimated to hold 180,000,000 gallons of water, which will be conveyed as a feeder to the existing reservoirs by seven miles of pipes, three miles and a half of which will be 15-in. and three miles and a half 12-in. pipes.

The cost of the works is estimated at about £6,000.—£25,000, for the Ponden works, and £1,000, for those at the Water Sheddles. The Messrs. Bailey are the contractors.

THE SEWAGE QUESTION.

King's Norton.—At a recent meeting of the Board of Guardians of King's Norton, Mr. Holmes, architect of the new workhouse, reported that in accordance with a request of the Board he had, in company with Mr. Wilmoth, surveyor to the Balsall-leath Board of Health, visited Stoke workhouse at Newcastle, Staffordshire, to inspect the process of dealing with the sewage of the workhouse, carried on by the Peat Engineering and Sewage Filtering Company, and of which we have already spoken. The raw sewage was dirty, dark-coloured, and of an offensive odour. After passing through different tanks, which Mr. Holmes described, the liquid matter was discharged quite clear. The apparent effect of the process was to remove all suspended matter and offensive odour. A sample of the water had been analysed by Mr. Wrightson, who stated that the sewage was not completely defecated, though it was to a considerable extent, and as much under the circumstances as he could have expected. The defecation might, no doubt, be rendered more complete by an additional filtering tank; but he considered that in its present state, though it was undesirable that it should find its way into wells, there could be no objection to its influx into any stream or river, as it would under no circumstances be unpleasant or inimical to animal life in a running river. He had examined a number of shallow well-waters in Birmingham during the last twenty years, and had often found them to exhibit more distinct traces of sewage contamination than the sample taken at Stoke workhouse. In case the Board should be inclined to give the system a trial he should have to submit the plans for the tanks to Mr. Wear's company, and to confer further with them as to obtaining the patent right, for which a nominal charge per annum would be made. The principal profit of the company appeared to be derived from the sale of peat charcoal, and, in the case of Stoke workhouse, the conversion of the solid sewage matter into manure. They mixed it with soot and other ingredients, and sold it for 4s. per ton. In its prepared state it was sold in bags, and when handled no offensive smell was perceived. In its coarse state, before it had undergone Mr. Wear's process, the deodorised solid matter was valued at 80s. per ton, and as the guardians would have some eight acres of land under cultivation, the manure might with advantage be partially applied to the ground. The cost of charcoal delivered in Birmingham, Mr. Wear said, would be about 35s. per ton. The nominal royalty for the use of the patent

would be 10l. per annum, and would include three journeys of inspection annually. The cost of the tank and apparatus would involve an additional outlay of several hundred pounds; but Mr. Holmes could not at the present time tell the precise amount. Mr. Holmes's report was ordered to be printed and circulated among the members, the consideration of it being deferred.

Experiments by disinterested persons ought to be made with peat itself, uncharred. If peat, in the lapse of time, become coal, the process must be analogous to slow charring, and it may be a question whether uncharred peat be not already changed enough, except on the living surface, to form a cheap and sufficient substitute for all the purposes supposed to be effected by peat charcoal on sewage. We recollect being spoken to, about a quarter of a century ago, by a Mr. Scott, from Fifeshire, in Scotland, as to the defecation of the metropolitan sewage by compressed peat, which he urged was capable of absorbing and utilising the valuable ingredients of sewage. If peat could be so used instead of peat charcoal, it would be an economical advantage of great importance where such processes are regarded as the best way to dispose of sewage.

COMPETITION PLANS FOR GATESHEAD SCHOOL BUILDINGS.

The School Designs Committee reported to the Board that they had made the following selection:—

"Group No. 1.—Plan No. 14, Thomas Oliver, Newcastle; No. 19, John Sidebottom, Southport; Nos. 21 to 24, G. H. Thomas, Liverpool; Nos. 25 and 26, John Johnstone, Newcastle; No. 39 to 44, Ross & Lamb, Darlington. Group No. 2.—Plan No. 4, Thomas Oliver, Nos. 55 and 56, John Johnstone; No. 72, Perkins & Sons, Leeds; No. 86, E. A. Heffer, Liverpool; Nos. 86 to 99, Parsons & Willard, Newcastle. Group No. 3.—Plans 128 and 131, T. T. Smith, London; No. 149, Thomas Oliver; Nos. 131 to 133, Ross & Lamb; No. 134, E. A. Heffer; Nos. 137 to 139, John Johnstone; Nos. 143 and 144, Matthew Thompson, Newcastle; Nos. 145 to 147, E. Gough & Hadden, London. Group No. 4.—Plans Nos. 149 and 150, John Johnstone; No. 155, Thomas Oliver; Nos. 160 to 171, T. T. Smith. Group No. 5.—Plans Nos. 25 and 26, John Johnstone; No. 199, Thomas Oliver; No. 206, Hennan, Alexander, & Hennan, Stockton; No. 201, Perkins & Sons; Nos. 204 and 205, Ross & Lamb; Nos. 220 to 223, Robert Fairbairn. Under the terms of competition the School Board are not bound to accept or adopt any design, but if a design for any group should be adopted by the Board it is intended to employ the architect of the adopted design as architect for that particular group."

From these they had afterwards selected for adoption:—

"Group No. 1, plan No. 14, Thomas Oliver; group No. 2, plan No. 49, Thomas Oliver; group No. 3, plans Nos. 131 to 133, Ross & Lamb; group No. 4, plan No. 155, Thomas Oliver; and group No. 5, plan No. 199, Thomas Oliver."

The recommendation was unanimously adopted.

NEW MARKETS AT NEWTON ABBOT, DEVON.

These markets, which are now approaching completion, from the designs of Mr. John Chadleigh, jun., of the same town, will be opened in a few weeks.

They are built in two blocks, with elevations in the Italian style, separated by a road 30 ft. wide. The smaller block, which consists of a hall, 105 ft. by 55 ft., intended solely as a vegetable market, with a covered shed on one side, 100 ft. by 15 ft., for the unloading of carts, has for some months past given temporary accommodation to the butchers' and panner market, pending the erection of the larger building, which stands on the site of the old markets. Adjoining the vegetable-market on the east side is the fish-market, necessarily of a triangular shape, covered with a flat roof having in it a lantern-light.

The western entrance to the larger building is through a clock-turret, 57 ft. high, having rooms for the toll collector, &c., on each side, to the corn exchange, 60 ft. by 40 ft., 25 ft. high to springing of roof, which is open, having hammer-beam principals with circular laminated ribs, and ornamental iron spandrels. All the roofs are boarded on the purlins, and have a space for air between the boarding and slates, open at the eaves and ventilated at the ridge. The corn exchange is ventilated by means of its windows and two dormer ventilators on either side of the roof. It is intended to be used also as an assembly-room, and has retiring-rooms on each side. Moulded cornices, architraves, &c., add to the internal appearance of the room.

The main hall has seven entrances, is 161 ft.

in extreme length, and 77 ft. in extreme width, divided by iron columns into nave and aisles, the former 43 ft. to the ridge. The roofs have wooden principals and purlins, and iron ties and brackets. This hall will be used as the butchers', panner, and general markets. There is an annex on the northern side for the carcass market.

A tower at the south-east corner of the building, 65 ft. high, designed to contain a supply of water for the use of the market, refreshment-rooms, &c., is omitted from lack of funds, and gives this corner of the building rather an unfinished look on the outside. The walls are built of the very good local limestone, with Bath stone sparingly introduced in a few dressings and cornices.

The buildings have been erected by the local Board, under the superintendence of their surveyor, Mr. J. S. Stevens, at a cost of about 6,000l.; Messrs. Harvey & Son, of Torquay, being the contractors.

The design of Mr. Chadleigh was selected in open competition.

REPORT TO BOARD OF WORKS FOR WESTMINSTER DISTRICT.

The fifteenth annual report of the proceedings of this Board has been printed. The district Board and their surveyor, Mr. Arntz, deserve some praise for having undertaken and carried out with success a somewhat hazardous but very important work during the late epidemic of smallpox. This was the establishment of an hospital, besides the pauper one at St. Ermin's-hill, for all persons, such as mechanics and others engaged in the building and other trades, who were well able to contribute to their own restoration to health, but wanted proper accommodation for isolation and attendance during the progress of the disease. Mr. Holt, the medical officer of health, who also interested himself in the project, thus speaks of it in his report:—

"Those premises that would have suited, the owners declined to let, and those they might have had were too confined for the purpose; they were, therefore, compelled to fall back upon their own houses in Milbank-street, which, with the active assistance of Mr. Arntz, your surveyor, were speedily converted so as to be available for the emergency; and in this temporary building there were admitted forty-six patients, thirty-nine of whom recovered, and seven died. Every precaution was taken to prevent the spread of the disease, by not only disinfecting the bedding, clothing, &c., of those who were admitted as in-patients, but also in those who were attacked in their own houses."

The Board alludes, with thanks, to offers of a site for a separate hospital of this order made by Sir William Tite, as chairman of the Westminster Improvements Commission, on liberal terms; by Archbishop Manning, without rent or condition of any kind; and by her Majesty's First Commissioner of Works, also without conditions. As the case was urgent, however, the Board at once tenanted houses of their own into an hospital.

GAS EXPLOSION AT LEEDS GAS-WORKS.

An alarming and fatal explosion at the Leeds gas-works draws attention once more to the dangers, real and imaginary, connected with the manufacture and use of gas. It is stated that the disaster at Leeds has caused considerable excitement, as similar gas-works exist in two other districts of the town, both of which are densely populated. But gas, as we have often shown, is not dangerous until it escapes. So long as it remains in the receptacles and pipes prepared for its reception, it is safe enough from explosion. But when it escapes and mixes with the atmosphere, we get a mixture which is not merely combustible, but more or less explosive. Its principal effort is to ascend, and if there be no roof or other obstruction to hinder it, the stream flows away upward, losing itself, as it were, in the atmosphere, and thereby disposing of the danger. A gasholder standing in the open air is scarcely so perilous as an ordinary stack of timber; but if a body of gas escape from a point situated within a building the case is widely different. At Leeds the escape occurred in one of the purifying houses, and there accumulated until it flowed out at one end through an archway, and became ignited by contact with the furnaces of the boiler-house. The gas being mixed with air at once exploded with a terrific noise, killing one man on the spot and injuring several others. The roof of the building was completely destroyed, and other damage was done, while the whole neighbourhood was panic-

stricken by the uproar and the concussion. A rent 10 ft. long was made in one of the gas-holders, but was temporarily stopped with clay, which prevented ignition, although the town engines had to do battle with a fire which seized the purifying-houses, and which raged for some time.

HOW TO HEAT A SMALL CONSERVATORY FREE OF COST.

A few years ago a friend of mine bought a house, one of a row; it contained two sitting-rooms on the ground floor,—one to the front, the other to the back. In summer the back room was unfit for habitation, owing to the heat caused by a close range in the wall which separated it from the kitchen of the adjoining house.

This suggested to me an idea which has been carried out successfully. In planning a new villa, I placed the kitchen fireplace in the west gable; the space behind the range was left open, and against this was built a conservatory, 14 ft. by 8 ft. The open space behind the range is furnished with a wooden door, over which, in the thickness of the wall, is formed an air-flue, having a damper. By shutting the door and opening the damper, the heat from the range is carried off, and vice versa.

This contrivance may not suit those who wish to maintain a high state of temperature in the conservatory during the winter, but a heat sufficient to protect plants from frost and to cause some varieties to flower during that season, can be maintained free of cost. S.

THE ANTIQUARIAN RESEARCHES IN ARGYLSHIRE.

THE excavations lately carried on at Ach-na-Gonul, near Inverary, at the request of the Marquis of Lorne, have led to some curious and interesting results. A huge cairn was opened to the extent of 70 ft., when several chambers, formed of megalithic blocks of granitic rock, were cleared and closely inspected for incisions. One incised block of granite was identified as a part of one of the chambers; another of schistose rock (actynolite) was found in the immediate neighbourhood. The incisions seem to identify the structure with those near Lochgilphead, which are surrounded with incised stones, many of which have been discovered by the Rev. Mr. Mapleton, M.A. (Oxon), of Dunrobin Castle, Argyshire, and are similar also to those of Northumberland and Ilkley.

The principal chamber was covered by an immense block, apparently worked in a pent-house fashion, for discharging the rain from the structure; and in it were discovered distinct evidences of cremation, charcoal, burned bones, fragments of incinerary pottery, and a vitrified mass of mica-schist and trap rock similar to that of the Vitrified Forts of Scotland, giving evidence of intense heat. Here also was discovered a block of white quartz of a conical form, like others discovered by Mr. Phéné, the first of them at Letcombe Castle in June last. It surrounded a kist or reliquary containing human bones, pottery, weapons, &c. Mr. Layard, we may here note, found small cones in thousands at Warka (we think it was) in connexion with the slipper-shaped coffins of that ancient eastern "city of the dead." The cone found at Ach-na-Gonul is now at Inverary Castle.

Continuing the excavations southward from the covered chamber, a long passage or gallery was opened midway, in which was another chamber 9 ft. long, to the east of which was a chamber 5 ft. square, approached by a narrow opening from the gallery. The whole length of the gallery and chambers (exclusive of the last), to the distance of 70 ft., contained remains of cremative operations, but the eastern chamber was entirely free from any such appearance. Mr. Phéné thinks that as it is well known that ceremonies of a dark and pagan ritual were conducted in secret constructions of this description, both in connexion with the rights of sepulture, and also as symbolical of funeral and other ceremonial, even when there was no actual burial, the indications given by the existence of the eastern chamber and the symbolical altar point strongly to this structure having been one of those places ["sacred halls"] connected with the mysteries of Paganism. It is said to be remarkable that the saurian-shaped mound lately described, is separated from the structure we are now describing by a district abounding with legends of mythical monsters of so classic a

kind that they seem to rival the Greek story of the garden of the Hesperides,—Loch Awe and Loch Aivich each claiming its peculiar monster.

Mr. Phéné's researches, then, appear to be so far corroborative of the idea of our correspondent, Mr. J. E. Dove, that such structures had something to do with those magical rites which constituted the universal religion in pre-Jewish and pre-Christian times.

BAUXIT AND FIRE-CLAY.

ACCORDING to Richter's researches, the power of sustaining intense heat is greatly dependent on the amount of alumina contained in fire-bricks compared with their contents of other ingredients. A substance has been recently discovered in Krain, which promises to become a very useful one in the manufacture of these bricks. It is a species of what the Germans call "bauxit," and Dr. H. Schwarz,* who has experimented on the subject, says that two parts of calcined Wochein (for this species of bauxit is found at Wochein), pulverised and mixed with one or two parts of fresh clay, gave the best results. It is stated that large crucibles, with their walls made of this substance, were exposed to the greatest heat of a regenerative glass furnace for several days, and that they remained unchanged, neither melting nor softening taking place.

If this news should prove correct, the wochein would be valuable on account of its very large percentage of alumina, which would enable the manufacturer of fire-bricks to increase the contents of that ingredient in his clay almost ad libitum; for while the ordinary fire-clay contains hardly 30 per cent. on an average, this wochein contains 50 per cent. of alumina.

On comparing the exact figures, this will become still more apparent:—

Chinese Stourbridge Pipe-Clay. Wochein.			
Kailine. Fire-clay.			
Alumina	33.7	23.1	50.82
Silica	50.5	64.1	53.7
Water	11.2	10.0	12.1
Ferric oxide	1.8	1.8	1.4
Lime	—	—	0.4
Magnesia	0.8	0.9	—
Potash, soda	1.9	—	—

The 1.60 per cent. of oxide of iron in the wochein might lead some to suppose that its influence might be detrimental, in so far as it might set as a flux; and so it does, but its action is never very potent unless accompanied by a large percentage of silica, which is not the case here.

The wochein, then, may be expected to be of some use in the manufacture of bricks, tiles, &c., where indifference to the influence of heat is, where indifference to the influence of heat is, where indifference to the influence of heat is.

NEW HALL AND OFFICES OF THE POPLAR DISTRICT BOARD OF WORKS.

THIS new building, which has been lately opened, has been erected to provide accommodation for the meetings of the fifty members of the Board elected from the parishes of Poplar, Bromley, and Bow, and for the various executive offices of the Board. It is situated in High-street, Poplar, at the corner of Woodstock-road; a position which, by reason of the narrowness of those thoroughfares, is hardly worthy of the structure.

The octagonal corner tower serves the purpose of an entrance-hall leading to the corridors and principal staircase, and connects harmoniously the more lofty portion of the building, containing the large hall, with the smaller frontage, containing smaller and consequently less lofty rooms. The upper portion of this tower is used as a waiting-room for contractors and others having business with the Board. On the first floor of the right-hand wing is the Board-room, 63 ft. long, 37 ft. wide, and 24 ft. high, with a gallery for 100 persons at one end, having a separate entrance and staircase. This room has been made somewhat in excess of the actual requirements of the Board so as to be available for public meetings of the ratepayers. The other parts of the structure contain offices for the clerk, surveyor, clerks of works, medical officers, and sanitary inspectors. There are also a gas-testing room and apartments for the housekeeper.

The external materials are malm brick and Portland stone, with polished granite shafts to the entrance-door and Board-room windows.

* "Polytechnic Journal," Band. 188, p. 156.

The dome is covered with Vieille Montagne malleable zinc, fixed in the French manner. The cost, exclusive of site, is 7,500*l.* Messrs. Hills & Fletcher and Messrs. Arthur & C. Harston are the joint architects.

THE NEW YORK CITY POST-OFFICE.

THE New York City Post-office, and United States Courts, from the designs of the supervising architect of the Treasury, Mr. A. B. Mullett, occupy the triangular space of ground purchased by the United States Government from the City of New York, forming the southern extremity of the Old Park, at the intersection of the Broadway and Park-row.

The building has a frontage of nearly 280 ft. on the Park, and 222 ft. on the Broadway and Park-row; it is withdrawn from the point of the triangle towards the Battery far enough to give room for a façade of 130 ft., from the centre of which is thrown forward a massive pavilion with a projecting portico, which makes the extreme length of the building on the Broadway and Park-row 290 ft. The view is south-west, showing the pavilion and the façade on Broadway, which is the same as on Park-row. The main cornice is 70 ft. above the side walk; the corner pavilions are 102 ft.; the centre pavilions on the Broadway and Park-row are 109 ft.; the domed roof of the south-west front is 123 ft.; and the whole height to the foot of the flagstaff on the cupola, 165 ft.; the longest façade is that on the Park with a pavilion 87 ft. broad crowned by a high octagonal dome, which is shown in our illustration.

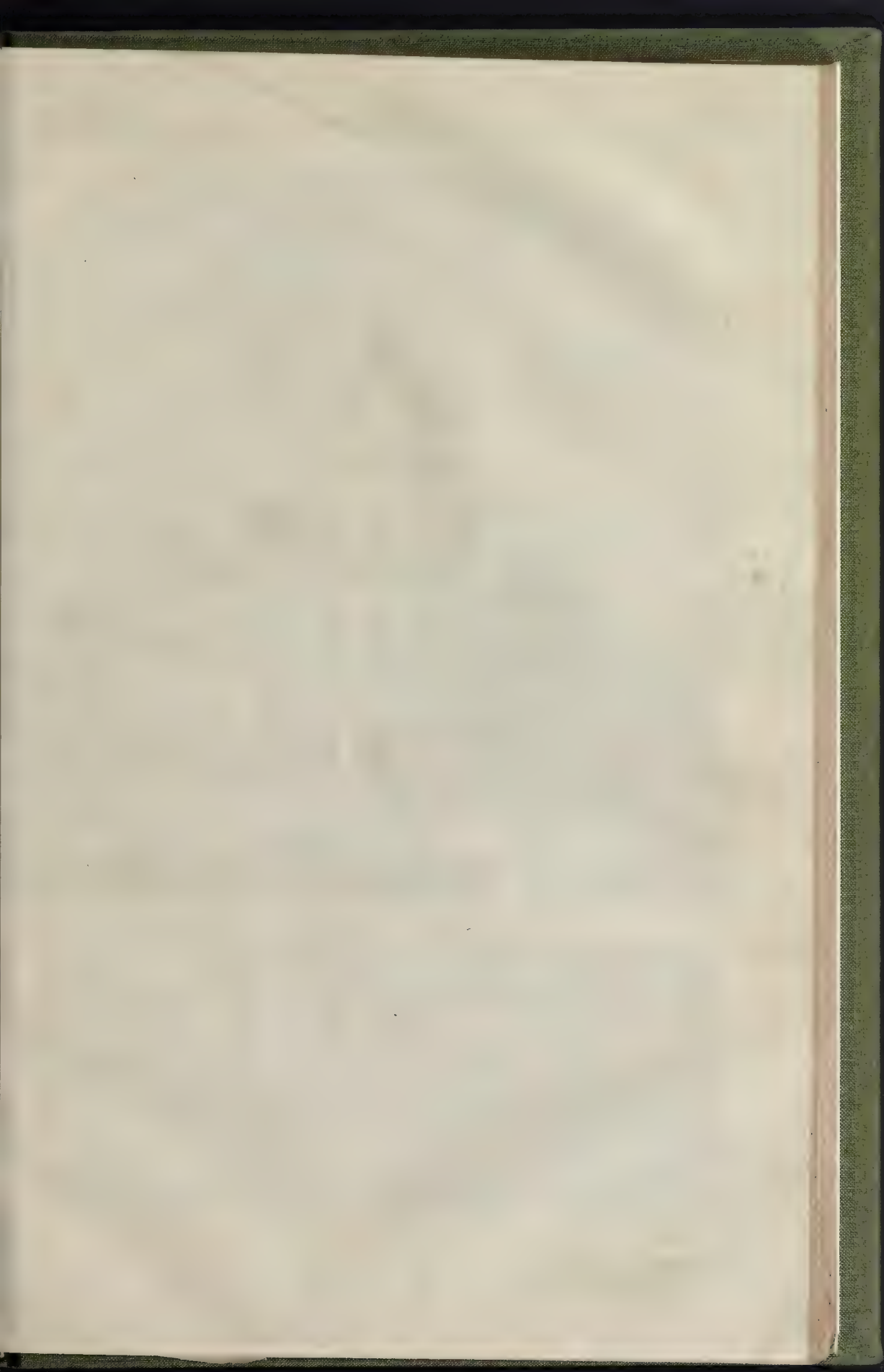
The soil being sandy, it was necessary in laying the foundations to put in concrete beds of 4 ft. in thickness, and massive piers of granite 30 ft. below the surface. The material of the exterior is the Dix Island white marble, the same as used in the Treasury buildings, Washington; the partitions will be brick, the floors of brick, and iron beams throughout, the roof and staircases of iron. A roadway, 25 ft. wide, will be reserved on the north of the building for the use of the mail wagons, which will receive and deliver the mails under an ornamental glazed projecting roof, and the roadway will have gates at the ends enclosing a triangular court about the main story, giving light and air to the inner rooms.

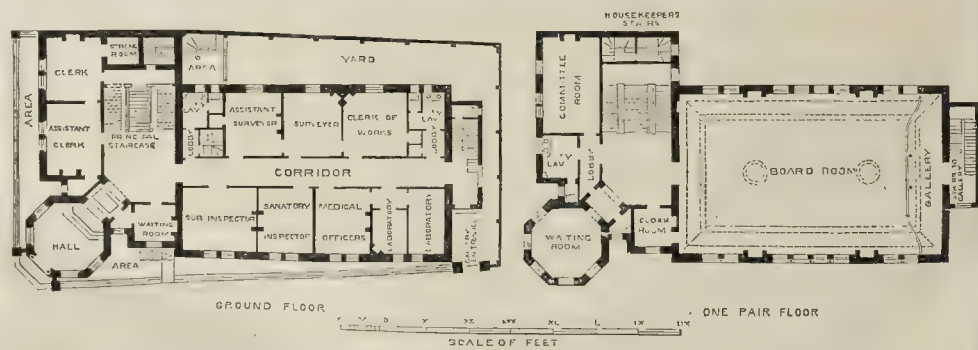
The whole of the ground floor will be devoted to the Post-office. The public corridor, 15 ft. wide, is on the Broadway and Park-row; while the Park is reserved for the mails. The principal entrance is south-east, under the portico, and in the central pavilion in the Broadway and Park-row, having fifteen points of access to the corridor. The whole of the interior will be roofed with glass and iron; at the top of the first story it is thrown into one large room; the partitions and walls of the courtyard being carried by iron columns, which serve for ventilating flues, and connect with large shafts built at each angle of the court, containing the smoke flues from the engine and boilers. Over the public corridor, which occupies only half the height of the principal story, is a mezzanine or half story; this opens to the post-office room, guarded by a balustrade, forming a gallery to it 30 ft. high. The lofty windows of the first story admit a flood of light and air in hot weather to the interior of the great room through the gallery.

Beneath are the basement and sub-basement, carried out under the side walks, and lighted by illuminated tiles in the pavement; the basement will be devoted to the making up of the mails and the heavy work of the office; the sub-basement will be used for engine, boilers, storage of coals, and other bulky articles.

In the second and third stories the whole Park front will be for the United States Courts and their dependencies. Three large court-rooms are provided, two of which continue up two stories; and around are the various offices for the judges, juries, clerks, attorneys, and the records of the courts. These rooms are reached by two large elliptical staircases in the pavilion of the front they occupy. The principal staircase will be the south-west front, which also gives access to the building. The interior communication is provided for by the corridors making the circuit of the building; in the upper stories with staircases at convenient points, with elevators from story to story; while the ventilators have been carefully planned with appliances of upward shafts opening above the roof.

The whole, when completed, is estimated to cost about 1,000,000*l.* sterling.





HALL AND OFFICES OF THE POPLAR BOARD OF WORKS.
MESSRS. HILLS & FLETCHER, AND MESSRS. A. & C. HARSTON, JOINT ARCHITECTS.



NEW YORK CITY POST-OFFICE, U.S.—MR. A. B. MULLETT, ARCHITECT.

BRADFORD GRAMMAR SCHOOL
COMPETITION.

OUT of the plans for the proposed new Grammar-school, furnished by the nine architects who had been invited to compete for the premiums, the governors have agreed to accept the plans of Messrs. Andrews & Pepper, provided all the conditions which they imposed can be carried out. The style of architecture of the design of Messrs. Andrews & Pepper is Perpendicular Gothic. The second premium of 25*l.* was awarded to Mr. George Ogden, architect, Exchange-passages; and the plans which took the third, of 15*l.*, were by Messrs. Huxley. Amongst the other architects who competed were Messrs. Lockwood & Mawson, Messrs. Milnes & France, and Mr. S. Jackson.

THE METROPOLITAN SEWERS OF
DEPOSIT.

It is to be hoped that action will follow my suggestion in the *Builder* for improving the metropolitan sewers. From my experiments and long experience as a sewer-engineer, I am certain that my proposal is really the right one to be adopted. The work, however, should not be done piecemeal, but upon a well-organised scheme. The plan would supersede flushing, because it would prevent deposit; and it carried out in all the sewers of deposit in the metropolis, an ultimate saving would be effected of 20,000*l.* per annum. Twenty-four years ago I pointed out to the authorities that all sewers of deposit could be made self-cleansing by simply putting smooth narrow channels along their bottoms at adjusted levels, and leading the drains into these channels. But as flushing was then considered the only remedy for the evil, my proposal was pooh-poohed and shelved. Since that time more than 500,000*l.* have been spent in flushing these sewers, and they are in no better condition now than they were then, and will be in no better condition in the year 1900 than they are now, after another half-million shall have been similarly expended on them. This half-million, if laid out as proposed, would make all of them self-cleansing, and the work could be done in three or four years. Now the question is, "Will the Local Boards and Vestries continue the never-ending and perpetually expensive process of flushing, or will they adopt a plan which would not only make their sewers of deposit self-cleansing, but improve the public health, and save the ratepayers' money?"

Recently, about one mile of the metropolitan sewers of deposit has been made self-cleansing. The sewers, where the experiment has been carried out, varied from 2 ft. 6 in. to 3 ft. 6 in. in width, and from 3 ft. 6 in. to 4 ft. 6 in. in height. The bottoms were flat, the sides vertical, and the crowns semicircular. There were shafts of access, called "manholes," about 150 ft. apart, where were covered under the paving with granite or Yorkshire stone kerbing. At parts the fall was good, at others there was no fall at all, and at other places the fall was the wrong way. It may be inferred that while only rain and waste waters were admitted into these sewers the deposit, which consisted chiefly of surface *débris*, was not particularly offensive; but when night-soil was allowed to enter them, the slope and refuse waters discharged with it spread over the wide flat bottoms, and became so weak as to be incapable of removing it. Hence its deposited and other noxious gases, escaping through the gullies, sinks, and closets, poisoned the stratum of air breathed by the people. Until about twenty years ago the deposit was removed by hoisting it through the manholes to the surface, and carting it away, but since that time it has been washed away by flushing. Now, however, the ordinary drainage from the houses, by running in the new narrow channels, sweeps the sewage matters before it, and keeps the channels perfectly clear. Scores of miles of sewers of the above description, which were put down during the reigns of Charles II., James II., William and Mary, Anne, and George I. and II., are still in existence. Some of these are cleansed by flushing, and some in the old way by hand-labour and cartage. Now, I have no hesitation in saying,—indeed, I am certain,—that if the bottoms of these sewers were to be similarly altered, they also would be self-cleansing. It has been lately shown in the *Builder* how the sewers of deposit, of the old Westminster shape, could be made self-cleansing, and the same could be done with the sewers in the Finsbury and

Tower Hamlets districts. But it is in the Surrey and Kent districts that the sewers are in the worst condition, especially in Walworth, Newington, Camberwell, and Bermondsey. If cholera should unfortunately break out,—well, it is to be hoped that it will not make its appearance. The alteration of the sewer bottoms as I have proposed would be equivalent to increasing the present water supply three or four fold; that is, to pouring three or four times the present quantity of water into the existing flat-bottomed sewers.

J. P.

THE IMPROVEMENT OF LEEDS.

I AM delighted to see you have been hammering and clinching nails I have often struck at Leeds. If I had been there it would have been a rare treat to me to hear the address you gave, and see the effect. You might, remembering the abuse the *Builder* got years ago for writing on the Leeds sanitary matters, and the bullying all the sanitary reformers have got since in the town, have exclaimed to the Leeds people, "Oh, Jerusalem, Jerusalem, that killest the prophets!" and if you had spelt it *profits*, and shown them conclusively the process of the murder, then, and then only, would you have been listened to.

I have heard men in prominent positions in that town, when shameful cases of neglect and lawlessness have been pointed out to them, simply say "Where there's muck there's money," and if you take one away you take both. Better have both than neither."

AN OLD SANITARIAN.

THE GAS QUESTION.—THE NEW SYSTEM.

COMPLAINTS have long been rife as to the high price and low quality of the gas supplied to the inhabitants of London, and every session of Parliament has Gas Bills under consideration, either in the interests of the gas companies or of the consumers, or of both. It is seriously discreditable that "the examiner" for the City of London should have to report concerning impurities such a fluctuation in the sulphur present in gas as from the minimum of 13.28 grains to 34.69 grains in the 100 cubic feet; that he has to report the presence of ammonia; and that he has to give such a low average illuminating power of the gas burned as 15.68 sperm candles; Manchester gas being above 22 candles illuminating power, and sold at a much lower price, namely, 3*s.* per 1,000 cubic feet of canal gas. Walsall has its supply at 2*s.* 2*d.* per 1,000; Birmingham, at 2*s.* 6*d.*; and such a remote locality as Plymouth pays only 2*s.* 6*d.* per 1,000.

It cannot be doubted that in every successive year this gas question will press more clamorously for settlement. That this must be so is evident from the rate at which consumption is increasing. The population, and inferentially the size, of London has increased 13 per cent. from 1861 to 1871, as against an increase of 12 per cent. for the preceding decade. It may be supposed that the consumption of gas has gone on in a correspondingly increasing ratio. In 1866 the consumption of gas in London was 8,500 million cubic feet. It is found that the consumption is nearly doubled every nine years, and that at the past rate of increase it will reach to 15,417 millions of cubic feet in 1874; in 1886, to 34,334 millions of cubic feet; and in 1893, to 91,667 millions of cubic feet! How such an enormous quantity is to be distributed will, when that time comes, be a knotty problem for the engineers of the day. In the meantime, it must be evident that if a better and an innocuous light can be supplied, at a lower cost, and from a smaller quantity of gas than is now consumed, such new light must be a great boon to the public. A Paris firm professes to be able to confer this boon in their patented oxy-hydrogic gas, exhibited, as we mentioned in our number for November 11th, at the Crystal Palace.

It is well known that the products of combustion from our ordinary gas are pernicious to health and destructive to elegant bookbindings and books, and to delicate fabrics or decorations in the apartments or buildings, into which they are discharged.

Oxygen, the supporter of all combustion, is abstracted from the atmosphere by burning gas, and in proportion to the extent of the abstraction the air is vitiated for respiration. MM. de Can and Dietz are proposing to introduce into London a system of lighting that was extensively in use in Paris before the war, and that has

been in use for some years in Brussels, Vienna, New York, and other cities, and by which Buffalo, in the United States, is entirely lighted.

The patentees do not propose to interfere with the hydrogen gas at present in use or its manufacture. Their method of consuming it is, instead of leaving the flame to draw its diluted oxygen from the atmosphere, in which it exists in a proportion of about one to four, to supply pure oxygen, wherewithal to feed the flame, and secure a better light from a much smaller quantity of common gas, and the complete combustion of what is burned. The oxygen is pumped from the atmosphere by a steam-engine, and passed, in a heated state, into retorts, charged for about three parts with manganese of soda. This substance has the property of absorbing oxygen, but surrenders it again to a supply of heated steam. From the retorts in which this process is carried on, saturation of the manganese with oxygen and its absorption by steam alternately, the nitrogen of the atmospheric air, for which the manganese has no affinity, is carried off by waste-pipes. The hot steam, with its charge of oxygen, is passed from the retorts to a condenser, in which the steam is condensed, and the liberated oxygen passes on to the gas-holders, ready for use. The manganese does not waste in the process, but simply plays the part of an everlasting sponge. The oxygen is conveyed to the burners by a separate service of pipes, and the two gases are not brought into contact until they pass out of the jet.

The burners of the oxy-hydrogic gas are of different kinds. In one a jet of oxygen in the centre has a jet of inflammable hydro-carbonic gas on each side. In another, the jet of oxygen is surrounded by a ring of hydro-carbonic jets. The result of the combination is a brilliant colourless flame, of great illuminating power, of much lower temperature than the hydro-carbonic gas.

It is stated that the oxygen can be purified and separated on a large scale at as low a cost as coal-gas. It can also be supplied in a portable form in a state of compression, the highest degree of compression employed being from eleven to thirteen atmospheres.

It was stated that the measure of light as ascertained by the photometer was equal from 100 ft. of common hydrogen gas, and from 20 of common gas and 152 of oxygen supplied with it; or, in another form, that the same light could be obtained from 200 ft. of common gas and 152 ft. of oxygen that is obtained from 1,000 ft. of common gas. It was further stated that the practical result, apart, we presume, from the question of pipes and fittings, was, that by the use of the oxy-hydrogic gas double the light could be obtained at the same cost as for common gas, or the same light at half the price.

THEATRICAL.

Manchester.—At the Theatre Royal, Miss Ellen Faucit has been turning the heads of the Manchester people with a short series of representations, including, of course, *Rosalind*, in which Miss Faucit remains without a rival. The *Guardian*, in the course of a critical eulogy, writes of another of her personations on this occasion:—

"After what we have said, it will be unnecessary for us to give words to our conviction that Miss Faucit's *Juliet* is not only one of the very finest of her artistic creations, but one of the finest of artistic creations known to the stage of the present day. We have preferred on this occasion to suggest what seems to us some of the peculiar difficulties of this character, and to dwell upon Miss Faucit's success in overcoming them. In the 'Lady of Lyons' her admirers will have another opportunity of listening to her perfect elocution and watching the beauty of her gestures, the very mannerisms of which we are weak enough not to desire to miss. But only those who have seen her *Juliet* can form a conception of her highest efforts in romantic tragedy. The rich exuberance of Shakespeare's 'Romeo and Juliet' is proved to be something different from extravagance when the test of such acting as Miss Helen Faucit's is applied to it."

Victoria Palace (London).—The new interior which is being erected, under this title, within the old Victoria Theatre, is making satisfactory progress, from the designs of Mr. Robinson. Mr. Snowden is the builder. It is intended to accommodate a very large number of persons, and will be opened at Christmas.

The Philharmonic.—The managers of the theatres interfered to prevent the proprietor of the Philharmonic Music-hall from approximating to things dramatic; so he applied to the Lord Chamberlain, and obtained his licence, and this house is now enrolled in the list of theatres. Situated in the far northern district, Islington, it is almost startling to find one of the best of

Offenbach's *bouffe* operas being done with lavish expenditure and much musical ability to a crowded *salon* every night; yet so it is. Indeed, it is not too much to say that this presentation of "Geneviève de Brabant" is equal to anything in its way that has been done by an English company.

The Survey.—We are not bound to denounce anything that is badly done; but when we find the very good dramatic critic of the *Observer*, amongst others, pointing out the excellence of a scene of the Cathedral Close, in "Edwin Drood," it is time some one should suggest discretion in praise. The scene would be a discredit to strollers in a barn. The bits of props intended to represent flying buttresses, and the way in which the roof is painted so that it is made to look as if it were an attic story above the parapet, assist in producing a whole which is simply atrocious. Mr. Julian Hicks ought to know better. Mr. Henry Neville's acting, in one scene of the drama, is excellent.

Antwerp.—A new theatre has been completed in Antwerp. The ceiling has been painted by Leneven, a member of the Belgian Institute, and is said to be very noteworthy.

Rome is to have, this time next year, in addition to the many theatres that city already possesses, a new one, and that the largest of all, which is to be built by the architect, Signor Morini, who in less than six months erected the Principe Umberto Theatre of Florence.

THE DARIEN CANAL.

SIR,—In your valuable publication the question of the proposed ship canal through the "Isthmus of Panama" is brought under the notice of your readers; and, with your permission, I beg to submit certain facts in connexion with the undertaking that may prove interesting.

In the report on "Inter-oceanic Canal and Railroads between the Atlantic and Pacific Oceans," published in 1867, in compliance with the resolution of the American Government, Rear-Admiral C. H. Davis sets forth nineteen different projects for canals, and eight projects for railway communications. Independently of these there remains a project on which considerable money has been spent by the "Société Civile du Darien," which has been passed in silence.

Rear-Admiral Davis writes in reply from Washington, on the 11th of March, 1870—"I had the pleasure to receive your letter of January 27th in due course of mail, and have deferred answering it until I could get possession of the Journal and Reports of 'La Société Civile' on the Darien Canal. These publications, including the 'Journal de Voyage,' December, 1864, have been to-day placed in my hands for the first time. I sincerely regret that they were not in my possession when I prepared the last edition of my report."

The plans, sections, estimates, &c., together with the original concession, have been inspected by several of our most eminent engineers, and the work reported on by the "Ponts et Chaussées" of France. These various documents are open to inspection should any one feel desirous of satisfying himself of the facts here advanced.

There existed prior to 1859 a "Société d'Étude" whose object was to study the question of inter-oceanic communication between the Atlantic and Pacific oceans.

The Columbian Government, on the 6th of May, 1859, passed a law for the purpose of and to facilitate the establishment of a canal from the Gulf of St. Miguel to Caledonia Bay.

The Columbian Government on the 28th of May, 1859, passed a law, by which Sig. M. de Francisco Martín was appointed Plenipotentiary in France and England to treat, negotiate, and conclude for the acceptance of the concession in accordance with the stipulations set forth in the law of the 6th of May, 1859, and which law is the *de facto* concession.

M. de Francisco Martín, on his arrival in France, caused advertisements to be inserted in the *Moniteur Officiel* on the 14th and 20th of July. After negotiations the concession was signed on the 10th of December, 1860; the only modification being that the confederation should receive five instead of three per cent. of the profits.

By the 46th clause, any modification is to be submitted and approved by the President of the Confederation. Beyond that before stated, no

alterations were made; the law was accepted as the concession; time for the completion of the various stipulations being computed from the date of the official notification that the duly signed concession had been received by the Columbian Government. The deeds were executed in duplicate, and forwarded by different channels. Acknowledgment of their reception has been made, but the Government has not yet sent the official notification.

In accordance with the 42nd clause, 40,000 francs were deposited on signing, and the surveys on which 70,000 francs were to be expended were commenced.

The Société d'Étude sent out engineers and staff for the preliminary survey. They left Southampton on board the *Shannon* on the 2nd of February, 1860. In accordance with the concession, the engineers and staff left Southampton on the 15th of February, 1861, on board the *Tasmania*. They reached their destination, and landed on the 10th of March, completed the surveys by the 25th of June, and arrived in Paris on the 20th of July, having spent considerably more than the 70,000 francs stipulated, which fact is acknowledged by M. de F. Martin.

The plans and estimates were submitted to the Ponts et Chaussées for their approval, as to their being in accordance with the stipulations of the concession, and on the report they were finally accepted by M. de Francisco Martín, and the Société Civile du Darien duly constituted.

All documents were from time to time forwarded in duplicate to the President of the Confederation. Owing to the continual political changes, their receptions have not been regularly acknowledged; nor can any further step be taken till the official notification, as within twelve months from that date the caution money has to be deposited, the Government electing either of the three modes in which the deposit shall be made,—as a deposit likely to be forfeited; as a loan at interest made to the Government; as a payment in anticipation of profits.

The Société Civile du Darien, two years after the signing of the concession,—that is, on the 8th of February, 1862,—took the opinion of M. Marie, Ancien Batonnier et Ancien Ministre des Travaux Publics; M. A. Cremieux, Ancien Ministre de la Justice; M. Mathieu Jenard, Ancien Ministre de l'Intérieur, Ancien Président de l'Assemblée Constituante; who gave it as their opinion, that whatever may have taken place, "the concession is valid, and essentially obligatory on both contracting parties." As a further test (if any were necessary), the Société obtained in the Tribunal de la Seine, Cour Temporaire de Paris, fourteen verdicts against shareholders who declined to pay their calls on the alleged grounds that the Société's rights in the concession had lapsed.

These facts speak for themselves. The Société Civile du Darien have completed to the letter the obligations imposed upon them by the concession; as further acknowledged in a letter of M. de F. Martin, dated the 12th February, 1862, in which he says,—"Until the official notification of the reception of the concession has been made, the periods mentioned in the different articles of the concession cannot be computed. This applies to the formation of the definitive company as well as the other stipulations contained."

The Société Civile du Darien may take for their motto, "Watch and wait" the proceedings and pleasure of the Columbian Government.

EDWARD L. PARRISH,

Consignee of the Concession of the Société Civile du Darien.

DELAY IN REPAIRING A CONDUIT.

In the case, Webster v. Corporation of Halifax, before Vice-Chancellor Malins, judgment has been given by the Vice-Chancellor, who began by stating that this litigation was of a most unfortunate description, and might have been avoided by a little forbearance on both sides. By a deed of 1859, the corporation, for a very small consideration (35l. only), obtained 1,360 square yards of land, and also the right to work, use, and repair a conduit (in which the rest of the plaintiff's land, 4 ft. high and 4 ft. wide inside, and 6 ft. outside; and if necessary to reconstruct it, provided that "it do not exceed the dimensions before mentioned," they paying for any damage done to the land. The corporation were bound to do as little damage as possible, and also to make compensation for what damage they did. This conduit was to be water-tight, and not an interruption of the water which ran in the land west of the conduit to the brewery. In 1862 the corporation repaired and altered (if not enlarged) the conduit, who reported that it was not water-tight, and required reconstruction. In March, this year, the work was commenced; and on the 8th of May, this bill was filed, because it was found that the work had been so done as to interrupt the flow of Mr. Webster's water to the brewery.

It was not attempted to contradict this statement, and the question was whether, in the nature of things, there was any occasion for this even for a single day. On this subject there was very contradictory evidence. The case which charged the corporation with stealing this water at the rate of 100,000 gallons a day, and selling it at 6d. per 100, of taking a profit of 1s. 6d. per day, entirely failed; however pertinacious the agents of the corporation had been in asserting their rights. Still he could not conceive that any engineer of ordinary skill could not within two or three days construct a conduit like this, not exceeding 300 yards long, 4 ft. high by 3 ft. 1 in. in width inside, with walls 1 ft. 9 in. thick on each side, which should be perfectly water-tight, and yet not intercept a drop of water of the plaintiff. He could not say that the plaintiffs were altogether wrong in embarking in litigation. The corporation also had made assertions with regard to their works which turn out to be unfounded. He, therefore, decided "that the plaintiffs are entitled to an order upon the corporation which will secure, within a reasonable period, the completion of the works in a workmanlike manner and a water-tight condition." Both parties had been much to blame; the one for needless litigation, the other for having so long resisted what they were never entitled for a moment to resist. The corporation must be limited in the conduit to 6 ft.; there must also be the right of inspection on the part of plaintiffs, the parties to agree upon a neutral engineer, and justice will be done by the corporation paying the plaintiffs 300l. towards their costs. Finally, six months were named as the time for completion.

DUST-TUBS.

THE vestry of St. George, Hanover-square, considered last week the motion of Mr. Walker "that this vestry recommend the general use in this parish of daily dust-tubs, and that the Corporation be requested to cause the same to be recommended to burn their waste paper and vegetable refuse, instead of throwing the same into the ash-pit, and thereby prevent foul smells from the same entering their houses to the great injury of health." There could be no doubt that dust was inefficiently collected in the metropolis, and that its accumulation was prejudicial to health. He quoted from an article in the *Zeeuwsche* bearing on this subject, and urged that the recommendations therein ought to be carried out. There were two difficulties to be met—the ignorance of domestic servants and vested interests. The wages paid to dustmen by contractors were insufficient; hence black mail in the shape of beer money.

Mr. Brown seconded. Dr. Appleton, as a medical man, did not think that waste paper could be prejudicial to health as a nuisance; it would be far better to have it re-made into paper. Besides, the motion, if carried out, would be a great addition to the burden of the ratepayers. Dr. Schuller had tried the experiment with success. Mr. Sappwell had tried the experiment, and without success. The motion being put, was lost.

THE COSMOPOLITAN LEAGUE OF INDUSTRY.

SIR,—The London Registrars of the Cosmopolitan League of Industry—in reference to the letter which you were so good as to insert in your issue of July 30th, 1870, and in which the then sole object of the London Branch of the League was incidentally detailed,—desire that I should inform you that since that date the London Branch has been incorporated as a separate Associate League of the Cosmopolitan League of Industry, under chapter xxvii. of the "Monitor Universal," printed copy of which I send.

On inspecting that document, you will observe that two additional objects have been inserted as conditions precedent; the statutory objects of the "London League of Industry" now being—

1st. The knitting together in one common bond of brotherhood of all persons as are honestly determined to earn their own livelihood and that of those dependent upon them; and who, at the same time,—as all good and true men should do,—utterly repudiate all ideas of slavery, serfdom, financial bondage, national or industrial indebtedness, or other moral, mental, or material degradation of their fellow-creatures.

2nd. The establishment of a just and proper representation of those who are dependent for their subsistence upon their daily labour; and the revindication, by just and proper means, of all land and other trust properties which have been violently, unjustly, or fraudulently wrested, obtained, or withheld from those who are the rightful trustees and users thereof.

3rd. The general advancement of the moral, mental, and material interests of all persons engaged in useful arts, trades, occupations, or pursuits."

FREDERIC RIDDLE,

Chancellor, London League of Industry.

J. G. C. C. GODSMAN,

Late London Chancellor, C.L.I.

DAVID SUTTON,

Registrar on behalf of the London Registrars, C.L.I.

VENICE.

ALLOW me, in reply to the comments of "Architect" in your last number, on "My First Night in Venice," to acknowledge the justice of his correction as to the supposed name of the Church of "Santa Maria della Salute." I was led into the error of ascribing it to Palladio by a somewhat obscure passage in Eustace's "Classical Tour." But, while thanking him for his correction, I beg to express my opinion of his opinion of Eustace, who (though he does speak irreverently of St. Mark's) is an authority on Classic work, calls it a "noble church," and I cordially agree with him,—supposing, as he does, that the church is not a masterpiece of the Venetian School, in what "Architect" is pleased to term my "enthusiastic song"—but which I aimed to make only a truthful description of scene and its associations which greatly impressed me at the time, as it has doubtless done thousands before me, by its extreme beauty.

ZINC AND PAINT.

In the *Builder* for October 28, p. 866, I read with great surprise a paragraph stating that the paint invented by Mr. Artus was useful for zinc in roofs, because it had "a *therio* not *always* been found durable."

Having, for many years, with the entire support of the Vieille Montagne Company, insisted that zinc exposed to the weather required no paint, but was efficiently protected, when thick enough and pure, by its own hard insoluble oxide, I felt sure that a mistake had been made, and set to work to unravel it. I now find that the paragraph was taken from a Parisian journal, the *Liberte*, and on application to the Secretary of the Academie des Sciences, I have received an extract of the proceedings at the sitting on Feb. 26, 1871 (copy of which I enclose), when M. Artus made his communication, and you will see that while it states that the paint protects a zinc roof from the heat of the sun, there is not one single word alluding to the question of durability.

As the statement was quoted as having been made by M. Artus, the Company's Superintending Architect in Paris, it had an especially damaging aspect, and the Company trust you will insert this explanation.

The difficulty of tracing the matter has occasioned the delay.

JAMES EDISTON,
Architect to the Vieille Montagne Zinc Mining Company.

RATING CHAMBERS.

THE QUEEN V. THE ASSESSMENT COMMITTEE
OF ST. GEORGE'S UNION. — CHAMBERS RATED AS HOUSES.

Tax question in this case (Court of Queen's Bench, November 15th) was one of considerable interest to the occupiers of Victoria-chambers, Westminster—namely, whether they were liable to be rated separately for their tenements, or whether the building was to be rated as a whole, on the principle in operation in the case of the relations between landlords and lodgers.

The question came before the Court as an appeal by the occupying tenants, against the decision in favour of the Assessment Committee.

The Court having heard Mr. Poland argue for the appellant, without calling on Mr. Manisty, Q.C. (with whom was Mr. Streeten), for the respondents, the Assessment Committee, gave judgment, holding that every one of the distinct tenements, 117 in number, was rateable to the poor and other rates paid by occupiers, and that the valuation of each of those separate tenements in the assessment list was right. The agreement into which the occupiers entered on taking possession had all the characteristics of a lease, and the lessor had none of the power belonging to a landlord in the case of a lodger. Assessment confirmed.

A HINT TO THOSE WHO MAKE TENDERS.

SIR,—We are often puzzled with the great disparity observed in the tenders published in the *Builder*; but if the method adopted by the tradesman whose "tender" I inclose were to be followed, and all were to make the same liberal offer, then where would the "lowest or any tender" be found? But the method seems to save all trouble of taking off quantities, making calculations, or even inspecting plans or specifications, and may be useful to contractors generally, if made public through the medium of the *Builder*. M. C.

"SIR,—I shall be glad to do the plumbing, glazing, and painting required in the house proposed to be built at Saltburn, according to plans and specification (which I enclose) not exceeding £5,000, for £5, less than any other offer. I will further guarantee to complete the work before asking for any part of the money.—I am, &c."

UNSAFE LANDINGS.

WITH reference to our report of proceedings, St. George's, Hanover-square, Mr. Barratt Lee wishes it understood that "the gentleman referred to has been paying paving rates for more than twenty years past, and he is now called upon to renew a public footpath for which he has already paid so long for the public benefit." In his reply, he submitted,—

"That as the aforesaid landings have been, and are used for the public benefit, I am advised it rests with the parish to do the renewals for which paving rates are paid; and that if any accident occurred at any time through the dangerous condition you mention, the responsibility remains with the parish."

SCHOOL BOARDS.

The Metropolitan School Board.—It has been resolved by this Board, on the motion of Mr. W. H. Smith, M.P., to temporarily hire buildings suitable for school purposes, pending the erection of schools of their own. Mr. Smith stated that, although sites for schools had been widely advertised for, only one had been secured, and only three or four others could be obtained without having recourse to the compulsory powers conferred upon the Board. He estimated that two years would elapse before the Board would be able to meet the educational require-

ments of the metropolis by the erection of new schools. This statement was controverted by Mr. Freeman.

Proposed New Schools in Shoreditch. — The London School Board have given official notice of intention to take three plots of land, situate in Shoreditch, for the purpose of erecting thereon school-houses in which a public elementary school may be carried on in accordance with the provisions of the Education Act. The places so described are at the corner of Nelson-street and Dove-row; the north side of New-street, between Cannon-street and Maidstone-street; and the north side of Gloucester-street.

TROWBRIDGE DRAINAGE.

At the end of last year the Local Board instructed Messrs. Goto & Beeley and Mr. Estridge, engineers, to submit plans, report, and estimates for the drainage of Trowbridge and purification of the river Bias. The scheme proposed by the engineers includes a main valley line of sewer, the completion of the branch sewers in the town, and the pumping of the sewage for the purposes of irrigation, as well as certain provisions for filtration, to prevent the pollution of the river at the different manufactories. The estimated cost of the public works is 15,000l.

The Board, at the last meeting, resolved to take immediate steps to carry out the drainage works, and instructed the engineers to prepare the necessary plans and specifications.

CEMENTS.

SIR,—About a month since I was on the roof of Milan Cathedral, where I was much struck by seeing the elabs of marble, of which it is composed, being jointed with cement, instead of lead. The man at work told me it was Turco mastico, and said that neither frost nor sun affected it. Certainly the sun does not soften it, for, though it was scorching hot at the time, the old cement was as hard as iron. It was a white powder melted, and applied in the ordinary way, the joint being dried off with a hot iron. At this time, when concretes and cements are so much engaging public attention, I am sure you would oblige your numerous readers by learning for them the nature of this cement, and by your saying where and at what price it can be obtained in England. T. A. H.

THE CO-OPERATIVE MOVEMENT.

At a meeting of the Social Science Association, held in their rooms, in Adam-street, Adelphi, Mr. Thos. Hughes, Q.C., M.P., read a paper on "The Present State of the Co-operative Movement," which led to some discussion. Mr. Hughes stated, in the course of his address, that in 1865 there were 441 registered co-operative societies, which made returns, showing a share capital of 1,164,338l. In 1870 the number of returning societies had risen to 749, showing an accumulated share capital of 2,034,261l. Should the present rate of increase continue, as there was every reason to expect, the co-operatives would number 1,000,000 heads of families, and find themselves in the possession of upwards of 100,000,000l. of capital, within the lifetime of the present generation. In the past year a cash business was done, amounting to 8,204,466l., realising a net profit of 555,435l., or a clear gain of 27 per cent. on the capital. Nor was this all; for some societies, such as the Monkwell-street Civil Service Society, purposely made no profits at all, but reduced prices, instead, to the lowest point; so that the average profit might probably be reckoned at little less than 30 per cent. But the gain of profits in money was, after all, only a small part of the benefit. These societies had secured their members from adulation or fraud of any kind; they had destroyed indolence by the ready-money business; and they had given business habits and experience to a great number of persons. These remarks, however, related almost exclusively to societies employed only in "distribution." The number of "productive" associations had been diminishing, for the simple reason that the qualities needed were of a higher and rarer kind than those required for the successful conduct of a store. Mr. Lloyd Jones, a veteran advocate of co-operation, expressed his entire concurrence in nearly everything the chairman had said as to the progress and prospects of these societies,

at least in the north of England, with which he was best acquainted. He believed that upon the success of this movement depended the safety of the country and its constitution. Mr. Hodgson Pratt, Mr. Rawlinson, C.B., and other speakers expressed themselves in favour of the movement, which some of them believed to be the best foe of Communism.

CHURCH-BUILDING NEWS.

Tamworth. — A meeting has been held in the town-hall, under the presidency of the vicar, with the view of taking measures to complete the restoration of the interior of the parish church. The chairman read a report from the restoration committee, from which it appeared that 3,650l. had been paid for the work already done, leaving a deficiency of 60l. Mr. Wellington recommended the removal of the galleries, which he regarded as the greatest of the remaining disfigurements, and offered a donation of 100l. Mr. Jennings suggested that the chief difficulty in removing the galleries lay in their having had a large grant from the Lichfield Society on the faith of a certain increase of accommodation. Mr. Briggs suggested that the Diocesan Society should be communicated with.

Waterford (Bengoe). — The corner-stone of a new church in the village of Waterford, an outlying hamlet of the parish of Bengoe, has been laid. The site of the new building is at the commencement of the new road leading from Waterford to Hertford, and within a short distance of the old place of worship, on rising ground. The church is the gift of Mr. Robert Smith. It will be Early Decorated, and built of Kentish rag stone, with Bath stone facings. It will consist of nave, chancel, and vestry; will be 81 ft. long and 23 ft. wide, and, when finished, will accommodate some 150 persons. There will be an open timber roof, and the spire will be shingle covered. The floor is to be laid with tiles, and the whole of the interior fittings of the church will be of oak. The reredos is to be of carved stonework, with alabaster shafts. The organ is to be situated in the north side of the choir, and in the winter season the church will be heated with hot air.

Thrumpton (Notts). — The quaint ivy-grown village church of Thrumpton, Notts, has recently received considerable improvement, Mr. Street being the architect, and Mr. Clapham the builder. The alterations consist of general repair, and the following new works:—Roofs, floors, sittings, oak doors, pulpit, font, and altar; the chancel is also new, with stained-glass window at east end, and alabaster reredos. A new organ is substituted for the old one. The restoration has chiefly been done at the expense of Lady Byron.

Lower Clapton. — A new church, dedicated in honour of All Saints, has lately been erected in the district of Clapton Park, Lower Clapton, and was consecrated by the Bishop of London, on the 2nd inst. The church consists of nave, aisles, chancel, with sacristies for clergy and choristers on the north side, and south aisle, in which will be placed the organ. At the west end of the south aisle of the nave it is intended to erect a large and lofty tower. The nave has five bays, lighted at the west end by a large five-light window, and at the north and south sides by lofty two-light clerestory windows. The aisles have single-light windows, and lean-to roofs. The chancel is rectangular, with a large five-light window, the head of which is filled with Geometrical tracery, at the east end. On the south side of the chancel are a piscina and triple sedilia, and on the north side a credence-table. The altar is raised eight steps above the level of the nave, and over the re-table is the centre panel (the only portion at present executed) of the reredos, representing the Crucifixion. It is intended to employ coloured marbles and alabaster in the completion of the decorations of the east, and adjacent parts of the north and south sides of the chancel. The font has an octagonal bowl of Sicilian marble, with panels filled with the sacred monogram, &c., on the sides facing the cardinal points. The pulpit is of Caen stone, with marble columns at the angles, and alabaster capitals and bases. It is square, canted at the angles, at each of which is a dog-tooth enrichment; and on two of the faces are quatrefoil panels, filled with colored marble, having crosses of alabaster in the centre of each. The seats in the nave and stalls in the chancel, together with all the doors of the church, are of oak throughout. The walls of the church are of

* Not in this journal.—Ed.

brick, faced externally with Kentish rag, and internally with red brick, relieved round the arches, and horizontally, by black bands. The church is designed to contain 800 worshippers, and has been erected chiefly by individual subscriptions and private munificence, aided by a grant from the Incorporated Church-Building Society. The cost hitherto has been between 7,000l. and 8,000l. The architect is Mr. Francis T. Dollman, and the contractors for the erection of the building are Messrs. Dove, Brothers.

Beswick.—The church of St. Margaret's, Beswick, near Beverley, has been consecrated. The new edifice, to seat about 130 persons, is built upon the site of a church which at the time of its being pulled down was in a very dilapidated condition. It was built in the most ordinary manner, mud, wood, and thatch forming a great part of the structure. It, however, dated back several centuries, small portions of Norman work being discovered amongst its stonework. Its demolition, upon the late Lord Hotham undertaking to replace it with a stone building, was not done too soon, for its condition was such that when the seats and other fittings were taken out it literally fell down. The new building is of Early Decorated character, and formed of nave and chancel, a vestry on the north side, and a good-sized porch on the south side. The interior is lined with ashlar stone. The chancel has three windows, and arched between them with carved caps and moulded bases, the reredos of Caen stone, with arches, carved caps, moulded bases, &c., and a credence on the north side of the altar-table, sedilia, altar-rails, pulpit, and reading-desk, are all in oak. The whole of the seats are made of pitch-pine varnished. The floor is laid with encaustic tiles. The doors are of English oak, and a pair of wrought-iron gates are fixed at the entrance to the porch. At the west end of the nave is a small tower, under which the font is placed. The walls are faced with Bradford wall stones, beaded and pitch-faced. The whole of the dressings are of Bath stone. The tower is finished by a spire, the total height of which is 75 ft. The roof is covered with green Welsh slates, and the windows are glazed with Hartley's cathedral glass. The ceiling of the nave and chancel is boarded, and wagon-headed. The churchyard is surrounded by a stone wall, and has entrance-gates of oak, with ornamental stone pillars.

Swallowfield.—All Saints' Church, Swallowfield, which has been restored, has been reopened for divine worship by the Bishop of Oxford. The church is an ancient edifice, and had formerly a wooden belfry and steeple. The register dates as far back as 1540, and on one of the exterior walls is a small memorial stone of the date of 1650. The restoration of the church is mainly owing to Sir Charles Russell, who contributed 500l. to the restoration fund. The work has been chiefly carried out by Sir Charles's own workmen, the masonry having been done by the Messrs. Wheeler, of Reading. Mr. Joseph Morris, of Reading, was the architect, and under his direction and according to his plans the work has been completed. The church is heated with hot-water pipes, supplied by Mr. S. Spencer, Reading. The church stands upon a hillock enshrouded in trees, at a corner of Sir Charles Russell's park. As the chancel walls were very dilapidated, it was determined to rebuild them, and, whilst pulling them down, the old Norman windows, which now occupy the east wall, were discovered. The south doorway is also Norman, but of a much plainer character. The centre portion of the eastern triplet window had been removed about three centuries ago, and a perpendicular window was then inserted. In the north side of the chancel there is a two-light window of the Decorated period, and on the south side of the nave there are two square-headed windows of a later date; the rest of the windows are new. The belfry is at the west end of the church, and is constructed of oak framing, which has been restored and filled in above the roof with brick nogging; new belfry windows have been inserted, and the spire has been covered with oak shingles. The chancel is paved with plain coloured tiles, and the space within the rails with encaustic tiles, some of the patterns being made to match the old tiles found in the church. The nave is floored with black and red Staffordshire tiles, with an ornamental iron grating in the centre, which conceals the hot-water pipes by which the church is warmed. The roofs are old, but before the restoration they were celled off; they are now thrown open, exhibiting all the timbers with plaster between. The nave is fitted with stained lead benches, the

ends shaped and chamfered. A pierced oak dwarf screen separates the nave from the chancel, and the latter is fitted with oak benches and altar-rails, wrought out of the old oak from the roof of Arborfield Church. This transept is faced externally with stone, whilst the remainder of the church is flinted with white mortar joints and stone dressings. Adjoining the Russell pew a faculty pew existed belonging to the Standish family, in a most objectionable form; this, however, has been removed, and its position is now marked by a memorial window, erected at the expense of the former owners of the pew; this window, consisting of three lights, with large cinquefoil above, represents in one design the "Transfiguration of Our Lord." The east windows have been filled with stained glass to the memory of the late Sir Henry Russell, and Henry his eldest son, and are erected at the cost of Sir Charles Russell. They consist of three narrow lights, with a bull's-eye above, and illustrate the Crucifixion, the Nativity, and the Resurrection; in the upper part is an emblematic representation of the Holy Spirit. On the south of the chancel a window has been placed to the memory of Mr. de Winton and his daughter. It is the gift of the Rev. J. Kitcat, and consists of two lights, in which are represented the Annunciation and the Presentation in the Temple, whilst an angel bearing the motto, "In terra pax," occupies the tracery. These windows have been executed by Messrs. Hardman. In the south wall of the nave a simple piscina was discovered, and this has been preserved as a relic. A reredos has been erected as a gift to the church by Colonel and Mrs. Dawson Green; the work has been executed by Mr. Earp, from the architect's designs. It consists of a Norman arcade (to correspond with the east window), wrought in Caen stone, and relieved by red marble shafts and alabaster bands, with zigzag mouldings delicately carved; the central panel is wider, with a trefoil head, and is filled with a carved subject, representing the institution of the Lord's Supper. The arcade does not extend the whole width of the church, but the sides are filled with a geometrical design, executed in coloured cements upon a Caen stone ground-work. The old oaken south porch is being restored.

West Allendale.—Ninobanks Church, situated in West Allendale, and three miles from the village of Whitfield, has been restored, and reopened. The old church had fallen into a ruinous state. The present church has been built upon the same site upon which the old one stood. Mr. Haaswell, North Shields, was the architect, and the contractor was Mr. Adamson, of Egglestone, near Barnard Castle. It has cost 800l.

Crowthorn.—The new church of Christ Church, Crowthorn, has been consecrated by the Bishop of Chester. Crowthorn formed part of the parish of Weaverham; but some time since it was decided to form a new district and build a church for that district. A site was given by Mr. R. O. Leycester, Toft Hall. The building is in the Decorated style. Mr. Pearson, of London, was the architect. The benches in the church, which are of pitch-pine, are all open and free. The pulpit, reading-desk, and lectern are of carved oak. There is room in the church to seat 250 persons, and the whole cost of the building is estimated at about 2,000l. Three bells have been presented by the Hon. Miss Lascelles. The building contract was undertaken by Mr. S. Drinkwater, Northwich, under whose supervision the work has been carried out. The stonework has been carried out by Mr. John Holland, of Castle Northwich, and the brickwork by Mr. W. Leicester, of the same place.

Dale End (Birmingham).—Some much-needed improvements have been at length carried out in St. Peter's Church, Dale End, though the greater portion of the work intended to be undertaken has not yet been done, the necessary funds not having been raised. The three-decker pulpit, reading-desk, and clerk's desk, which obscured the view of the chancel, have been removed. The pulpit, which now stands by itself, has been decorated by Mr. Sears; and there are a new oak lectern and reading-desk. Messrs. May & Mountain have placed a heating-apparatus, at a cost of 103l., in the edifice. The masonry part of the work has been done by Mr. Hall, builder. The interior of the church has not been painted and coloured for the past twenty years, and it is proposed to clean and recolor it. The whole of the work, which includes the repair of the roof, will involve an expenditure of 400l. or 500l.

Cambridge.—The rapidly-growing district in and about the parish of Grantchester, of which

"Johnny Cook's Corner" may be considered as the centre, is becoming an important suburb of Cambridge. The Master of Corpus Christi College presented a freehold site for a church, funds were raised, and it was decided, after discussing the relative advantages of wood and iron, to construct a temporary church of the former material. Mr. R. Reynolds Rowe was employed as architect, and a contract was entered into for the erection of the structure, with Mr. Hasall, builder, the result being a structure, at small cost, but with ecclesiastical appearance. It consists of a nave, aisles, well-developed chancel, organ-chamber, and vestry. All the woodwork inside is painted. The roofs are slated, and the gables terminated by iron crosses; the windows are glazed with opaque glass, so as to obviate the use of blinds, and are made to open freely.

Madley (Herefordshire).—Madley Church has been allowed to fall into a sad state of dilapidation. The roof is unsafe; the casements of the windows, which are large, and of which there are a great number, are decayed; and the whole church is cold and damp, the floor never having been excavated or drained. Mr. Kempson, the architect employed, has sent in a report, of which the following is an extract from his estimate for the works necessary to be undertaken:—The roofs, 1,285l.; glazing, 335l.; drains, 50l.; plain tile paving, 600l.; heating, 200l.; seats, 650l.; painting, oiling, &c., 100l.; doors, 100l.; stonework, about 300l.; total, 3,620l. This sum does not include the architect's fees, expenses, &c., and he concludes his estimate by saying:—"Pulpit, altar, reredos, credence, altar-rail, chancel screen, and oak panelled ceiling in tower would also probably be required; but the cost of these last would entirely depend upon the funds at command." The parishioners are anxious that the church should be thoroughly restored; but its unusually large size, far beyond the requirements of the parish, makes it impossible that the inhabitants can raise sufficient funds. The non-residence of many of the landowners increases the difficulty.

Matlock.—The parish church has been reopened after a restoration, at a total cost of over 2,000l. The contractors for the work were Messrs. Buxton & Sons, of Lea and Matlock Bath, for the woodwork, and Mr. A. Bridge, of Matlock, for the stonework. The plumbing and glazing were done by Mr. Keeling, of Matlock, and the whole has been carried out under the superintendence of a clerk of the works. On the 26th of April, 1870, invitations were offered to some half-dozen selected architects asking them to send in designs in competition for taking down the old nave and building up a new one. The architects who sent in designs were Messrs. Hine & Son, Nottingham; Mr. Hull, Mr. Benjamin Wilson, of Derby; and Messrs. Wilson & Oldham, Manchester. The designs of Mr. B. Wilson, of Derby, were chosen by Mr. Blomfield, architect, on the part of the committee. The church, which is dedicated to St. Giles, contains sitting accommodation for 500 persons in open benches, and consists of nave, north aisle, chancel, organ-chamber, and a transept on the north side. It is built of stone throughout the interior, having a boarded surface, and the exterior hammer-dressed stone with cleansed dressings. The nave is divided by three arches on each side with stone octagonal piers, having moulded caps and bases and cleansed stone arches. At the east end of the north aisle is a transept erected at the sole expense of the late Mrs. Knowles, having a large three-light window (traciated), which at some future time it is proposed to fill in with stained glass. The organ-chamber is situated on the east side of the transept, with which it is connected by two Gothic arches, and is open to the chancel by another arch. The old arch from the nave to the chancel has been taken down, and another new one substituted. The western archway exposes to view a window in the old tower. This archway was, previously to the restoration, quite blocked up, and the whole is lighted by windows with traciated heads. The roofs are trussed rafters, open-timbered roofs covered with wrought boarding, and has a very pleasing appearance. The whole of the interior woodwork is stained and varnished. The pulpit is of white Ancaster stone divided into Gothic panels, which are filled in with red Mansfield stone, with a moulded and enriched capping. The font is also of Ancaster stone, and is octagonal in plan, with columns at the angles in Mansfield stone. Owing to the small amount of funds at the disposal of the committee, the idea of providing a new pulpit and font were abandoned.

done for the present. However, Mr. J. C. Arkwright, at his own cost, instructed Mr. Wilson to provide them. The church is heated with hot water by Messrs. Cramp, of Derby, at a cost of 120*l*. The lighting is by brackets, &c., to the nave and aisles, and by standards to the chancel, relieved in blue and gold. These have been supplied by Messrs. Hart, Son, Peard, & Co., of London. An additional school-room was opened in December last, at a cost including the site, of 561*l*. 17*s*. 6*d*.

DISSENTING CHURCH BUILDING NEWS.

Richmond (Surrey).—The Vineyard Congregational Chapel, Richmond, has just been re-opened, after enlargement. The chapel has been lengthened by about 20 ft., and its acoustic qualities improved. A five-sided apse, with groined roof, has also been added. Underneath three additional class-rooms and a room for the business meetings of the managers of the church are obtained, together with a heating-chamber, containing a "Gurney's" stove. Fronting the street a porch has been added. The whole has been executed, at a cost of about 900*l*, by Mr. George James, builder, London, from the designs and under the superintendence of Mr. William Burnet, London.

Burton-upon-Trent.—A new Wesleyan Chapel has been opened here for divine service. The site is at the corner of Station-street and Union-street; the building forming a prominent object on the approach from the railway station to the town. The style is Early Decorated. The elevation to Station-street has a large gable, pierced by a fine five-light tracery window (which is intended to commemorate the contributions of Mrs. Adams to the building fund), below which is a canopied entrance to the body of the chapel. The Union-street elevation is broken up by four pointed gables, each of which contains a two-light tracery window to give light to the body of the chapel and the galleries. The plan of the chapel, which contains 845 sittings, is in form of a parallelogram, being 51 ft. wide, 60 ft. in length on the ground floor, and 54 ft. in length on the gallery level, the galleries being recessed back over entrance vestibule and vestries. The main body is divided lengthways into four bays by cast-iron columns, with moulded capitals; these columns being used to support the galleries and framed principals of the roof, which are exposed and stained, the spandrels being filled up with perforated boarding. The galleries are approached by two staircases, one on each side of Station-street front. The height to the top of the ridge is 63 ft. The materials used in the erection are pressed red brick facings, relieved by bands of blue bricks, and Bath-stone dressings, &c. The tower and spire occupy the corner of Union-street and Station-street, and together reach the height of 120 ft. to the top of vane. The spire is of Bath stone, relieved by Hollington stone bands. The work has been carried out by Mr. George Lilley, builder, Ashby-de-la-Zouch, and Mr. David Bassett, stonemason, Burton-on-Trent, under the supervision of Mr. Edward Holmes, architect, of Birmingham; their joint contracts being 3,395*l*. The gas-fittings were supplied by Mr. William Nicholls, of Burton-on-Trent. The system of warming adopted is that of Messrs. Haden & Son, of Trowbridge; and the carving has been executed by Mr. Thompson, of Nottingham. It was intended, when the contract was entered into, that the spire should be one of timber and slate, 150*l*. being set down for that part; but Mr. Bassett was in favour of a stone spire, and himself defrayed the additional cost.

Brantree and Bocking.—The Brantree Congregational Chapel has been reopened for divine service, after having undergone a restoration, enlargement, and embellishment. The chapel is a rectangular building, of the usual Classic type so much in vogue during the last part of the eighteenth and the early portion of this century. Its internal dimensions are 68 ft. by 50 ft. No attempt has been made in the recent alterations to change the character or to interfere with the main structural portions of the building; the roof, however, which was defective in its covering, has been close boarded, felted, and re-slated; the whole of the windows have been renewed, and the blank windows restored to life. Externally, the principal alterations are in the front, where additional windows, with stone dressings, and bold coupled doorways, with stone columns and pediments, give a new expression to an old face. Internally, the flat ceiling has

been broken away, and the centre portion, 26 ft. in width, has been formed into an elliptically-vaulted ceiling, running the entire length of the building, and divided into seven bays by plaster ribs springing from moulded and dentilled cornices. A height is thus obtained of 33 ft., instead of, as formerly with the flat ceiling, only 25 ft. A shallow apse has been thrown out in the rear of the building, in communication with the vestries, expanded by an arch springing from double pilasters; and in this, upon the ground-floor, stands the organ, immediately in front of which are the singers' seat, dais, and pulpit. The galleries have been lowered and the pitch increased, and the whole of the galleries and ground-floor re-seated with stained yellow deal benches throughout. The pulpit is of white deal, with wainscot panels, inlaid with mahogany, ebony, and box woods, supported on six wainscot columns. The table is of pitch pine, with wainscot panels and enrichments. The windows have been filled with enamelled glass, with tinted margins. The walls are distempered in grey, relieved with stencilled devices in cornices and strings. The building is heated by hot-water pipes, and lighted by twelve starlight burners, and wall brackets under the galleries. The general works have been carried out by Mr. James Brown; the benches, pulpit, galleries, &c., by Mr. Walter Letch; and the heating and gas by Mr. Crittall, under the direction of Mr. Charles Pertwee, of Chelmsford, architect. The entire cost of the works, including an iron railing and gates to be fixed in the front, and the removal and improvement of the organ, is 1,780*l*.

Paddock (Huddersfield).—The corner stone of a new Congregational Chapel has been laid on a piece of ground immediately abutting on the main road at Paddock, close to the present schools, for the use of the Congregationalists in that portion of Huddersfield, and in view of the large building belonging to the Methodist New Connexion Chapel, nearly opposite where the new chapel is being erected. In preparing the designs, Messrs. Kirk & Sons have adopted the Gothic style of thirteenth century. The plan consists of a nave, 70 ft. by 38 ft., with transept, 21 ft. wide and 7 ft. deep. On each side of the nave and recessed some three yards from the front of the building, are wings, 10 ft. square inside, containing the main entrances, and stone staircases communicating with the gallery. The floors of these lobbies are to be laid with ornamental tiling. Somewhat back from the centre line of the transept, and fixed upon a raised communion, will stand the pulpit or rostrum, which will be a structure of large size, approached on each side by a flight of stairs. Further back than the transepts, and behind the rostrum are to be two small vestries, with lavatory and retiring-room attached, and also two side entrances, each of which will have a passage and broad staircase, communicating with the gallery for the convenience of the choir, Sunday scholars, and the occupants of gallery pews at this end of the chapel. The gallery occupies three sides of the building, and though of no great depth at the sides, it gains considerable accommodation at the end and in the transept recesses. The choir and gallery fronts are to be formed of perforated tracery panelling, and surmounted by a cornice, and the gallery timbers, which will be dressed and visible from below, will be supported on light ornamental iron columns. The basement, approached by one of the back staircases, will contain a large vestry, suitable for week-night services, and also a room for the reception of the heating apparatus. The total number of sittings on the ground-floor and gallery will be about 700. The principal elevation, facing Market-street, will consist of a lofty gable, flanked on each side by the entrance lobbies, one of which is intended to be carried to a considerable height above the eaves, and finished with gables and a steep-slated turret, surmounted by ornamental iron-cresting. In the fronts of the two wings will be the main entrances, consisting of deeply-recessed and richly-moulded pointed arches, filled with heavy doors hung with ornamental wrought-iron hinges, and approached by broad and commodious steps. The sides of the wings will have tall two-light windows with the heads filled with tracery, and the upper part of the tower over one of these wings will also have similar windows on each side. The side walls of the chapel will be pierced by coupled windows with pointed heads, and having deep stone transoms where the gallery crosses them, and between each window

will rise a buttress. The transepts are to be finished with gables nearly the full height of the main roof, and each containing a large four-light tracery window. The whole of the roofing (with the exception of a small portion near the ridge devoted to purposes of ventilation) will be open-timbered. All the roofs are to be covered with dressed boarding, felted, and lined with slate. The general form of the roofing has been carefully considered by the architects with a view to acoustic requirements. The material of which the chapel is being built is stone from local quarries, hammer dressed, and wallied in broken course, with ashlar dressings, from Croasland Hill quarries. The interior is to be finished in stucco lined in courses to represent masonry. The whole of the woodwork throughout will be of red deal, stained and varnished. The body of the chapel and gallery are fitted up with stalls, having moulded ends. These, and, in fact, the whole of the fittings will be worked to special details, supplied by the architects. The chapel is to be lighted for evening services by means of large coronas, suspended from the roof, and also by standards and brackets upon the ground floor. The edifice will be warmed by means of hot water circulating through pipes laid beneath the floor, and covered with perforated iron grating. The contractors for such of the works as are already decided are as follows:—Masons' work, Messrs. William Mallinson & Sons, of Lockwood; joiners' work, Mr. Thomas Walker; plasterers' work, Mr. W. E. Jowitt; plumbers' work, Mr. G. Garston; painters' work, Mr. J. H. Stutard; glaziers' work, Messrs. Goodwin & Sons; and ironfounders' work, Mr. J. W. Harrison, all of Huddersfield; and the building is being carried out under the immediate superintendence of the architects, Messrs. Kirk & Sons, of Huddersfield and Dewsbury.

Garston.—The foundation-stone of a new Wesleyan Chapel has been laid at Garston. The old building has long been considered inadequate to the requirements of the congregation, and as it will have to be demolished to make way for the new railway, the present was considered a fitting opportunity for commencing the erection of a new chapel. The site selected is between the old Garston-road and Island-road. The new building is to be in the Gothic style, and will accommodate 500 persons. It is to cost 2,500*l*, towards which 1,900*l*. have already been subscribed. The architect is Mr. C. O. Ellison, of Liverpool; and the builder, Mr. Blakeley, of Birkenhead.

Long Sutton (Lincolnshire).—The Congregational Church in this town has been re-opened, after having been almost entirely rebuilt from designs by Mr. Taft, of Leicester. The style of architecture is Romanesque, and the material for the walling Whittlesea cream-coloured bricks, with dressings of Ancaster stone. The contractor for the work was Mr. Chappel, of Holbeach.

Banbury.—A new Wesleyan Chapel has been opened in the suburbs of Grimsbury. The new edifice is situated in West-street. The building is of brick, with Bath stone dressings. The style is mixed, but it partakes somewhat of the Grecian. It is approached by a flight of steps, and the front is surmounted by a pediment, in which there is a small circular window. There are pilasters at the front and sides, and at each side of the building there are pediments similar to the one in front. A stone cornice runs all round. The gallery is over the front entrance, and is approached by two flights of stairs, one on each side of the entrance lobby. The pews are open and low-set, and are of deal, stained and varnished. The pulpit is of the same material, and in front of it there is some fretwork, showing a red ground. A cornice runs round the ceiling, on which there are moulded ribs, dividing it into panels. The building is lighted by four pendants hanging from the roof, and two brass standards, one on each side of the pulpit. The height of the chapel from floor to ceiling is about 21 ft. The body of the chapel is separated from the lobby by a partition, in which there are two doors. Besides the chapel, school-rooms have been built. They are behind the chapel, and comprise a school-room, 29 ft. 6 in. by 28 ft.; an infant school-room, 16 ft. by 18 ft.; and four class-rooms, 14 ft. by 16 ft. Adjoining the infant school is a small vestry. Under the school-room there is a large room, 28 ft. by 39 ft., which may be used as a day-school should it be required. At each side of the chapel there are entrances to the school-rooms, which will accommodate 450 scholars. The building is so constructed, that the school-rooms can be thrown

into the chapel at any future time should an enlargement of the latter be considered necessary. The chapel will accommodate 350 people. The ventilation has been attended to, and a heating apparatus has been put in. The total cost of the erection has been £2,501, being 150*l.* less than was anticipated when the foundation stone was laid.

Birmingham.—The foundation-stones of a new Wesleyan chapel, situated in the Moseley-road, has been laid. The main block of the chapel building, which occupies 58 ft. by 84 ft., contains sittings for 500 persons, 20 in. being allowed for each sinner. The gallery is round three sides of the chapel; and behind the main building is the minister's vestry, which is fitted up with all necessary appliances. Over the vestry is an orchestra, and beneath, the cellar for the heating apparatus. School-rooms and large class-rooms are provided in two wings, standing in the rear of the chapel. The style of the main building is Italian, and it is executed in Birmingham pressed bricks, with stone dressings. The front elevation is imposing, having a frontage to Moseley-road of 68 ft., and an elevation of 46 ft. The entrance-doors, which are placed in the centre of the facade, are surmounted by cornices, and supported by six Corinthian pillars, coupled and standing upon moulded and pannelled pedestals; from the cornices rises an ornamental parapet. All the windows and doors on the elevation are provided with carved impostas, moulded archivolts, and carved keys. The whole facade is supported by Corinthian cornices, and an ornamental parapet. The framing of the interior is executed in red deal, stained and varnished. These will be the leading features of the chapel when it is completed. The cost of erection will be 4,325*l.* Messrs. Loxton, Brothers, of Wednesbury, are the architects; and Mr. James Chappelle, of Willenhall, the builder.

FROM SCOTLAND.

Edinburgh.—It is proposed to restore St. Giles's Cathedral in the High-street. The Kirk-session taking up the matter in a public-spirited way, have procured plans from Mr. W. Hay, architect, for carrying out the more extensive alterations that were pointed at. The design proposes, as a first step, the entire removal of the galleries and other fittings. The whole interior will then be scraped, so as to clear off the numberless coats of whitewash with which its stonework has been encrusted. A new porch of ornamental woodwork will be erected just within the doorway, and at the back of this, facing the great east window, will be placed the royal pew. This new porch is a conspicuous feature in the design, its enclosure being of oak panelling, suitably ornamented, and the screen behind, which forms one side of the porch, being divided into compartments, with shafts supporting canopies of perforated woodwork. In front of the royal pew are seats for the lords-in-waiting and royal officers; and from the front of these a passage is to be carried down the centre of the church to an inclosure to be formed immediately below the great window. Next to the royal pews there are, on one side of the passage, stalls for the City Magistrates, and on the other, stalls for the members of the College of Justice. The remainder of the area is fitted up with the open benches. In the central area, between the two rows of pillars, the seats are furnished with carved ends and ornamental panels, those in the side aisles being of simpler design. The pulpit, a structure of carved woodwork, is placed against the first pillar on the south side, and the wall-space under the great window is occupied by a reredos, showing eight Gothic panels, wrought in Caen stone. The plans have been approved by the various public bodies who have a right to be consulted in the matter. There remains the question—How to meet the necessary expenditure, estimated at something between 3,000*l.* and 4,000*l.* The *Scotsman* says it is clearly a case for an appeal to the general public, who are, or ought to be, interested in seeing the metropolitan cathedral of Scotland restored to a creditable condition. Such an appeal is about to be made. Operations are about to be commenced for the erection of the Trinity College Church on the site at the corner of Chalmers's-close, and the new thoroughfare, to be known as Jeffrey-street, now in course of formation. The plans for the building, as originally framed by Mr. Lessels, architect, embraced in their details various features derived from the ancient edifice, whose

remains have lain bleaching for a quarter of a century on the slope below the Regent-road. Lately, however, says the *Scotsman*, it occurred to those charged with the carrying out of the undertaking that a considerable portion of the old church might be reproduced in connexion with the new one. Mr. Lessels accordingly altered his plans so as to give effect to this idea, the method adopted being to join on at the back of the new church what may be regarded as a distinct building, constructed of the old stones, and preserving some of the finest portions of the original. Irrespective of this annex, the church will be an oblong structure, with its front and main entrance towards Jeffrey-street, and one side abutting on Chalmers's-close. The front view shows in the centre a gable, having its apex surmounted by a cross such as appeared in a similar position in the old church. Immediately under the cross is a circular cusped window, and below this again a large pointed window, with traceried head, after the design of that which occupied the end of the transept in the original building. On either side of the large window is a niche intended to receive a statue, and under it is the principal entrance, being an exact reproduction of the deeply-moulded doorway, with arch of Norman Gothic pattern, which formed a notable ornament of the former church. On the west side of the gable rises a square tower, in which the architect has introduced various features of his model. At the height of 70 ft. the tower takes the form of a broached spire, of octagonal section, which is relieved half way up with a row of dormer windows, and terminates, at the height of 115 ft., in a gilt vane and weathercock. On the other side of the gable, forming the north-east corner of the building, is a turret, carried up from the ground, and finished at the top with a stone roof and ornamental finial, in which, as well as in several other points, details of the old church are preserved. The frontage, including the tower and turret, has a width of 62 ft., with a height of 70 ft. to the top of the cross which crowns the central gable. In the west elevation, the tower shows a doorway giving access to the west gallery. At a meeting of the City Improvement Trust, Bailie Marshall objected to the plans and elevations of Chambers-street as too ornate, and not in consonance with the style of architecture of the College and Industrial Museum. He moved that the plans be remitted back to the architect, and that a plainer and simpler style of building should be adopted. Eventually the plans were approved of without a division. The line of tramway between Haymarket, Edinburgh, and Bernard-street, Leith, with loop line by St. Andrew-street, York-place, and Picardy-place, is now opened for passengers to Leith.

Glasgow.—The *North British Mail* mentions a proposal to construct a tunnel, with suitable approaches, under the river Clyde, at Finnieston-street, a central point for a large amount of traffic. The scheme is devised by Messrs. Story & Smith, C.E., and the works are designed for the accommodation of passengers and all other kinds of city traffic, and, if need be, railway traffic in addition. Messrs. Story & Smith propose to lay two iron tubes at a proper distance from each other under the bed of the Clyde, one for the north and the other for the south traffic. It is intended to provide each tube with a footway for passengers, a roadway for carts, carriages, &c., and a foot-space for the men having charge of them on the opposite side from that intended for ordinary foot-passengers. Provision is also made for the conveyance of water, gas, and other pipes in the tubes. Estimates are being made with the view of having the scheme submitted to the notice of such persons as are likely to be interested in it, more especially the Clyde Trustees. New music and assembly rooms are to be built at Glasgow. The new concert-hall is intended to seat from 2,500 to 3,000 auditors, with an orchestra for 600 performers, and a suite of assembly-rooms capable of admitting 250 couples. The total cost is estimated at 121,402*l.*

Dundee.—The Dundee Water Commissioners have decided, by a majority, to bring a new supply of water from Lunthraen Loch to the town by the direct route, and not, as was the alternative proposal, by the Monkrie route. The difference in the cost between the two schemes is estimated at about 130,000*l.* The Water Commissioners have resolved, by a majority of 11 to 8, to proceed this session with a Bill for this scheme, and to employ, in the room of Mr. Bateman, Mr. Stewart, C.E., Edinburgh; Mr.

Leslie, Edinburgh, to be consulting engineer. Plans, surveys, &c., have been ordered to be executed immediately.

Books Received.

The Model Dockyard Handy-Book. With numerous Illustrations. London: 31, Fleet-street. 1872. THE proprietor of "The Model Dockyard" seems to be an Admirable Oricthon. In addition to the many, varied, and beautiful objects fabricated under his personal direction, this interesting little book gives evidence that he is no mean hand at authorcraft. It embraces, in addition to a large amount of information of a popular character, in relation to the special objects of which it treats, detailed descriptions, illustrated, of sailing and steam vessels, and small craft of every variety; and of steam-engines, stationary and portable, marine, and locomotive; with drawings and descriptions of steam-crane and steam fire-engines. "The Model Dockyard" contains, we believe, actual examples, complete and finished, of all the numerous interesting objects enumerated and illustrated in the Handy-book, and also of the separate parts from which the sailing or steam vessels, the steam-engines, and the numerous other objects presented are constructed, and which are needed occasionally for repair. The Handy-book, and the Repository to which it is a guide, have evidently interested paterfamilias and his boys, twenty thousand copies having been taken during the last six years, in the four editions, each in succession enlarged and greatly improved, that have been published during that time.

Miscellanea.

Proposed Memorial of Dr. Priestley, at Birmingham.—A public meeting has been held at Birmingham, for the purpose of taking steps to establish a memorial of Dr. Priestley, the "Father of Pneumatic Chemistry." Mr. S. Timmins, F.R.S., was voted to the chair, and explained that it was proposed to purchase part of the site of the home at Fairhill, near Birmingham, where Dr. Priestley resided for eleven years. The building was burned down in 1791 by rioters, after which Priestley went to America. In the course of the proceedings it was stated that so hearty would be the response to the movement, that a sum of 3,000*l.* might be raised, and that the memorial should be made of a national character, by the founding of a Priestley Scholarship for the support of a student of science at some public scientific institution. Several gentlemen urged the desirability of erecting a statue to Priestley in the centre of the town. It was ultimately resolved that the memorial should embrace the three objects—viz., the purchase of a site, a scholarship, and a statue. A committee was appointed to carry the resolution into effect.

Metropolitan Improvements.—An important thoroughfare, consisting of three new streets, leading from the foot of Fleet-street to the western end of the Holborn Viaduct, was recently thrown open to the public. The streets, by name St. Bride-street, Shoe-lane, and St. Andrew's-street respectively, run by an easy ascent from Ludgate-circus to Holborn, and are, together, about a quarter of a mile long. A subway, containing the gas, water, and telegraph pipes, extends from end to end; while for the accommodation of the houses to be erected, vaults have been built on each side. The streets are about 40 ft. wide, and the footways have been paved with Val de Travers asphalt. The work has been carried out from the plans of the engineer, Mr. William Haywood, for the corporation of the City of London, by Messrs. Hill, Keddell, & Waldram, the contractors for the Holborn Viaduct, at a cost of about 45,000*l.* Mr. Lidstone was the clerk of the works.

The Whitechapel Baths and Wash-houses.—The first building of the kind erected was in Whitechapel. It was designed as a model, and by the time it was finished a debt had been incurred of some 3,000*l.* The debt has been reduced by half; but the building, after a useful existence of twenty-five years, is now closed, and is about to be sold to pay off the remainder of the debt.

Approaches to the Law Courts.—The Metropolitan Board of Works, at their last meeting, declined to accede to the request of the New Law Court Commissioners, that they would demolish the Church of St. Clement Danes, in order to widen the Strand, and thus improve the approaches to the New Law Courts. The Works Committee were of opinion,—an opinion endorsed by the entire Board,—that the making of approaches to a national building like the new courts of justice should be paid for out of the imperial exchequer. It was stated that the Government had already recognised this principle by expending 7,000*l.* in widening Carey-street, where it adjoins Chancery-lane. The Board further opined that no complete widening of the Strand could be effected unless the block of buildings at the rear of St. Clement Danes Church, and situate in Holywell-street, were demolished as well as the church itself.

Ware Power as a Motive Force.—Mr. S. B. Deverell, of Monks Gambia, South Australia, proposes to erect a shaft in any convenient part of a ship, passing through the upper deck and resting on a lower one, free to rotate either way. To the lower end he attaches a heavy body with its outer extremity supported by a wheel travelling on a circular rail. On the upper and above the upper deck he attaches two bevelled wheels with circular ratchets. These wheels are to be loose on the shaft. Between these wheels he places an arm proceeding from the shaft, and having rival pawls to gear into and work the respective ratchet and bevil wheels. He provides a bevil wheel fixed on the end of a counter shaft, to fit between and gear into both of the bevil wheels on the vertical shaft.

Iron Fronts for Buildings.—A building of a somewhat novel character has just been completed at Derby, according to the *Engineer*. The front of the structure, which has been raised for Messrs. J. & G. Haywood, ironfounders, &c., is entirely of iron, and has been manufactured by the firm. The designs for the building and the decorating and painting have been supplied by Mr. Owen Jones, of London. The building is of a very elaborate character, and presents a striking contrast with some of the shops to be found in other towns. The decorations and painting were intrusted to Messrs. Staton & Co., of Derby. It is stated that a very large trade is being done at the Thorncliffe and Chapelaton Ironworks, near Sheffield, in cast-iron window and door heads, as well as in general castings of this class, which are now largely used in buildings.

New Hall of Holywell Green Mechanics' Institute, Halifax.—This new hall has been opened by Lord F. Cavendish. The erection, which is built upon the site of an old school, is from designs by Messrs. Horsfall, Wardle, & Patchett. It is in the Italian style, and includes a large room, 60 ft. long, 30 ft. wide, and 18 ft. high. At one end is a platform, and at the other a gallery. Underneath this room are a news-room, smoke-room, &c., where games are provided; and on the basement story are kitchen and other conveniences. At the entrance to the large hall is a small cloak-room, and a hoist is provided, by which, in case of tea-parties, &c., provisions may be sent from the kitchen to the large room; which is lighted by sunlights. The institute are indebted to Messrs. John Shaw & Sons for their new hall.

Rebuilding of Surrey Chapel.—It appears that, in consequence of the lease of this well-known place of worship, of which the Rev. Newman Hall is now the minister, being about to expire, the probability is that it will shortly be taken down; and this being so, it has been determined to erect a new edifice in the neighbourhood, which is intended to be of much larger dimensions. A site has not yet been obtained, but it is expected that one will shortly be secured close to the present building, which is one of the main objects desired. Already 10,000*l.* have been raised towards the rebuilding fund; but a still further large sum is required before the new building can be commenced, the estimated cost of the intended new structure, including the land, being little short of 20,000*l.*

Water Power with Mountain Tramways. Mr. William Sanderson, C.E., is engaged at present in making experiments with the object of trying how far it would be possible to utilise water-power on the Himalaya Mountains in connexion with the light mountain tramways.

Amotherby, Malton.—In pulling down the old church here two Anglo-Saxon crosses, several parts of other early crosses, three grave-covers with foliated crosses, and an effigy of a knight in good preservation, were found, and have all been preserved. The grave-covers are of the fourteenth century, and their existence in the old walls was unknown. One bears a Norman French inscription, "Ic git William de Bordeuden. Priez sa lame." The Bordeuden family held possession in the district in the reigns of the three first Edwards, and it is thought probable that the effigy is of one of the family, the shield being barry of sixteen, charged with three boars' heads. The knight is in armour, with surcoat and sword, and spurred feet, resting on a lion couchant.

Polishing Metals.—The object of the invention of Mr. H. S. Sanderson, of York-road, Lambeth, is the preparation of blacklead ready for use in a liquid state. The composition adopted consists of blacklead, such as is used for polishing stoves, and for other uses, combined with turpentine, water, and sugar, or saccharine matter, and the proportions which have been found to answer well are to each pound by weight of the blacklead one gill of turpentine, one gill of water, and one ounce of sugar; but these proportions may be varied, and in some cases all the ingredients are not necessary.

Smelting Iron Ore by Steam.—A process, the inventors of which claim that iron ore can be reduced without the admixture of coal or the use of the blast, is noticed in the *Iron Age*. The peculiar process consists in conducting a volume of steam, at the same pressure as that of the ordinary blast, into and over a coke fire, there decomposing the steam and reducing the ore by the additional heat, while sulphur and phosphorus are eliminated by the hydrogen, in the form of sulphuretted and phosphoretted hydrogen.

Costly Follies.—It is stated that the ancient city of York is to have the proud distinction of possessing the largest railway station in England. It is to be built by the North-Eastern Railway Company, at an estimated cost of 200,000*l.* Two or three years have been spent in perfecting the plans, which have now been sanctioned by the directors. Six per cent. on this expenditure shows a rental of 12,000*l.* a year, without the cost of the land!

Elveden Hall, Suffolk.—Mr. G. Mitchell, of Brompton-road, says as to Elveden Hall:—"The chimney-pieces, marble fenders, stoves, and tile hearths, were manufactured and supplied by me to the Maharajah Duleep Singh's own designs; and by a singular coincidence an illustration of one of the said designs has been placed by your printer in my last week's advertisement in the *Builder*."—Mr. Holeyman (not "Holman") was the decorator engaged.

Pneumatic Despatch.—The reading of papers on pneumatic despatch tubes at the Institution of Civil Engineers, showing the progress that has been made in this mode of transmission, has naturally led Mr. Frederick Gye to allude to the suggestions in this direction made by him in our columns many years ago. His communication will be found in our volume for 1855, at p. 603, and his original proposition was dated 1845.

The Society of Antiquaries.—An exhibition of Stone Implements (Neolithic and Savage) will be held at the Society's apartments, from Thursday, December 7, to Thursday, December 14, 1871, inclusive. It will be opened at the ordinary evening meeting, December 7, when a paper will be read by Mr. John Evans, F.R.S. On the 14th, papers will be read by Mr. A. W. Franks and Col. Lane Fox.

Proposed Friendly Societies' and Public Hall for Stratford.—A meeting has been held to promote the erection of a 'Friendly Societies' Building and a Public Hall at Stratford. A large room for public meetings, concerts, &c., to hold 1,000 persons, at a cost of 7,000*l.*, is the programme. A committee was appointed to carry it out.

Congregational Memorial Hall.—The Committee of the Memorial Hall Fund have agreed on plans prepared by Mr. John Tarring, architect. The building will occupy a large frontage in Farringdon-street, part of the site of the old Fleet Prison. The cost of the freehold was 25,000*l.*, and the hall and offices, it is stated, will cost as much.

Railway to the Albert Hall, South Kensington.—Parliament is to be applied to next session for the incorporation of a company to form a short railway from the ring line, or metropolitan and district railways, near the South Kensington Station, to the Exhibition buildings and Albert Hall. Application is also to be made for power to form a subway from the South Kensington Station to the Albert Hall.

Tramway Traffic.—The extent to which the tramway traffic in South London has grown can be judged from the fact that in connexion with the Blackfriars and Westminster lines to Greenwich, Camberwell, and Brixton, forty-five cars are daily running.

Temple Subway.—Application is to be made to Parliament for the incorporation of a company to construct a subway across the Thames, from east of the Temple Station to Princes-street, Commercial-road, Lambeth.

Drawing in Oxford.—Mr. Ruskin has offered to give to the University of Oxford the sum of 5,000*l.* sterling for the endowment of a Master of Drawing, in the University galleries.

Society of Painters in Water-Colours.—The tenth Winter Exhibition of sketches and studies by the members of the Old Society is an agreeable collection of 381 works.

TENDERS

For enclosing, laying out, and detaining an extension of the burial-ground, Dagenham, for the Dagenham Burial Board. Mr. E. C. Allam, architect. Quantities supplied:—

Potter	2486	0	0
Holmes	388	0	0
Bagdod	375	0	0
Kirk	369	0	0
Goodlaw	362	0	0
Hughes	352	0	0
Barwell	349	15	0
Hull (accepted)	325	10	0

For villa residence in Hook-road, Surbiton, for Mr. W. D. Hughes:—

Spearing & Stewart	2613	10	0
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For house and laundry at Cliftonville, for Mrs. Smith, Mr. Wm. W. Edridge, architect. Exclusive of party and boundary walls:—

Blackmore & Howard	2570	0	0
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For roads and sewers on the Milkwood Estate, Brixton, Messrs. Wm. G. Habershon & Pite, architects:—

Wilcox	25,786	0	0
Thompson	2,693	0	0
Taylor	2,683	0	0
Elmore	2,610	0	0
Pearson	2,598	0	0
Young	2,560	0	0
Goodair	2,332	0	0
Haynes	2,301	0	0
Mayo	2,289	0	0
Clark	2,292	0	0
Keeble	2,158	0	0
Jarman	2,037	0	0
Bloomfield	2,148	0	0

For alterations, additions, and new counting-houses to a warehouse, Wood-street, City. Mr. Herbert Ford, architect:—

Hill, Keddell, & Waldram	25,500	0	0
Browne & Robinson	3,180	0	0
Meyers & Son	3,124	0	0
Conder	3,109	0	0
Stimpson	2,887	0	0
Hessauw & Co.	2,985	0	0
Ruddle	2,984	0	0
Brass (accepted)	2,695	0	0

For addition of wing to the residence of Mr. H. W. Maynard, Wimbledon. Mr. A. R. Barker, architect:—

Farnous & Townsend	2710	0	0
Colls & Son	2607	0	0
Pocock	625	0	0

For alterations to shop, Broad-street, Hanley. Messrs. R. Scrivenner & Son, architects:—

Woodbridge	2325	0	0
Barlow	267	0	0
Barley (accepted)	294	0	0

For villa, Stone, Staffordshire, for Mr. S. J. Mountford, Messrs. R. Scrivenner & Son, architects:—

Freskley	21,664	0	0
Woodbridge	1,569	0	0
Barratt	1,557	0	0
Coker	1,440	0	0
Barlow	1,440	0	0
Whitmore	1,397	18	6
Timmins (accepted)	1,325	0	0

For medicinal furniture, for Duwood Lodge, Staffordshire. Messrs. R. Scrivenner & Son, architects:—

Chamberlain & Co.	2363	3	0
Messrs. Edwards (accepted)	343	4	7

For cottages, Dreaden, Longton, for Mr. W. W. Cope, estate:—

Newton	2715	0	0
Inskip	698	0	0
Harvey	691	0	0
Collis & Hudson (accepted)	690	0	0

For parsonage, Oulton, Staffordshire. Messrs. R. Scrivenor & Son, architects:—		
Cooke.....	£212	0 0
Barratt.....	500	0 0
Whitmore.....	539	13 6
Barlow.....	529	0 0
Freakeley.....	443	0 0
Ratcliffe (accepted).....	430	0 0

For houses, Lower Norwood, for Messrs. Courage & Co. Mr. Geo. Elkington, architect:—		
Holgate.....	£2,621	0 0
Kirk.....	3,484	0 0
Kept.....	3,437	0 0
Mitchell.....	3,432	0 0
Thompson.....	3,278	0 0
Devain (accepted).....	2,876	10 0

For the erection of buildings, for the Industrial Class at West Kensington, for Sir Ralph Howard, Bart. Mr. Thos. Archer, architect:—		
Allen & Son (accepted).....	£1,390	0 0

For alterations to wine-vaults, Pelham Arcade, Hastings, for Messrs. Ellis, Wilson, & Ellis, Jeffery & Skiller, architects:—		
Hughes.....	2,650	0 0
Farks.....	548	0 0
Bridgland & Others.....	540	0 0
Rodda.....	515	0 0
Vidler (accepted).....	510	0 0

For roads and sewers, Spencer Park Estate, Wandsworth, for the Right Hon. Earl Spencer, Messrs. Beeson, Son, & Breton, architects:—		
Harris.....	£1,199	0 0

Aties & Co.....	1,198	0 0
Parsons.....	1,175	0 0
Wigmore.....	1,155	0 0
Chappell.....	1,150	0 0
Yasi (accepted).....	1,100	0 0
Adamson & Sons.....	950	0 0

We have been requested to state that the tender of Messrs. Adamson & Sons, for new buildings in Ryder-street, St. James's, under Mr. John Wimbale, has been accepted at £5,400.

TO CORRESPONDENTS.

R. M.—P. E. M.—S. S.—L. H.—T. A. H.—J. K.—C. R. S.—R. W.—A. Pedestrian.—B. F.—Co. Co.—D. G.—B. R.—S. L.—A. N.—R. F.—N. H.—R. B.—Col. J.—A. A. Corrovia.—J. S. F.—W. B. W.—R. M.—P. T.—R. M.—J. L.—R. L. R.—F. H. S.—J. W. R.—T. G.—H. B.—A. R. P.—R. H. P.—C. M. (see "History of London," published since that date).—J. A. (as a rule, in measuring joiners' work, the superficial measure is to be taken; tennas are considered in the price).—A. C. (next week. Our statement is correct).—S. H. (see the *Builder* of last week).—A. H. (send address).—W. H. R. (next week).—M. & H. T. (next week).—R. F. (next week).—R. F. (next week).—C. C. H. R. (next week).—Cement and iron (next week).—Weakley & Co. (next week).—

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

NOTICE TO SUBSCRIBERS.

Advertisements cannot be received for the current week's issue later than **THREE o'clock, p.m., on THURSDAY.**

NOTICE.—All Communications respecting Advertisements, Subscriptions, &c., should be addressed to "The Publisher of the Builder," No. 1, York-street, Covent Garden. All other Communications should be addressed to the "Editor," and not to the "Publisher."

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VOL. XXIX.—No. 1504.

The Development of Greek Architecture.

THE Ionic order and details are under still more, much more, decided obligations to Asia than the Doric to Egypt, and naturally, inasmuch as they passed from Persia or Asia Minor to Greece

already replete with motives derived from the applications of carpentry that Egypt entirely failed to supply. Consistently again, therefore, the Ionic style affected from the first and persisted in lighter proportions than the Doric. It has appeared, or, at least, been very plausibly inferred from representation on the vases, and one exemplar structure at Selinus, that when the features of the stone structures of Egypt in column and cornice were first applied by Greeks they were wedded by them to the lighter forms of their own timber precedents so far as the new material would allow. But this was not permanently, nor, indeed, can we suppose for long. The more limited scantling available for stone on the one hand enforced contraction of intervals absolutely when stone alone was to be employed, and Egypt, moreover, could scarcely be taken into counsel in art without impressing peremptorily a consciousness of the dignity that resides in heavy masses and bold contours and crowded ordination; and so against the Selinuntine temple and the vases we have to place the contrasted archaic proportions of the first Parthenon, and of the temple at Corinth. The Greek knew how to select the most cumbersome forms of wooden construction to be harmonised with the more massive style of the Egyptians, and turned to forms in favour with the genius of the versatile colonists of the Eastern coasts, to find expressions for lighter and less awful associations. And here the problem that he encountered was still essentially the same,—to transfer into masonry details that originated in carpentry, and that, apart from recommendations of elegance, had too strong hold on use and habit to bear to be dismissed,—and then to transform these to such an extent that no crude betrayal of origin should be extant,—that metamorphosis should be so complete as to assert itself as fixed and final,—and to reduce all to those rules of simple repetition and symmetry that are indispensable for architectural repose.

In following forth the timber construction of a simple trabeate chamber, we saw how the flank would present a wall-course equivalent to an architrave, and above it an interspaced series of ends of beams,—the prototypical triglyphs, while at the ends the architrave would be covered by the extended side of the beam,—representative of a continuous unbroken frieze. It would manifestly be quite as consistent for a representation of such an arrangement to be carried completely round, and so supersede the display of ends of beams on the flanks, as for itself to be superseded in favour of triglyphs repeated along the front in defiance even of the incongruity of a beam at the angle being implied to extend in both directions. The small Ionic temple on the Ilyssus presents the type of such

an entablature above an architrave not divided into the fascias that had an independent origin.

Let us suppose now, to keep still to the simplest example, that the entire front of our typical chamber is left open from wall to wall, being spanned above by the single beam. This beam has now for the front the function of an architrave, although ranging and on a level with the frieze on flank, which there is neither reason nor opportunity for repeating above it. The walls that support it exhibit in front the section of the wall-plate below the transverse beams, and it is surmounted consistently either by a cornice immediately, or by the visible and projecting ends of horizontal purlines of incomparably smaller section than its own. The wall ends may be left or treated as antæ or superseded by columns indifferently; in either case a combination results that again may be returned upon flank in architecture of masonry uniformly, and is distinguished as curtailed of one member,—the intermediate frieze. The rock-cut architectural façades of Lycia, as represented in Texier's work, exhibit this form with most glaring indications of its origin. It is repeated, with abundant Hellenic enrichment and elaboration in the Ionic heroon of Xanthus, of which the architectural and sculptural fragments are in the Lycian Room at the British Museum. The order here was without a frieze; in compensation the architrave was, in contravention of all fitness, charged with sculpture. The archaic Doric temple at Assos,—a rare example in Asia,—though with a regular frieze and sculptured metopes, exhibits the same provincial solecism of a sculptured architrave; it is now in the Louvre. The frieze is also wanting in the Ionic entablature of the Pandroseum at Athens, but compensation is there obtained consistently with elegance by unusual elaboration of the cornice on the one hand, and then by the graceful dignity of the columnar maidens.

The Lycian monuments enable us to follow very accurately the origin and development of the course of dentils that replace, in Ionic architecture, but in no way represent, the mutules of the Doric entablature. Many rock-cut tombs occur that are pure representations in stone of unqualified carpentry, and present the very combinations that are still employed in native constructions. Others exhibit imitations of an architectural masonry that was itself a more or less modified imitation of woodwork. We recognise without difficulty a layer of small cylindrical poles disposed across the architrave as close together as possible; in the regularity of stone imitation they are all alike and even, and in exact contact. A continuous course above, of single or several ledges, represents a border or framed coping of squared timber that retained a layer of earth pressed down upon the flat roof so hard as to exclude heat and moisture. In the Lycian Room at the British Museum will be found a fragment of such a cornice or entablature, so to call it,—the cylindrical members surmounted by what is rather a heavy triple fascia than a mere coping of superimposed planks. The close-set circles on the architectural fragments from Mycenæ, of structures which mythology, if we may not say tradition, ascribed to Lycian builders, are manifest reminiscences of this style of construction, and the more open circular plates or discs upon the upper fascia of the architrave of the Pandroseum may have like relationship, only one degree removed. In some examples we see the series of cylinders closed at either end by a squared rod of like diameter, and in later forms their places are taken throughout by such rods which project with intervals between them, and appear as proper dentils. This is a feature which is thereafter never or rarely absent from the Ionic of Asia Minor. Marks on the under side of the cornice of the Xanthian heroon proved that they had been applied there, though

none were found,—at least, none were recognised and brought to England. It may be noticed in passing that the picture of this structure by the discoverer, on the base of the model, is a false restoration; it will be found corrected, with authentic measurements, by E. Falkener, in his *Museum of Classical Antiquities*. In passing also it may be regretted that the energy for acquisition that is happily vigorous in the National Museum should not be seconded by some national provision for adequate publication of the treasures acquired,—acquired in trust for the whole world of art and letters. Neither from individual students nor popular publishers can we expect engraved records of all the architectural fragments of the Mausoleum that, until engraved, might for all purposes of even home study, not to say foreign, be just as well still buried in a marsh or built into a wall at Badrun. To return:—

There is still another combination of these simple elements that is worth observing, for the sake of the mark it has left on architectural history, though it never commended itself to the taste of the Greek during the better ages of the art. The transverse beams may be made to rest immediately, not on a wall, but on a series of independent supports,—on columns. Upon this supposition, the ends of the typical chamber are to be regarded as closed, and the flank open, presenting a range of columns, on the summit of each of which would appear the end of a beam covered again by the continuous timber ledge. Thence derived the ordination of the rock-cut tomb of Darius, where the equivalents of beam-ends or triglyphs rest on the hollow backs of double-bull capitals. The plain die that is constantly placed upon enriched Egyptian capitals, had, there can be little doubt, a similar origin. It began as the end of a main beam that carried a roof,—afterwards lost its prolongation behind, like the Greek triglyph, and even suffered the further derogation of being formed out of the same stone as the member above it. The heavy abacus block of Byzantine architecture so constantly interposed between capital and archivolte had no other origin. So when we study the transformations that produced the Romance churches on the Rhine, it soon breaks upon us from some more marked example, that a member more or less bold above the capital is, in fact, all that remains of the atrophied Roman architrave,—for the most part an exaggerated moulding of the architrave band. And is it not before our eyes in many a church in London, how the Roman column advanced below a broken and returned entablature,—advanced as it gained confidence still further, and brought away with it, to stand free all round, an entire segment of the entablature? The nearest approach to an application of this motive in Greek architecture within the limits of its purest period, is the peculiarly developed abacus, by recognising which Mr. Cockerell so happily completed the internal column at Bassæ.

As regards the column, we find its essential parts and characteristics recognised in a general way in almost all architecture of all countries, civilised or barbarous,—of the New World or the Old. The flat plinth, the diminishing shaft, the capital and abacus, may be recognised in rudimentary forms among hut-building savages of all climes: among the qualified barbarians of military or sacerdotal empires,—of Assyria or Egypt,—we find these forms elaborated with considerable sense of ornamental effect that was not the less unappreciated by the Greek, because in correcting his own ideal of their functions and appropriateness of expression, he made no scruple of altering them in every detail, or of reversing them, as readily as,—with one degree less of license,—he sometimes omitted all altogether. The slender Doric column of the Greek vases has invariably a flat plinth, like the Egyptian columns invariably, whether

slender or bulky; but it is as invariably omitted in the monumental Doric that has attained to full consciousness of majesty and full proportions of massiveness. The suggestive model of the Ionic voluted capital is clearly recognised upon Assyrian monuments, and with much more exactness than in the overwrought and fantastic combinations of Persepolis. But even in Assyria the forms appear to have become already so conventionalised that we are hopeless of gaining a hint for tracking them backwards to any simple constructive principle or contingency.

The Greek, it is most certain, took no care to penetrate to the obscure motive hidden in barbaric history and the night of ages; but he caught with eagerness at a form that he perceived was susceptible, for all its crudity, of becoming a vehicle of refinement and elegance, and conferred upon it an expressiveness from his own resources in lieu of the worn-out or lost, that may easily have been entirely new, and quite as easily an unconscious revival.

Although it were possible to resolve the forms of Greek architecture far more extensively, not to say satisfactorily, into details and contingencies of primitive construction, it should still be understood that the interest of the result is chiefly archaeological, or at best historical, and is not by any means to be rested in as an explanation of Greek architecture—as accounting for the ultimate combination. All that is most important in this was due, as all architectural excellence must be, to a rare conjunction of artistic sensibility—sensibility to beauty,—with philosophical or scientific thought. We are too poor in store of the earlier precedents of the Greek styles to be able to trace the course of these formative influences as precisely as we follow them in their work, when centuries after they were co-operant again—and again selected original crude forms, or forms once refined that had become degraded into crudity, and endowed them with a novel energy of life, and re-created them as the Gothic style.

But that such were the truly vivifying and organising energies in either case is at least not likely to be doubted by artists and architects, however they may be underrated or overlooked by critics of Greek development in this or any other direction, who are too unfamiliar with the difficulties of educating Beauty—that, *χαλκὴ τὴ καλὰ*. In the beauty of the language of Greece, which I have already referred to as having much analogy in its development with that of its architecture, we may consider the formative influence of the æsthetic sense to have operated almost purely. Language, in its stages of development, is modified almost unconsciously—man did not contrive words, and plan syntax while they were altering both every day—at least from lifetime to lifetime. The result in Greek is a language in which, for example, there is no name for a single abstract quality that is not so agreeable that it may not be welcomed in use as a personal appellation. It sends, then, a cold shudder through one to read in Lectures on the Science of Language (Max Müller, p. 179), that the Greek sense of euphony—their abhorrence of successions of sounds offensive to delicate ears, "was nothing but laziness"—"to economise the muscular energy, beginning from the abdominal muscles, and ending in the muscles that open the glottis to its widest extent"—"the result of muscular effeminacy." Admitted it must be that no such weakness can be imputed to the ears to which the word Professor Zieher is cited on the same page "as anything but an unpleasant sound."

There is an etymology of architectural members as there is of words—and the study of it is no less involved in one case than in the other,—has the same difficulties and the same rewards,—has to be pursued by parallel processes,—and under guard of the same watchful precautions. The meaning of an architectural member may diverge as far from its primitive as that of a word—and the changes of form in one case, whether meaning varies or not, may be as extravagant as in the other. When the meaning has remained unaltered, the interest lies in re-tracing and recognising the successive stages of "phonetic corruption" of the word—the lecturer had better have said "phonetic alteration" where improvement is always a possibility—the laws and characteristic powers that brought it about, and at last in identifying the primitive form, and detecting, if possible, some natural connexion between the sound and its meaning. In this set of changes, the most conspicuous influences will often be extraneous to the exact original meaning, but never independent of re-

ference to any meaning whatever; they may be such as the requirement for greater brevity or celerity of pronunciation or inability of a new tribe or family to pronounce particular letters, as architecturally a member is modified for cheapness, for material, for want of artisans of skill, or for new applications. But even so as reference to and sense of the meaning, original, derivative, or transferred, lives on throughout, this sense will continue to operate all through; and even as a significant propriety ruled at the first invention of an architectural detail or adoption of a word, so will it continue to operate and influence change in one direction rather than another,—and so leave certain not casual but characteristic impress on even the most metamorphosed form.

Our other factor has been hidden to stand by, as unceremoniously as unreflectingly. The features of Greek architecture, or, indeed, of any other, are as little capable of assuming beautiful expression, even after their order of distribution has been determined, as the features of the human face, unless controlled by some principle, unknown it may be, and difficult to evolve, but certain not the less of governing, proportion,—of definite ratios between commensurables. Accident, guesswork, selection from mere tentative attempts may be all that come into question in subordinate works; but in the highest of all, where the harmony moves on throughout without breach or lapse of quantitative propriety, some more conscious and digested study must be assumed. There may be difficulty in recovering the principle, but its existence is palpable, in its consequence the result. We must not be satisfied to evade the problem in these terms, which we find, in the recent work, in so many respects as meritorious as laborious, of Adolf Michaelis, on the Parthenon. "Many attempts have been made to formulate in numbers the proportions of the individual architectural members; But the proportions obtained are, for the most part, so complicated, and of such different nature as between different parts of the structure, brought into comparison, that it is difficult to recognise an intention among them. Perhaps the captivating impression of the general proportions of the structure (it is pleasant to find this admitted) reposes precisely on the fact that they have no commensurable numbers whatever as their basis."

It is not in this spirit that the topic is adverted to either by Mr. Fergusson or by Sir Digby Wyatt in his Slade Lectures.

ORNAMENTAL DESIGN IN THE WORKSHOP.

In spite of the tendency of popular taste, in regard to ornament, to run in mere grooves of fashion, it is unquestionable that of late years there has sprung up among some, at least, of those who build and furnish houses, a progressive desire for something better and more intellectual in the way of decoration than is furnished by the ordinary dealer in furniture, plate, and other household accessories. There are those who are desirous to have the interior, as well as the exterior, of their habitations artistically treated; and, consequently, it not unfrequently happens that the architect is called upon to design furniture and other items for his client, in addition to his more special duties in planning and superintending the building. As, however, it is manifestly impossible, from considerations of time and money, that this special designing and manufacture of *meubles* for each individual case can be indulged in very largely, it becomes the more important that taste in the workshop itself should be so refined and educated that there may be a chance for the purchasers to obtain really artistic and well-wrought articles ready-made; and every effort to promote such artistic training of the workman and manufacturer cannot but meet with our sympathy and encouragement on this ground alone; besides which, the taste of the manufacturer and his artisans precisely governs that of the large class of persons who buy without thought or care, except for durability and "money's worth," and who take what is put before them, without asking questions, so long as it is what is fashionable. Could we secure the prevalence, therefore, of a pure taste in design in our workshops, we might see the houses of the middle classes artistically furnished, even against their own will,—a consummation which is at some distance yet. In the meantime it becomes a sort of duty to take special note of all publications which

aim at effecting improvement in these matters, in order both to draw attention to what is of value and to exercise a little critical judgment in what may be falsities or failures therein.

We have before us some four-and-twenty numbers (new series) of a periodical, published monthly, with this object, in six languages (we are not told which six), under the title, in its English dress, of *The Workshop*, and under the editing and conduct of "Prof. W. Baumer, J. Schnorr, and Others."* This consists mainly of engravings, well and clearly executed, of many varieties of ornamented or ornamental objects in many varieties of style,—sideboards, gates, railings, cups, bookcases, &c., in Greek, Roman, Gothic, Renaissance, Modern French, and other types of style. Each number is preceded by a short essay on some subject connected with ornamental design, such as "Comparative Views of Productions of Art Industry of the Present Day;" "The Structure of the Candelabrum;" "Crystal Manufacture and Jewelry;" "Value and Importance of Ancient Models;" and so on. As these, when not ostensibly written by Germans, manifestly emanate from the German school of art-criticism, it is almost needless to say that they are, more or less well and thoughtfully written, and that the criticisms contained in them are logically deduced from fixed and, as far as we see, perfectly true principles. To secure the artisan on both flanks (so to speak), the theoretical and the practical, there is further appended to each number a sheet of large-sized working details of some of the principal objects figured in the numbers. In short, according to the statement in the prefatory note, the work may be considered "as a practical and decorative work of art" (on art, we suppose is intended), "furnishing specimens, with working details, for all branches of art industry and trade manufacture. The designs, executed in the first style of art, in all cases where not original, are copied from the best existing examples, both English and foreign, by which the artist and manufacturer have presented to them a combination of all styles extant." This is a very extensive programme; and one is inclined to doubt, firstly, whether it can, and secondly, whether it ought to be fully carried out. As it was said of a great though rather artificial English poet,—

"He more had pleased us had he pleased us less;" so we are minded to say of Messrs. "Baumer, Schnorr, and others,"—

They more had given us had they given us less.

In the essay prefixed to the first number of the original series, entitled "Our Present Need," the editors set forth their general aims as to the chief deficiencies of modern decorative art, or rather the causes of said deficiencies, and the means of remedy. We have got, as they truly say, into a method of copying by turns all the styles of all former ages and countries, but with no final result as to the working out of any one of them. We have "lost the true principles of art;"—"lost sense and feeling for true beauty of form;"—"we ignore even the simplest dictates of common sense, viz.—that every vessel, every article for necessity, comfort, and luxury, has some distinct rational form;"—"that each material is marked by certain artistic qualities which must be brought into characteristic shape, into the requisite forms of expression." What is the remedy? "The eye can only be educated by exercise of sight, by repeated contemplation and study of the beautiful. Where are we to find this? Not in Nature alone; not at least in such a manner as to be of immediate use to the artist. To become a master of his art, his task must be to subdue even Nature herself by conventional rendering of her types, and this he will learn by turning to existing works of art, the relics of the past, and exercising his eyes and understanding upon them." These sentiments seem in the main so virtuous as to claim and compel our total assent; only when we examine the collection of designs placed before us for the exercise and feeding of this dormant artistic faculty, we find we are expected to be a little too omnivorous—for a healthy growth of taste, at least. The editors make a point, as we said, of having presented the artisan with "a combination of all styles extant;" and elsewhere they express their scepticism as to the result to be obtained from selecting any single past style as a starting-point to work from. But it seems rather paradoxical teaching to infer that, because no art has been evolved from a study of any one style, it may be evolved

* London: James Hagger, 67, Paternoster-row.

from a study of all together. The editors recognise certain principles and irrefragable laws in artistic design; why not therefore confine the artisan's studies to those styles and specimens in which these laws are conformed to? Why place before his eyes a collection of specimens including some of the most faulty and unprincipled forms of treatment that can be? Why engrave what is bad in taste, and contrary to the principles enunciated? Are these specimens intended as a warning of what to avoid? Or is it that the editors, like some other people, have a better theory than practice? At all events, while noticing some very good things in the publication, we are compelled also to point out some very bad ones.

In the matter of furniture, the designs under notice being mostly the product of German taste, we find a very different type from that which at present characterises furniture made from the designs of architects in England. We have two designs, certainly, from Mr. Waterhouse, for a buffet and a sideboard (pp. 317 and 330), in the solid heavy style, peculiarly fitted for designs in hard wood, which has become habitual with some of our architects; the first mentioned of the two is, for a simple thing, one of the best in the book; and is, like other productions in the same manner, a thing that would look better in execution than in drawing; contrasting in this respect with many of the productions of the Continental Renaissance schools. On the other hand, it is on the whole a relief to turn over a book of this kind without coming upon any of these orohety, angular, *bizarre*-looking concerns which pass for "Gothic furniture" with some of our young enthusiasts. Unhappily we are not without flagrant specimens of bad taste in the opposite, what may be termed the meretricious direction. If "naturalism" is wrong, how are we to forgive such a sideboard as that at p. 10 of the old series, with its raised ornaments of knots of carved fruit and fishes, in the middle of the panels? The foot-note points out that these may be "suppressed" if a simpler treatment be preferred: we wish such things were all "suppressed" in good earnest. There are other specimens of the same taste at page 7 of the new series, and elsewhere—festoons and satyrs and scrolls. If those are not "*rococo*," Messrs. Editors, what do you include under that term? There are among the more ornate designs better things than these, less weak and common-place in treatment, as the cabinet and mirror, page 8, and the chimney-piece and mirror, p. 91; this latter is a very sensible, pleasing, and well-proportioned design, though made up in the main of very well-worn features and details. But we will here inculcate a lesson on the supposed "artizan" student, which the editors have neglected to inculcate; viz., that too much ornament, in such things as sideboards and the like large pieces of furniture, is an error easily fallen into, and which defeats its own object. It is much better to see a little refined ornament thoughtfully applied than to see an object encrusted with elaborate carving, leaving no plain spaces for contrast; the work for the hand may be in the latter, but the work for the mind is in the former, generally at least. In this collection, certainly, the plainer pieces of furniture are mostly the best; as, for instance, the oak buffet on p. 10 (very well suited to the material, and which, carefully executed, would have both a refined and solid appearance), and the book-case, p. 245, the details of which are rather poor however. A carved bench "in the Hall of the Railway Station, Stuttgart" (p. 39) is very good,—a solid without being clumsy. Page 185 shows us a good console-table and picture behind; the glass frame treated with a quiet, conventional, well-considered ornament, which is very satisfactory. On p. 219 is about the best design for ordinary chairs in the book; none of them are very good,—sharing the common fault we see in nearly all chair designs, that when any attempt is made to give them a solid, stable appearance, the legs are made the lightest and thinnest part of the structure, whereas they are just what should be the heaviest. We like to see a chair and a table stand firm on their feet; but it is a gratification, small as it may be, seldom to be enjoyed. A cabinet by Herr Steffan, architect, Munich (p. 380), shows quiet and tasteful treatment in a rather old Renaissance style: it looks very well in the drawing, but we fear would be but tame in execution; engravings shaded in line in this way are very flattering to this style of design. A *tabouret* in the Pompeian house built for Prince Napoleon, looks a very good bit of furniture, solid and graceful at the same time; but this,

again, is a type of article which gains in illustration.

Of the specimens of ironwork shown in these volumes, it is noteworthy that the wrought-iron work is nearly all of an excellent type of design, the cast iron in nearly every case villainous. It is certain that the processes employed in wrought work, and the methods of putting the metal together, are far more in accordance with the artistic capabilities of the material, and tend to bring them out more than casting can ever do. Indeed, all surface-work and relief comes out so coarsely in cast iron, that we opine the only thing that should be attempted therein is in the way of plain square sinkings to define form, without any attempt at delicate variations of surface contour. But the specimens shown in *The Workshop* are simply vulgar; castings of elaborate scrollwork and naturalistic foliage; and at p. 103 are some panels which are quite outrageously bad to have place in such a work, patterns formed of intertwined boughs and leaves imitated in iron. The nearest attempt at a specialty of treatment is in the balustrade of the new railway bridge at Mannheim-Ludwigshafen (p. 174), which is conventional enough, but not, we should think, with the kind of sections and mouldings for making much of the material. The specimens of wrought-iron railing and panel-work are all of a more or less Classic type, with flowing lines, but treated with perfect regularity and symmetry, and all of them, unless we except the semicircular door-head grille from Vienna (p. 159), of unexceptionable good taste and elegance; and it is gratifying to see proof that this kind of work can be used in harmony with Classic design with just as much beauty and truth as in the Gothic style, with which it is usually associated with us. It may be worth remark, that in the German examples given, so far as we judge from the drawings, much less of riveting and piecing is observable than is common with some of our most popular metal workers. A wooden railing (p. 268), though a good design, is too light, and much more suited to cast iron than any of the designs given for that material. There are also sundry designs for perforated ornamental work in wood, a style of work effective and inexpensive, in which we have often pointed out that more might be done among ourselves. The French, from whom these designs are taken, though using this class of work, have not managed to make much of it in the matter of grace and elegance of line and design, so far as we have observed.

It is disappointing to find, among several rather elaborate designs for ceilings, so much repetition of commonplace and over-ornamented treatment,—mere panels and scroll-work. One specimen (p. 139) is better than others in this respect, the main lines of the composition being well arranged, and the ornament, though in profusion, kept very flat and unobtrusive; apparently intended to be in colour rather than relief. Among ornamental designs coming more immediately under the head of architectural decoration are a great variety of specimens of carving (foliage, &c.) from different periods,—Greek, Roman, Gothic, and Renaissance, mostly very well given by the engraver. Among these objects one can scarcely pass without comment some of the details of M. Garnier, from the Paris Opera-house: though anything but pure in taste, it is impossible to deny to them a spirit and individuality of treatment, in their own way, not very common in modern architecture. The pilaster capital at p. 5 is particularly clever. Some modern pillar capitals (p. 167) "in imitation of the Rhénish type of Romanesque capital" are suggestive, No. 9 especially, of novelty of treatment in a feature where novelty is rather needed; and a very good suggestion in the way of a monument is contained in that to the memory of the poet G. Schwab, by Prof. Baumer (p. 12), where a kind of heavy square pillar, on a plinth, terminates in a quasi-capital, with laurel wreaths and a lyre worked on the face, which is surmounted by the poet's bust. Despite the festoon unnecessarily stuck on the face of the plinth, this is a far more sensible and purpose-like idea of a monument than most we see,—in our own country, at any rate.

Among smaller ornamental designs are some that are elegant enough, for cruet-stands, &c., and for plates and porcelain, rather overdone with ornament,—a common fault. For dinner-service plates, &c., a little ornament round the rim (which, when in use, is the only part much seen) is more suitable than an elaboration of ornament all over the surface: one feels a

delicacy about eating off such fine things. A French design for steel fireirons (p. 350) is exceedingly pretty and appropriate, both in regard to material and purpose; and we will single out for particular approbation a stand-lamp for a table, designed by F. Reutsch, of Dresden, which is one of the best things in the book; very simple, but thoroughly elegant and suitable in form, and without the slightest pretence or straining after effect. Among a good many specimens of book-covers are two particularly good,—an album-cover (p. 121), where the brass bracket that fixes the clasp is made to form part of the design of the back in an unusual manner; and a larger book-cover (p. 216), to be executed in gilt and stamped leather, which is admirable for its simplicity and refinement, not without a certain richness of effect. So would we wish our favourite poets to be bound.

The Workshop circulates, we are informed, over "a great part of Europe and the United States," and we do not doubt that the artisans who study it may get many good hints and suggestions therefrom; but we must again regret that a style of book which might be invaluable if got up with more rigid attention to enforcing the best art principles, should be reduced in real value by the admission of so many things that are in a very questionable, and we should almost have said obsolete taste,—which ought at least to be obsolete. To place together examples of good and bad treatment of a feature, and point out the difference of principle involved, would have been giving good and useful instruction of a kind that is much needed; but to mix good and bad styles up at random, to act upon the artisan mind, is a not very wise experiment;—speaking under the supposition that the editorial taste is really as correct in these matters as the preface and essays would lead one to suppose. We must, at all events, recommend the artisan subscribers to *The Workshop*, to take its examples with reservation, so far, at least, as any use of them in forming principles of design is concerned. That they are correct and sufficient examples of the various types, good and bad, which they illustrate, we willingly concede. But we have yet to see a book of this kind, at a cheap rate, which shall be composed on one uniform principle, that of representing specimens of design in different materials in such a manner as to give in each case the individual manner of treatment for which the material is perfectly suited, and only that. Such a book would be a valuable school of taste for the manufacturer and artisan, which we cannot say of Messrs. Baumer & Schnorr's publication, though giving full credit for the ability and good intention displayed therein.

THE PRINCE OF WALES.

THE dumb-wells have again uttered a not uncertain sound. Soft, quiet air has again struck a blow that has been felt far and wide. It is no exaggeration to say that the whole nation watches with anxiety the progress of the Prince of Wales towards recovery from the violent attack of typhoid fever by which his Royal Highness has been prostrated. The illness dates, there is reason to believe, from the Prince's visit to Lord Londesborough's house, near Scarborough, for several other members of the party there assembled are suffering with the same disorder in varying forms. The readers of the *Builder* do not require to be told that typhoid fever is produced by a poison resulting from the decomposition of animal matter; that it is the disease of bad drains and dumb-wells or cesspits; moreover, it is especially the attacker of mature men, and, as all know, destroyed one supremely valued life.

Two months ago, after pointing to the condition in which the drains and cesspits of many large country houses are, we wrote, as in other words we had written years before,—“To remedy these evils will certainly cost money, and money is more readily spared for fashion than for domestic comfort and means of health. The annual cost of a couple of racehorses would put the family mansion into a sound sanitary state. But the annual vote is for the racehorses, and the foul sewers are left to become still fouler, and the family rats are left in peace. Vast sanitary improvements have been made during the last thirty years, but very much remains to be done. There are buried dumb-wells to be rooted out when discovered, sewers of deposit to be reconstructed, and country

mansions generally to be properly sewered and drained. If this company in the drawing-room could see the foul subterranean arrangements over which they are dancing, and could comprehend their danger, they would break up and leave in as much horror as they would rush from a gunpowder magazine near to a slumbering fire. Men have yet this prime lesson to learn,—namely, that means of health in their dwelling-houses are worth far more than rich furniture and costly picture galleries, and that these means of health cannot be secured until all cesspits, cesspools, and dumb-wells have been abolished, and there is a dry subsoil, absolutely free from the possibility of sewage taint.

If we had written with a view to the particular incident now before us, other words would so rarely have been used. Will the warning, emphasised as it is, now be taken? There seems every reason to anticipate, under Providence, the earnestly hoped-for recovery of the Prince; and should his lamented illness lead to a general removal of the dangerous conditions we have pointed out, good indeed will have come out of evil.

THE COLOURED DECORATIONS OF ST. MARY OF THE CAPITOL, COLOGNE.

A CORRESPONDENT sends us the following description of the new coloured decorations in this church, referred to recently in our pages:—
1. *Narthex (West Wall).*—Our Blessed Lord (enclosed in an aureole) sitting in majesty, surrounded by angels.

Under the Windows.—Beneath the windows are the representations of various Mediaeval legends.

Ceiling.—In the domical ceiling in the centre or eye are four angels pouring down water (representing the Deluge). Surrounding this subject are various Scriptural incidents, commencing from the creation of Adam and Eve, and continued to the death of Abel.

2. *Nave (Nave Arcade).*—The nave arcade is decorated with the "masonry pattern" as high as the capitals. From the abut up to the extrados of the arches is a design in flowing patterns. Behind the latter and the clearestory is a frieze representing our Saviour's ancestors through St. Joseph (on the north side); on the south, our Lord's descent through the Blessed Virgin. The arrangement is such that each bay contains three figures, severally canopied. At the sides of the clearestory windows is to be seen a kind of masonry pattern, with flowing designs intermixed.

Nave Roof or Ceiling.—On the ridge is represented the ladder up to eternal salvation,—i.e., winged figures in every attitude clinging to the various "rungs." In each bay of the vaulting (which is sexpartite) are two medallions, representing prophets and prophetesses of Holy Writ. Between each of these subjects the spandrel is filled with a flowing design.

Nave Aisles.—These have not yet been decorated in colour.

3. *North Transept.*—Above the arches of the arcade (opening into the aisles) is a frieze formed of drapery conventionally treated. In the two bays before the apse, immediately over the arches, miracles and other Scriptural subjects are depicted. In the ridge:—1. A Saint tempted by a devil, but supported by an angel.
2. The Virgin Mary guarded by two angels.

Apsal Concha, North Transept.—In the apse concha at the north end is the Crucifixion of Our Lord. On each side, is a symbolical representation of sea and earth respectively. In the remaining two bays are depicted our Saviour's sufferings, &c.

Aisle Walls, North Transept.—The walls of the aisle are decorated with the masonry pattern up to the springing of the arches. The ceiling is in quadripartite vaulting; in each bay is a circular medallion, containing a grotesque bird.

Eastern Chapels, North Transept.—In the south-eastern chapel there is only plain coloured diaper-work. In the north-eastern chapel the ceiling is adorned by the figures of "Justitia," "Fortitudo," &c.

4. *Crossing of the Church.*—In the centre of the vault is a painting of the Virgin and Child, surrounded by six angels, each in a canopied niche; between either of these latter are the heads of SS. Peter, Paul, Samuel, Hosea, Jesus Sirach, and Isaiah, contained in circular medallions.

5. *South Transept.*—Various Scriptural subjects are represented above the arch opening into the crossing. In the apse concha of the

ceiling (on the south side) is seen the Nativity of Our Lord. In the ridge are angels, saints, and evil spirits, represented in compartments of three. Below the ridge are the incidents:—Conception of the Virgin Mary, Purification of the Virgin Mary, and miscellaneous Scriptural subjects, consisting of miracles, &c. In other respects the design is similar to that of the north transept.

Eastern Chapels, South Transept.—The north-eastern chapel is decorated with four ornamental medallions.

6. *Choir.*—The painting of the choir is not yet finished, the greater portion of the ceiling being concealed by scaffolding. In the eastern apse concha is the Coronation of the Virgin. The spandrels of the arches are richly decorated with conventional and naturalistic foliage.

Choir Aisles.—The choir aisles, or ambulatories, are painted, as far as regards the ceilings and the capitals, and the window-splays.

The Church of St. Maria-in-Capitol is of the Early Romano-British style, very plain and massive. In plan it consists of a western narthex, nave with aisles, north and south apsidal transepts, having aisles both on the northern and southern sides, as well as eastern chapels (two of the latter in each transept). The choir is also terminated apsidally with an ambulatory. All the colouring previously described appears entirely modern, but very possibly some kind of authority, in the shape of remaining vestiges of the ancient coloured decoration, may have been found to warrant, in some measure, the treatment of the various subjects.

THE ROMAN WALL.

Or all our national historical monuments the walls thrown across the north of Britain by Hadrian and Antonina Pius are the most stupendous and interesting. The vast amount of engineering skill and manual labour expended in their construction, in the face of fierce and courageous enemies, is almost beyond calculation, even when the great works in their ruins are patiently studied,—a task which but few have the inclination or power to undertake. To be fully appreciated they must be studied step by step: the upper barrier from the Firth of Forth to the Clyde; the lower, from Wallsend, on the east, to Bowness on the Solway Firth. When the vestiges of these immense tracts of earthworks and masonry are explored, then the inscriptions which illustrate their history are to be sought for, scattered in all directions, even so far as Chicago. A research of this kind is rendered unnecessary, because the recently-published works of the late R. Stuart on the Wall of Antoninus, and of Dr. Bruce on the Wall of Hadrian, include almost all that have hitherto been discovered. The "Lapidarium Septentrionale" of the latter gentleman, now being printed, will soon give the public, for the first time, a complete collection of the inscriptions collected on the line of the lower barrier: *per lineam Valli*, as the "Notitia" has it, or as it is commonly termed, "The Roman Wall." But a personal survey of the works, at least in part, cannot be dispensed with by all who would understand fully the difficulties of the task undertaken by the Romans, and the manner in which they triumphed over a bleak and wild district, and secured their mural defences by garrisons in walled castra and castella.

The lower barrier and its auxiliary fortifications, are copiously described, and illustrated by Dr. Bruce,* who has devoted a long portion of an active life to personal surveys and study, and who is still earnestly engaged in completing his researches. In company with him and Mr. Clayton (who is the Guardian Genius of miles of the wall district), I have recently renewed my acquaintance with some of the eastern parts, and have been introduced to discoveries recently made by Mr. Clayton, at The Chesters, which includes the important station called by the Romans *Cilurnum*; and at Carrawburgh, once *Procolitia*. Our researches were crowned by the discovery, without the aid of spade or pickaxe, of an inscribed altar at Hexham, which, as it is the latest addition to the monuments of the wall, may claim priority of notice. It stood with one uninscribed, about 4 ft. 6 in. high, by the side of the church, facing and adjoining the new road, in the cutting of which, several years

* "The Roman Wall: a Description of the Mural Barrier of the North of England." Third edition, 4to. London and Newcastle, 1867.

since, the altars were dug up, and by the provident care of the sexton, secured from being broken up for building materials; but, until our visit, no one ever noticed the inscription, which is as follows:—

APOLLINI
MAPONO
TERENTIUS
FIRMVS
PRAEF. CASTR.
LEG. VI. V. P. F.
D. D.

"To Apollo Maponus, Terentius Firmus Saeinius . . . Prefect of the Camps to the Sixth Legion, surnamed Victrix, Pia, Fidelis, has dedicated" (this altar). The fourth line, now indistinct, gave, no doubt, the names of the prefect's father and family; the latter may have been that of Quintus; it is, fortunately, the least important line in the inscription.

The correctness of the rectification I suggested some years ago of the hitherto adopted reading *Apollini Apono* upon an altar at Cambridge, found at Ribchester, is confirmed by the clearly legible *MAPONO* of that of Hexham. An altar found on the south-west of the wall is inscribed *DEO MAPONO*, which these other discoveries explain as allied to or identical with Apollo, who acquired this surname from some place in the north of Britain, or from some British or Celtic myth, in which possibly, his attributes may have corresponded with a deity termed *Mapon*, as those of Mars did, we assume, to *Belatucador*. It is worthy of note, too, that *Mapono*, as a place in Britain, and apparently in the north of the province, occurs in the list of the geographer of Ravenna.

Profectus Castrorum here occurs for the first time in Romano-British epigraphy. One was assigned to every legion; and his duty was to direct the laying out of temporary and winter stations, their defences and internal arrangements. The sixth legion (we learn from a Continental inscription) came into Britain with Hadrian, and has left numerous evidences of its presence in the middle district of the wall (in which Hexham may be included), as well as in Scotland, on the line of the Antonine Wall. The foundations of the Church of Hexham are composed of the materials of Roman buildings: two of the stones have inscriptions recording the erection of some public building, in the time of Severus; and the erection of an altar: military detachments are mentioned in both, and they may have belonged to the Sixth Legion, which subsequently was quartered at York. Two fragments of inscribed stones saved by Mr. Fairless during the recent pulling down of buildings are engraved in the last edition of "The Roman Wall." In one of these the sixth legion is also mentioned. But, as yet, the name of the Roman town or castrum, which occupied the site of Hexham, has not been decided on; and will require further consideration ere it be recognised beyond question.

Dr. Bruce read a paper on the discovery at Hexham, at the opening of the Society of Antiquaries of Newcastle-upon-Tyne, on the first evening of last month. At the same time he brought forward a discovery made at Abbotsford by Mr. Robert White. It is a fragment of an inscription recording the Twenty-second Legion, surnamed *Primigenia*, of the presence of which in Britain no other instance has been found, except on a coin of Carausius. From a marble cippus found at Ferentinum, in Italy, it appears that in the expedition to Britain under Hadrian there were vexillations of the Seventh, the Eighth, and the Twenty-second Legion, styled *Primigenia*, each a thousand strong. A visit to Abbotsford to inspect this fragment enabled Dr. Bruce to recognise some sculptures which had been brought, many years since, from Old Penrith, where they were dug up; and from the same place it is inferred came the fragment under consideration. The sculptures (figured in Lysons's "Magna Britannia") represent Apollo, Mars, Mercury, Jupiter, and Venus, and, without much doubt, they have belonged to a group of deities presiding over the days of the week, such as occurs in the tessellated pavement at Bradenham, in Hampshire, and elsewhere.

Mr. Clayton's excavations on the site of *Procolitia* are daily bringing to light something of interest. When the "Notitia" was compiled this station was garrisoned by a cohort of the Batavi. Inscriptions discovered upon the spot confirm this historical record, and prove also that other auxiliary troops, such as the Aquitani, were in garrison here, and the reigns of

Hadrian, Severus, and Maximinus are indicated by lapidary evidence. A large number also of minor inscriptions indicate the amount of work done by various companies of soldiers have been found; and lastly one of these thus marked:—

THRVPO
NIANA
EXXIII

showing the number of yards built by a century called Thruponiana; a fragment of an inscription to Caracalla; and a finger-ring incised with the letters—

MAT
RES

which, probably may be in the sense of a votive offering, MATRIBUS RESSTITUTIS, a dedication to the *Dea Matres*, to whom so many altars on the line of the wall are addressed.

On the occasion of our visit, under the guidance of Mr. Clayton himself, some substantial buildings on the south-west of the station, on the exterior side, were being laid open. Like all the buildings of these *castra* destined for the troops, they were well heated, the *profructum* of the hypocaust, in this instance, having a double mouth. The consumption of fuel in this cold climate, by so many garrisons brought from the south, must have been enormous; but wood was common; and that they knew perfectly well the benefits of the coal close beneath their feet is proved by its presence *in situ*. In the station at The Chesters (*Oslurnum*) we saw a heap of coal just as it had been found in a room where fires, for some manufacturing purposes, had been used. The walls of Procolitia (like those of all the *castra* and the great wall itself) have suffered at the hands of long ages of ignorance and selfishness, having been resorted to as a quarry of faced stones ready-made for the builder; but now spoliation is checked here and throughout a long district of the wall which has fortunately been purchased by Mr. Clayton.

Since my visit to the wall (which I printed an account of in my "Collectanea Antiqua") important discoveries have been made at The Chesters. The east and north gateways have been laid open, and several rooms in the interior; also the eastern abutment of the bridge over the North Tyne. The last is the most remarkable, and of which we have, so far as I know, no other example in this country. It will be sufficient on this occasion to direct attention to an excellent view of the remains in the last edition of Dr. Bruce's "Roman Wall," which gives a good notion of their solidity and grandeur. The piers which supported the wooden bridge have been traced and planned, as well as the abutment on the western side. The whole is well worth the study of architects and engineers. For the rich treasures of the ancient mural inscriptions and sculpture appropriately preserved at The Chesters I must refer to Dr. Bruce's works, especially to "The Lapidarium;" but there is a plaster cast of a fine slab from the west end of the Antonine Wall, with an historical description, I think, unpublished, which has a peculiar interest in illustrating the impolicy of separating ancient monuments from their histories and realities. The original slab, in spite of the entreaties and protests of Dr. Buchanan, and of the Society of Antiquaries of Newcastle, was taken by Mr. McChesney, the consul at Newcastle, to the University of Chicago, in which he is professor of geology. Of what possible use it could ever have been there it is difficult to imagine; but if ever of service, there is but little doubt it has now perished. The bad taste in transferring the old Penrith monuments to a garden wall at Abbotsford has been referred to; but the taste is common, and no doubt, much of ancient epigraphy and sculpture may yet be recovered by a systematic examination of houses, out-houses, gardens, walls, &c., along the line of the great Wall.

At Benwell, which occupies the site of Condercum, about two miles westward of Newcastle, inscriptions have been found confirming the "Notitia" evidence that a cohort of the *Astres* was permanently quartered here; and showing also that detachments of the second and twentieth legions were here on special service. Mr. Rendal has carefully preserved in his grounds, on the exterior of the castrum, the lower portions of a small square building, doubtless a temple, with two very fine decorated altars discovered in it, almost uninjured. The inscriptions on both have historical interest; but they are especially remarkable in being addressed to a deity under a title hitherto unknown,—that of *Anocitius* or *Antenocitius*. The two spel-

lings seem variations only of one and the same word, which, like many more in the Romano-British mythology, seems peculiar to the country. Although I have no example in support of my opinion, I think now, as I ever did, that the god who received these dedications at Condercum, in discharge of vows, is Apollo, or the Sun, as the preserver of health, which, in a northern climate, and in such a locality, exposed to natural disturbances and to the powerful foes in open rebellion, must have been in daily jeopardy.

C. ROACH SMITH.

ARCHITECTURAL NOTES FROM FRANCE.

ADVICES received from an English architect, who has recently visited some of the provinces of France, speak of the great activity of building operations, both public and private, that is everywhere to be noticed. As a general movement of this kind cannot be attributed to the origination of the Governments (as in the case of Paris and the chief centres of population), there is good reason for believing that the hoards which the French, as a people, are in the habit of accumulating, are thus finding profitable employment.

At Lille, the cathedral is being perfected, under the care of the architect, Monsieur P. Camsisid. The nave, which was incomplete, is being carried out to its full length, and the roofs over the three spans are being covered in. The western tower is being carried up, and will receive a spire, with a gallery and chamber for a watchman. No less than ten different kinds of stone, selected from different quarries in Belgium and in the north of France, are employed, according to their respective qualities, in outer and inner work, and in the facing and lining of the walls, vaulting, piers, steps, foundations, and decorative sculpture. The vaulting is in progress, and the sculpture is noticeable. The private buildings in Lille, especially in the handsome new street, are also advancing with rapidity.

At St. Denis great activity is manifest, both in repairing the damage caused during the siege of Paris, and in carrying on the work of general restoration. The cathedral is in the hands of the well-known architect, Monsieur Viollet-le-Duc. The windows, especially those of the clerestory, have suffered severely, as many as eighty shells having struck the building. It is remarkable that so little damage has been done to the substantial parts of the fabric. Some of the earliest examples of the flying buttress are here to be found, and as in the works of the ancient architects these contrivances are structural, and not merely ornamental, or, indeed, disfiguring, it may be readily calculated what would have been the effect of the demolition of one or two by the shells.

At Poitiers, a somewhat retired, not to say out of the way, part of France, new streets have been laid out, and many private buildings are newly completed or in progress. They are good substantial structures, with an ample allowance of decoration; but as very strongly illustrating the want of originality and of true architectural power too generally observable. A new *Hôtel de Ville* is being commenced at Poitiers. The old Church of Notre Dame, the exterior of which, especially in the choir, needs much repair, is receiving a new chancel paving, of an elaborate design in white, black, and red marble.

At Bordeaux, extensive public works have been recently carried out, including handsome boulevards and public markets. The physiognomy of this ancient home of the English in early times very strongly recalls that of a Spanish town, and the gaiety of the people, the life and stir in the streets, and the general open-air life that fills the place, all tell of southern suns. Large numbers of houses are in course of construction,—a fact the more remarkable when we consider that, fourteen or fifteen years ago, there were whole streets of unoccupied houses to be found in certain quarters of the city. The commencement of this activity probably dates before the outbreak of the war; but the works are actually in progress. The *Grand Marché*, two pavilions of which are finished and occupied, is now being completed by the addition of a third.

We leave to other pages any comments on the increasing dullness of Paris, the contrast of which with the general activity of the provinces is a new and most suggestive feature of the condition of France. Everywhere politics are

now fearlessly talked,—a fact which is in itself a revolution; as the timidity of the rural populations, and their willingness to take their political opinions ready made from the prefect, the *maire*, or the *curé*, is one main cause of the readiness with which any adventurer who manages to get hold of the official reins in Paris is obeyed throughout the length and breadth of the kingdom. A sense of uncertainty, and of the essentially make-shift and temporary character of the present condition of affairs, is universal. The Orleans family were staying, in September, at Aix in Savoy, and our friend was struck by the universality of the deference paid everywhere in public to these princes. That between the shocks of the political earthquake the French provincial should have betaken themselves, with such busy industry, to the rebuilding and improving of their cities, is a remarkable display of the irrepressible elasticity of the race, and a proof of the immense resources as yet undeveloped in the country.

THE REBUILDING OF CHICAGO.

It is interesting to compare the various morals and lessons deduced by various writers both in England and in America from the late calamity at Chicago, and, while teachers having at last got a good text, are trying to drown the din of the rebuilding of that city, by raising their voices to the highest pitch, in the fear that their views may not be adopted, it may be worth while trying to discover what ideas the Americans themselves entertained on the subject of the building of Chicago previously to the conflagration. We all know how the system of erecting "fire-traps" in the form of little wooden houses in all parts of the city was decided, and how, since the fire, their destruction has been characterised by all Americans as a great blessing wrought by the destroying element. Though these huts are looked upon as in a great measure the cause of the demolition of the heart of the city, yet against that loss every American balances the fact that in doing their dread work they too have been destroyed.

In glancing over a file of the *Chicago Times*, we came upon a rather lengthy article in the number for July 9th, 1871, upon the "Science of Building," and the state more especially of Chicago in reference to the practice of that science. The writer of the paper devotes himself mainly to the consideration of the subject from a money point of view, declaring that the system of building wooden houses, and without any general plan, is the cause of the waste of millions of dollars annually (the sum may perhaps be taken *cum grano*); for beyond the facts that such erections are continually requiring repair, wood being so perishable, and that they are "so soon rendered wholly worthless by wear and tear," we are asked to bear in mind that "a wooden house is in the nature of a temporary loan on ruinous interest. It meets the present demand by an immense sacrifice of the future. Not only is a wooden house always in need of constant patching, but it is an increased expense in a dozen other directions. It is so much colder than a brick house, that there is a very material increase in the cost of necessary fuel. Moreover, it is of a character so rarely* affected by the sudden changes of our winter climate that it is perceptibly unhealthier than a brick structure. To the loss of the building power there must be added the cost of additional fuel, of doctors' bills, of more clothing for the body and the bed, and of other outlays that will be readily thought of by one who occupies one of these *paper mache* structures that play so conspicuous a part in the residences of Chicago citizens."

A man starting in business who has only capital enough to erect a small wooden shanty, sufficient for his immediate wants, cannot, of course, be prevented from building such a habitation, provided he keep within the limits of the law; but such erections should be prohibited within certain limits, and, above all, in close contact with large houses. Such a man is recommended to wait till he can afford to build a brick house. It is possibly a fair question to ask whether it is wise for a man, for the sake of immediate saving, to saddle himself with the certainty of a heavy future outlay. The man who builds a wooden house differs from him who builds one of more lasting materials somewhat as a man who,

* We presume the word is used in the sense of "to such a rare or great extent."

starting with a moderate outlay, leaves himself with a note of a thousand dollars to run all his life, and upon which he has to pay interest, differs from one who, starting with a larger outlay, thereafter is out of debt; but do not think, upon those who can afford, but do not choose, to build a better house, a moral reason in favour of brick or stone is brought to bear.

"There might be a strong auxiliary argument adduced in favour of brick over wood, that the owner of a house of the former material has a superior moral position over the man who occupies one composed of the last-named material. There is a sense of security, dignity, and stability about a brick house which communicates itself to the owner or occupant, and which is not possessed by the owner or occupant of one of more perishable materials. *Ceteris paribus*, the man who owns and occupies a brick residence will be a better citizen, a more reliable business man, and a more dignified, affable gentleman, than he who lives in a wooden concern which every breeze rocks like an earthquake."

Such a reason is, perhaps, rather beside the immediate question of the safety of wooden buildings, but we quote it as showing that the Americans appear to use every argument that can be induced a less free use of wood in the construction of houses. Wood, they say, and truly, ought only to be employed in decorations and embellishments, and not as the main ingredient; and the chief results of more substantial and indestructible houses being built would be found in their diminished liability to fire and to the wearing influence of the elements; in greater salubrity, and a consequent decrease in mortality; in a subsequently diminished outlay, and in the general improvement in the appearance of the town.

Chicago, we know, possessed many buildings, and streets, even, as fine as Paris could boast of, and to whatever extent their loss may be attributed to the existence of so many contiguous wooden huts and lumber piles, it is certain their fine effect was often as much spoiled by the combination as enhanced by the comparison.

Whatever may have been its faults, Chicago has now a grand, though so mournful, opportunity of remedying them. Before this opportunity existed, the paper we are referring to came forward with advice; and what that advice was,—not given, we may presume, in such haste and excitement as have produced many strange recommendations since it existed,—we have now to consider.

In the first place, it is suggested that land was not sufficiently economised, three acres being covered by separate buildings when two acres would suffice, if the buildings were more compactly built.

"Chicago apparently occupies an enormous area of territory, and yet it really employs but a limited portion of it. Land is a valuable commodity; and, hence, should be economised, precisely as is the case with other commodities of recognised value. The fact that Chicago occupies three acres in every case where two would answer the same purpose, proves that one-third is wasted. It is not only a waste of land, but it is a waste of time. The more apart men live who do business with each other, the greater is the waste of time. There is also the expense of transportation between these separate localities, that is precisely so much wasted from the profits of those who pay it."

A practical conclusion, then, is that we should build more compactly. We thus economise valuable land, time, and the expense of transportation between remote points. The man who lives a given distance from his office, his banker, his grocer, and the other places and men whom he is obliged to communicate with daily, is a certain number of dollars richer than a man with the same assets who lives twice as far from these places and men.

As a remedy for this it is proposed that houses should be built in blocks or rows, and it is urged that a great saving would be effected in the cost of such houses, as only, practically, seven exterior walls would be required for two contiguous houses, instead of eight for two detached houses. We can hardly think, however, that houses thus built afford greater immunity from a general conflagration; and we should be inclined to think that on this account,—as well as for reasons similar to the "moral argument" used in favour of brick over wooden tenements, viz., that a detached house is more dignified than one of a row,—the building of detached houses should be rather encouraged. Land is not so scarce in Chicago as in London, and

should it ever be necessary for Chicago,—or the business part of Chicago,—to contract within itself, when it can spread no further onwards there will then be more room for such an operation. The further propoal is that every house should be an immense sort of hotel, in which any number of families could be accommodated, while only one set of drains, kitchens, laundries, servants, and,—so precise is the writer,—of "wash-tubs, smoothing-irons, and clothes-lines," would be available for their joint use, instead of having so many separate establishments all requiring separate suites of these necessities. This would be co-operation "with a vengeance," but we venture to think that such a system would lead to quite as serious results in the way of fire as the old system of wooden huts. Everybody would be dependent on or responsible to everybody else for the extinction of fires, and when one did break out it would have far more to destroy at one swoop than if it broke out in an ordinarily-built one-family mansion.

C. E. F.

ART, PAST AND TO COME.

On the occasion of distributing prizes at the Stood School of Art, Mr. Gambier Parry delivered an address, and in the course of it reminded his hearers that they had but a small idea of what Greek art was, as there were only broken fragments of its great originals remaining. We must be struck, too, he continued, at the fact that very few of their great works were in marble, and yet the general idea was that they were in beautiful marble, but such was not the case. If marble were used in a column of a temple, it was always painted; their sculpture likewise was painted. He told them not to be shocked; but their English eyes did not know what colour was; to know that, they must live under the sun. He then alluded to several of the Greek artists, some of whom worked in ivory, in bronze, and in gold. The fact is clear that their originals were in bronze, and considering how beautiful their works are, which at best were but mere copies, they might conceive what the originals must have been. And how little, excepting in imagination, could we understand the intensity of national genius and conception of the purposes and meaning of their fine arts. What we had of those works were merely broken specimens. They were a few originals, marred by time, and yet those ruins were the standards of our ideas. Turn again to their buildings, and the subsidiary arts of pottery, gems, and the mouldings of things for their own use, and mark their perfection. Other nations followed in their train, but they were mere copyists. The Etruscans took their models from Greece, and so also did many others, but the once noble art dwindled down in what was called the Dark Ages; it became but a poor skeleton of the past, whose voice was but a faltering echo which soon died away. Now he had brought them down to the Middle Ages, which was a very sad and a time very much disturbed. Those who wanted peace or quiet, whether they were religious or not, mostly took refuge in religious houses, where there were saints indeed, and many sinners, and many artists were the saints or sinners, and these men began to feel a yearning. Well, these men, feeling those yearnings and longings to rise, exerted themselves to work up the old spirit again, and the arts began to rudely rise. It was very rude; but it expressed their ideas, and they could stare at their works and feel sympathy with another, and thus one soul spoke to another. Men wrote memoirs of what they could recollect, traditions were collected, and arts gradually began to revive, and that kind which, for want of a better name, they called Gothic, opened upon them. But the Gothic art was then but as a flower in the wilderness, growing in the transient sunbeams in most troublesome times. Still, it was no foster edifice; it was to them a reality. Artists grew, sculptors carved, and masons builded, and art was national because natural. Besides the beautiful art called Christian, there was that which sprang up under the influence of the Mahometans, and which had left its masterpieces in all directions, not only in the East, but in Africa, the beautiful chapel of Palermo, and other places. It was complete, thorough, national, true. There were others still; and if they looked south of the Alps they would see how art revived there, and they might tell the same story of that as he had of the Gothic art on the north side. There was need for something, otherwise Dante would not

have made his appearance, and thus they soon had that beautiful style known as Early Italian, as displayed at Florence, and which became nearly allied to the Northern Gothic. It was handed from one to another, until it came to that wonderful man, Michelangelo, for whose work there was no precedent, and after whom there had been no example. That brought them up to the sixteenth century of the Christian era; but, alas! human ambition and luxury, human pride, and the greatest of all deadly poisons of art, individual conceit, seemed to take the place of the simple life of the Middle Ages, and this, like an air of poison through a conservatory, caused the flowers of art to droop and die. Now, what they had to learn from all this was that all arts have flourished when they have been natural, and what arts had failed were Etruscan and Roman, because they were copied. They wanted luxury and beautiful things, but that was not art in its better sense. Those arts which were brought to perfection were those which were begun in simplicity of national necessity; they wanted them, and so they worked them out perfectly. Now, he would ask them to consider what was going on in their own country, and he could not think of it but as an utter Babel. It seemed to spring from no great motive genius, nor to centre round any living national purpose. There was much love for it, but very little discrimination, and yet there were individuals and societies devoted to the highest culture of it. We have gloried too much, and used selfishness, and therefore could not be considered a virtuous. Independence, freedom, self-sacrifice, simplicity,—those were virtues. Art, in our opinion, seemed to be rather as an ornament to be put on and off, and not felt as an essential part of our life and being. Every style, too, was in vogue, from the Egyptian hall to the Gothic chapel. Statues, he said, were erected without a murmur of national displeasure; and, having sarcastically alluded to that of Wellington, he referred to that of Stephenson in the hall at Liverpool, where he was represented as a Roman senator. He believed that before another thirty years were over art would be taught in a very different way. He believed a great Queen's prize would be offered to the best student of all England, who probably will have to take some natural subject and produce two drawings, one of them a perfect reality of it, and the other a perfectly conventional idea. And that, too, was the thing they must do if they wished to become artists; they must learn to lay hold of a thing, and also to represent it.

THE GAITY THEATRE, DUBLIN.

The Gaiety Theatre in Dublin, of which its progress we have already spoken, was opened on the 27th ult. It has been built from the designs of Mr. C. J. Phipps, of London, architect; and in general effect the auditorium somewhat resembles the *Gaiety* in London. The relative dimensions of the two theatres are said officially to stand thus:—

	Dublin.	London.
	sq. ft.	sq. ft.
From curtain-line to back of pit	68	63
" " balcony stalls	38	36
" " first circle stalls	44	45
" " front of gallery	47	47
From footlights to back walls of stage	61	41
Width between walls of stage	64	61
Width of the proscenium opening	28	30
Height of " "	37	39
Height from pit floor to centre of ceiling	46	64

The pit-stalls and pit have 21 rows of seats, accommodating 700 persons. The balcony, on first tier, is a semicircle of 28 ft. diameter, opening out "by curves of a contrary figure" to a width of 37 ft. at the proscenium columns. The balustrade in front is an open trellis-work of iron, gilded. In this balcony are 200 arm-chairs, in 7 rows, 2 ft. 10 in. wide, each seat turning up, to give facility in passing. There is an enclosing corridor all round this tier, and at the back a series of circular arches, filled in with plate-glass sashes. The upper circle has 5 rows of seats, to accommodate 210 persons; the corridor at the back is enclosed by a partition high enough to lean upon. The gallery has 11 rows of seats, and will seat 700 people; and between the pillars where the several tiers stop and the proscenium columns, are 3 tiers of private boxes. The total accommodation is for 2,000 persons.

The coloured decorations are Romanesque in style, for the most part painted on the flat. The ceiling is divided into semicircular panels springing from each pillar, having ornament in gold

and colour on a neutral ground; the spandrels are filled in with illuminated scrollwork, on light ground, and the centre part is in turquoise blue, powdered with gold stars. Over the proscenium boxes are figure subjects illustrative of Irish history, painted by Mr. O'Han, of Dublin. The panel on the left-hand side represents the Bard McKevin being crowned by the daughter of King Art McMurragh, of Leinster, in gratitude for his having saved her father's life, by singing his famous war-song, the "Baag Catha," when the king was on the point of being surprised by his enemies at a feast, the singing of which song put him on his guard and enabled him to escape. The subject on the opposite panel is an Irish minstrel chanting the legends of "Ossian" before Prince McNeil, of the Red Hand, King of Ulster—and his Court. Continuous to these panels are two subjects taken from Moore's Melodies,—painted by Mr. W. Phillips, of London,—filling up the spandrels under the groins of the ceiling. The one is the origin of the Shamrock—"The Chosen Leaf of Bard and Chief;" and the other, "The Minstrel Boy."

The proscenium pillars, as at the London theatre, are of out stone, with carved capitals. With respect to ventilation, over the sun-burner is a shaft 6 ft. in diameter, running up through the roof. Communicating with the ceiling of each tier is also an air-shaft on either side, running from top to bottom of building—which will take away the heated air and products of the gas consumption. There are no chandeliers; and the footlights are out of the sight of the audience, and burn downwards, the product of the combustion being taken away in an iron cylinder running parallel with the front of the stage, and carried up in a fine in the main wall. There are two floors below the stage for the sinking—and a floor at height of 50 ft. above the stage, for the raising of scenery. Off the stage are property-rooms, scene docks, green-rooms for artists and orchestra, and about 15 dressing and other rooms. We need only add that the general contractors were Messrs. Meade & Son, Dublin; the decorators, Messrs. Dobson & Co., Dublin; the gas-fitter was Mr. Anderson, of Dublin; Messrs. Strode, of London, executed the patent sun-burner and footlights; and the upholsterers were Messrs. Arnott & Co., of Dublin. The clerk of works was Mr. George West.

THE GATESHEAD SCHOOLS COMPETITION DESIGNS.

SIR,—Allow me, as an architect of considerable experience in the erection of schools, to give your readers the notes made in my book, on a careful examination of the above drawings when publicly exhibited in the town-hall, premising them by saying that, of the 136 sets of drawings sent in from different parts of the country by different architects, 24 were chosen for final selection, half of which had not earned even a passing note in my book, and one I had contempt myself by describing in the one word "absurd."

For brevity's sake, I will give only my notes on what were afterwards selected by the committee, viz., Nos. 14, 48, 155, and 196, all by a local architect, and No. 131, by a firm in Doncaster.

"No. 14. Infants' department. Cloak-room, being merely the general porch entrance, will not work: clothes would not be safe; and classroom and playground being at the opposite side of the school-room thereto, children going from one to the other would have to cross the school twice before going into playground. Boys' and girls' cloak-rooms open to same objection as to relative position to classroom and playgrounds, causing too much passing and re-passing in large room, and stopping work therein. Drawings remarkably well 'got up,' and likely to win unless men practical in actual school-working are the judges."

"No. 48. Infants' class-room accommodation too small, being fit only for about 65 instead of 210 children, as per Government plans. Classroom position open to objections named in plan 14, by same architect. Two distinct schools are provided for infants requiring more supervision than one. Boys' and girls' departments are each in large single schools, with thirteen groups of desks, although Government rules fix 'five, or at most six.' Cloak-room arrangements as before. Drawings 'got up' same as No. 14, and open to same remark."

Nos. 131 to 133 were not thought worthy of

any special note, so many being better in the writer's judgment.

"No. 155. Infants' schoolroom all in one, for 480 children, less than the two small class-rooms. Entrance-porch used as cloak-room, and open to objection named in No. 14. Boys and girls each in large schoolroom, with twelve groups of desks instead of 'five, or at most six' required by Government rules. Classroom arrangements open to objections previously named. Drawings 'got up' as before."

"No. 196. Infants' cloak and class room as in No. 14. Classroom much too small for use, only 10 ft. wide; other cloak and class rooms better than in other places by same architect, but would still require alteration to be made workable. Drawings as before."

These, Mr. Editor, are the notes I made before the committee's selection was known, and are, therefore, uninfluenced by it in any way. There were several plans far superior for their practical working to any of the foregoing, and I looked for them in vain even among the first twenty-four. So it comes to this: either the committee of selection or the writer is a very bad judge of school-plans; and your readers must decide for themselves whose opinion they think best worthy of reliance,—that of fine gentlemen chosen from a School Board which has only been in existence a few months, and which is now building for the first time; or the writer, who has built many schools, and whose plans and specifications have passed the Committee of Council without even a suggested alteration in matters of detail.

Similar competitions are now open, and many more will follow under the new Act. Will you, Mr. Editor, use your influence to prevent architects competing unless practical men, such as the Government school inspectors, are called upon to decide? Good plans will than be secured regardless of tricky effects, too often seen in competitive drawings, to catch the eyes of the unwary. If architects risk the cost of competition, surely committees should go to sufficient expense to secure proper decisions.

AN ARCHITECT.

ART IN LIFE.

THE prizes gained by the pupils of the Reading School of Art were distributed, on the 17th ult., by Mr. Tom Taylor, who delivered an interesting address. After treating of the rise and progress of art in various countries, Mr. Taylor said:—"Modern life does not colour, and is not coloured by, modern art in the sense in which earlier life coloured and was coloured by earlier art. The art called forth by public demands in earlier times, by courts, by establishments, festivities, and pageants of the nobility, the abbey, cathedrals, churches, the guilds and corporations in cities, whether in the form of pictures, carvings, processional and heraldic banners, trappings and insignia, splendid and brilliant clothing, armour, the pageant of civic and religious ceremonies, tournaments, guild-feasts, and so forth, was seen and enjoyed by the populace even more than by those who provided and paid for it. The church festivals, public entries, and royal progresses were all occasions for showy and stately living pictures to which our existence nowadays has no parallel. In spite of the rudeness of private habits, art was, in a certain sense, in the air breathed by our forefathers; and this was even more the case in foreign countries than in England, as in the ancient Bruges and Ghent, Pisa, Florence, or Venetia. And if this country was poor in native painting and sculpture, it had from the twelfth century an architecture of its own, stately and beautiful, in cathedral, abbey, and castle, and later in country manor-houses and town mansion or city guildhall, which served as a framework for the brilliant moving pictures indicated above, and familiarised all classes in some degree with artistic impressions, such as are by no means to be extracted from any conditions or incidents of life in our time. For it is impossible to blink or disguise the painful truth that English lives,—especially those of the masses,—are now as widely divorced as lives can well be from all the blessings and refining influences of beauty, natural or artistic. In most of our seats of labour the beautiful in nature has been ruthlessly sacrificed to the demands of industry. Look, for example, at the widespread of blackened wastes, the hideous mountains of slag and cinders now gradually usurping hill and valley, field and river-bank in the Black Country, in the iron and copper mining and smelting dis-

tricts of England and Wales. Look at the rivers of Yorkshire and Lancashire choked from source to sea with the foul refuse of mine and foundry, their fair waters filled with the filth and polluted with the stains of innumerable mills and manufactories; at the dense canopy of smoke that hangs for ever over the busy hives of the cotton and woollen manufactories; or the forest of tall chimneys that belch forth their blackness above the grim forges and grimmer streets of Sheffield and Birmingham. Nature, in these parts of our island, is being more and more subdued to the use of man at the cost of all she can give to bring man face to face with the glory of the Creator in His works. Under these circumstances, which are telling yearly more and more upon our population, making their lives of toil more gloomy, and grimy, and cheerless, and so forcing them more and more to those excitements, relaxations, and indulgences which take them for a moment out of their dull, sad selves, but to leave them lower, more dispirited, and restless than before, it becomes yearly more and more an urgent duty of all who feel the condition of England a question pressing upon their hearts and consciences, to devise and discover means by which the evil influences attendant upon our industrial system may be counteracted, and the,—thank Heaven, not unrequited,—opportunities it affords by its very crowding and feverish quickening of intelligence for raising and cherishing our eminently unworldly social system, turned to account. Education is the great panacea in which most of us put great hope; but what is that education to be? Am I mistaken or Utopian in insisting that such forms and appliances of art-teaching as alone are possible for the millions shall form an important part of it? We cannot make artists or even good designers in the gross. But we can encourage, and provide machinery for, the teaching which will bring out what of this ability may be latent in the land. We can even cultivate to some degree, by elementary drawing, the eye and hand of our youth in the primary schools of our towns, at least so as to enable them to discern in some degree forms and colours,—what is graceful and well proportioned, what harmonious and tasteful from their opposites. Even in a utilitarian point of view, this teaching is important to the workman, as enabling him to understand and express ideas and intentions in matters of his craft, conveyed by the pencil, as giving him accuracy of eye and hand, for the more delicate parts of his craft, and to use and at need make diagrams and drawings of machines. I need say nothing of the importance, in a country so largely dependent for its trade on the industries concerned with the weaving, dying, and printing of textile fabrics, with pottery and porcelain, with work in metals of all kinds, of educating skilled designers, and so enlisting for our productions beauty as well as strength and honesty of workmanship. Foreigners have hitherto had the credit of finer taste and more ingenuity of invention in these matters; and it has given their work an advantage in many markets and for many kinds of productions. The pressure of this competition was never so hard and close as now. All who have studied the subject are agreed that if we wish, I will not say to maintain our supremacy, but even to hold our ground against our rivals, it must be by more sedulous and successful cultivation of the arts of design, as well as of the science concerned in the processes of manufacture.

NEW COUNTY COURT OFFICES, DURHAM.

THESE offices, erected from designs by Mr. Thomas Charles Sorby, surveyor to the Crown for County Courts, are now completed. They are situated at the junction of the Bath Bridge-road and Old Elvet.

The building is in the sixteenth century Continental Gothic style. It is constructed with Waskerley Fell natural coursed blockers and brick bakings. The whole of the cornices and dressings are of rubbed Rainton Park stone.

There is a moulded stone plinth to the height of the ground-floor windows, and moulded string to the first floor, and moulded cornice surmounted by a parapet pierced as a traceried balustrade, and finished with a moulded coping. The windows have moulded mullions and transoms, with shouldered linteals in some cases, and pointed heads in others; the angle is corbelled over, and the corbel enriched with shield and foliage.

The public are admitted to the offices through a moulded stone-recessed doorway, with a Tudor arched head and massive solid oak doors, fitted with handsome circular brass plates with the crown and office hours engraved thereon.

The entrance-hall is lined with red and white bricks, and moulded Rainton Park stone dressings to doorways, and stained deal ceilings and cornices. Oak swing doors in this hall give access to the public offices on the right, and bailiff's office on the left, both of which are fitted with oak counters, desks, and presses, and seats for the public.

The strong room is built and grained with brickwork in cement, and is fitted with Hobbs's strong-room door, and with shelving.

The tile floors and hearths and coverings to dog-iron grates have been supplied and laid by Whetstone, of Coalville, Leicester. The grates have been supplied by Messrs. Stuart & Smith of Sheffield, and the fossil marble chimney-pieces by Mr. Nelson, of Carlisle. The ground floors, are of concrete and Portland cement. There are a lavatory and w.c. and storeroom for the offices on the ground floor, and on the first floor there are the bankruptcy office, registrar's room, office-keeper's living-room, kitchen, scullery, larder, w.c., pantry, and two bedrooms.

Mr. R. Sanders, of Durham, is the builder; Mr. Robert Phillips the clerk of works.

The Crown has purchased sufficient land to build a court-room at some future time attached, and the building is planned with that view so as to be capable of extension.

RICHMOND SEWAGE WORKS.

IN reply to the advertisement of the Richmond Sewage Committee, offering a premium of 100 guineas for the best practicable plan for disposing of the sewage of the parish, upwards of twenty schemes were submitted; and at the last meeting of the Committee the premium was awarded to the authors of the scheme marked, "C. E.," found to be Messrs. Gotto & Beesley, of Great George-street, Westminster. The system proposed by these gentlemen is the same as is carried out by them at Rio de Janeiro, where it has been in operation for the last seven years, to the drainage from a population of about 400,000.

The sewage is deodorised by means of sulphate of alumina, charcoal, and other chemicals; then passes through long precipitating tanks, when the solid matter is separated; and the effluent water, after being strained and filtered through charcoal filters, passes off clear, and free from smell. There are special appliances for drying and removing the solid deposit, prepared for agricultural purposes. The high part of the town will be drained by gravitation, and the sewage from the low part will be pumped.

The cost of the deodorising works is estimated at 7,000*l.*, and the intercepting sewers at 5,900*l.*, or a total cost of 12,900*l.*

The Sewage Committee have given the necessary notices for obtaining the land for the works.

THE CONSERVATION OF MONUMENTS.

At a recent meeting of the Oxford Architectural Society, Mr. J. H. Parker addressed the meeting on the desirability of a Royal Commission being appointed for the purpose of ascertaining the present condition of those important monuments of antiquity which, if destroyed, could not be replaced; and also the most effectual means of preserving them from further decay and injury. Last year, when the subject was discussed, he was requested to write to the inspectors of monuments in France and Germany for information, with a view to seeing if we could not get such an officer appointed for England. Neither of them was, however, able to furnish him with printed documents on the subject, but they gave him the necessary information in private letters. M. Viollet-le-Duc, formerly the inspector in France, said that there was an expenditure of 40,000*l.* a year made for that purpose in that country. This gentleman was a very good archaeologist, but, unfortunately, he was an architect, and most architects were too fond of pulling down and rebuilding; consequently, many an old building has been destroyed under the pretext of restoring it. If an inspector were appointed in this country, he did not think that the French system was one which they should imitate. They would be more likely to adopt the German system. Baron Quast was

the inspector in Germany, and he was also a member of the Government. The Treasury were, however, exceedingly shy in granting any money for the purposes of archaeological research, and, unlike France, had made no grant for such a purpose. There was not a sufficiently large number of persons in that country interested in the subject to justify the Government in spending money from the taxes. Unfortunately this was the case in England. On one occasion he was at a little town, called Zoest, where there was a church about to be pulled down, as the inhabitants considered that they did not require it. It was a building of great historical interest, and he thought it was a great pity that it should be destroyed. He therefore wrote to Baron Quast respecting it, and he said that he was most anxious to preserve it, but added that the parishioners were bent on pulling it down. The Baron said there was only one chance of getting the building preserved, and that was to address a letter to the king respecting it; that would be attended with greater success than any other course he might adopt. Consequently, he wrote to the Crown Princess of Prussia (Princess Royal of England) on the subject, and after some weeks he received a most courteous letter in reply, stating that her Royal Highness had spoken to the king respecting the church, and that it would be saved. With respect to the appointment of an inspector of monuments in this country, Mr. Parker said he had recently had interviews with Mr. Bruce, Earl Stanhope, and the Marquis of Salisbury on the subject, and their opinion was that public money could not be granted for such a purpose. The best thing to be done would be to get a voluntary inspector if they could. Mr. Beresford Hope had promised to bring the matter before Parliament last session, and Earl Stanhope had promised to support it. It had not, however, been brought forward, owing to pressure of business, but it might be on a future occasion, and a gratuitous inspector of monuments appointed to act. The monuments belonging to the Crown were regularly inspected, and reports made on the state of them, but Government considered that private property could not be interfered with. He trusted, however, that some inquiries might be made into the matter, with a view to seeing what could be done. Mr. Parker then went on to state that the Government had so far entertained the suggestions which the society, through its president and secretary, made to them in the course of the communications during the Long Vacation of 1870, that they had applied to the Society of Antiquaries of London, asking them, as the only Antiquarian Society possessing a Royal Charter, to obtain as complete a list as possible of the historical monuments of Great Britain. Unfortunately, the Antiquarian Society did not know anything of the correspondence with this society, and they understood historical monuments to mean tombs, and set themselves to work collecting a list of all the Royal tombs. But these had nothing to do with earthworks. Now, however, the Archaeological Institute had taken the matter up, and proposed that all the churches containing heraldry should be examined, and a record of them made.

THE NEW "SOCIAL ALLIANCE."

THE principal members of the council of Skilled Workmen have held a conference at Angus's Temperance Hotel, Bridge-street, Blackfriars, to consider the present condition and future prospects of what has been termed the "New Social Alliance." Mr. J. Scott Russell, C.E., presided, and the other members of the council who attended the conference were, Messrs. Applegarth, Barker, Broadhurst, Deighton, Howell, Gills, Latham, Lloyd Jones, Potter, and Whetstone. After some preliminary conversation, Mr. Scott Russell stated in detail what had occurred since their last meeting. The movement, he remarked, although temporarily impeded by the premature publication of the "seven resolutions" in an inaccurate and sensational form, still possessed great vitality, and he confidently anticipated that the principles embodied in those resolutions would at no distant date receive the sanction of the Legislature. Recently he had spoken to most of the lords and members of the Lower House who had given their adhesion to the new programme, and they were still willing to assist the working men to attain the objects they had in view. With regard to the diavowals published by several of the members of the Legislative

Council, he wished to explain that they had reference, not to the real resolutions, but to the garbled version which had appeared in a provincial paper, and in which such alarming words as the "Commune" and the "Proletariat" had been introduced. The very extravagance of the language used, however, attracted to it a degree of public attention which it would not have otherwise received. An animated discussion ensued, various proposals were considered, and eventually the following resolution was proposed by Mr. Lloyd Jones, and seconded by Mr. Barker:—

"That, in the absence of any definite proposition from the Legislative Council for mutual action in regard to the seven resolutions, we, the acceptors of those resolutions, postpone for the present taking any further steps in regard thereto; but we are willing to co-operate with any members of the Legislature, without reference to political party, for the purpose of improving the social and industrial condition of the working classes."

All the members present, with one exception, agreed to the resolution, and Mr. Scott Russell was instructed to submit it to the consideration of the Council of Legislation."

A MODERN ROCK SEPULCHRE.

MR. RASHLEIGH, a gentleman well known at Fowey, in Cornwall, lately deceased, had, during his lifetime, got an excavation made by miners at the summit of a mound in the neighbourhood, and inclosed, as a tomb for himself, and in this he has recently been buried. The rock sepulchre is described by the *Cornish Telegraph*.

The entrance to the vault is down a flight of steps. The excavation was perfectly dry, and declared to be comfortably warm. The site of the tomb is rather remarkable; originally, it is said, a chapel, called St. Catherine's, stood on the spot, which was the warrant for the consecration of the ground; more recently, it was known as the one-gun battery. It is about 130 ft. above the sea, and commands an extensive prospect, both up and down the Channel. It is almost within a stone-throw of the residence of the deceased, "Point-Neptune," which it directly overlooks. Over the grave is a four-ribbed granite skeleton cupola, surmounted by a Greek cross; and beneath the structure is a prostrate tablet,—a granite slab, as yet, blank of any record. The whole of the monument is inclosed, with its small grass plot, in a wrought-iron railing. It has borne the title, since its erection, of Mr. Rashleigh's mausoleum.

CEMENT AND METALS IN CONJUNCTION.

SIR,—With reference to your article on "The Behaviour of Cements and Metals in Conjunction," I have been a user of Portland cement for about twenty-five years, and my experience enables me to state most decidedly that when properly used it is an excellent preservative of iron. It should be laid on the iron, not on paint, and well rubbed on. If sand be used it should be in the proportion of one-sixth,—this being the proper proportion for coatings of cement on brick to tanks to make them impervious. In the cementing of iron ships, it is the practice of my firm to use crushed scoria, fire, and common bricks, to mix with the cement. This is laid between the iron ribs, forming a sort of concrete inverted arch. One vessel done in this way, the *Tyne Queen*, completed her voyage from the Baltic with part of her plating completely torn away.

If the *Megara* had been done in this way the probability is she would not have been lost.

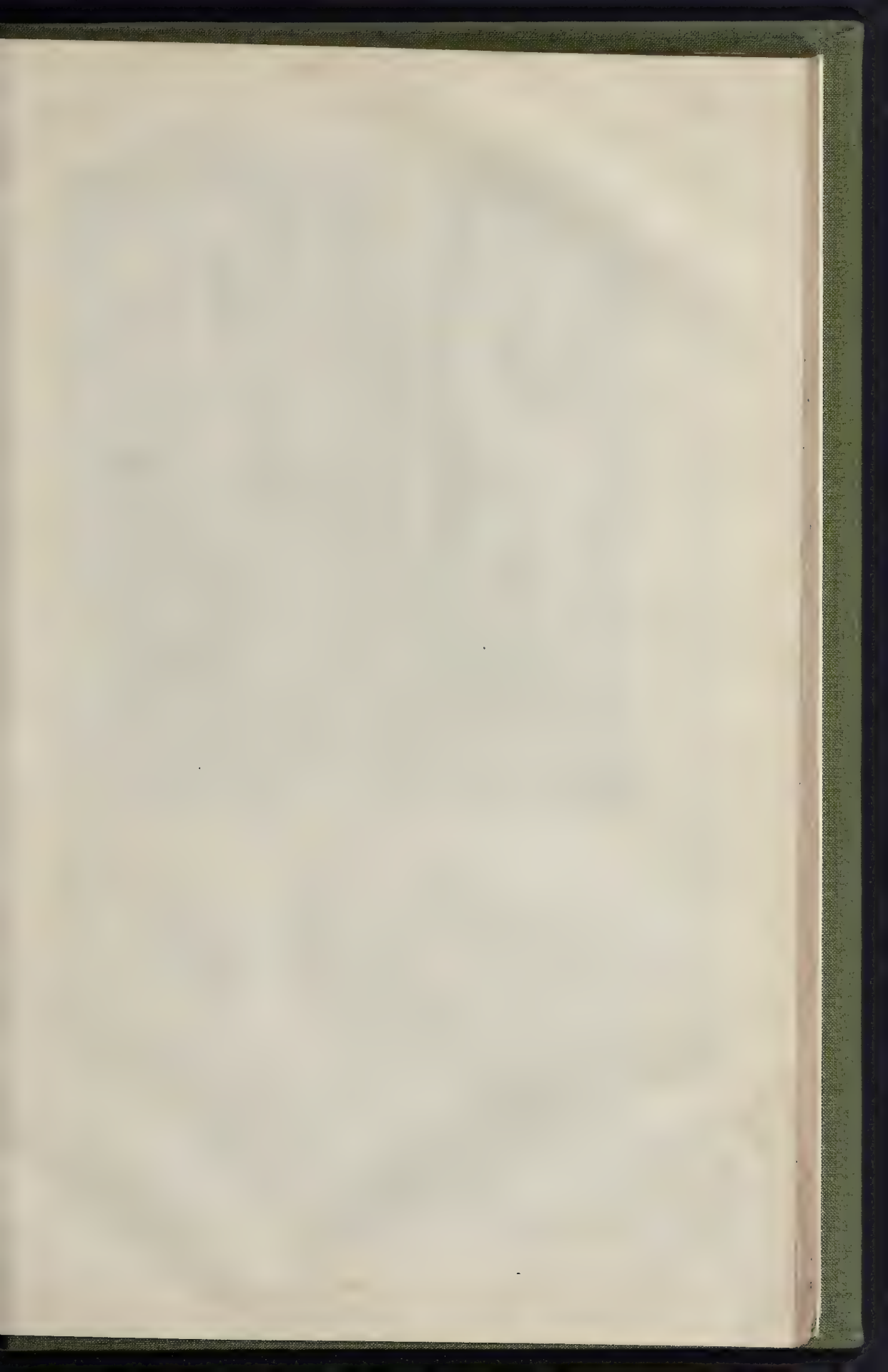
Where Portland cement has failed as an inside lining to iron ships, it must have been bad in quality, or used with too much sand, gravel, or ashes.

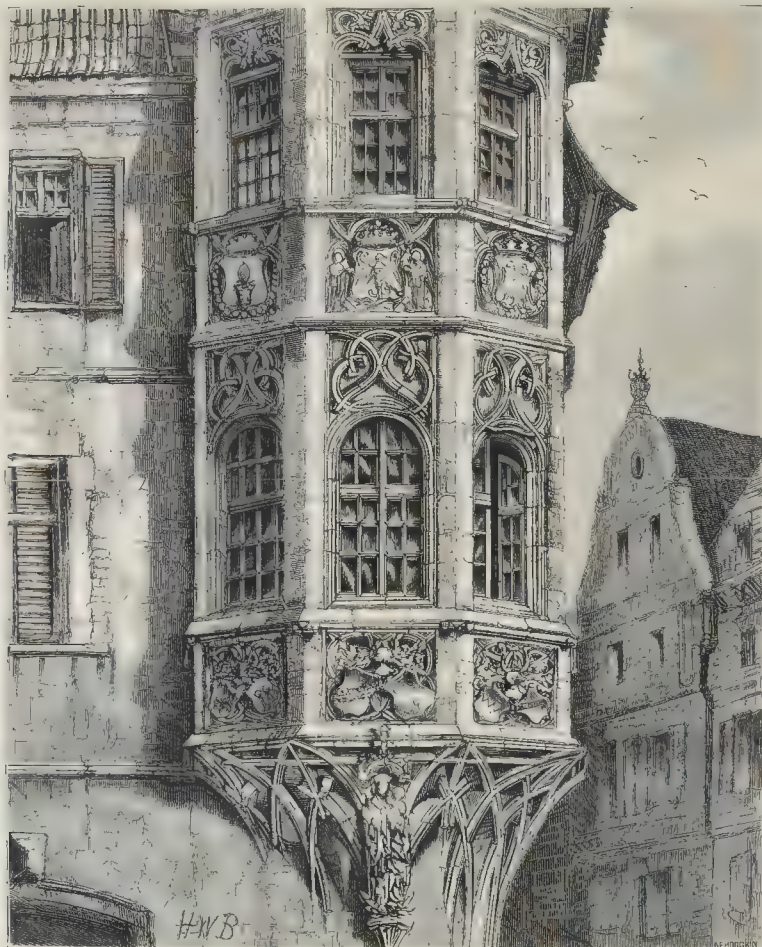
W. B. WILKINSON.

Another correspondent writes:—

After reading your article I took the evidence of all the hawk-boys in my employ (ten in all), and their unanimous opinion amounted to this:—That all cements known to the building trade, if left upon the steel tools, would cause them to rust, except one, and that was Portland; and that, no matter how much or how long Portland was left upon the tools, its removal would never disclose a spot of rust. A bricklayer, aged 60, confirmed this fact, having observed it from its first introduction. A mason confirmed this evidence by stating that iron cramps, fixed into stones with Portland cement, never cause the stones to split, because the cement did not allow them to rust.

These statements are satisfactory as far as they go, but the facts we stated remain the same. That lead has been destroyed in numerous instances through being bedded on Portland cement, is undeniable.





CORNER WINDOW IN AUGSBURG, GERMANY.—Fifteenth Century.

NEW WORKS AT DALTON MILLS,
KEIGHLEY.

DALTON MILLS are regarded by the Keighleyites as the beginning of a new era in the factory architecture of Keighley. Mills need not necessarily be hideous, shapeless, and dingy apparitions. At Dalton Mills we have a number of large and comely buildings standing pleasantly among clumps and belts of trees, shrubs, and healthy, refreshing verdure, and within a few yards of a mill chimney there flourish parterres of variegated and healthy flowers. This chimney is a tower, and round the shaft, through which the seldom perceptible smoke from the furnaces rises, an easy staircase winds to within a few yards of the shaft top, and up these steps—as clean as the staircase of many bellries—you may ascend to a capacious balcony. From this altitude a fine view of the valley is obtained.

Crossing the site of the new offices by the main entrance, towards the north-east angle of the premises, we enter the mill yard—a large open space, which will shortly be entirely surrounded by the buildings, and will form a sort of irregular quadrangle or court to the whole. The dimensions of this space will be:—Average length, 130 ft.; width at the east end, 160 ft.; and at west end, 100 ft. Measured outside the building, the north side of the premises is about 500 ft. long, the south 440 ft., the east 400 ft., and the west 280 ft. The mill is passed on the left, and in front rises the tower chimney, which occupies the south-east corner. The remainder of the east side is filled by the present engine

and boiler houses, which are next the chimney, and the spinning-shed, which runs along the river up to the bridge on Dalton-road, close behind and past the mill, the triangular space which the direction of the road leaves on the north of the mill being occupied by a warehouse. The new offices already mentioned, and for which contracts have been entered into, will fill up the gap between the mill and the Genappes yarn building, which stretches along the greater part of the north side.

Opposite the Genappes building, on the south side, will be erected the new mill, its wing connecting the two, and completing the chain of buildings on the west side; the block of the new engine-house now being rapidly raised will join to and rise above the new mill at its east end, and its boiler-house will extend behind it up to the foot of the tower chimney. The new engine and boiler houses are placed exactly opposite the present ones, the space of about 30 ft. between them being partly roofed, so forming a covered yard between the two boiler-houses.

Roman-Italian is the style adopted. Mr. Snodden, of Leeds, is the architect.

The blue slated roofs contrast with the tawny colour of the stone walls. The walling itself is pitch-faced throughout, with ashlar-moulded strings, rusticated quoins, arches, &c.

Strong Close House, the residence of the proprietor, stands in its park on the other side of the river. A broad carriage-drive through a shrubbery leads up to the front of the house, which is a mansion in the Italian style, and

designed by the same architect. This extensive property is approached by one of the worst roads in Keighley.

CORNER WINDOW IN AUGSBURG.

THE corner window, or "Erker," as it is called in German, is a very characteristic feature of Northern Gothic houses, and is to be met with all over Germany, France, and Belgium: it is singular that it should not have found its way into England during the Middle Ages. The example we give dates from quite the end of the fifteenth century. It is a delicate, graceful example of late German Gothic work, made more interesting by the sculpture and heraldic carving with which it is adorned. The arms represented are those of the German emperor; the city of Augsburg (a Corinthian capital bearing a wood-apple); the Coburg family (a rue bend), which we may mention was the shield of the late Prince Consort; the Imperial eagle, and the *fleur-de-lis* of the Fuggars, the great bankers of that period. The niche with a statue of the Madonna, introduced into the species of vaulting which forms the corbel of this window, is a very pretty and original feature in the design. It is unfortunate that the lofty spire, or roof, which once terminated this pretty oriel, has disappeared; it is replaced by a flat-pointed roof, of bad design.

Corner windows of the same description as the one we illustrate abound at Prague, Augsburg, Nuremberg, Würzburg, and Landshut.



THE PROPOSED COURTS OF LAW: STRAND FRONT.—MR. G. E. STREET, R.A. ARCHT.

0 10 20 30 40 50 FEET

THE PROPOSED NEW COURTS OF JUSTICE.

The view we give in our present number, made from the architect's elevation in outline, represents the Strand front of the Courts proper, a façade about 300 ft. in length. Farther to the right comes the block of offices, separated from the courts by a quadrangle, and running up to Bell-yard, giving an additional frontage on the Strand of about 190 ft. The central doorway in our view is the public entrance to the Great Hall, and the doorway in the turret on each side of it opens to the staircase leading to the public galleries of the Courts. These turrets are shown about 27 ft. in diameter and 70 ft. in height to the top, the roof being about 35 ft. more. The south end of the central hall, seen behind, is shown to be 140 ft. in height to the top of the figure serving as a finial. The plan we published last year* is, we believe, still adhered to in the main, though various minor alterations have been made: the public staircase turrets, for example, were then intended to be much larger in diameter, and were semicircular in plan, instead of, as now, octagonal. The bridge, too, shown across the central hall, has been abandoned.

The floor level of the central hall, we may remind our readers, will be but a few steps above the Strand level: the courts will be on the floor above; that is, on the level of Carey-street, which is about 17 ft. above the level of the Strand. Now that the ground is to a great extent taken out for the foundations, this difference is seen: a range of vaulted recesses, the whole height of the difference in the levels, has been built along the Carey-street front, to hold up the roadway. A bed of concrete is being put in uniformly over the whole area, with this exception, that the bed on which the central hall will stand is entirely disconnected from the remainder by a space all round of about 4 ft. in width, probably with the view of preventing any disruption, should the extra weight of the great hall, with its large buttresses and stone vaulted roof, lead to any subsidence at that part of the building.

We should be glad if we could praise the design, but we cannot. It is worthy neither of its purpose, nor of Mr. Street's reputation. We have arrived at this opinion with great unwillingness and regret. When the competition was decided, we did not scruple to exclaim loudly at the unfairness which characterized its close; we thought, and we think still, that Mr. E. M. Barry was very badly treated, and that the decision arrived at, in the face of the judges' report, was unjustifiable. Mr. Street, however, having been selected, there was an end to our opposition, and we would not willingly throw any obstacle in his way: quite the reverse. The present design, nevertheless, so far as the Strand front is concerned, cannot be accepted without a protest, and something more. The overhanging turrets at the two extremities (the details of which, moreover, are so poorly designed, that they would not pass muster in a suburban villa); the overhanging pinnacles of the staircase turrets; the meanness and insufficiency of the main entrance; the ugliness of the great window; and the feeble treatment of the gables of the central hall, are amongst the weaknesses which will strike most critical observers. The great objection to the design, however, is utter want of unity and of anything like the dignity and grandeur which should mark an important public building. The more the central portion of the design, especially, is studied, the less satisfactory it appears; and if a model of it were made, the objections would be even more strongly seen. If the end of the great hall, brought forward, were seen from bottom to top, we should have, at any rate, a central feature; but as it is, with the end of the hall some 70 ft. behind, there is here nothing but a hole, the common gabled buildings seen on each side increasing the meanness of the effect.

In the engraving we give, which is only a shaded geometrical view, this is not at first observable: a perspective properly prepared, or, better still, a model, as we said before, would help to show how entirely unsatisfactory this front would be in execution.

We repeat the expression of our regret that we find ourselves forced to write thus adversely; but in the interest of the public we have no alternative. Mr. Street should at once be requested to prepare another design.

THE ARCHBISHOP OF CASHEL AND FREEDOM OF OPINION.

THE following paragraph having appeared in the last issue of the *Irish Builder*, the Right Rev. Dr. Leahy, the Roman Catholic Archbishop of Cashel, has written a letter to the proprietor, threatening an action, we are informed, if the name of the writer be not given up:—

"*Thurles Cathedral and Italian Art.*—A tabernacle has arrived from Rome, and is about to be placed in this cathedral. Now, without any disrespect to the Catholic Archbishop of Cashel, we think his lordship might have given the order to some of our resident artists. The money that pays for it was subscribed in this country. If there were no artists in Ireland capable of executing this work of art or handicraft, we would not object. Ireland and Irish art cannot afford to suffer in this ignoble manner!"

Dr. Leahy says that this statement is a gross perversion of the facts, and considers that it is calculated to prevent people from contributing to the funds of the cathedral and other works proceeding, "by reason of the charge that in the works in course of execution Irish artists are ignobly set aside."

It is understood that the foundation of the *Irish Builder's* remarks is the following paragraph in the *Limerick Reporter* of November 3:—

"The grand tabernacle for the noble cathedral of Thurles has arrived from Rome to his Grace the Most Rev. Dr. Leahy, Lord Archbishop of Cashel and Emly, and has been conveyed into the cathedral to be placed in its proper position."

It was not, we think, an unwarrantable supposition, in face of the above paragraph in the local organ, that the tabernacle in question was an Italian work of art. The Archbishop makes an explanation to the effect that it was brought from Rome simply on account of the antique marbles composing it, and that it is at present under a process of remodelling to fit it into the altar in the cathedral, the altar being the work of Irish artists.

The Archbishop acknowledges that it was brought from Rome; and because a professional journal, acting on the statement made in the local organ published in Dr. Leahy's diocese, expresses its views upon the matter antagonistic to the importation of Italian art, law proceedings are threatened.

Dr. Leahy must allow other people to hold an opinion as well as himself on public matters. Whether those opinions are unsound or unpalatable does not bar the liberty of their utterance. If reasonable grounds existed for their promulgation, it is wrong to call their publication a "gross misrepresentation" of the actual facts. We hope the Archbishop will act wisely, and that we shall hear no more of this threatened action.

RE-OPENING OF ST. PHILIP'S CHURCH, CLERKENWELL.

THIS church, which has for several months past been under renovation, has been re-opened with special services. It was built about forty years ago. Of late years the east end has been quite ruinous and unsafe, on account of the foundations having given way. It was found imperatively necessary to make very extensive repairs, and at the same time it was resolved to construct a chancel as a memorial of the late Mr. Wroth, the incumbent.

The improvements just completed comprise the removal of the side galleries and lengthening the church by a considerable addition to the east end. A reredos of carved stone occupies the space behind the communion-table. In its three compartments it contains representations of the Annunciation, the Crucifixion, and our Lord appearing to Mary Magdalen in the Garden, and the windows throughout the church have been filled in with tinted glass.

The architect was Mr. R. J. Withers.

THE COMPLETION OF ST. PAUL'S.

SIR,—That the promoters of this great work should have contemplated, when they first broached the subject, doing more than men of the highest professional judgment think desirable, was, at most, a fault on the right side. The grandeur of their ideas no doubt attracted contributions from many who would have remained unmoved by a less glowing picture. But two things urge now a more sober view of the matter. The large sum required to put into form that magnificent dream is scarcely likely to be sub-

scribed, and the best taste is opposed to the attempt. Perhaps future contributions will flow more steadily, and may suffice for all that is required, if the public can feel assured that they are subscribing to the improvement, and not to the destruction, of the character of the building.

In the controversy which could not fail to arise, as to what should be done and what should be left undone, it seems to have been overlooked that St. Paul's has acquired a character during the present century which could not have been anticipated by Sir Christopher Wren, but which should certainly now be taken into consideration, in the completion of the building. It is as much, in the present day, a national mausoleum as the metropolitan church, where the memory of our greatest men enhances the consecration it has received for religious services, and is the charm to draw so many, not only of our own people, but visitors from every country, to stand under its solemn dome. If we succeeded in making it a bad imitation of St. Peter's at Rome,—for the necessary sum to make it a good one is not likely to be subscribed,—while it might lose with advantage the faded and neglected look it has worn for so long, it would of course lose altogether the quiet and reverent air so suitable to the genius of the place. Who can have entered St. Peter's without feeling how greatly its proportions and the impression of its size have suffered by the excess of colour and ornament, which allows no rest to the eye and no liberty to the imagination? But this building is so vast that it can afford to be contracted for the sake of the magnificence which adapts it to the purposes for which it has been built; and it is impossible not to be impressed by its completeness in this respect, and by the enormous expenditure of labour and money which has been necessary to bring it to this state of completion. On the other hand, some of the smaller Italian churches, and especially some at Palermo, may be admired for the wealth of marble and ornament which has been lavished on their interiors; but these have little to lose in point of size, and they find compensation in the richness of the material for the absence of any other impressive feature. St. Paul's, however, cannot be treated on either of these grounds, and any style of decoration which would injure its monumental character and disturb the air of solemnity which is now so striking must be seen at once to be inappropriate.

That the decoration of the dome should be in mosaic there ought to be no doubt, on account of the durability of the work, which in such an inaccessible position must be an advantage, but chiefly on the ground that has been taken by some critics to condemn it, that the splendour of colouring and reflected light will tend to bring the dome nearer to the eye. Its grand and beautiful proportions lose at present much of their effect from the extreme height at which it springs, and from the gloom in which it is half lost.

Of some of the work already done, it may seem ungracious and almost hypercritical to say that it must be undone, and that the committee will best consult their own peace of mind if they undo it quickly. With regard to the structure just completed in the north transept, it serves no purpose, and is most injurious to the building in several ways. The exclusion of the outer air is secured by the modest and well-designed inner doorways, which would scarcely be noticed. But high above and on each side of these, shutting out the features of the great door, ruining in height and breadth and depth the proportions of the transept, and dwarfing the monuments in its neighbourhood, a large and glaring portico has been added without any apparent purpose, unless to use up some rather handsome columns and carved woodwork. This abominable excrescence, in its freshness of colour and gilding, seems to thrust itself into every corner of the building. The intention has been good, but no failure could be more complete, and the committee will be honoured for their good sense if they philosophically put up with the little loss of time and money and credit that the experiment may have cost them. They have funds sufficient to proceed at once, and for some time with work that must meet with the entire approval of the public, and of those best informed in matters of art; and contributions are not likely to cease because the work is in progress. But, to satisfy subscribers in the past and in the future, they cannot too soon assure them that their money will be well spent, and that they may hope to see the fruits of it in their lifetime. A. P.

* Vol. xviii., p. 668.

THE ARCHITECTURAL ASSOCIATION.

THE ordinary fortnightly meeting was held on Friday evening, the 17th of November. Mr. J. D. Mathews, vice-president, took the chair. Four new members were elected, and nine proposed.

The essay for which the Association prize was recently awarded was read by the author, Mr. W. B. Mallett, being "A Monograph of William of Wykeham;" an account of his life, works, and character; of which the following is an abstract—

Born in 1224, near the end of the reign of the second Edward; he lived through the reigns of Edward III. and Richard II.; in various wars active and powerful, dying when Henry IV. had been five years on the throne, in 1404 (September 27th), at the ripe age of "full eighty years." His birthplace, Wykeham, or Wickham, about fifteen miles from Winchester; his parents not rich. Educated at Winchester, at the expense of Uvedale, lord of the manor of Wickham, and constable of Winchester Castle; he acquired a reputation as a mathematical scholar and for his piety; became Uvedale's secretary; probably had charge of works, Winchester Castle (few remains of this work); in 1355 called the most distinguished architect in England,—an architect, not yet an ecclesiastic. Introduced to Edward III.; made, 1356, Surveyor, &c., of the King's works; the castle at Windsor, a royal palace on an ample and extended plan (nearly a clean sweep made of most of the older buildings),—a great work, covering twelve acres,—the design specially adapted to the site, and although subsequent alterations have left little remaining in its original state, the general form and arrangement still pay a fine monument of Wykeham's skill; his salary, 2s. per day, and 3s. a week for a clerk: probably all told, the essayist said, an income of something like 700l. of our money. In 1369 appointed to the care of other of the king's buildings; 1361, directed works at Queenborough Castle, Isle of Sheppey (no architectural remains), called after Philippa, the heroine of Calais; resigned his office, 1362 (36 Ed. III.).

In December, 1361, an acolyte (had received the tonsure in 1352, apparently resolved to become a priest one day); deacon, &c.; and in June, 1362, priest; preferment of all kinds then bestowed upon him by the king, twenty benefices being held together by him for some years. In the return made October, 1366, in consequence of Urban V.'s Bull against pluralities (published May, 1365), "Sir William of Wykeham" stated that all he held were "benefices, without cure and compatible with a cure, except the archdeaconry of Lincoln;" total yearly, 842l.; valued by the essayist at 15,000l. of our money. Thus prepared to take a part in the great world of politics, and perhaps to prepare some of the finances wanted for his great schemes yet in the future, in 1364 made Lord Keeper of Privy Seal, and in different ways employed in State affairs. Appointed Bishop of Winchester 1366, but not consecrated till October, 1367; apparently this the hope of his heart, to secure which he had declined other offers. Now he had a great and secure position in the country, an immense revenue, &c.; and was Chancellor, the head of all affairs of State, till 1371.

At the lamented death of the Black Prince, June 8th, 1370, Wykeham, a great personal friend, was named his executor; and on the death of the prince's widow (Joan of Kent, "the Fair Maid"), here also, and Richard, their son, (Richard II.), recommended specially to his care. At this period, however, occurred the only severe trouble of a long and, as it looks to us now, evenly prosperous life; wrought by the Duke of Lancaster. Charges against him, trial, sequestration of the revenues of his see,—all put aside at the coronation of Richard, July, 1377.

During these latter years he had matured and set about realizing the scheme for education, which has now for near upon half a millennium, kept his name fresh in the minds and hearts of his countrymen,—one sense of the "vita perennis" of his epitaph. In 1373 a school was opened by him at Winchester; 1382, the formal charter obtained; 1387, the permanent buildings commenced; 1393, opened (1394, the chapel). In 1380, the foundation laid of New College, Oxford; 1386, consecration of the chapel, &c. Since then, homes of mental and moral culture,—a brave effort towards translating his motto, "Manners (mores) makyth man," from word into fact, preceding by nearly a century and a half the foundations of his imitator, Wolsey.

In 1389, on the king (aged twenty-three) asserting himself as "of age to manage his own affairs," Wykeham again made Chancellor, an office accepted only out of sheer necessity and love of the young king. The two years and three months to September, 1391, were the beginning of the comparatively uneventful and successful section of Richard's reign,—to be attributed, at least in some degree, to the wise counsels and policy of Wykeham. The essayist followed on with a description of the works at Winchester Cathedral, from 1394,—restoration and remodeling of the nave which left all the grandeur and massiveness of the original work, while adding a rich and special beauty. In concluding, attention was called to the manifold powers, so long and so usefully exerted on a great stage, and not without existing solid proofs of genuine wisdom. As an architect, influencing strongly without a doubt the future of the art in this country, and actually creating buildings not yet old after 500 years,—monuments equally of science, and fitness, and beauty; as a statesman, manifesting ability in difficult tasks and in the art of ruling men; as a bishop, of manly piety, striving for the reformation from within of the institutions of the national Church,—a policy that found, fatally too, few imitators; as a practical worker towards the moulding by right culture of many generations: in all these and other traits he showed himself a great man, and, in expressing some of the best desires of his nation, a great Englishman. In the changed conditions of our social life, it may be considered practically impossible that such varied rôles should again fall to one man, or perhaps that any one should bear his part so successfully in them all; thus, for many reasons,—

"He was a man, take him for all in all,
We shall not look upon his like again!"

A discussion followed, in which several members spoke;—as to the intimate relations of general and architectural history; the architect wishing to derive pleasure and inspiration from the past of his art must contrive that his memory and imagination shall show simultaneously the images of the social and political state and of the architectural character of the time and country. Remarks were also made on the fact that, as a complete list exists (e.g., in "Bishop Lovth's Life," &c.) of the buildings and benefices with which Wykeham was connected, it would be possible and interesting to ascertain the degree in which he resembled the modern architect who inspires every detail, by hunting down these works and delineating both their general and minute peculiarities.

A vote of thanks was accorded to the essayist; who, in answer to a request from the chairman, consented that a copy of the Monograph should be made for the library of the Association, and that sketches, lists of authorities, and references, should be inserted therein.

SCIENCE AND ART SCHOOLS.

Cambridge.—The Syndicate appointed to consider the question of an appropriate site of a building for the department of Experimental Physics, to take professional advice on the subject, and to obtain plans and estimates, have issued their report. They have found no site more suitable than one adjoining Free School-lane, at the entrance of the old Botanic Garden. At the request of the Syndicate, Mr. W. M. Fawcett, M.A., has prepared plans and drawings which the Syndicate submit to the Senate and recommend that they be approved, and that they be authorised to obtain tenders for the execution of the work. These plans provide, in addition to a lecture-room, a large laboratory, a number of smaller rooms in which advanced students can conduct experiments requiring instruments of precision, and also include a porter's lodge, which will command the entrance from Free School-lane to the whole of the new museums. The plans have been submitted to the Chancellor (the Duke of Devonshire) and approved by him, and although the estimate for the building is greater than the amount contemplated when his Grace's offer of providing the building was made, the Syndicate state that he has intimated his wish to present the building complete to the University. Extracts from the architect's report were annexed to that of the Syndicate.

Bristol School of Science and Art.—The Government prizes and certificates won by the students of this school in Queen's-road, in the

recent examination, have been distributed to the winners, at a meeting held at the Fine Arts Academy. There was a full attendance, and the Dean of Bristol was voted to the chair, and Mr. J. N. Smith, the head master of the school, stated that during the past year the pupils had won 39 prizes of the second grade, against 40 in the previous year; 16 prizes of the third or highest local grade, against 23 last year; one Queen's prize, against 2 last year; four free students' prizes, of which there were not any last year; and 18 full certificates, being 8 more than last year. So that the results of this year compared very well with those of last year. Ten works had been selected for the national competition, and from these there had been obtained a Queen's prize: this was for a design for a fan by Miss Kate Moore. In a private report he had received, several similar designs were highly commended. They might therefore congratulate themselves on having done a good year's work. Mr. K. D. Hodgson, M.P., awarded the prizes.

Stoke, Fenton, and Longton School of Art.—The annual meeting and distribution of prizes in connexion with this school took place at the Townhall, Longton, when there was a large attendance. The Mayor of Longton (Alderman Green) presided, and Mr. George Melly, M.P., distributed the prizes. The report stated that,—

"Since 1869, they are glad to say, the classes have been successfully at work, the numbers attending have continued to increase, and satisfactory progress has been made. The attendance of the students has been,—1870.—On the books, 117; average attendance, 65 monthly. 1871.—On the books, 128; average attendance, 68 monthly. Thus showing a steady increase both in numbers and attendance. Local prizes were awarded to this school as follows:—In 1870, 13 prizes; in 1871, 14 prizes. At the national competitions five Queen's prizes were awarded. In 1870, 8 students were elected to the free studentships offered by the Science and Art Department to the most advanced and deserving students, as an inducement to continue their studies; and in 1871, 7 students were so elected. The school has not been established more than four years, having been opened in 1847; so that Stoke may claim to be the parent school of the Potteries. How well it has performed its work many of the old students can attest. One is a master of a school of art, others have made art their profession, many are filling important positions as designers, whilst the greater number are producing works which have enhanced the fame of the Staffordshire Potteries throughout the world. Whilst the committee gladly acknowledge the various loans from South Kensington, they still regret that the Central Institution is not made more useful to the provinces. We have not in the school one first-class specimen of porcelain painting, although the authorities are complaining of the want of space for their numerous examples. The committee would gladly see a still greater increase shown in the school, both by employers and employed, as they feel convinced that it is quite impossible for the district to retain that pre-eminence in its manufacture which it has hitherto enjoyed without some such means of instruction."

Maidstone School of Art.—The annual public distribution of Government and local prizes and certificates, in connexion with this institution, took place at the Concert-hall, Corn Exchange, Maidstone. The Government prizes awarded to the students of the Animal Physiology class, held at the Working Men's Club, were also distributed. Mr. F. Wykeham-Martin, M.P., presided, and distributed the prizes.

The report contained the following statements:—

"The committee, in drawing up this, their third report, are pleased to state that the progress of the students continues to be satisfactory.

This is the first year any of the pupils have been competent to send up to South Kensington any drawings of the full length human figure from the antique, and yet two of the pupils have obtained Government prizes. This is encouraging for both the successful pupils and for the master, as it shows ability and painstaking.

The number of students under instruction at the present time is,—Middle-class students, 19; artisans, 28; total, 47.

The annual Government examination was held on the 1st and 2nd of May. Thirty-six students were presented; 23 passed, receiving certificates; 4 obtained prizes; and 2 obtained full certificates.

The number of drawings sent up to South Kensington for approval was 168; eight of these obtained prizes.

After the published report of Government on night classes throughout the kingdom last year, it is gratifying to find our students took the largest number of prizes in the third grade. And, comparing the number of students who were examined with the number in other schools, we were quite as successful in obtaining prizes in the second grade."

The report of the science class held at the Working Men's Club said:—

"At the commencement of the session in October last there were fourteen students in attendance, but three of these discontinued their attendance. Three others joined in time to go on with the class this year, so that the class began and ended with fourteen. Out of these there were eleven who presented themselves to be examined in May last. Every one of these succeeded in obtaining certificates of proficiency, and nine of them obtained Queen's prizes."

The fees paid by the students amounted to £1. 15s., and a grant of 17l. has been obtained from Government. Arrangements have been made for conducting classes in Magnetism and Electricity, and Physiology, for the coming winter."

Leaves School of Science and Art.—The hope expressed at the opening and the close of the

successful Fine-Art and Industrial Exhibition, held at Lewes, in February, 1868, has been realised to a greater extent than could have been anticipated. By the efforts of the honorary secretaries, the Rev. P. de Putron and Mr. Chas. Parsons, and other gentlemen, a school, in connexion with the Science and Art Department at South Kensington, was opened in May of that year, and it is stated that, under able management, the institution has gradually gained in strength,—the classes are, indeed, at the present time so crowded that it is difficult to accommodate all the students,—and all that is now wanted to give it permanency is the erection of a suitable building. For this purpose an excellent site has been chosen at the corner of Albion-street, and so soon as sufficient funds are forthcoming, the erection of the building will be commenced. Liberal subscriptions have already been received. With the view of creating additional interest in the school, it was decided to have an exhibition of fine-art, which was opened on Monday before last, at the County Hall, and the proceeds arising therefrom will be devoted to the building fund. The authorities of South Kensington Museum tendered their support, and forwarded many contributions, which, with a choice collection of water-colour drawings, &c., contributed by artists and friends, form a valuable adjunct to the local works of the students. These may be said to be now publicly exhibited for the first time, and show the progress that has been made by the students during the three years' existence of the school. There was a large and influential attendance in the Assembly-room on a recent occasion, to hear a lecture by Mr. J. C. Buckmaster (from the South Kensington Museum), on "Practical Art." Mr. J. G. Dodson, M.P., presided. The report of the school was read at this meeting.

BUILDING PRICES.

SIR,—Can you tell me whether there is any really reliable work published on building prices? It must necessarily be impossible to produce a work which would rule in all districts on account of the variation in the prices of materials as well as of labour; but a book containing time accounts of labour required to perform different works connected with the building trade, together with proportionate quantities of materials, might be adapted to any place by an application of the current prices of labour and materials.

For instance, give the time required for erecting so many yards of 1 brick or 1½ brick brick-work pointed both sides, one side, &c.; mortar to (so many) yards of brickwork; bricks, ditto. One ton of lime (from —) will take — of sand, and — hours mixing for use.

Such a little book, if carefully and clearly compiled, would have a ready sale to many who have long ceased to use books like "Laxton's Price-book," more than for referring to as an advertising medium. A. B. C.

* * * An approximation to what is here desired will be found in Dobson & Tarn's "Student's Guide to the Practice of Measuring and Valuing" (Lockwood & Co.).

THE NEW MINT.

SIR,—The attention of London ratepayers should be called to the notice given by Government of their intention to apply to Parliament for powers to erect a new Mint on the Thames Embankment, at its eastern termination; and this in spite of the successful opposition that was raised in the last session of Parliament to this same project. This time the property to be acquired has as one of its boundaries "the said roadway on the Thames Embankment," thereby implying that a building is not only to be erected on land reclaimed from the river at the ratepayers' expense, but also not in a line with the Temple and other existing buildings: in short, the Government propose to do here what they have been effectually prevented from carrying out at Whitehall on a larger scale. To this scheme, then, the Temple, the parishioners of St. Bride's, and all Londoners should, on aesthetic as well as sanitary grounds, offer an unswerving opposition,—as one that will injure seriously the present appearance and prospects of the Embankment. On more economic grounds the question may well be asked why, for an establishment that requires only a building of the ordinary factory appearance, with tall chimneys, so eligible a site as that indicated should be selected, which imperatively calls for

a structure of some architectural pretensions. It is to be hoped that, forewarned and forearmed, the ratepayers will enable Mr. Charley again to defeat the Government proposal.

Before the Metropolitan Board proceed with their proposed improvements at Blackfriars, it will be well for them to consider whether the alterations contemplated are sufficiently comprehensive. The intended removal of the City Gasworks should make them pause before sanctioning any plan that will, in all probability, be final. The general opinion seems to be that the roadway on the Embankment ought to be diverted just below the Temple Gardens, on to the very ground on which it is proposed to build the New Mint, as then, at no distant date, the existing roadway could be lowered, carried under the first arch of Blackfriars Bridge, and extended eastwards. Had not such extension of the Embankment been originally contemplated, nothing would have justified the present line of this part of the Embankment-wall, which here encroaches on the river several feet beyond the abutment of the bridge. Let, then, nothing be done here for the present, as the removal of the gasworks, wholly or in part, cannot but materially affect the question. Y. C. E.

COTTAGE HOSPITALS.

Sandgate.—A meeting has been held in the National Schools, for the purpose of considering the offer of 1,000l. by Mr. J. Morris, to build a cottage hospital. Lieutenant-General Hankey occupied the chair, and a resolution was adopted, thanking Mr. Morris for his generous offer, and accepting it; and an influential committee was appointed to establish a fund and organise for the collection of subscriptions.

Ealing.—A meeting of gentlemen residing at Ealing, has been held under the presidency of the Right Hon. S. H. Walpole, M.P., to take into consideration the establishment of a village hospital to meet the increasing wants of this portion of Middlesex. For the last twelve months a dispensary has been in successful operation, but it has been found insufficient for the requirements of the district; and as several of the resident gentry had promised liberal subscriptions, it was resolved at once to commence a cottage hospital. About 100l. were promised in the room, in donations and annual subscriptions, and 100l. were offered by one gentleman towards the erection of a suitable building, and it was resolved to commence operations at once in the cottage now in use temporarily for a dispensary.

Traford-Southwell Cottage Hospital. — On Monday a meeting of the hospital committee was held, Mr. Wherry in the chair, to inspect the plans prepared by Messrs. Adams & Son, in compliance with the instructions of Miss Trafford-Southwell. The plans were approved, and will be forwarded to that lady. The cost will be about 1,500l.

MONUMENTAL.

A Joint Monument to Shakespeare, Milton, and Chaucer.—A benevolent lady left a large sum of money for a drinking-fountain to be placed at the end of Park-lane and Hamilton-place, and requested Mr. Ayrton to choose the subject and carry out the necessary arrangements. The First Commissioner of Works thereupon issued an invitation to six of our best sculptors to send in designs, and Messrs. Noble, Armstead, Thornycroft, Philip, and two others acceded to the request. The design chosen was that of Mr. Thornycroft. It represents Shakespeare, supported on the one side by Chaucer and on the other by Milton. At the back of the poets is a figure of Fame blowing a trumpet, and underneath there is to be a very narrow rill of water perpetually trickling.

Flora Macdonald.—The monument recently placed over the grave of this heroine, in the churchyard at Kilmuir, in the Isle of Skye, is a monolith 10 in. cross, 15 ft. 6 in. in height, placed upon a basement, 10 ft. high, of stone, from the quarry of Kenney, in Aberdeenshire, and is a good specimen of grey granite. The cross was designed by Mr. Alex. Ross, architect, and was executed by Mr. D. Forsyth, Inverness. As compared with other monumental crosses in Scotland, this is the largest. The Inverary cross is only 8 ft. 6 in. in height; Maclean's cross at Innes, 11 ft.; that of Oronsay, Argyshire, 12 ft.;

St. Martin's, 14 ft.; Gosforth, in Cumberland, 14 ft. 9 in.; and that of Ruthwell, Dumfriesshire, 16 ft. The monument to Flora Macdonald stands 28 ft. 6 in. high, of which the principal stone, the cross itself, is, as we have said, 18 ft. 6 in. in height.

Sir Bartle Frere.—Mr. Woolner, A.R.A., is on the point of completing a statue of Sir Bartle Frere, the late distinguished Governor of Bombay, which was commissioned by the authorities of that city, and will be ultimately placed within the town-hall, in company with similar portrait figures by Bacon, Chantrey, and Foley. The statue will be exhibited at the Royal Academy next season.

Lord Dunsand.—Mr. G. E. Lawson, of Edinburgh, now in London, whose statues of Dominic Sampson and Diana Vernon excited attention in the recent Scott Centenary Exhibition, has received a commission, through the Chilean Ambassador in Paris, to execute in bronze a colossal statue of the celebrated Admiral Lord Dunsand, to be erected in Valparaiso.

Nice.—A monument has lately been erected in the cemetery at Cimiez to the memory of the late Mrs. Richard Lamb, of Westwood, county Durham. It consists of an altar tomb, on which lies the figure of the deceased, and round the sides are sculptured the seven corporal works of mercy. This portion is reached by a flight of steps, 4 ft. in height, and the tomb itself is covered by a canopy of stone, supported by four columns of Peterhead granite. The work has been executed from the design of Mr. Welby Pugin, at a cost of about 2,000l.

BUILDERS' BENEVOLENT INSTITUTION.

The thirty-sixth election of pensioners in connexion with this Institution took place yesterday (Thursday), at Willis's Rooms, St. James's. Mr. George Plunkett, of the firm of Cubitt & Co., presided at the commencement of the proceedings (twelve o'clock), and opened the poll. There were thirteen candidates (four males and nine females), of whom only two (one male and one female), were to be elected. The candidates were—Francis Sandon, William Gale, Mark Mintry, Matthew Seich, Frances Seare, Mary St. George, Jane Brothill, Elizabeth Trevethan, Ann Budd, Eliza Lambert, Arabella Hambrook, Sarah C. Bear, and Ann Williams. Including the two elected yesterday, there are now forty-five pensioners on the funds of the Institution,—the males receiving 24l. each per annum, and the females annuities of 20l. At the close of the poll (three o'clock), Mr. Joseph Bird presided. The scrutineers (Messrs. Thos. Stirling and Matthew Hall) having announced the number of votes recorded for each candidate, the Chairman declared that Mr. William Gale and Mrs. Mary St. George were the successful candidates. Votes of thanks to the scrutineers (proposed by Mr. Thorn, seconded by Mr. Richardson, and supported by Mr. George Bird), to the vote-checkers (proposed by Mr. Stirling and seconded by Mr. Nicholson), and to the Chairman (proposed by Mr. Richardson, and seconded by Mr. H. W. Cooper), concluded the proceedings.

THE SEWAGE QUESTION.

MR. BAILEY DENTON has had reprinted in pamphlet form letters and an appendix, already published in the *Times* and *Maidstone Journal*, explaining shortly the several processes that have been adopted for the treatment and utilisation of sewage, with special reference to the selection and preparation of land for irrigation and for intermittent downward filtration. The present form of publication will be more suitable for ready perusal and preservation for reference by sewer authorities and others interested in the sewage question. They explain Mr. Denton's ideas as to the necessity of under-draining all irrigated lands, and his process of intermittent filtration through natural soil, as carried out at Merthyr Tydvil, in South Wales, under his direction.

A "Report on the Cultivation, by Means of Sewage Irrigation, of the Lodge Farm, Barking, for the Year ending 31st August, 1871," has been published by Mitchin & Co., Parliament-street, S.W. It would be well that others

* * * "The Sewage Question: Letters, with Appendix." By J. Bailey Denton, C.E. London: Spoon.

engaged in sewage-farming would follow this example. Very large crops have as usual been produced at Barking; but it is strange that, although in retail the vegetable and other crops have been sold to the public at the usual prices, wholesale dealers do not appear to have given the producers a fourth part of the usual prices this year. Thus, onions have come down from 43*l.* per acre, on the ground, to 28*l.*; scarlet runners, from 11*s.* a sieve to 2*s.*; and so on. There must have been a pressing rush on the market at one period of the season. Of course, sewage-farms, as well as market-gardens of the usual kinds, have suffered in profit. The system on which the Barking farm has hitherto been worked remains unaltered, the objects for which it was created being carefully kept in view. The report states that good land absorbs more of the nutritive ingredients of sewage than poor land, and that a small addition of farm-yard dung warms the ground, and increases the profitability of sewage farming.

Waford.—To test the accuracy of Mr. Lovejoy's estimate of the produce per acre of the mangolds on the sewage-farm, Mr. Swanston (who took the 40-guinea prize for the best cultivated farm, and who has for many years managed Lord Essex's home farm) was requested to point out a piece of land representing a fair average. He, in the presence of other men of experience, chose 22 poles, the produce of which was immediately cleared, and drawn on to a weigh-bridge, and gave for the result 57 tons to the acre. They are worth 12*s.* per ton on the land (growing), and 17*s.* in London, giving 34*l.* per acre.

GLEN-TANAR, ABERDEENSHIRE.

A small ruin of an old "Laird's house" has been converted into a church in the Forest of Glen-Tanar, in connexion with the Highland residence of Mr. W. Canliffe Brooks, M.P., and was consecrated on the 15th ult. by the Bishop of Aberdeen. The roof, an open one of rustic pine, is covered with heather, and internally powdered with lead bars having a small mirror in the centre of each. The seats are of pine, with rustic ends. The glass is all ornamental. There is a simple iron corona for candles; the walls unplastered are covered dado high with brown holland, bordered with red braid. There is a granite bell-turret, and bell, at the east end. The whole has been arranged as simply as possible from the designs of Mr. George Truefitt, architect, the builders being Messrs. Warraoh & Daniel, of Aberdeen.

ANCIENT BRICK BUILDINGS IN ENGLAND.

In the "Glossary of Architecture," the earliest brick building is given as *circa* 1260, the case cited being that of Little Wenham Hall. In this work occurs the following:—

"A few instances of early fourteenth-century brickwork occur, and towards the close of the style, and in the fifteenth century, brickwork becomes common."

Among the antiquaries of the last century it was the general opinion that from the time of the occupation of this country by the Romans, brick buildings were not revived until about the middle of the fourteenth century. This is evidently a mistake of a century, for in an inscription taken at Faversham, in the reign of Henry III., a "tenement of brick" is distinctly mentioned.

GEORGE BEDD.

INCOMBUSTIBLE ROOFS.

REFERRING to the frightful calamity which has befallen Chicago, and to the apprehensions which have been expressed, through the press, that London is not secure from the occurrence of such a disaster, would it not be well for you to advocate in the *Builder* the adoption of a principle of roofing analogous to that which Messrs. Corbett & McClymont have introduced on the Redcliffe Estate? It appears to me that their roofs of plain tiles and cement entirely obviate the risks which would evidently beset the ordinary London roof in the event of such a fire during the prevalence of high wind and hard frost. An article on this subject in the *Builder*, and quoted in the daily papers, would not only afford valuable information to the dwellers in cities, but would call public attention to the circumstances that the builders of the Redcliffe Estate had for some time appreciated its advantages and extensively adopted the principle.

With a secure roof, and a few well-saturated pieces of old carpeting, rugs, and blankets judiciously applied to the protection of windows and outer doors, the rapid spread of such a fire would be greatly checked.

W. IFOLD.

THE ORGAN IN HOLY SCRIPTURE.

SIR.—A correspondent recently threw doubt on your observation as to the number of times the organ is mentioned in the Scripture. Allow me to support your statement by a note. The "Mannet d'Archéologie Pratique," by the Abbé Pierret, published by Didron, says:—"The word *organon*, from which the Latin *organum*, and the French and English *organ* and *organ* are derived, signifies an instrument of music, and especially those blown by wind. Holy Scripture gives us this word eighteen times '*organum*,' and always as a musical instrument." G.

DESCENDING FLUES.

SIR.—If your correspondent is building and has another fire against the upcast flue, I should advise the use of Boyd's flue partitions, and the fire to be lighted in the room belonging to the other flue first to heat the upcast and create a draught.

If the flue is already built, put a soot-door as near the bottom as convenient, and put a gas-jet laid in with iron barrel to heat the upcast; let it be in some conspicuous place, or it will be forgotten in time.

R. PHILLIPS.

HOT-WATER PIPES AND THE BUILDING ACT.

SIR.—Knowing from experience the difficulty district surveyors have to get the clause in the Building Act, requiring hot-water pipes not to be fixed nearer than 3 in. to any combustible materials, carried out, good may be done by quoting the following from the *Times*, which appeared under the head of "Fires":—

"On Saturday morning about six o'clock a shed building in Wright's-lane, Kensington, belonging to the guardians, and used in connection with the workhouse as a disinfecting-room, was burnt down. The outbreak was attributed to the over-heating of the hot-water pipes."

Often has the notion that hot-water pipes could set fire to anything been laughed at when the clause to which I refer has been enforced; but the above incident shows how necessary it is that it should be properly attended to. If I remember rightly, a church at the East-end of London was also destroyed through the over-heating of the hot-water pipes.

Y.

SOANE'S MONUMENT.

SIR.—While the council of the Society of Arts are gradually distinguishing and preserving from neglect the homes where our illustrious men have lived, the monuments erected to their glory and the graves which cover their remains are, in some unaccountable manner, suffered to fall into utter ruin, and to be wantonly defaced. The truth of this observation has been frequently borne out by abuses which your paper has been the first to notice; and now there is another gratuitous illustration patent to the architectural world in the notorious cemetery of St. Giles-in-the-Fields, King's-cross. I allude to the condition in which the mausoleum of Sir John Soane is suffered to remain in that burial-place. Secluded and forgotten, with balustrades broken, marble capitals chipped, inscription willfully defaced, and entrance filled up with brick-rubbish, the dome mutilated, and the coping broken, it affords a very striking testimony of the respect in which the name of one of England's foremost architects is held by the vestrymen whom his talents and wealth have enriched. I write with the authority of a personal knowledge; for lately curiously took me to the burial-place in quest of the graves of John Flaxman and Mary Woolstonecroft Godwin. Both of these were in fair condition (the only tombs, by-the-way, in the whole cemetery of which this could be said); but, on the contrary, in front of the Soane Mausoleum, which, from its magnitude and costliness, was at once conspicuous, a group of rough boys were "cockshying" some bricks against the memorial tablet, adding still further to the injuries already there; and, in reply to a mild remonstrance, exclaimed, with indignant impudence, "Mind your own business!" Further inquiry convinced me that no one is responsible

for the condition of this tomb,—the tomb of the founder of the first art museum and architectural library in England, and a most successful and conscientious artist, of whose ability and genius the Bank of England and the Dulwich Gallery bear ample witness. I hope that you will lend your powerful influence to preserve from ruin one further monument in addition to the many successfully rescued by your energy.

A SOANE STUDENT.

HOW TO HEAT A SMALL CONSERVATORY FREE OF COST.

SIR.—In your issue of the 25th of November your correspondent "S." points out how this very desirable object has (as he asserts) been obtained.

Now, may I suggest that the great damage is done to plants by the occasional very cold mornings our climate is subjected to? On his plan, in an ordinary household, the kitchen fire, we may assume, is extinguished by about ten o'clock p.m. at latest. Allow an hour after that for the surrounding bricks to cool, and you have in your conservatory, by the ordinary law of heat, an even colder atmosphere by morning than if no heat had been suffused through it.

May I suggest a really efficacious means for the same object, viz.:—Use the waste heat from the kitchen during the day to heat a reservoir of water, say 60 to 100 gallons. This can be raised to boiling point in about two hours, and all the ordinary kitchen operations going on just the same; then pass the air over the reservoir and out to the conservatory.

The mass of water will retain its heat nearly intact until morning, and you will thus do effectually what, by the plan as pointed out by "S.," must, I submit, be only very inefficiently attempted.

If "S." will pay a visit to Messrs. Comyn Ching & Co.'s establishment, Castle-street, Long-acre, he will see there how this system can be efficiently applied.

PRACTICE.

THE EQUESTRIAN STATUE OF THE PRINCE CONSORT FOR THE CITY.

SIR.—It is to be hoped that, as a large sum is to be expended on the pedestal (*viz.* 2,000*l.*), the design will be commensurate with many of the improvements of the present day; and that the aid and skill of the architect will be in keeping with that of the sculptor, so as to render it worthy of the nineteenth century. Hitherto we have nothing to boast of. Let competent judges be appointed to decide its merits.

A SUBSCRIBER.

CONSTRUCTION OF CHIMNEYS.

ATTENTION has been drawn to a house which Mr. James Howard, M.P., is building upon his estate at Clapham Park, Bedfordshire, wherein an arrangement of underground passages leading to the chimneys is adopted, so that the whole can be swept without the sweeps entering the house.

In reply to an inquiry, Mr. Howard obligingly says,—"You will understand the whole arrangement when I tell you that we build into the chimney, at the junction of each grate-flue with the chimney, a stout cast-iron frame with a wrought swing door; so that when the sweeping-machine is put up, the flap-door swings over, and shuts the communication with the room."

HEATING WITH HOT WATER.

SIR.—Now that so many churches and buildings are heated by hot-water apparatus, I beg to offer a few remarks upon their preservation.

1. The water used for filling them should be only rain-water, which will prevent the boilers furring for many years.

2. The water should be changed each year, it being run off as quickly as possible, so as to carry all sediment with it.

3rd. Where the boilers are of cast-iron, the upper or furnace door should never be opened until after having nearly closed the damper in the chimney, so as to prevent any sudden rush of cold air into the furnace. A sudden rush of cold air in severe frosty weather across a hot cast-iron boiler is very likely to crack it,—par-

icularly the bottom ring of a tubular boiler; and although a hot-water engineer and boiler-maker, I like to see all work last out of its fair time.

DUVAL CAMPBELL.

FIRE CLAX.

SIR,—I have read with surprise your article upon "Bauxit and Fire-clay" in last Saturday's *Builder* (wherein you say, "According to Richter's researches, the power of sustaining intense heat is greatly dependent upon the amount of alumina contained in fire-clays compared with their contents of other ingredients"), because I have found during many years' experience that clays containing the greatest amount of silica were best suited for resisting intense heat; and I would be glad if any of your experienced readers would state the results of their observations upon the subject. I enclose analysis of fire-clays, all found in the clay quarries of the Buckley district, and know that No. 2, which you will observe contains 95.75 of silica, will stand much more fire than any of the others.

JNO. M. GIBSON.

AVERAGE REPAIRS.

SIR,—In reply to the recent inquiry in the *Builder*, of "B. S. S." as to the average allowance to be made out of the rent for the current repairs of houses, I think that it will bear no reliable proportion thereto, for rents vary so greatly according to locality. An eight-roomed house will let in an esteemed part for 45*l.* a year, or more; but in a poor neighbourhood for 21*l.* which you will observe contains 95.75 of silica, will stand much more fire than any of the others.

The only plan, it appears to me, is to strike the average upon the basis of the value of the annual rate of the house: thus the eight-roomed house in any neighbourhood would cost, say, 100*l.* to build; and perhaps the *smallest* allowance thus made would be 4*l.* or 1 per cent. But in an old or badly-constructed house 2 per cent. would be nearer. Still the cost of building would be the most judicious foundation to work upon, and as a general rule 1½ per cent. on that.

H. & E. P.

HADFIELD CHURCH COMPETITION.

SIR,—Permit us to say a word with reference to the notice on page 909. We observed the advertisement about Hadfield Church, in the *Builder* of 21st October last. We knew no one there, but as we had built several churches which seemed to us to answer the requirements of this case, we sent the committee what we thought would suit them, viz., particulars of churches about the size mentioned, which had cost 4*l.* a sitting or so, or in the words of the advertisement, "Plans on approval for a church, to accommodate 600; cost not to exceed 2,000*l.*" We took no further steps in the matter, but after some time were sent for, and duly appointed the architects.

We may add that, at the outset, we understood that the committee deprecated the idea of any drawings being in the first instance made on purpose, and that what they wanted was some definite information as to what they could have for the sum they proposed to expend. We have since learned that the committee carefully examined all the drawings that were sent in, and that they gave particular instructions, in returning these drawings, for the carriage to be prepaid.

MEDLAND & HENRY TAYLOR.

KITCHEN BOILERS AND PIPES BURSTING.

SIR,—The frost has come on us suddenly. Last winter we were told that it was not so bad, and that no such much damage was done through pipes bursting. Judging from the words of the coroner at the inquest on the last death, a verdict of manslaughter will probably be given against the master of the house, who has exploded his servant in future; because he has neglected to avail himself of the means to obviate the danger. Many architects are now acquainted with and using appliances which completely effect this object.

I venture to suggest that it is the duty of all architects and builders, in justice to their clients, to satisfy themselves as to what is the best remedy for the dangers of boilers bursting, and the loss and inconvenience of water-pipes bursting, and recommend its use.

WATERSON & CO.

CLEANING A MAUSOLEUM.

In the Lord Mayor's Court on November 27, before the Deputy-Recorder, and a common jury, the case of Carey v. Foster was tried. This was an action brought by the plaintiff, a monumental stonemason, carrying on business with a partner, under the title of the Cemetery Memorial Company, at Highgate and Kensal-green, to recover the sum of 16*l.* 8*sh.* 6*d.* from defendant, a barrister, for cleaning and repairing a mausoleum in Highgate Cemetery. The defendant paid a sum of 3*l.* 15*sh.* 2*d.* into court. In cross-examination, plaintiff said he did not remember defendant asking what the expense would be, and stating that he supposed it would not be more than 2*l.* or 3*l.* The defendant, however, who was one of his own men, had not patented it, he objected to say what its ingredients were. The material to make it might have cost him 3*l.* He had charged ten hours for each of the men on Friday, although they had only worked four hours and a half. Defendant said plaintiff had helped him to open the mausoleum, where he met him by accident after breaking a key in the lock. Plaintiff then suggested that he should clean the place and wash it over with a solution to protect it from vegetation. Defendant asked if it would cost more than 2*l.* or 3*l.* Plaintiff said it would only be work and labour, and he did not know the cost. The solution was not considered to be a complete failure, and it gave the monument the appearance of having been painted with white paint: no one would think it was a building of Portland stone, and the only thing to be done was to have it scraped off and restored to its former appearance. Several

monumental masons were called for defendant, and they agreed that the work done was a perfect failure—that the door would have to be rehung and repainted, and the solution rubbed off the whole of the exterior. They estimated the value of the work, if properly done, at between 7*l.* and 8*l.* The judge summed up the case to the jury, and said if they were of opinion that sufficient had been paid into court, their verdict must be for the defendant; and, if not, their verdict must be for the plaintiff, and they must state by what amount.

The jury returned a verdict for the plaintiff for 12*l.*

SUBTERRANEAN LATRINES.

MR. AN P. HOWELL, the surveyor of the St. James's, Westminster, Vestry, in his annual report just published, says:—

"I cannot close this brief summary without an expression of regret at the failure of the attempt to construct an underground drain in Great Marlborough-street. Had it been completed, I am convinced the anticipated annoyance would have been found to have been greatly exaggerated; it would have served as a model for many others, and the advantage of such a structure would have been proved. Actually, nothing has been done towards providing additional accommodation for that large class of persons who in London are compelled to pass their time in the open air, or for those in various stages of ill-health. If the medical profession were consulted, the statements that could be made and the statistics that could be collected, of the disease, injury, and death, caused by the want of such conveniences, would, I am sure, act as such a powerful stimulus in the matter, that a very strong case of alleged nuisance or infringement of decency would have to be made out before the local authorities generally would be deterred from building such resorts as their judgment might dictate; taken on the whole, it stands to reason that the more numerous such places were, the greater the decency would be maintained. I will not say that may be done, and considering the time and attention that have been given, and the efforts that have been made by the Vestry of St. James's, it is singularly unfortunate that they should be overpowered by circumstances, or the only circumstances over which they have no control, or cannot overcome, viz., a convenient site."

ART AS APPLIED TO MANUFACTURES.

A LECTURE on this subject was given last week by Mr. J. H. Chamberlain, in Birmingham. The lecturer, after some introductory observations, spoke of art in connexion with common objects. The art of painting had almost ruined sign-painting. If a man wished to call attention to any particular house, he simply painted up a name, or "The Jolly Tar." In the old days he would have had a drawing, and the drawing would most certainly have been of an attractive kind, and of such a kind as would have arrested the attention of the ordinary passer-by. The ginger-beer man, in order to draw attention to his ginger-beer, represented a clown with a bottle in his hand, the ginger-beer being in a state of violent explosion. Well, if that was art at all, it was very low; but all people looked at it, and the manufacturers, who simply thought whether a thing would pay or not, could not grower at the ginger-beer man. Mr. Chamberlain then went on to say there was a great deal of art in England years ago, in a very unpretending way, in many of their churches. Many of them had been restored or rebuilt, and when they went into villages now they got a new building, a new altar, and many other things which were new, and which were essentially different from the old work. Perhaps they were in a better sort of art, but they most often have felt that the whole thing was out of place. They were, in fact, copied from the town, and did not belong to the village; and instead of awakening art, they were likely to do the very reverse. Having spoken of the doctrine of use, the lecturer criticised several kinds of modern upholstery, and especially what was called Gothic furniture, which was uncomfortable, covered with sharp angles, and all kinds of carving, pinnacles, gables, and bosses, comfort being entirely lost sight of.

Books Received.

Narrow Gauge Railways. By C. E. SPOONER, C.E. London: Spon, Charing-cross. 1871.

NARROW-GAUGE feeders, we have always urged, are as essential to the ultimate development of the railway system, as twigs and leaf-stalks are to the ultimate development of a tree. Main trunks of railway cannot penetrate everywhere, and there must finally be slighter and cheaper lines to ramify into all the corners or recesses of the country, whether in mountain districts or in level plains. If it were possible to apply some simple mechanism to axles or wheels, whereby their gauge could be readily widened or narrowed, or so altered as to suit either trunk or feeder, the carriages in many cases

remained the same, and broad enough for the broader gauges while not too broad for the narrower, all difficulties in the way of either steam or horse feeder lines or roads might soon be removed, and an elaborate network of minor rails and tramways be very soon spread throughout the country, to the immense advantage both of the railway companies and the public. Literary and professional works on narrow-gauge railways are therefore of great public importance at present; and the book now under notice enters fully into the subject, and is illustrated by various diagrammatic and other engravings. The *Festiniog* narrow or 1 ft. 11½ in. gauge is specially treated of, with the revolving axled wheels so suitable for sharp curves or turnings in the windings of the narrow-gauge lines. The volume begins with a reprint of a paper read at the Inventors' Institute on narrow-gauge railways, and there are other reprints and reports throughout the whole, forming a valuable mass of information on this important subject.

Miscellaneous.

Discovery of Paintings at All Souls' College, Oxford.—An interesting discovery has just been made at All Souls' College. The college is undergoing renovation, and while the workmen were removing the painted canvas from the roof of the chapel, no less than fifteen paintings were discovered attached to the rafters. Each painting is on wood, about three-quarters of an inch in thickness, about 9 ft. in length, and varying in width from 5 ft. upwards. What some of them are intended to represent it is difficult to decide, and how long they have been in the roof is unknown. Two or three of the paintings evidently represent angels sounding trumpets, whilst the others are figures of men and women of very large size, and in remarkable postures; some of the former are represented as bent up in an unnatural manner. The work is in very rudely executed. It appears from Chalmer's "History of Oxford" that the canvas ceiling which has just been removed was painted by Sir James Thornhill, about the beginning of the last century. These paintings must therefore have been in the roof nearly two centuries.

The Subsidence of Turnmill-street.—In the arbitration case, The Clerkenwell Vestry v. The Metropolitan Railway Company, Mr. John Clutton, the umpire appointed by the Board of Trade, under the Lands Clauses Consolidation Act, to inquire into and arbitrate upon the circumstances connected with the damage occasioned to the sewer in Turnmill-street, Clerkenwell, began the investigation at the Westminster Palace Hotel, on Thursday last week. The circumstances in question formed the subject of a friendly suit between the Clerkenwell Vestry, as controllers of the sewer, on the one hand, and the Metropolitan Railway Company on the other. The excavations made by the latter at their Farringdon-street Station were alleged to have caused the giving way of the sewer, and the consequent subsidence of the street. The damages claimed amounted to 1,700*l.* The company denied their liability. The case of the claimant was gone into and closed, when the case was adjourned to a day to be fixed by the umpire.

Wesleyan Chapel Building Fund.—The progress of the Metropolitan Wesleyan Chapel Building Fund is said to be satisfactory to the Wesleyans. The sum of 50,000*l.* was promised some time ago by Sir Francis Lyoett, on the condition that a further sum of 50,000*l.* be contributed by subscribers in the provinces, thus enabling the committee to give 2,000*l.* towards each of fifty chapels to be erected in London. The sum of 38,000*l.* has already been subscribed to meet Sir F. Lyoett's liberal offer, and there is now no doubt that the whole will be forthcoming. The building of a number of chapels is already in progress, while others are in contemplation.

The New Royal Mint.—Application is to be made to Parliament next session for power to erect the New Royal Mint on the site selected at the Thames Embankment, near the City Gas Works there and Temple-street. Power to sell the old Mint and its site is also to be applied for.

Mr. Ruskin has been elected Lord Rector of the University of St. Andrew's, by a majority of seven over Lord Lytton.

Condition of Leicester.—Our recent observations have been received in the right spirit by the county papers. *The Midland Free Press* says:—

"We have another enemy at our doors. Fever, although not at present of a very dangerous type, is lurking about, and much sickness prevails. An article in the *Builder*, which we reprint in another page, boldly charges the Board of Health with negligence, and to choked sewers and imperfect ventilation of sewers, aided by water contaminated by sewage matter, fever so prevalent is attributed. It is clearly incumbent upon the Board of Health, with such a state of things, and such charges hanging over them, to appoint an efficient sub-committee to consider the question of the health of the town in all its bearings. Hitherto we appear to have been only half-doing things, and for fear of expense have gone on throwing money away in make-shifts. It is time to have done with this system. We cannot afford such 'cheap' and imperfect work. The borough rates have risen quarter after quarter, and there is nothing but discontent and dissatisfaction on all sides. If the ratepayers had 'value received' for their money, or if the tax ended when the rate-collector had called, the thing might be endured, but when to 'improvement' and general district and other rates there have to be added doctors' bills and suffering households, it is surely time to call upon the 'powers that be' to alter their method of proceeding."

Carved Wood Reredos.—In Croagh Grange Church, Dorset, a reredos of Norman character, corresponding with the original style of the building, and mainly of oak, has been set up. It extends the full width of the east-end, but the portion behind the altar-table, or reredos proper, is slightly higher than the remainder, and projects a little more in front. This portion has semicircular arches, with carved capitals and shafts of ebony, and inlays of walnut ebony and box-wood, filled with a subject, carved in oak, of the "Supper at Emmaus," and having on either side a square panel, containing an adoring angel. The lateral portions of the reredos consist each of an arcade of three semicircular arches, supported by capitals and ebony shaft, the spandrels between the arches being occupied by carved rosettes, and inlays of different woods. The work has been executed by Mr. Boulton, from the designs of Mr. E. A. Roache, architect.

Effect of Sanitary Improvements.—At the last meeting of the Rotherham Board of Guardians Dr. Beard alluded to the fact that the supply of good water to Rawmarsh would be a great benefit to the locality. That morning, when driving from Swinton in company with Dr. Blythman, the latter gentleman pointed out a block of houses at Rawmarsh where fever had once been epidemic. Through good drainage having been effected by the Local Board, and an excellent supply of water having been laid on, that state of things had been altered, and the houses were perfectly healthy and free from the diseases referred to. Much good had, without doubt, been accomplished by the Rawmarsh Local Board, and it ought to be a satisfaction to the Corporation of Rotherham to know that they had assisted them in doing so by giving them a plentiful supply of water, which, with other things, had most certainly reduced the rate of mortality.

The Sanitary State of Leeds.—In a leading article on the state of the New Wortley district, the *Leeds Mercury* blames Chancery for granting an injunction against the passing of undefeated sewage into the river, and the corporation for having done nothing to remedy the resultant evils. The case of the Vicar of New Wortley is adduced. He and his wife and family have severely and over and over again suffered from fever and other ailments during the last six years; but according to the writer himself of the article, the construction of their dwelling and its drains is defective, and the privy system and pigstyes prevail in the neighbourhood. When the injunction was granted is not stated, but it is spoken of as a recent grievance. If the vicar's family, however, have suffered so grievously for six years, surely the corporation far more than the Chancellor is to blame.

Death of an Irish Sculptor.—Mr. Joseph Watkins, R.H.A., M.R.I.A., an Irish sculptor of promise, was interred in Mount Jermon Protestant Cemetery, last Saturday morning, having died of an attack of gastric fever. Some of his well-executed busts were to be seen at the annual exhibitions of the Royal Hibernian Academy and in some of the public halls and private dwellings in Dublin. It was only a few short years since he embraced the profession of the sculptor; yet his industry and love of his art enabled him to make rapid progress. Dying at the early age of thirty-three, with a professional career scarcely well begun, he leaves behind him works that do him and his art credit.

Steam Boilers.—The problem of enormously reducing the consumption of fuel in steamships (says a contemporary) has been solved, not by some famous maker of marine engines, but by the great plough-manufacturing firm, Messrs. J. & F. Howard, of Bedford. Their safety watertube boiler has proved itself capable of being worked with security at a pressure of 140 lb. to 150 lb. per square inch, as well at sea as on the land. A calculation in the *Times* shows how, in a single voyage to China and back, the saving in coal might amount to 1,000t.; while there would be an additional available freight of several hundred tons. When peak-hall fuel has been introduced, giving, as it does, three times as great a result as coal, weight for weight, the economy of ocean steam navigation will indeed be one of the most remarkable triumphs of modern invention.

Provident Dispensaries.—The first report of the Medical Committee of the Charily Organization Society (Lewis, Grover-street) gives a series of rules for Provident Dispensaries, adopted by the Council. The committee recommend the admission into the Managing Committee of the Dispensaries of a certain proportion of the benefited members, acting as representatives of the whole body; and they hope the time may come when Provident Dispensaries will become entirely self-supporting, and the management rest altogether with the members. Meantime the committee desire to draw attention to the abuses of the medical charities, and to develop the provident principle as a remedy which the public are advised to promote instead of eleemosynary dispensaries.

Fall of a House in Glasgow.—On Thursday morning, in last week, between four and five o'clock, a large four-story tenement in Old Wynd, Glasgow, with little warning, fell with a crash into the street. For some time past it was considered that the building, which was a very old one, was in a dangerous condition, and the tenants were warned to leave. Of these, twelve, with their families, obeyed the warning; but six, numbering in all about fifty persons, remained, and nearly paid with their lives for their temerity. At the hour mentioned a considerable happened to pass the building, when he heard a creaking sound, as of a beam of timber yielding to a severe strain. He at once, at the risk of his own life, rushed up the stairs, and awakened the unconscious inmates, and scarcely had the last got clear of the building when it fell.

"The Cry of the Poor."—Under this title a tractate has been published at Bristol, by Morgan, Clare-street, purporting to be "a letter from sixteen working men of Bristol to the sixteen aldermen of the city" concerning the impure air of the city, a people's park, free bathing-places, news-rooms, and a free lending-library, no toll-bridges, and a fish-market. The subjects are of special interest to the citizens, and it is the duty of the aldermen to see to them; but will the citizens, either rich or poor, help to pay the cost? That is the question. Of course, the "sixteen aldermen" cannot be expected to do so.

Royal Albert Hall.—A new cantata, by Mr. W. Carter, entitled "Placida, the Christian Martyr," and dedicated to H.R.H. Princess Mary of Teck, is to be performed on Tuesday evening next, December 5th, at this hall, conducted by the composer. A selection of sacred music will also be given, including Mendelssohn's "Hear my Prayer" and "Judge me, O God," Beethoven's "Hallelujah Chorus," &c. The principal artists are Madame Lemmens-Sherrington, Mr. E. Lloyd, Mr. Frank Elmore, &c., with a choir of 1,000 performers.

Fire at the Thames Plate Glass Company's Works.—At a few minutes before midnight on Sunday last a fire broke out in the premises of the above company at Orchard-street, Blackwall, and it was not entirely extinguished until noon of Monday. The fire began in the casting-house, a building of 250 ft. long and 35 ft. wide, and it extended to the melting-house, a building, 200 ft. in length and 45 ft. wide.

The Late Mr. C. J. Richardson, Architect.—We notice with regret the death of this gentleman, which occurred on the 20th ult. at his residence in Kensington.

West Ham School Board.—Mr. J. T. Newman, of Fenchurch-street and Upton Manor, West Ham, has been appointed architect to the West Ham School Board.

The Cattle Show.—The Smithfield Club Show, in the Agricultural Hall, Islington, will be opened on Monday next.

TENDERS

For the enlargement and remodelling of Dalton-hall, Yorkshire, for the trustees of the estates of the Right Honourable Lord Hotham. Messrs. Edward J. Payne & Henry F. Talbot, architects. Quantities by Mr. Thos. H. Mausel.

Markwick & Thurgood.....	£18,917 0 0
Wilson & Son.....	18,870 0 0
Simpson & Malone.....	17,988 18 3
Thompson.....	17,702 0 0
Jackson.....	16,830 0 0
Briley.....	16,600 0 0
<i>London of the Conservatory.</i>	
Macfarlane & Co.....	350 0 0

For alterations to manufactory, Hanley, for Messrs. Powell & Bishop, Messrs. Scriveners & Son, architects.—	
Bedford, Brothers.....	£375 0 0
Cooke.....	323 0 0
Bailey.....	318 0 0
Barlow.....	317 0 0
Mathews (accepted).....	317 0 0

For stables at Barlston, Staffordshire, for Mr. J. W. Pankhurst, Messrs. Scriveners & Son, architects.—	
Barlow.....	£239 11 0
Cooke (accepted).....	805 0 0

For roads, footpaths, and 15-in. drains round the estate of the Right Hon. Earl Spencer, Wandsworth-common, Messrs. Beaton, Son, and Breerton, architects.—	
Harris.....	£1,199 0 0
Avis & Co.....	1,186 0 0
Farnson.....	1,175 0 0
Wignmore.....	1,165 0 0
Chapell.....	1,160 0 0
Neal (accepted).....	1,100 0 0
Adamson & Son.....	950 0 0

For new public schools, Boston, Lincolnshire. Mr. Wheeler, architect.—	
Chapell.....	£1,340 0 0
Flowman.....	1,255 0 0
Hobson & Taylor.....	1,372 0 0
Huddleston.....	1,197 0 0
Farnell & Co.....	1,185 0 0
Sherwin (accepted).....	1,104 0 0

For additional buildings to workhouse, Spalding. Mr. Kirk, architect.—	
Broadhurst.....	£2,915 0 0
Stevenson & Co.....	2,530 0 0
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The Builder.

VOL. XXIX.—No. 1505.

Proposed Roman Exploration Company.



RESH notice is being attracted to the subject of the exploration of the buried relics of Rome, archaeological or artistic, to which we called the attention of our readers last September. Mr. J. H. Parker, C.B., whose excavations in Rome have already led to discoveries of no small value, is again in the field. He proposes to raise a fund of 50,000*l.* by way of capital of a limited company, to be formed with the object of purchasing land in Rome, exploring it to the utmost, and then reselling it—it is presumed at a profit—for building purposes. There can, we apprehend, be but little doubt that explorations such as Mr. Parker and his friends have now, for some time, conducted in the Eternal City, will in future only prove practicable under widely different conditions. While the incubus of priestly government brooded over Rome, the very pride which even the Italian peasant takes in the relics of the ancient glories of the country was extinguished by the harsh tyranny of greedy ignorance. Rome, though still calling its chief dignitary by the Pagan title of Pontifex Maximus, claimed to be regarded only as a Christian city. The walls of Romulus, the cloaca of Numa, the temples of Republican times, were only to be endured in ecclesiastical Rome if christened and whitewashed. Even the very names of that earlier time, with which the essential forms of the Papacy are so much more closely connected than its advocates choose to admit, were often whimsically travestied in monkish garb. It is difficult to recognise the *Xystus vetus* under the title of Santo Sisto Vecchio, or the *Mutatorium Cesaris* in San Cesareo; but transmutations of the kind may serve to show the manner in which Roman antiquity was dealt with by Romish ingenuity.

No doubt can be entertained that English archaeologists will find their position at Rome very different under the Italian Government, from what it was under the Papacy. The great object, under the latter, was to collect *bajocchi*, under all and every pretext. To attract foreigners to spend money in the city, was the sole industry of Rome of late years. Even such mites as the payment of rent or damages for leave to dig were not to be despised. Nothing can be more characteristic than a little incident casually mentioned by Mr. Parker. Last winter, under the friendly offices of the Monks of St. Gregorio, he obtained permission of their lessee to open a pit in a garden belonging to the convent, for the consideration of 10*l.* The pit was accordingly sunk to the depth of 24 ft., and discovered the well-known pavement of the Via Appia, and fragments of the travertine gateway built by Domitian for the Porta Capena; showing that there were two archways to this gate. No sooner, however, had the excavation

proved thus productive of information, than the *locatario* comes down on the straightforward Englishman. 10*l.* was the price for opening the pit. That bargain was settled. Now the pit must be filled up again. There was no bargain for keeping it open! So good Mr. Parker had to pay a further sum of 20*l.* for permission to keep his pit open for six months!

This is only a characteristic instance of the manner in which Englishmen, bent on historic research, are regarded in Rome. How much can be got out of them is the one question; nor, we will venture to assert, is any foreigner safe from plunder, unless he avails himself of the services of an Italian lawyer. These gentry alone, from long practice, can meet the fertile and inexhaustible ingenuity of their own countrymen, what they call matters of business, but which we, poor simple islanders, are apt to regard as ably-utilised opportunities for swindling.

Now without supposing that any great moral change has been effected in the Roman citizen by the hoisting of the Italian tricolor on the Quirinal, it must be borne in mind that the state of things has undergone a great alteration. The new Government, though inheriting very much of the spirit of the old, yet owns some deference to the public opinion of Italy, and, perhaps, some to that of Europe. It cannot afford to wrap itself up in contemptuous indifference. It may be, and we believe is, quite as reluctant to do any act of justice that involves parting with a grain as was either of the most corrupt Governments which it displaced. But it must at all events put some face on the matter, which it was not necessary for its predecessor to do. Now the Italian people take a great pride in all visible proofs of their former grandeur. Not a peasant so dull but he respects the relics of antiquity. This respect must be evinced by the Government. Exploration and restoration, even if they cannot be made self-supporting, form a popular mode of giving employment to some of the legion of idlers who seek to eat the bread of the country; and the prosecution of works of this nature looks respectable, both at home and abroad. Thus the uncovering of Pompeii is being steadily prosecuted, at the expense of the State, under the able and modest direction of the Chevalier Fiorelli, who, as private secretary of H.R.H. the late Count of Syracuse, had the care of much of the archaeological research carried on at the expense of that unfortunate Prince. Then the Italian Parliament has voted 12,000*l.* for the purpose of excavating the whole of the Palatine Hill, with the slopes round it, as far as the Forum Romanum and the Arch of Janus on the north, the Via Sacra and Clivus Sacra on the east, the Arch of Constantine on the south, and the Circus Maximus on the west. Already have discoveries been made which indicate that the pestilential condition of Rome is due rather to the constant violation of the laws of health, whether as regards the decency of the living or the disposal of the dead, than to any mysterious terrestrial *miasmata*. Even supposing, then, the anxiety of the Government for discoveries to be real and practical, it would be their duty to supervise all excavations carried on in Rome; to see that their course and consequences were strictly subordinated to sanitary considerations, and that they formed integral portions of some well-considered and comprehensive plan.

Now, if we were to learn that an Italian Archaeological Society had been formed for the protection of Acrebury or of Stonehenge, for the restoration of Uriconium, or for the excavation and leaving open those portions of tessellated pavement or other Roman work which have been, within the last few years, discovered in London, we should hardly be apt to treat these volunteers with too much gratitude. After all, it is not clear whether a better case could not

be made out for an Italian protectorate of English, or rather, Roman, archaeological remains in this country, than for an English occupation of those of Rome. The Italians do respect their relics,—the English, as a people, do not. The rapid destruction of some of the grandest relics of an unknown past which has taken place, since the time of Stukely, at Avebury, would have been an offence against the public law of Italy, and would have been repressed by authority if (which is most unlikely) any Italians had been found brutal enough to attempt it. Then the great military roads that opened our previously pathless forests; the fortified camps which have left their names, in the form of the affix of Chester, in so many counties, even as they have left traces of the normal plan of the Roman *Castrum* in the four-way streets of Gloucester, and many other cities of Roman origin; the actual remains of imperishable reticulated brickwork, or of tessellations, the materials of which were taken from yet older buildings;—in all these things the Italians of to-day have a hereditary interest even more direct than our own. Nor can we, on any possible grounds, pretend to so much right to explore Italy as an Italian archaeologist might claim for the exploration of England.

Under these circumstances, we think that the plan now suggested, should it meet with enough support to assume a definite and digested form, is perhaps the only one under which it will be feasible for English enterprise to make any satisfactory progress in the recovery of the ancient historic evidence of Roman archaeology. To purchase land, at a fair price, in the open market; to investigate thoroughly all structural remains; and subsequently to sell the land for building, is a scheme in itself possible. Moreover, it has the advantage of not being one altogether of an eleemosynary character. There is some prospect, if not of a return, at all events of a dividend, of the original subscription to the subscribers. Many a man would be likely to contribute his 10*l.* on the understanding that, if not exactly an investment, yet it was a purchase of a chance. Archaeological knowledge would certainly be increased, if the money were wisely expended. And the fair probability would remain that the shares might be worth their nominal value.

Of course, something distinct and definite will be announced by Mr. Parker as the arrangement in virtue of which he invites subscriptions. Some board of directors must be named, some responsible trustees for the proposed investments. Above all, it will be desirable, that intending subscribers should be informed under what legal advice their money is to be laid out. On this, indeed, the whole stability of the project will depend, so complicated are the claims affecting landed property in Italy, and so usual is the appearance of some lurking prior mortgage, after the purchase-money has been paid, that a degree of caution quite foreign to our English habits is necessary in any transaction of this nature in that country. Moreover, it is necessary, to avoid trouble hereafter, that the goodwill of the Government should be assured. Here, again, an Englishman will naturally inquire what possible effect can the good or ill will of a Government have on the purchase of property from the owners? He will find that in this case it has much to do with it. The powers of interference with his proceedings are great, and may be exercised, at the instigation of some insignificant enemy, in a very annoying manner. Objects of art, for instance, are claimed by the Italian Government as a sort of treasure-trove. Wherever a claim of this kind exists are to be found all sorts of rights of inspection and conservation that may prove intolerably vexatious if any ill-feeling exist. Mr. Parker tells us that he has obtained written permission from the Italian Government to make excava-

tions in any part of Rome. Of course, in coming forward as promoter of a company, he will desire to discharge himself of any unnecessary responsibility, and will take care to print and publish the exact text of this permission. It will be necessary also to show that the local laws with reference to public companies are exactly and formally complied with. In fact, there is a good deal which must be done before subscriptions to a limited company can with propriety be received.

We treat of the subject with much sympathy with Mr. Parker. He has devoted much time, labour, and money to the service of archaeological discovery. Labouring under the disadvantage of the absence of a professional education, he has yet produced works that are valuable to the architectural student as well as to the archaeological amateur. To say that he has a hobby, is only to say that he is one of those men to whom science is generally indebted for most of the impulses to its pursuit. To say that he makes mistakes, is only to say that he is one of those whose discoveries are not limited to the side of the highway. He has spent, he tells us, half of his fortune in Rome; and it would be well for the world if the pursuit of unwritten evidence had many such disinterested votaries. His discoveries have been neither few nor small. His labours have been incessant. Our own hearty concurrence, moreover, is due to the moral tendency of his labours. At a time when criticism has pushed its analysis to the extent of absolute destruction of our records of the past, it is very much to find a man who comes honestly forward to say, "Romulus was not a mythical personage, for here is the masonry of his wall; Roman history is not a series of fables, for here are the traces of kings, consuls, and emperors." If Mr. Parker went no further than he has done, he would rank as a benefactor to the most important of sciences, the philosophy of history. It is the more needful that he should be kept free from any entanglement with what he has himself experienced to be a very unattractive administration; and that any investment of English money, to such an extent as 50,000*l.*, in Roman land, should be placed under the most formal guarantees competent to the laws of the country and to the administration of the kingdom. Long and bitter experience has taught us how easily the various Italian Governments are to encourage the flow of English money to fertilise the long arid soil, either of the wastes around Brindisi or of the valleys covered by the debris brought down by the Po. But when it comes to question of return,—*Hic labor, hoc opus est.* The old maxim that no faith is to be kept with heretics appears still to be honoured at Florence. Englishmen, we know, are heretics.

Mr. Parker suggests no less than thirty explorations and excavations to be pursued in the coming winter. Among them, that which strikes us as the most important, serving in no small manner as a key to more, is the completion of the marble plan of Rome, attributed to the third century, and mentioned by the historian Panvinus. Fragments of the plan were discovered in 1867, in an excavation undertaken by the monks of SS. Cosmo and Damiano. Its completion, and publication by means of a permanent photographic process, is not only most important as an archaeological procedure, but would be of great service to the exploration as furnishing a sort of block plan, by reference to which the course of discovery can be conveniently indicated.

The incidental mention made of this important record of ancient topographical science, as the twenty-second out of thirty objects proposed for investigation during the coming winter, is an indication, in our opinion, of the main cause why the efforts made for the exploration of Rome, no less than those for the exploration of Jerusalem, have hitherto attracted so much less public support than the actual importance of each subject demands. Professionally, educated archaeologists are very rare. Very imperfect views are but too common as to the relative value of the remains of different eras of structural art; and prehistoric archaeology is much confounded with architectural antiquity. Hence it happens that interest in the actual discoveries of other people is not uncommonly very vivid. Many a man may find pleasure in grubbing about in his own account, turning up, with equal content, a denarius of Caracalla, or a silver penny of Queen Anne, who cares but little to know what discoveries are in progress in the adjoining county. Again, many a man may be

capable of making a good survey, of grasping the military features of an ancient fortification, of tracing the course of an aqueduct, or of carrying out detail after detail of local investigation, who has not the logical and orderly grasp of mind needed for the clear enunciation of the great historic problems to be illustrated by the result of his toil. And again, a man thus fitted to direct a survey of the kind, can only, by the rarest chance, have the habit of the publicist, the power to bring before the world, clearly and incisively, the main outlines of his case, in such a manner as to win or to command attention. It is certain that this must be done, in order to attract the interest of any large portion of the public. Of Rome every one has heard, and of Jerusalem every one has heard; but what we may expect to discover in either locality, for what we should look, and what will be the value of the discoveries we seek,—these are matters which the public must have explained to them, not only before they will take the trouble to send post-office orders but even before they will so much as read through a column of details in small print in the daily papers. In this preliminary statement of their object, illustrated, year by year, by the clear description of the successive discoveries, each referred to its proper head, both the Roman and the Palestine explorers have been signally deficient. It is the latter case it is the less excusable from the block outlines which we ourselves supplied (*Builder*, 4th January, 1868) of the seven successive cities that have been reared on and around the hill of Zion; the eighteen successive architectural eras indicated by history; and the locality, or other features, distinctive of each. To burrow at haphazard, lighting now on a coin of the Seleucids, now on a lamp of the Arabic caliphs, now on a ballistic ball of Titus, and now on a charred fragment of the cedar roof of Solomon's porch, is interesting enough for those who are engaged in the pursuit, but will never attract public support, unless as the detailed and orderly prosecution of a well-arranged scheme.

The exploration of Jerusalem, however, while it cannot claim support on the ground of such personal and disinterested exertion as Mr. Parker has devoted to the exploration of Rome, is illustrated by two important features, the excellence of which we cannot too strongly urge the latter investigators to copy. The admirable education of the Royal Engineers, in surveying and mapping country, has been turned to the best account in Palestine; and the Ordnance maps which have been completed and engraved, are permanent contributions of great value, both to topography and to geography. Again the photographs taken by the non-commissioned officers of the same corps are clear, well-defined, and effective.

In the repeated exhibitions to which Mr. Parker has invited us of the products of his own labours, we have had more than once to regret want of due attention to these two important particulars. A map of Rome and its environs, on which the various discoveries could have been indicated, would of itself have been a valuable production, and would have enabled people to see at a glance what was in hand. The definition of Mr. Parker's photographs, as a rule, has been extremely imperfect. Out of more than two thousand, there are but few that any one would care to look at as pictures. As records they are, no doubt, of much value, though the appearance of the prints does not promise any permanence even of their present indistinct details. One-fourth of the number of views, taken with artistic selection and with mechanical beauty, would have set many of us half wild after the exploration. It is not the case that the climate of Rome is naturally unfavourable to taking good negatives in the camera; for those taken by M. Braun, and reproduced by the carbon process, are some of the most admirable works ever yet effected by any branch of graphic art. If the services of this photographer are available, a very few prints from his factory would be worth a great number of inferior, quasi-amateur, productions.

In Rome itself exist relics of the cradle of European society. While Regal, Consular, Imperial, and Papal Rome are not divided from one another by the broad lines of fire and of steel that Nebuchadnezzar and Titus drew across the walls of Jerusalem, still the principal buildings of the various eras, however grading into one another, are to be recognised by well-marked features. Portions of the *Arx* of Romulus yet remain on the Palatine Hill. The stones em-

ployed are 4 ft. long, 2 ft. wide, and 2 ft. deep. They are split off from the tufa quarries by means of iron wedges, exactly as these quarries are worked in the present day, and do not appear to have been dressed, or but roughly so, with the axe. The building of the later kings shows some reduction in the size of the blocks. Fragments of the wall of Servius Tullius are to be found on the eastern side of Rome, running on the high ground for a mile, and connecting, by a great *agger*, the several *arces* of the famous seven hills. In this wall the stones are wrought and closely fitted, and secured to one another by iron clamps, not run in with lead. From these samples of the art of the mason 2,600 years ago, down to the most finished and splendid productions of the time of Hadrian, archaeology can trace both the progress of the builder's craft and the growth and development of the city. In the catalogue of photographs, printed in 1868 by Mr. Parker for private circulation, are to be found a valuable historic series of the successive styles of work, and a general distribution of the photographs into appropriate classes. It is much to be regretted that this arrangement was not carried out and perfected. The catalogue of the 1,900 photographs exhibited in New Bond-street last year is without any order except that in which the photographs happened to be taken. Mr. Parker's materials are rich; his knowledge is extensive. For such a systematic programme as we have indicated he could readily supply ample data. The authorities for dates, very briefly referred to in his preface last year, should be distinctly set forth. The general scheme of his researches, divided into historical chapters, should follow. Results already obtained, referred to their proper heads, would then be regarded in their proper light; and archaeological and historical students, seeing what was actually in hand, would be likely to strain their energies to find Mr. Parker the support which he requires.

Whatever be the complexity, or even the error, of detail, whoever be the labourers,—the Archaeological Society of Rome, the newly-projected company, the Italian Government, or any native and private explorer,—the value of a competent survey of Rome cannot easily be overestimated. We have good hope that the time has now arrived when this important object will be steadily and worthily pursued. However much or however little may henceforward be effected by English funds, it must not be forgotten that Oxford has sent forth a pioneer, who laboured for the elucidation of Italian history while Italy was no more than a geographical expression. The mere presence at Rome of Englishmen able to pass educated criticism on the efforts of Signor Rosa (which is seen to be rather in the direction of what is called restoration than of discovery proper) is important. The whole of learned Europe will listen with interest to clear and impartial accounts of any attempt to draw back the veil of so many centuries. We are happy to call attention to the present proposal of Mr. Parker; and we need not say that we heartily wish good speed to every well-considered effort to show light on the archaeology of Rome.

THE BRIDGES OF LONDON.*

The Bridges considered as Means of Communication.—The question of communication between the north and south sides of the Thames at London, always has been, and always must be, a matter of the greatest importance. It is now a question of some difficulty on account of the great accumulation of business at the east end, considered in connexion with the very large traffic on the river up to London Bridge. The two great traffics by land and water, as it were, overlap. Bridge communication is much wanted in the neighbourhood of the Tower; the great river traffic, however, will not admit of interference below London Bridge, except at enormous cost. High level bridges have been proposed, a tunnel has been constructed, but still the traffic from the east of London Bridge comes to that crowded thoroughfare, and there is no immediate prospect of any change in that respect.

Much has been said lately and proposed with a view to widening London Bridge, but the difficulty is not so much on the bridge itself as in the approaches. The object should there-

* By Mr. Henry Carr, C.E. From a paper read at the Royal Institute of British Architects, on Monday evening, December 4th.

fore be to divert traffic westward as much as possible, thus relieving the easternmost bridge by diverting that traffic to the west which might go westward. The mode in which this might be accomplished will be alluded to presently.

If it be determined to widen London Bridge, it should be so done as not on any account to interfere with the general elevation, any addition by ironwork would be a barbarous proceeding, destroying the effect of one of the finest bridges in Europe; and, moreover, as before stated, such addition to the bridge would not relieve the approaches which are as objectionably crowded as the bridge itself. Again, the foundations of the bridge would not admit of more weight being put upon them: that objection would be fatal to several plans which have been proposed.

One suggestion, which has been for some time before the Bridge House Estates' Committee, is shown by the two plaster models: this plan is considered as the utmost that should be attempted; the addition would be 27 per cent. to the footpath, a valuable increase, as would be evident to any one watching the southern railways when pouring their thousands into the City in a morning. This suggestion would not interfere with the general elevation of the bridge as seen from the river. The proposal is to thrust the parapet somewhat over on to the cornice, and to make it as thin as granite will admit of being worked and fixed with safety. The footpath is now 9 ft. in width, the addition would be 2 ft. 6 in. on each side, thus making the footways 11 ft. 6 in.

However, as said before, the great object should be to lead the traffic westward, which can only be done by improving Southwark Bridge. There have been three great objections to the use of Southwark Bridge.

First the toll: that is now done away with. Secondly, the want of good access, both north and south: New Southwark-street on the south and Queen Victoria-street on the north, have obviated this difficulty.

The third objection to the use of Southwark Bridge is the steep approach and narrow width: this is the point still to be dealt with.

It is proposed to take down the existing cast-iron arches, and to substitute arches of wrought iron; by this change of construction the thickness of arch and road material might be reduced from 9 ft. to 5 ft. 6 in. It is proposed also to reduce the roadway underneath from 29 ft. 6 in. above Trinity highwater to 25 ft., making it the same as under New Blackfriars, the summit level of the roadway would thus be lowered 8 ft., which would admit of the gradient on the south side being altered from 1 in 26 to 1 in 43, and on the north approach from 1 in 20 to 1 in 40; 1 in 40 being the standard of good gradient fixed by the Bridge House Estates Committee for New Blackfriars.

In altering the arches it is proposed to corbel out the footpaths, increasing the width of the bridge from 42 ft. to 64 ft., thus making it the same as the present London Bridge.

The nearest route from the Bank to the Elephant and Castle is over Southwark Bridge; if, therefore, the approaches were made good and the width of the bridge increased, it is felt that a considerable proportion of the London Bridge traffic might be thus drawn westward.

There is a curious fact regarding tolls illustrated by a circumstance in connexion with this bridge. The bridge was thrown open, toll free, on the day of the entry of the Prince and Princess of Wales into London, and some little pains were taken to advertise the fact; a large traffic came over on that day, and such a permanent increase of traffic continued as to raise the dividends 33 per cent., till the tolls were finally abolished. After long negotiation an arrangement was effected with the City authorities to throw open the bridge, toll free, for a year as an experiment, it being well known, on the part of the Bridge Company, that when once thrown open toll free it could never be closed again.

The bridge cost 660,000*l.* cash. The value of the bridge at the time of sale, arrived at by capitalising the income at 5 per cent., would be 60,000*l.*; the sale was effected at 200,000*l.*

To say nothing of the value of the bridge itself, equally good approaches could not have been purchased and cleared in any site so suitable for less than a million, the bargain may therefore be considered a fair and good one for both parties.

It is no doubt desirable that Waterloo Bridge should also be thrown open toll free, but though

the original shareholders have never received any dividend, the annuitants are in receipt of a very considerable income, to buy off which, and to pay the original shareholders something, would amount to a very considerable sum,—far more than at present there is any prospect of being given by parties interested in this locality, which is beyond the reach of the City purse.

The rebuilding of Westminster Bridge of a width of 84 ft. has provided ample accommodation there. It may be regretted that the inclination on the bridge itself has not been made a little steeper, in order to ease the approaches; the gradient on the bridge is 1 in 58, and the approaches 1 in 30 at the steepest part, whereas a general inclination of 1 in 43 would have been more advantageous for the road traffic, without interfering to any appreciable extent with the river traffic; the approaches have been somewhat sacrificed to the bridge, instead of considering the whole as one work, and giving the best possible inclination throughout.

Lambeth Bridge was built to meet a supposed want, but it is singular how little traffic there is really found to go over. From parts of Pimlico to the City this bridge offers a good route, but the traffic from Pimlico to the City is very small, and with an Englishman's inveterate objection to tolls, the route by the Thames Embankment no doubt takes the bulk of the passengers who do not go by omnibus.

Vauxhall Bridge occupies a site of considerable importance, and though it is on the outskirts of the metropolis, a fair amount of traffic from the West-end to the south of the Thames takes this route. The extension of the South-Western Railway to Waterloo Bridge, and lately the formation of the southern embankment from Vauxhall to Westminster Bridge, has caused a very severe loss to this company.

Chelsea Suspension Bridge is a valuable communication for residents in the adjoining localities, and will probably become of increased importance as the southern side of the river becomes more populated, and every year as building increases, free access to Battersea Park becomes the more desirable; but still this bridge, though no doubt one of "the bridges of London," can hardly be considered as taking part in the great metropolitan traffic.

The Bridges considered as mechanical Structures, with reference solely to Strength and Stability, will lead naturally, in the first instance, to the question of Foundation.—The original timber bridges which crossed the Thames at London towards the end of the Saxon reign and the beginning of the Norman are involved in much uncertainty, but there seems evidence of examples of the importance of driving the piles of such bridges deeper than was then accomplished, for they were washed up by floods, and pulled out by the Danes to a very serious extent, carrying with them the superstructure.

The defect of these piles probably led the builders of the first stone bridge into the opposite extreme, namely, making the piers too massive, and by their very mass intended for strength, leading to destruction by increased scour. The preservation, maintenance, and extensive repairs of the first stone bridge appear to have been a serious difficulty and constant expense from the very date of its completion. The foundations were, in fact, defective from being too wide. The depth of piling might probably have been sufficient, had not the waterway been blocked up by the great width of pier, thus causing scour.

The piles of the first wooden bridges were not stable. The foundations of Old London Bridge were not altogether successful; therefore in building the next bridge, Westminster, another plan was tried,—the French system of caissons; in fact, barges in which the piers were partly built while floating, then sunk in place, and the sides removed, the site having been dredged to receive them. The objections to this plan are, that a perfectly level bed cannot be obtained, and the caisson bottom must inevitably rest, in the first instance, on limited portions; increased weight and time will no doubt produce a more even bearing, but it must involve settlement to some extent.

This caisson system was adopted at the next bridge built—Blackfriars; the caisson bottoms or platforms on which the piers stood, lately taken up, were 88 ft. by 37 ft., and two balks and a half thick; area, 3,256 ft.², bearing a weight of about 11,241 tons, or 31 tons per foot super., supposing the whole area to take its share of

load equally; but, in fact, the weight was carried by a much more limited area, the load per foot on the surface of timber area of footing was about six tons. The timber projecting beyond the footings could not have taken any material weight. Had this weight been evenly distributed over the whole bearing surface, that surface being the London clay or gravel, resting on the clay, the foundation might have been good enough as long as not undermined; but there were symptoms of the arches having yielded on the centres being struck, which leads to the suspicion that the pier foundations had slightly moved—in fact, had come to their bearing as the increased weight came on. In arches Nos. 5, 6, and 7 from the south, lead was found run into joints on the north side; in each case the arches evidently having lurched over to the south, opening the joints on the north haunch, lead was run in as much as 1 in. thick at extrados tapering inwards, the masonry joint being tight as intrados. The opened joints were not in one course through, but stepped a course up or down. It is supposed that some four or five tons of lead were taken out, but the greater part was stolen. This system of caissons is now universally admitted to be defective and inefficient, principally from liability to be undermined by increased scour.

Next in order comes Waterloo Bridge, the first of the bridges built in what may be called the present day, built after the date when engineering had become a distinct profession. The foundations of this bridge were of a totally different character from all preceding; no expense nor pains were spared; everything was done which at that time was considered most efficient. Coffer-dams of double piling and puddle were formed which did their work successfully, laying the foundation dry. Southwark Bridge followed on the same principle, and new London Bridge immediately after.

Taking the case of London Bridge, the area of the pier foundations was laid dry with coffer-dams 43 ft. below Trinity high water; bearing piles of whole balk were then driven over the whole space, 4 ft. and 3 ft. 6 in. apart; cross rails were laid on the pile heads, the intervening spaces were filled in with rubble and brickwork, the whole planked over, and the piers built on the foundation thus prepared. The weight on the foundation of the centre pier is about 21,151 tons: supposing this to be evenly distributed over the whole of the bearing piles, there would be a weight of about 88 tons on each pile, and, of course, on each oil crossing each pile-head. The specification describes these oils as either elm or fir. The sample of timber representing a pile-head and cross rails shows what the effect would be of a weight of 88 tons on each pile. The oils were crushed at 30 tons. Clearly they could only support a very small portion of the 88 tons. The bridge therefore, no doubt, rests principally upon the intervening spaces which had been filled in with rubble.

Supposing the weight evenly distributed over the whole area of ground, it would be 6 tons per foot, and this weight the London clay seems just capable of bearing; but it is a question whether the solid clay undisturbed in its natural condition would not have been far more secure than when broken up by driving the bearing piles. The London clay is not a spongy material requiring piles to consolidate it.

It is well known that the courses of the piers have a downward tendency towards the east about 10 in., and the eastern side of the superstructure has the same tendency, but not quite to the same extent: the average is about 7 in. The number of arch-stones fractured would lead one to suppose there had been motion on the piers receiving their load; but, on the other hand, the recorded small subsidence of the arches on striking the centres indicates the contrary.

The inclination of the courses is accounted for by one engaged on the works thus:—

"Denmark-hill, April 16th, 1869.
My dear Sir,—I have much pleasure in being able to give you the information you desire. There never was any settlement of the piers of London Bridge. I made the drawings of that bridge for Sir John Roan. Messrs. Jolliffe & Banks were the contractors; their principal master of the works was Mr. Henfrey, who was a very competent person. He had a young man with him, Mr. Hollingsworth, a relative. The foundations were constructed in coffer-dams, and the pumps fixed at the down stream end, the piles driven, and the piers were laid with an inclination towards the pumps.

"The stone was dressed in courses at the Isle of Dogs, brought up and laid with that inclination. Mr. Henfrey intended to change the incline courses into horizontal before they approached low-water mark, but he died; and young Hollingsworth took the initiative, and did not dis-

cover the error before it reached the springing. He no doubt gained what he could afterwards.
I am, my dear Sir, yours very faithfully,
"Henry Carr, esq." (Signed) E. W. MORRIS.

There are difficulties in this explanation, more particularly as regards the fact that all the piers would not be in the same stage of progress at the same time, nevertheless the letter from one engaged on the works is of interest.

Sir John Rennie, the engineer, considers that a slight subsidence did take place in 1829, when the bridge was in progress. It is strange, however, that all the piers should have gone in the same direction, and nearly to the same extent.

In New Westminster Bridge another plan of foundation was adopted, resembling that in building Old London Bridge, the object in view being to avoid the expense of coffer-dams. The principal bearing is on 145 elm piles in each pier, driven 3 ft. 3 in. and 2 ft. 6 in. centre to centre, and out of below low-water. These elm piles are surrounded with forty-four iron piles, 5 ft. centre to centre, with cast-iron plates driven between the piles, thus forming a complete casing, which surrounds and includes the elm bearing-piles. The interstices are filled in with concrete, making the whole solid.

The weight on these piers is so slight, when compared with that on the piers of London Bridge, that the question of foundation becomes of less moment. The weight per pile is about 15 tons, supposing the elm piles to carry the whole weight; or about 11½ tons, supposing the iron piles to take their share. Much the same question will arise with regard to these foundations, as in the notice of London Bridge. There is an outer casing of cast iron, the interior filled in. Query,—would not solid cement concrete, resting on a well-prepared bed, have made a more efficient and more durable foundation than piles of timber, the interstices only filled in with concrete? Homogeneity is the essence of strength. One homogeneous mass is the true foundation wherever it can be obtained.

The next system of foundation introduced was that of iron cylinders, open at bottom, and sunk into the bed of the river, by excavating inside first by divers; afterwards, when water-tight strata are reached, by pumping out and working dry; the interior, when a sufficient depth has been reached being filled solid with concrete or brickwork.

The railway bridges,—Charing-cross; London, Chatham, and Dover; and Cannon-street, are thus carried, the weight per foot on the bearing area varying from about 6 tons to 7 tons. The testing weights showed that foundations so heavily loaded have quite as much to do as they are prepared to take, the Charing-cross piers having subsided 3 in. and 4 in. with the testing loads.

Nothing can exceed the facility of putting down such cylinder foundations, and nothing can be better where sufficient area is given, and where such form is suitable to the superstructure. The weight required to sink these cylinders seems to be about 3 tons per foot of circumference, that weight including the cylinder itself and the load placed on for the purpose of driving it down.

There is one interesting circumstance with regard to the cylinder foundations of the London, Chatham, and Dover bridge. The cylinders were 18 ft. diameter. It was desired in six cases to give a more extended bearing area. The excavation was boldly and successfully carried down 5 ft. below the cylinder bottom, and the diameter of excavation was extended from 18 ft. to 21 ft., increasing the area 36 per cent. The cylinders were relieved of the weights need to sink them before being undermined; but no support was required to carry the cylinders, nor was any timbering requisite in the space excavated. This is a good illustration of the solidity of the London clay.

There is one very important distinction between railway and road bridges. In railway bridges the weight is always carried in the same position, and is naturally transferred on to definite and distinct points. Circular cylinders placed under these terminal points of the arch or girder become therefore suitable foundations. But the case of a road bridge is different, inasmuch as the varying traffic is distributed indiscriminately all over; the weight and strength of the bridge have, therefore, to be distributed also over the whole width, and consequently a continuous pier is more suitable than such isolated columns as are sufficient for railway bridges.

The suspension-bridges at Chelsea and Lam-

both follow suit with the railway-bridges. Suspension-bridges are similar to those carrying railways, in having the weight collected and borne by few distinct and isolated points, the chains acting in that respect in the same manner as girders. Circular cylinders in road suspension-bridges are therefore suitable, for the same reasons as in railway-bridges,—the weight is accumulated on certain definite, distinct, and isolated points.

In rebuilding Blackfriars Bridge wrought-iron caissons were adopted, varying, however, very materially from those used in the piers of the railway-bridges. Each pier was formed by four rectangular caissons, 36 ft. by 18 ft., carrying the roadway, and two triangular caissons projecting beyond, and carrying the outwaters. A space of 3 ft. was left between the caissons, which space was eventually filled with concrete, and bridged over by the masonry, at a level 4 ft. below water, the pier being continuous from that level upwards.

The two piers on the Southwark side are carried down to 42 ft. below Trinity high water; those on the City side, where the strata are softer, are 47 ft. The instructions received from the Bridge House Committee were to put in such foundations as would admit of the river being dredged to 30 ft. below Trinity high water; or 4 ft. lower than the then existing deepest part. The new piers are 14 ft. and 19 ft. deeper than the deepest of the old foundations, and are all well into the London clay. The lower part of the caissons, up to 4 ft. below low water, which are filled in solid with concrete and brickwork, are left in permanently; the upper parts were removed as the work proceeded, the masonry piers commencing at the above-mentioned level, and the width being reduced from 36 ft. to 22 ft. 9 in. for the smaller, and 26 ft. for the larger pier. The area of bearing surface is 3,739 sq. ft., and the weight carried by the middle piers is 3½ tons per foot super, resting on the clay, which is about half the weight per foot on some of the railway circular cylinders. On an isolated foundation, where slight settlement would not affect or endanger the superstructure, a far greater weight may safely be placed than could prudently be trusted on a similar area forming part of the foundation of a large and continuous superstructure, such as the piers of Blackfriars Bridge, where slight settlement of any one portion would have disturbed and fractured the masonry above.

In the upper portion of the piers of bridges there is not such scope for variety as in the construction of foundations. For the Thames, the right material, no doubt, is granite, and the best heating is good sound brickwork. Good sound brickwork, carefully built in Portland cement, or lias lime is stronger work and more solid than even ashlar throughout, but the granite facing must be well bounded in, not such work as is sometimes done,—a face carried up of stone nearly of the same depth throughout.

The arches of all bridges of any size or importance, up to a late date, were always of masonry; but after various examples of iron had succeeded elsewhere, cast iron was used for the arches of Southwark Bridge. In later times the manufacture of wrought iron has advanced so rapidly, and wrought iron offers such advantages over cast, that it is now almost universally used.

The cast-iron arches of Southwark Bridge certainly are a bold and noble construction. It is a singular and almost unique fact with regard to cast-iron arches that they were in the first instance made much sligher than in later works. The bridge at Sunderland, of 236 ft. span, has arches of about 46 in. area of metal. Southwark Bridge centre arch, of 240 ft. span, has arches of 6 ft. depth, and 122 in. area.

The tendency in all other works has been to give greater mass in the first instance, and to build sligher in later times. The builders, however, of Sunderland Bridge gave their successors no opportunity of paring down,—the margin of stability there was small indeed.

The danger with cast iron in general, and cast-iron arches in particular, is that of getting an unequal bearing, either from defective fitting or from expansion and contraction. The rise and ordinary change of temperature, or about ½ in. for each degree: such rise and fall must produce considerable variation in the load to be sustained by the extrados and intrados of the arches.

The brittleness of cast iron, together with the improved facilities for the manufacture of

wrought iron, have led to the almost universal adoption of wrought iron for arches. If one portion of a wrought-iron arch,—say, the intrados,—should, from bad workmanship or other cause, have more load to carry than the strength of the metal will bear, a general compression would take place in that portion, and a corresponding shortening, allowing the remainder of the arch (the extrados) to come into play before any mischief took place.

Though cast iron, in the dimensions usually experimented upon, has probably double the power of resisting compression that wrought-iron has, nevertheless it is usual not to trust it with much more than about half the load, showing how strong is the general feeling of distrust in that brittle material.

As regards oxidation, however, the balance is much in favour of cast-iron, both from a less tendency to rust and also from the same absolute amount of loss being a less per-centage on the greater mass. This is a strong reason against using thin wrought plates in any construction exposed to the weather—the loss, say of one-eighth of an inch, by oxidation would be immaterial in a thick casting, but would be fatal in a quarter-inch wrought plate.

This question of rust was most carefully considered with regard to Blackfriars Bridge, but no satisfactory result was arrived at. A plan of dipping the iron hot into a bath of prussiate of potash and chloride of potassium, and further treatment with cyanide of potassium, according to Messrs. Morewood's patent, was entertained but abandoned as impracticable on so large a scale. The effect, when properly carried out, is to case-harden or convert the exterior surface into steel. The patent process of Madame de Lavenant was tried with great promise of success, but with ultimate failure. Her plan is to coat or paint the iron with a preparation of finely pulverised glass, which is then submitted to such a heat as will fuse the preparation, and form an enamel surface.

Ultimately the ordinary course of heating the ironwork and dipping in boiled oil was pursued, four coats of paint following,—asphalte paint for the interior surfaces, and Torbay oxide of iron paint finished with Messrs. Ross & Co.'s olive green for the exposed face.

The great desideratum of the day, no doubt, is some means of permanently protecting iron from rust: this is now said to be done by Turner & Allen, of Upper Thames-street. Their process is to coat the iron with bronze or copper in such a manner as to effect perfect union between the two metals. If this union of the two metals really be as perfect as stated, no doubt it will prove a most valuable discovery. Some specimens of coating both with glass and bronze are laid on the table for the inspection of those members who do not happen to be acquainted with these processes.*

THE DECORATION OF ST. PAUL'S BY NATURE AND ART.

If any apology were needed—and can there be any?—for reverting to the present and future of St. Paul's Cathedral, it would certainly be negatived by the significant sentence at the conclusion of Mr. Lupton's letter,—“Has Mr. Shone, who speaks for the Restoration Committee, nothing to say about the new painted glass windows?” It would be, as we think, exceedingly interesting just at the present moment if Mr. Lupton would give the artistic and architectural world the benefit of his thinking on the subject of the new painted windows. There is always a wide difference between the criticism of one of the public on a work of fine art and those of professionals. The professional is apt to look at the means too much, and to forget the result, while we are sure that the non-professional critic will look almost wholly, if not quite, at the result. There is no small advantage in this, as the real test of the value of an artistic work must always be, not the *how* it was produced, but what effect it has on the human mind and feelings when out of the artists' hands, and in its place. This thought is more important than at first sight it looks, and in the present case, that of the windows in St. Paul's, it is all important; for what we want to know is, what sort of impression is made on the mind of an intelligent and clever man by such work as this.

The windows in St. Paul's were commenced under peculiarly favourable circumstances, and

* To be continued.

great study and pains seem to have been employed in their production, by previous travel, and by looking out for the best examples to go by, and in the finding the best man to do the work. The result is, unfortunately, artistically considered, not a success; for these windows, like the rest of the new "decorative work" at St. Paul's, are the result of the system of *art manufacture*. Let us try to make this thought intelligible. One great difficulty we labour under, and it is this: that there is unfortunately no one public building in London which can be pointed to as exemplifying, in perfection or completeness, the solved problem of a "decorated building" as an artistic performance. We can only point to parts and sections of buildings,—here a roof, there a wall surface, and there a window, or a panel, but no complete work; so that the reader must build up, in his imagination, or, as the Germans would say, in his inner consciousness, if he can, what a *decorated building* by a great artist would be.

It is not a little difficult to treat a subject so extensive in a short space, but we cannot help expanding to wonder how it was that in the comparatively rude and poor days of Charles I., so magnificent and complete a work as the "Banquet Hall," and its painted roof, by Rubens, came to be done. No one now even dreams of painting the roof of the choir of St. Paul's in this way. Why, the whole of the choir of London, with its Lord Mayor and all his surroundings, the banks of Lombard-street, and the whole of their world of wealth, would stand horrified and aghast at the bare idea. Yet why should it be so? The money-power in the days of King Charles was as nothing compared to what that power now is; and why should it be that in that by-gone day a work should have been produced of genuine fine-art and painting, the like of which we now do not even dare to contemplate. That we are not progressing in the art of decorating is quite certain. We would, therefore, point to this roof of the Chapel Royal as an example in principle to go by of fine-art and artistic decoration. A partial success, for what a pity it is that the wood-work and stone surface of this noble hall should be so disfigured as they are, and choked up with common paint and tumpsty gilding, killing the paintings! This is one mode of painting or decorating a roof. For the reverse of this system of art-production, we may instance the flat, ungainly, and sound-destroying roof of Exeter Hall, from which it would almost seem the hint has been taken for decorating the roof of St. Paul's, for they are both alike the produce of the shop-decorator, and such work may, as everybody knows, be bought like paper-hangings. Indeed, it may very fairly be questioned whether the art of paper-printing and hanging,—somewhat despised though it be,—is not the finer art of the two. What is now doing in St. Paul's is of this latter Exeter Hall type of art. What we suggest as the true and real way of work is that of the Rubens and Chapel Royal type, as far as it has been accomplished. We would ask the reader who is sufficiently interested to go to both buildings, and, looking well at them, to balance the loss and gain, and to mentally compare them, and to declare which is best to go by, the art-manufacture of the one, or the real and true art, the painting in its true sense of the other. No artist can for one moment hesitate; and it does seem something quite marvellous that there

should be in this country such an institution as the Royal Academy, and for it to be passed by without a thought, and some London shop entered, wherein to find the art-power to cover the roof and walls of such a building! It would be, indeed, impossible to overrate the value and importance of filling St. Paul's with painted glass and pictures worthy of the place they decorate. We do not hesitate to say that it is not at all inferior to the exhibition of pictures in the National Gallery, even if it be not superior to it, as an art influence, for it would show to the public what the object of high art and painting is, and what they are capable of doing. One of the great objects of St. Paul's is to read to the public the sacred stories and wise teachings of that great and wonderful book, the Bible, and it is considered as one of the proud things which England does, to do this, day by day, without pause or interruption: ought it not, therefore, to be one of the objects of those who have it as their duty, to supplement this daily oral teaching by the conlar teaching of pictured representations of those very stories and scenes which are read of? No one, probably, will be found to deny this, but the great question then comes, who is to do it? Is it to be a mere matter of business merely, like the decoration of a music-hall, or a theatre, or a fashionable room? This is the whole question, for no one, we presume, can or will defend the work which has been put up by way of "decoration" on the ceiling of the east end of the choir immediately over the windows of the apse of St. Paul's. Who is he, therefore, or are they, who should be called on to do this work? There can be but one answer. He or they should be selected from the ranks of that body which represents the picked men, as artists, of modern England, viz., the members and associates, and may be the students, of the Royal Academy. If the Royal Academy represents, as we are so often told it does, the high-art producing power of the time, and includes within its body not only the best and highest of artistic power, then it logically follows that out of its body must be found those who are most worthy to do such work as this. Will they do it, if called upon; and will the committee of the St. Paul's Restoration Fund call upon them to do this work? Our own conviction is, that it would be far better, and a far nobler work, to decorate or cover with real and *bona-fide* painting the choir of St. Paul's only, and to expend the whole of the money in the hands of, or promised to, the committee in this sole work, than to cover the whole of St. Paul's ceiling, walls, and even floor, with mere art-manufactured work, which may be, as all know, bought over the counter like paper-hangings and printed calico window-curtains.

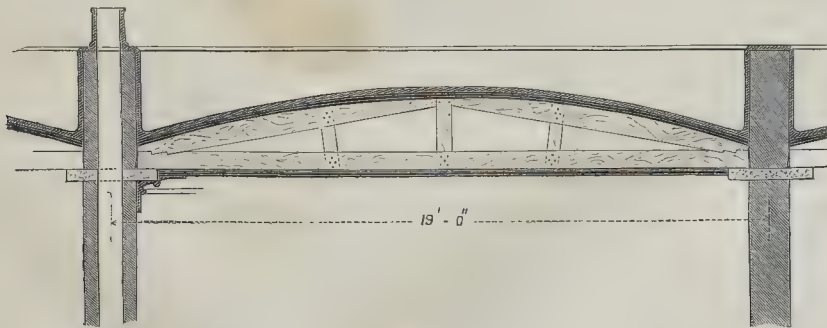
It is not for us perhaps to prognosticate as to the how this great work should be gone about, or as to the probable nature of the result; but judging of it by the light of those works which have been seen by all from the heads and hands,—we repeat the *hands*,—of Millais, Holman Hunt, and others; then may we confidently affirm that painting, worthy of the building, and truly decorative and instructive, would result. No mere supply of sketches or "cartoons" be it understood, is here meant for other and inferior hands to execute; but these paintings, we are suggesting, shall be the sole work of the painters themselves, just as much so as the "Chill October"

and the "Scape-goat." This is what is meant by "painting," no matter where it is or on what material, whether stone or glass. A "Crucifixion" on a surface of glass is to the full as difficult, and requires as much art power in its way, as does the same subject on paper or on canvass. The general ideas, the composition, the drawing, the actual painting, the life in it and expression of the individual figures and faces, and all else, are to the full as difficult and as much the work of a great artist, and equally demand artistic power of the highest order the time and country can produce. We are supposing and suggesting that the work shall in the first instance be confined to the choir only, and the three windows in the apse,—not the upper or clearstory ones, for it may well be a question whether or no it would not be a judicious thing to hang silk drapery over these windows, so as not to interfere with the full effect of the lower and more important ones. The upper window, now filled with glass, which lets in a good deal of clear daylight, "puts out" the lower and more sombre ones below. We are also supposing that the whole of the stone surface throughout the cathedral, doorways and all, shall be cleaned clear of their successive coatings of common oil colour, and the pure and nature-coloured stone surface made visible. *This simple process in itself is decorating St. Paul's.*—Nature's decoration. We must also suppose the whole of the poor and shabby gilding, inexpressive of anything as it is, gone, and cleaned off from the carved work and mouldings. Thus we should have at least two good things in St. Paul's,—first, *Nature's own decoration*, the ever-varied stone-coloured surface of the walls, and piers, and arches growing ever dimmer and more harmonious by time, and offering a clear and bell-like surface for the sound from the voices of the choir and organ-pipes; and, secondly, we should have, a little of it at least, some real and genuine "painting" on the clean plaster ceiling, or, perhaps better, on canvass, as at Whitehall; and then there may come windows, good, as far as the art power of the present age can produce them. More, of course, we cannot have.

TILE AND CEMENT ROOFS.

IN view of the part played by the roofs of the Chicago houses in spreading fire, attention has been directed to means of rendering this part of buildings less combustible than it is at present; and in our last issue, Mr. William Hild invited us to describe the inexpensive mode of roofing adopted by Messrs. Corbett & McClymont, on the Redcliffe Estate, South Kensington. We willingly comply, and give a section of one of the roofs, showing the construction. Arched ribs are placed from party-wall to party-wall, resting on stone corbels; boarding is laid on the ribs, and then two, or in some cases three, courses of plain tiles are laid in cement, the surface of the tiling and the face of the party-walls being afterwards rendered with Portland cement and sand. A stout plaster ceiling shuts all in below. Good workmanship is necessary; and care should be taken to prevent settlements in the walls.

Such roofs are not a novelty; they have been used here and there for some years past, but not to the extent to which they have been adopted by Messrs. Corbett & McClymont. There is a



Section of Roofs on the Redcliffe Estate.

trap-door in each to facilitate escape in the event of fire, and this ought to be of slate or some other incombustible material.

A modification of this arrangement, by which the use of woodwork should be altogether avoided, would be an improvement. We add the builders' own specification:—

Construct ribs as per sketch to form roof, and to be fixed not more than 2 ft. 2 in. apart, and on 4 in. stone templates as shown. Lay over same 1 in. rough boarding 4 in. wide, and 1 in. apart. Lay two or more courses of sole tiles in Portland cement over the whole, and float over the surface with Portland cement and sharp sand in proportions of three to one.

A correspondent mentions that in Stockholm a fire never extends beyond the house in which it originates, as the roof is invariably of brick or stone.

ST. BARTHOLOMEW'S HOSPITAL SURVEYORSHIP.

On Tuesday last the committee of governors selected the names of three of the candidates who are to be returned to a general meeting to be held on the 18th inst., when the election will take place. The names selected were those of Mr. Edward l'Anson, Mr. E. N. Clifton, and Mr. Frederick Marrable, in the order in which we have placed them. The other candidates were Mr. Charles Barry, Mr. W. Gardiner, Mr. W. F. Meakin, Mr. Henry Hunt, jun., Mr. Richard Bell, Mr. W. M. Tenlon, and Mr. Henry Dawson.

ARCHITECTS' COMMISSIONS.

Two anonymous correspondents of the *Nottingham Daily Express* have asserted that the architects of that town "are in the habit of receiving commissions from timber dealers and others who thus buy their custom and their certificates of the soundness of materials." Mr. Sidney B. Stevenson, architect, in the same journal, repudiates the assertion:—

"To the ungenerous and sweeping charge [he writes] that architects of Nottingham resort to dishonest means, I have only to say that it is not true. There are men who resort to all sorts of schemes to build, or do anything else without paying a fair price for professional talent, and who, instead of placing themselves in the hands of men who are above the reach of being tempted to trickery, employ some 'go between,' and thus in the end pay dearly for their experiment. I hope the 'Two Freeholders' are not of this category. The time has gone by for professional men to make exorbitant charges continuously. If there are those who make it a rule to 'bleed' their clients, it is some consolation for those who do not do so, to know that the chance is not often repeated of giving a second dose."

THE SANITARY CONDITION OF SCARBOROUGH.

Those who have authority in Scarborough and are interested in its well-being should take into immediate consideration its sanitary condition. Mr. G. P. Dale, F.R.C.S., who has been endeavouring to remove a stigma from Lonsborough Lodge, has thrown a lime-light into the ordinary lodging-houses of Scarborough. Mr. Dale writes:—

"Those of your readers who have had experience of the sanitary appliances of lodging-houses in watering-places will recall many cases of sickness corroborating these statements. In the hottest months of the year, when these houses are overcrowded with inmates, a breakdown happens. The effluvia is at such times so offensive to the senses, that nausea, sickness, or diarrhoea immediately follows; the whole household is stricken down. There the evil, such as it is, ends. I cannot recall one instance of such illness ending in typhoid or other allied fever. These cases are of daily occurrence during 'the season.' Hardly one house escapes, yet I can affirm that during twenty years' practice in Scarborough, I have not seen twenty cases of typhoid fever."

He gives his example, of course, from Scarborough, and a pretty state of things his statement points to. The matter should be officially inquired into, and the evils thoroughly combated, if the people of Scarborough wish their gay place to remain in favour.

In striking confirmation of the impression thus conveyed, Mr. William Cadman writes,—"Three times I have called the attention of the Scarborough authorities to their manure depot. The sad and much-to-be-lamented result of the Prince of Wales's visit will—yes, must—rouse them. Scarborough (I believe I may say) is seldom, if ever, free from fever. Now, all the filth, ashes, &c., from the town, which must contain the poison generated by sewage, is carted through the town, and deposited about half a mile, or a little more, in the valley above Lord Lonsborough's lodge. The wind is mostly down or up this valley. When down, the poison must pass into and about Lonsborough Lodge.

The Convalescent Hospital is also very near this depot, and the immediate neighbourhood is seldom, if ever, free from fever. Any one having to drive to Seamer must pass this depot. The Lonsborough party had to do so, and must have felt the sickening effect. Also a dreadful smell ascends from the drain along the sands past the Grand Hotel. This effluvia, with an easterly wind, must ascend to Lonsborough Lodge; the westerly wind bringing the poison from the depot."

Mr. Dale and the professional gentlemen acting with him, who say, apparently with much satisfaction, that the fall of the drains in Lonsborough Lodge to the main sewer "is very great," show that the arrangement is eminently qualified to discharge the sewer gases into the house; in fact, if the drains are not ventilated externally,—and we do not hear that this is the case,—that result at times cannot be avoided. No one for an instant thinks of attaching the slightest blame to Lord Lonsborough, or to insinuate that his house is any worse than scores of others. It is of the utmost importance that the truth should be arrived at.

A REVIVER FOR SOUTHAMPTON.

THE great, or what should be the great, southern port of the United Kingdom; the home station of the splendid fleet of ocean-going steamers of the Peninsular and Oriental Steam Shipping Company; the despatching post-office for India and other quarters of the globe, is not thriving, and the reasons of its threatened decline are not far to seek or difficult to find. Its intercourse with Manchester and the manufacturing districts is round by London. Its coal and iron are, for the greater part, carried to it by sea; the passage long, and not seldom very rough, sometimes dangerous. Minerals and manufactured goods are heavily weighted when they reach the port with the costs of freight, and commercial and shipping interests suffer in consequence. The high price of coal detests owners and captains of vessels from coaling there,—almost hinders them, indeed, from using the port. Ships that have arrived inward with cargoes, have to depart outwards in ballast, when their owners would gladly take cargoes,—whole or part,—in coal, iron, or manufactured goods; but those that have to ship these products are deterred from sending them to Southampton for shipment by the difficulties, detentions, uncertainty, and costliness of conveying consignments thither. A remedy for these disadvantages has always been held to be direct railway communication between Southampton and the localities with which it desires to have facilities for commercial intercourse. Twenty-six years since a direct line to Manchester was projected, but thrown out on third reading in the House of Lords, after it had passed the committees of both Houses, and after it had involved the promoters in costs amounting to 180,000*l*. Ever since then the inhabitants have been discussing the subject, and often fighting, in Parliament and out of it, to obtain their object, but hitherto without success. The inhabitants are again "much exercised" concerning this great commercial and social need. A requisition to the mayor, signed by above 600 of the most influential inhabitants, resulted recently in an enthusiastic meeting in the Guildhall, at which resolutions were passed with great enthusiasm, pledging those present to support a direct line to South Wales,—which also shortens the distance greatly to many other places and districts,—that has been laid out by Mr. James Brunlees and Mr. Arthur Pain, engineers. The line, it is stated, has been laid out by the route least likely to cause competition with the great companies that claim the territory, but disclaim the obligation to give to the people of Southampton the railway accommodation that is of almost vital importance to them. It is to be feared that when the promoters get into Parliament they will find themselves as did the lamb with the wolf in old *Æsop*; whether they drink up stream or down, they will be set upon for troubling the water.

The proposed line is to commence in the South Wales coal-field; to cross the Severn at a point about midway between Gloucester and Bristol, by a high-level bridge, of nearly three-quarters of a mile in length, with 120 ft. of will proceed in a south-easterly direction, but with a spur thrown northwards from Malmesbury to Nailsworth, to meet the traffic from

Birmingham, Manchester, and the North. The main line of the South Midland will cross the Midland at Berkeley Docks, and will cross the Great Western at Wootton Bassett and Hungerford, where the line forks,—one spur running on to the South-Western at Basingstoke, the other proceeding southwards to Andover. The promoters will apply for running powers over the South-Western between Andover and Southampton, and, in return, will give that company access to the South Wales coal-fields, from which it has hitherto been shut out.

The distances saved by the proposed route would be 43 miles between Cardiff and Southampton, 21 miles between Manchester and Southampton, and 17 miles between Cardiff and London.

The scheme has the old-fashioned honest paternity of the railway projects of early days: there is no scheming or dodging about it: all is open and above-board. It is believed to be as promising as it is thoroughly sound; and it is to be hoped, in the interests of fair play, that the promoters may be able to hold their own against all comers; may obtain their Act; and that Southampton, instead of falling into decay, may become, ere many years elapse, the Liverpool of the South of England.

SURVEYORS UNDER THE DILAPIDATIONS ACT AND APPRAISEMENT STAMPS.

IN reply to an inquiry made by Mr. E. G. Bruton, the Assistant Secretary of the Inland Revenue Office has been directed to say "that a surveyor appointed for a diocese under the 'Ecclesiastical Dilapidations Act, 1871,' is not an Appraiser within the meaning of the Stamp Act, 1870, and is not bound to make his report on an appraisement stamp."

MANCHESTER FREE LIBRARIES.

THE nineteenth annual report of the Manchester Free Libraries has just made its appearance, and contains many interesting facts illustrative of the growth of these institutions. A beginning was made with a reference library and one lending library. The reference library had then 16,000 volumes. It has been greatly extended and enriched, and now contains upwards of 45,000 volumes, including many books of great value. The single lending library has been multiplied by six, and a seventh is in progress. The 5,300 volumes appropriated to circulation in 1852 have increased to 60,573 volumes in 1871,—that is, the libraries possess 105,693 volumes in all the departments. The six departments, which include a public reading and news room, at each lending library, engage the services of thirty-seven heads of departments and assistants, including nine female assistants. During the last year the libraries have been used by about 2,112,900 persons, of whom 420,249 have taken books to their homes, 136,238 have read books in the lending library reading-room, 69,385 have used the reference library presumably for study and research, and about 1,495,000 have availed themselves of the privilege of perusing the newspapers, periodicals, and other publications, for the use of which no application is required, admission being absolutely free, without questions asked. During the last year 6,682 volumes have been added to the libraries, of which 5,861 were purchased, and 821 presented. In evidence that books are not purchased to stand undisturbed upon the shelves, it may be mentioned, that during the last year 1,952 volumes were withdrawn from circulation as "worn out." In the first year from the opening of the library, the aggregate issue was 138,312 volumes, or a daily average of 461 volumes. Last year the aggregate average issue was 917,163 volumes, or a daily average of 3,185, or nearly 270 volumes in the hour. The aggregate number of volumes applied for during the year has been 917,613, of which 606,199 were taken home, 147,323 read in the branch reading-rooms, 92,594 were given out in the reference library, with 171,497 specifications of patents.

The Reference Library is supplied with 155 periodical and serial publications, transactions, &c., many of which are presented by societies and publishers.

The lending library reading stands and tables are liberally supplied with newspapers and magazines. In one of these rooms there are taken in daily, 33 copies of daily papers, 3 twice a week

papers, 48 weekly papers, and 54 monthly publications. Occasional copies are contributed, or procured, of 35 others. From the same department 39 different periodicals are lent to borrowers: these include the *Atlantic Monthly*, *Blackwood's Magazine*, the *Builder*, the *Cornhill Magazine*, the *Dublin*, *Edinburgh*, *Fortnightly*, *London Quarterly*, *Quarterly*, and *Westminster Review*; *Fraser's*, *Gentleman's*, *People's*, *St. James's*, *St. Paul's*, *Sunday*, and *Temple Bar* magazines; with many other excellent publications. This great boon is highly prized, and taken advantage of extensively. The monthly publications are issued on an average eight times per month, and the reviews about twelve times in each quarter.

The supply of mental pabulum thus provided for all classes in or near Manchester is more generous and of more easy access than the people of any other city and town in the United Kingdom,—it may almost be said on the face of the earth,—are favoured with.

SMOKE DRAINAGE.

MR. B. W. GIBSON sends us a letter of his, printed elsewhere, inquiring, as others have inquired before in our pages, why houses should not be built with downward flues terminating in the water drains. He says:—"Connect your drains of any district or block of houses with a ventilating furnace having a lofty ornamental shaft, and you at once obtain (availing yourself of the inverted syphon) the motive current of air, and a means of destroying the noxious gases of our underground system, while the central furnace would supply warm air or water, or even gas, to all the contiguous dwellings, and the heavy flogitious matters would be condensed chiefly in the sewers."

Amongst the advantages the writer notes:—
1. Absence of smoke in a city atmosphere.
2. Diminution of cost in construction of various chimney stacks.
3. Absence of architectural disfigurements, such as zinc owls and red cylindric pots.
4. Saving of fuel by total consumption of the smoke in the grate, the fire burning downwards, instead of upwards.
5. Greater ease in cleansing the flue from soot, and in the removal of ashes.

6. Steadiness and irreversibility of air-draught, and power of thoroughly ventilating a room, even when unfurnished with a fire.

Many years have passed since a similar proposition was first made, and plans and models were then prepared to show how the arrangement could be carried out.

The objections to it, however, are so strong, that it is not likely it will soon be put to practical test. Few men would be brave enough to take a house, the comfort of which depended on the constantly successful issue of combined action over which he had no control. The accumulation of soot in the drains, notwithstanding the more complete combustion suggested as being obtainable, would interpose another considerable difficulty.

SANDLORD LAW AND PUBLIC HEALTH.

SIR,—In common with many of your readers, I was much disappointed at seeing the present state of the law with respect to the relations between landlord and tenant as laid down by Mr. E. L. Tarnock (p. 892). I will not speak of the legal paradox of making a man pay rent to the termination of a lease for premises which had been blown up or burnt, or, it may be, had fallen down! If such be the common law of England, the sooner some statute is enacted for specific liquidation of onerous obligations on this question the better for us all, landlord and tenant included.

This, however, is not my principal object in taking up the oedgel. Here is my practical complaint (I quote from Mr. Tarnock):—

"Neither is a tenant free to execute essential work and deduct the cost from rent accruing due to his landlord, even where the latter has agreed to do repairs, and neglected them; the remedy against him then being by action of *assumpsit*, or for breach of contract."

Now, let us consider this position for a moment, supposing it to be correct, as regards its bearing on the public health. No essential repairs, it seems, are to be initiated by the tenant. How far, then, does the principle apply? What is an essential repair? Who is the judge in the first instance? Will any of

your legal readers assert that I must bring an action of *assumpsit* against my landlord for a chimney-can or a slate, which I think is every moment likely to topple off my roof, and cleave my skull? Must I bring an action for breach of contract in place of ordering a gutter to be repaired which endangers my parapet; or still worse, a burst pipe which is sapping my foundations? The thing is absurd. I still say nothing of a rotten soil-pipe, or a foul and filthy water-closet, which will certainly create typhoid fever or something of a more malignant character, if not properly looked after. And yet I know perfectly well that no class of repairs are so much "agreed to" by landlords, and, at the same time, so much "neglected by them." A. M.

*** Every lease ought to contain a proviso for the cesser of rent, in case the premises should be destroyed, as by fire, until such time as the landlord has properly rebuilt or restored the same; should this proviso have been omitted, the tenant has no means of escaping from the payment of rent even during the time that the premises remain uninhabitable.

PUBLIC BUILDINGS.

If the International Exhibition is to be a permanent affair, may not the "British public" ask that there may be a little more architectural display externally, and a little better arrangement internally? The present barn-like building seems to have been built rather as a boundary-wall to the Horticultural Gardens than as a structure of national or international importance.

When the building of '62 was erected there was a great outcry against Captain Fowke for his design, although it was held by many to have fine features, so that, if finished as he intended (vide the plans in the Royal Academy that year), it would have made a noble building. Are there many now who, capable of judging, can conscientiously call the present design and execution superior to his? There is nothing noble in it, it is dwarfed and shed-like. It seems but a very humble dependent of the noble hall that forms one of its entrances. Is expense the case? Or do they intend to erect a nobler building?

Again, will the nation be satisfied with the proposed elevation of the New Law Courts? Will the design suit the situation? Is it externally of the bold proportions and stately appearance a building of this description should possess? The design seems to me to better befit the country to stand in grounds as an asylum than the purpose it is appropriated to.

I for one would like to be proud of the public buildings we of the nineteenth century leave to our prosperity to compare with Wren and other earlier architects of note. G. S.

SANITARY MATTERS IN IRELAND.

THE chronic neglect of sanitary measures is bearing its inevitable fruits in the Irish capital, and in other towns throughout Ireland. Small-pox is still in the ascendant, and is not confined to the poor quarters of the city, but has laid hold of dwellings in the more fashionable quarters. This the leading journals of Dublin acknowledge, and are beginning at last to attribute it to corporate apathy and indifference.

Dr. Grimsaw has just read a paper before the College of Physicians. In his remarks upon "Sanitary Reform," he took occasion to refer to the various Acts now in force in Ireland bearing upon the subject, and showed with what powers the Irish executive were invested by the passing of these Acts and their incorporation. Notwithstanding these powers, the municipal authorities of Dublin pursue their old course of half-measures or no measures, and the Castle authorities also rest upon their oars. The police authorities in Palace-yard, and the civic authorities at the City Hall,—both next-door neighbours,—are agreed upon one thing, and are quite unanimous in doing it,—this is simply nothing. The minor sanitary officials of the corporation do a little, but they seem to be acting in restraint under their superiors. Now and then, an unlucky butcher or bacon-seller is hauled up before the authorities for vending unsound meat, and once or twice in a month the owner of a human piggery is cautioned or fined; but the delinquents in several cases bear the fines with true Milesian equanimity, and go on still sinning.

The police-courts are often the scene of a legal battle between opposing attorneys,—the nuisance in the meantime existing, and furnishing plenty of practice for the hospitals and the merry undertakers.

The Gas Company of Dublin is also playing fast and loose with the feelings of the citizens, and the directors are apparently adepts in the matters of "light and shade." A few days since a penalty was enforced against them for throwing too much shade upon the night-side of Dublin, but their picture in this instance was a scarcely less illuminated one than their former efforts in the same line.

"Dear, dirty Dublin," is a saying not more alliterative than true; but Dublin, with all her dirt, possesses much beauty in face and form, which could be seen to advantage if her guardians were compelled by law to do their obvious duties in the preservation of her character and regulations. They leave her in dirt, however, and her health and that of her population suffer accordingly, and will bear farther unhappy results.

COTTAGE HOSPITALS.

Tewkesbury.—The success attending the cottage hospital scheme, and the grateful readiness with which the poor have availed themselves of its benefits, have induced the governors to provide a building of a plain character, especially adapted to the purposes of the institution, and which shall be so arranged as to provide accommodation not to be met with in any ordinary cottage, however otherwise suitable. A portion of land was obtained for a site near the present cottage hospital, and plans for the erection of a building of the kind required as an estimated outlay of £1,000, received from Mr. Middleton, of Cheltenham, the appointed architect, and approval of. The tender of Messrs. Collins & Collis, builders, was accepted, and an amount subscribed towards the building capital, which justified the committee in at once commencing with the work. The ceremony of formally laying the foundation-stone has just been performed by the president of the institution, Mr. John Sarman, in the presence of a numerous assembly. The new building will be in the Early English style; of brick, with Bath stone dressings. Provision will be made for eight beds; there will be four wards, including a convalescent ward, and the requisite accommodation for the surgeon. A board-room will also be provided, together with the usual offices and sleeping and other apartments for attendants.

THEATRES.

Opening of a New Theatre in Hull.—The New Theatre Royal, in Paragon-street, Hull, which has been entirely rebuilt, under the direction of Mr. Sifton Parry, has been opened to the public. The building is erected on part of the site of the old Queen's Theatre, about two minutes' walk from the railway station, and is at once commodious and in the most easily accessible part of the town. The façade of the Theatre Royal is called of Classical design, with large pilasters, surmounted on pedestal bases, with large composite capitals and cornices, with a pediment over the middle pilasters. The interior is similar in shape and design to the Globe Theatre in London, and will hold 1,200 persons. Every appliance that can possibly conduce to the convenience and enjoyment of the visitor, it is said, has been studied; and while the ventilation of the building will be perfect, there will be a total absence of draughts. There are suitable ante-rooms and refreshment-bars, and the speedy clearance of the house in the event of a panic has been provided for. Mr. G. A. Middlemiss, of Sunderland, was the architect.

Burning of an Australian Theatre.—The Haymarket Theatre, Melbourne, after a short life of feverish excitement, mingled with long seasons of intense depression, has been destroyed by fire. The building, with the exception of a portion of the frontage, converted into a public-house, was unoccupied. The fire is believed to have broken out in the kitchen of the tavern. In a few minutes it had obtained such a hold upon the auditorium that any hope of extinguishing it was futile, and the efforts of the firemen were confined to preventing the fire from extending to the neighbouring houses. Every portion of the theatre and vestibule was destroyed, excepting the outside walls, and there is no probability of any attempt being made to reseatuate a place of

amusement which was a financial and artistic failure. Jefferson, Mr. and Mrs. Charles Kean, Lady Don, Madame Celeste, and several operatic celebrities, performed in this theatre.

THE TRADES MOVEMENT.

Sheffield: Carpenters' and Joiners' Board of Arbitration and Conciliation.—The delegates of the carpenters and joiners of Sheffield and the district have adopted a code of proposed arbitration rules, and in forwarding a copy to each employer they say:—

"We hope that you will use your influence in trying to form a Board of Arbitration with the other employers of carpenters and joiners, and prevent us from having to resort to other means to gain that object which we have given ample notice for, namely, the reduction of working hours and advance of wages. We hope that you will see the necessity of joining with us to bring this matter to a satisfactory termination to all concerned."

The Board is to be styled the "Board of Arbitration and Conciliation for the Carpenters and Joiners of Sheffield and District," and the object of the Board will be to arbitrate on any question relating to wages, working rules, and any other matters that may be referred to it from time to time by employers and employed; and by conciliatory means to interpose its influence to prevent and settle any disputes. The Board is to consist of eight employers and eight operatives, and the whole of the deputies shall serve for one year, and be eligible for re-election. The Board is to have full power to settle any disputes that may arise from time to time, and the decision of the said Board shall be binding on all parties concerned. A sub-committee to be formed to inquire into all cases of dispute, and, if possible, to settle the same; but such settlement, to be binding on either party, must have the approval of the General Council. Such sub-committee shall consist of the two secretaries, two employers, and two operatives, selected by the secretaries, from time to time as occasion requires, from the members of the General Council. Any expenses incurred by the Board to be borne equally by the employers and employed.

A "GOOD TEMPLARS" HALL, OF CONCRETE, AT WORKINGTON.

The foundation-stone of a Temperance Hall has been laid at Workington. The site of the proposed building is near to St. Michael's Church, adjoining Station-road. The building itself, which has been designed by Mr. Eaglesfield, of Maryport, architect, is to be 60 ft. by 46 ft., and when completed, will have on the ground floor a lodge-room, 30 ft. by 30 ft.; a reading-room, an ante-room, a kitchen, and a room for the person appointed to look after the building. There will also be two underground rooms. The upper story is to consist of a large room fitted up with a platform, and capable of accommodating 900 persons. The principal entrance to the building will face a new street which is about to be made, and there will be another entrance opening into Station-road. The estimated cost of the hall, which will be built of concrete, is about 1,200l. The contract for the erection of the building and the whole of the woodwork in connexion with it, has been let to Mr. R. W. Schofield, of Workington, who has undertaken to finish his part of the work by the 26th of May next.

INFIRMARY AND DISPENSARY, SHOREDITCH.

This building is being erected at the angle of Hoxton High-street and Raeburn-place, and is an extension of the workhouse, which was built about nine years ago. Its length is about 164 ft., and breadth 27 ft.; the height is 54 ft. The ground-floor is devoted to the dispensary, waiting-room, consulting-rooms, surgery, and necessary stores. The upper floors are divided into two wards, 72 ft. by 24 ft. each, with the necessary conveniences, nurses' rooms, &c., ventilated by air-gratings and hoppers formed in the sashes, also by the Galton stoves. Accommodation is provided for 150 beds.

Doctors' rooms, also rooms for matron and assistants, and convalescent rooms for men and women are provided on the upper floors by raising the existing adjoining buildings. It is faced with Gault bricks, Farcham bricks being used for the arches and strings. Greenmoor stone is used for the sills and all interior work, and Portland for the porches, the columns being Red Mansfield.

The works are being carried out under the architect, Mr. William Lee, Gresham-buildings, by Messrs. Hill, Keddell, & Waldram, at a cost of 11,000l.

VENTILATION OF SOIL PIPES.

Sir,—We have read a great deal of late respecting the great importance of proper ventilation of house-drains so as to prevent the accumulation of foul air beneath the house, which is the cause of more disease than any other. I find that the Local Board at Croydon makes it compulsory that all houses shall have an air-pipe from the highest part of the drains (say at the rear of the house), which shall be carried up above the highest window, so that no accumulation shall take place beneath the house; but there is one point of great importance which I find is seldom attended to, and that is the ventilation of the soil-pipe from the water-closets, where they are not connected with the rain-water pipes. The water-closets are often placed inside the house, and in large houses on every floor, without any air-pipe on to the roof; the result often is the foul air rises through the trap of the closet, often causing disease and death. I believe the want of this air-pipe to be a very great evil, and hope the time is not far distant when the placing it in connexion with the soil-pipe, will be made compulsory. E. O. S.

THE FOREIGN MISSION COLLEGE, MILL HILL, MIDDLESEX.

The College of St. Joseph, at Mill-hill, near Hendon, which forms the subject of our illustration, is destined for the education of Roman Catholic missionaries to serve in the British colonies. It has been erected from the designs of Messrs. Goldie & Child, architects, and is in a freely-treated style of architecture, consistent with the materials used, local stock bricks, with dressings and bands of red and black bricks, stone being sparingly used throughout. The plan comprises two wings, forming two sides of a quadrangle, and connected with the church by a cloister. On the ground-floor are a spacious library, refectory, and recreation and lecture rooms, with parlours for visitors opening on to a wide cloister paved with encaustic tiles. The kitchen offices are to the rear. On the upper floor are the students' sleeping apartments, opening right and left from a corridor extending the entire length of each window, and giving thorough ventilation to the building. On the first-floor is an infirmary, separated from the rest of the house by a screen, and provided with a window opening into the church, to enable the sick to assist at the divine offices. There is accommodation for 100 students, besides the superior, his assistants, and the professors.

The college is now completed, and the church, forming the fourth side of the quadrangle, is in course of erection. It will consist of a nave, with flanking side chapels terminating in a semicircular apse, with surrounding aisle; a lofty belfry will rise from the end of the cloister adjoining the church, while a spacious sacristy will be provided on the opposite side. The church, besides the students and inmates of the college, will be opened to strangers, who will occupy a portion of the nave.

ORGAN-LOFT IN THE CHURCH OF ST. PANTALEON, IN COLOGNE.

Nor many English visitors find their way to the neglected Church of St. Pantaleon, in Cologne. Amongst such superb ecclesiastical edifices as the great Minster of that city, and the churches of St. Mary in the Capitol, St. Gereon, St. Martin, and St. Cunibert, it is not to be wondered at that this out-of-the-way and forlorn church is overlooked; and yet in any less wonderful city than Cologne the Church of St. Pantaleon would assuredly not pass unnoticed.

The Church of St. Pantaleon now forms the garrison church for the Prussian regiments stationed at Cologne, and in order to satisfy the spiritual wants of this body, the church changes its religion twice every Sunday; that is to say, early in the morning it is used for the Roman Catholic services, and at noon for those of the Augsburg Confession. It is, of course, the immediate property of the Prussian Government, and it is not creditable to such a great and wealthy Government that the church which is their private property should be the only neglected one in the whole town. Surely one might expect that when the city of Cologne has set such a brilliant example of liberality in the superb works being now carried out in connexion with the cathedral and townhall of that city, and where the liberality of private individuals has produced such fruits as the restoration of St. Mary in the Capitol, St. Gereon, and St.

Martin, the Government might be expected to keep its garrison church in tolerable repair and free from filth.

The Church of St. Pantaleon is a large cruciform building, consisting of a nave of great width (nearly 37 ft. in the clear), with narrow aisles and low transepts of Romanesque work; to the east is a spacious chancel, with a Third Pointed apse and side-chapels, and to the west a very solid Romanesque tower, much modernised and crowned by what was originally a lofty bulb-shaped spire, but is now an ill-formed mass of timber and slate. Attached to the south side of this church there existed, until a few years ago, a most interesting cloister of very singular and most valuable Romanesque work; but after having, through many years of execrable neglect, fallen into ruin, it was at length pulled down, and only very slight traces of it are now to be seen adjoining the south wall of the church.

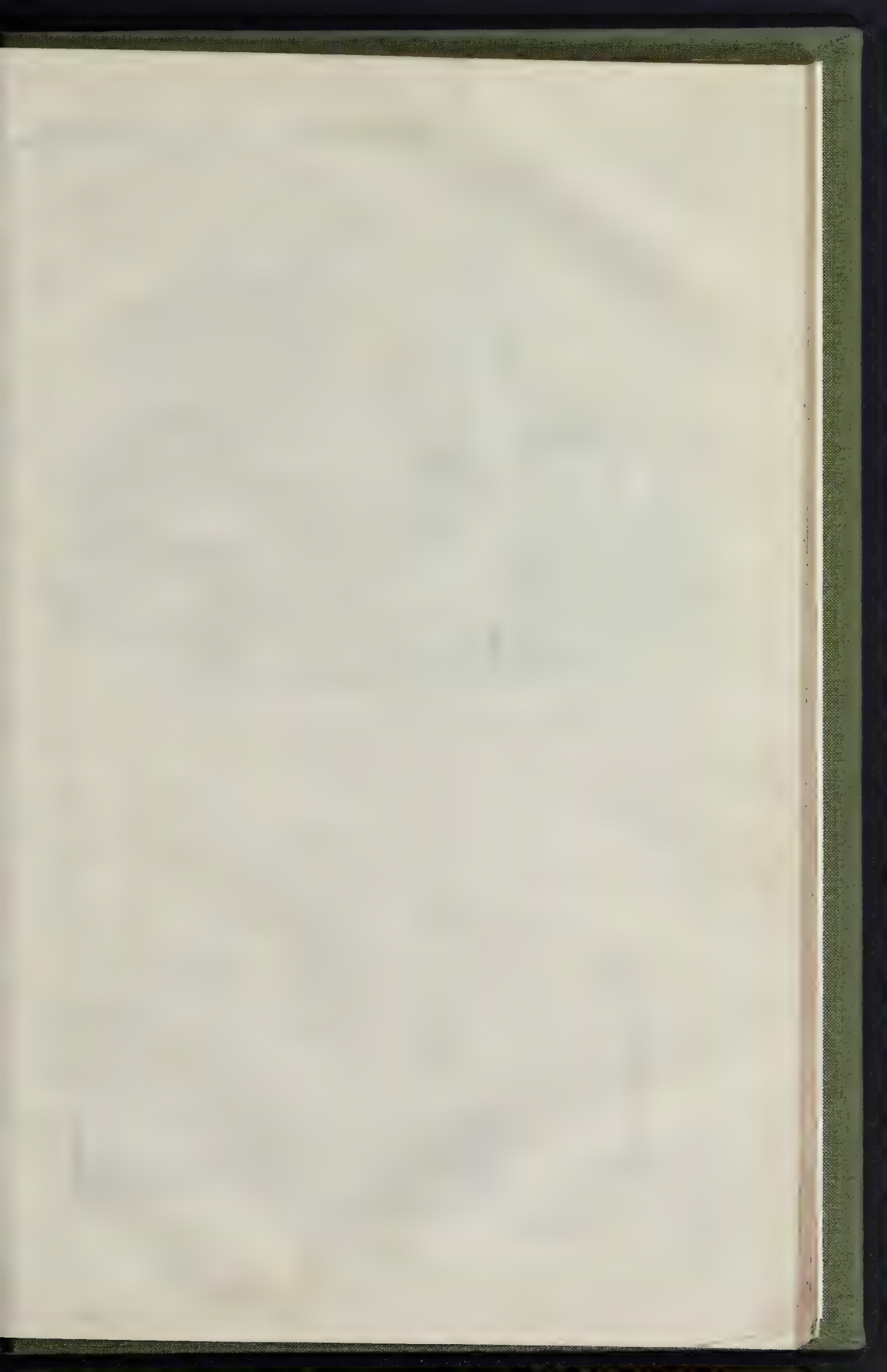
The earliest portion of the existing building is the narthex or porch under the tower. The church of which this formed a part, and of which also the existing nave may have formed a portion, was consecrated in the year 980. The transepts are much later work, and although Romanesque in character, probably are not earlier than the 13th century. The destroyed cloisters were of the very latest Romanesque work, and probably dated from about the year 1240 or 1250.

The interior of the Church of St. Pantaleon has been denuded of everything that could give it interest except the handsome organ-loft, of which we give an illustration, and some fine late glass in the three long windows of the apse.

As will be seen from our illustration, the organ-loft is of the latest Gothic work, and cannot be of an earlier date than the year 1489; probably it is even later than that. It is a work of the greatest delicacy and intricacy, but its construction is a singular example of the false method of working into which the late German architects were led by their excessive love of the wonderful. All these twisted and interpenetrating canopies and pinnacles which look so skilful, cease to astonish us, when we know that they are so many little pieces of stone stuck on copper wire! Some people have even doubted whether these canopies are made of stone at all, but we can at once set this matter at rest, for the canopies at St. Pantaleon, which we were able to examine most carefully, are certainly stone. And at Augsburg Cathedral are some canopies of the same description, constructed of red marble. It is, however, possible that canopies of this description may be found in the north of Germany, composed of a composition (Gyps), as artificial stone was largely used in the Middle Ages in the neighbourhood of Luneberg, and portions of Hanover, a singular example of which is the series of figures of the Apostles in the aisles of St. Michael's at Hildesheim, which dates from the year 1186. We are, however, convinced that as a rule these twisted canopies and pinnacles are of stone; of course where they may be found of composition, they are always carved, never cast.

When we first saw the organ-loft at St. Pantaleon's, we were inclined to think that it had originally formed portion of a roof-loft, but closer examination proved to our satisfaction that it still occupies its original position, i.e., the west end of the nave. During the seventeenth century the pillars which supported it were removed, and the present hideous substructure erected, which robs this charming work of much of its beauty; for however false the construction of this organ-loft may be, none can deny its beauty as a composition, and the delicacy and refinement of its details. We regret to say that this beautiful work of art shares the same neglect as the rest of the church. Scarcely a single finial remains perfect, and probably after a few more years of neglect, it will share the fate of the cloisters.

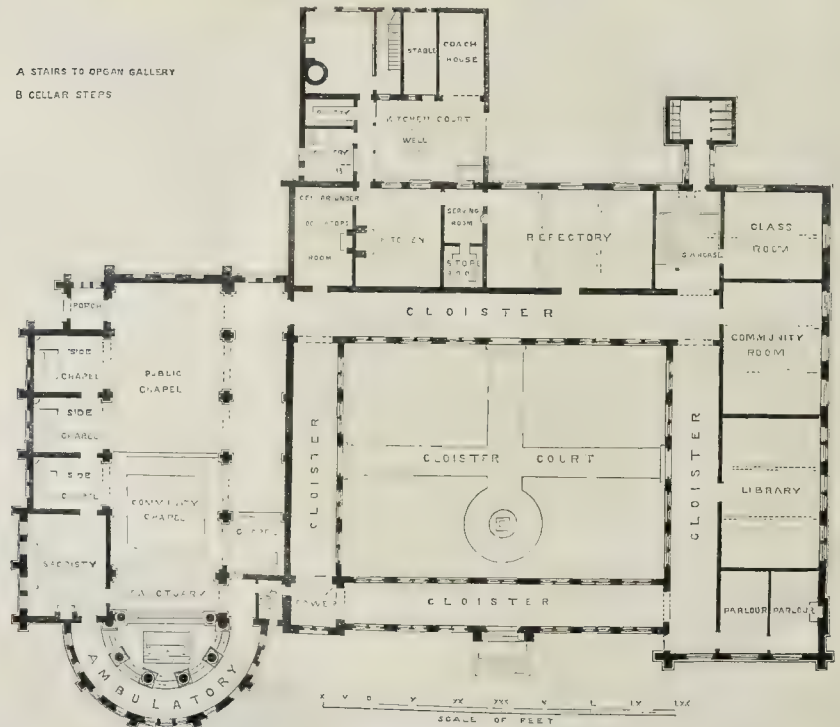
We would suggest to the Government of Berlin, that if they have no intention of restoring the Church of St. Pantaleon, it would be advisable to remove this organ-loft to the cathedral, where it would exactly fit in the place now occupied by the present temporary organ-loft, i.e., the end of the north transept; and this removal would give the additional advantage, that in the cathedral this work could be well seen, whereas in its present position, owing to the church being very dark, and the great height at which it is placed, it is only seen with difficulty, and much of its beauty consequently lost.



THE FOREIGN MISSION COLLEGE, MILL HILL, MIDDLESEX.—MESSRS. GOLDIE & CHILD, ARCHITECTS.



A STAIRS TO ORGAN GALLERY
B CELLAR STEPS



Plan of Ground Floor.



ORGAN-LOFT IN THE CHURCH OF ST. PANTALEON, COLOGNE.—End of 15th Century.

BRITISH ARCHEOLOGICAL
ASSOCIATION.

THE opening meeting, on the 22nd ult., the Rev. Canon Simpson in the chair, was distinguished by the announcement that the Society is arranging to move into larger rooms, where their library and museum can be properly used and seen by the associates.

A short paper was read by Mr. Edward Roberts, on the discovery and examination of what appears to be an ancient British cemetery (lately mentioned in our pages), on Sanbury Common, in the parish of Ashford, Middlesex, recently made by Mr. Leonard, the owner of the land, aided by the personal superintendence of three appointed members of the Association, and the liberal assistance of Mr. Thomas Ashby, of Staines, who, being desirous of preserving all local antiquities, kindly defrayed all the expenses attending the excavations necessary on the occasion. The result of two days' labour of the officers of the Association was the finding of a large number of very rudely-shaped urns, filled with the remains of burnt human bones, small pieces of charcoal, and a few calcined flints, but neither tools, coins, ornaments, nor weapons of any kind, although some pieces of flint bore some resemblance to arrow-heads, but failed, on examination, to betray the work of man. Six of these urns were exhibited to the associates, still containing untouched remains within them.

They were all made of a rough kind of clay and two kinds of paste, and had the appearance of being burned on the spot,—that is, over the bones whilst at red heat, so that the earth around had served apparently the purposes of a kiln.

One particular feature in the discovery, remarked upon by Mr. George R. Wright, who, with Mr. Black, had assisted in taking these urns from the earth, was the absence of any barrow about the cemetery, the land around being very flat, and apparently on a level with the Thames, which is about a mile and a half distant from the spot. To this Mr. Syer Cuning observed there were many instances on record of all traces of the barrows or mounds of earth having been removed ages ago; and he therefore thought it probable such might have been the case with this undoubtedly very primitive burying-place,—possibly of the Stone period, from the character of the pottery. It transpired, during the remarks that followed on this important and most interesting find, that Mr. Franks, of the British Museum, had been since to see the cemetery, and that several of the urns that Mr. Leonard had been fortunate since to recover were to form part of the collection of stone implements and weapons, illustrating the Neo-lithic age, about to be exhibited at the Society of Antiquaries, although the date probably to be assigned to these sepulchral vases is more likely to be of the Bronze age than the Stone period.

WALTON SEWAGE AND THAMES
PURIFICATION.

THE Walton sewage works are now nearly completed, and there is a desire on the part of the inhabitants of the villages and towns adjoining, and draining into the Thames, to obtain information of the means that are being adopted to comply with the Act which forbids the future pollution of the Thames.

The estimated length of the sewers in the village proper, that is, the parish of Walton-on-Thames, exclusive of that part of Hershon on the side of the railway the further removed from Walton, and the ecclesiastical district of St. Mary's, Otlands, is, in the village, two miles, and from the village to the land to which the sewage is to be conveyed, three-quarters of a mile. The pipes which form the main conduit are purposely small, 12 in. by 9 in. and 8 in. by 6 in. They are egg-shaped, so as to require less water to keep them clean, for at Walton the water-supply is at present not at all adequate to the wants of the population. Throughout the village there are about fifty inspection-shafts, covered with cast-iron lids, laid flush with the surface of the road, and so constructed that by the insertion of a wooden paddle the sewage may be kept back until enough has accumulated to flush the sewer by its rush when suddenly liberated.

At about a mile from the village, $1\frac{1}{2}$ acre of land has been purchased by the Sewage Vestry, to which the sewage matter is to be conveyed.

This is not to be considered as a sewage farm: it is simply a filter-bed, to be used intermittently, as recommended by Dr. Frankland, after numerous experiments made by him at the Royal River Pollution Commission. This process will, in all probability, be unremunerative, but the parish has, by adopting it, complied with the Thames Conservancy Act, and has placed itself in a position to take up any scheme that may, in the future, prove a success, whether irrigation, precipitation, filtration, or any other.

The works have been carried out from the beginning by Mr. R. W. Peregrine Birch, C.E., under the direction of a sewage committee, Mr. Raffell acting as clerk of works. The pipes, which are of glazed fireclay, were manufactured by the Farnley Iron Company (near Leeds), who obtained the contract by tender. To meet the expenses of laying down the new sewer, 3,000l. were borrowed from the Loan Commissioners, to be repaid with interest at 5 per cent. in twenty years; but it is confidently hoped that the whole of this sum will not be required. The present old brick sewer will still be retained, but will be used solely for rain and storm water, none of which will be allowed to enter the new sewer.

THE DESIGN FOR THE LAW COURTS.

SIR,—The thanks of all art-lovers among the general public, and of the entire artistic profession, are largely due to you for the outspoken way in which you have discharged an invidious and no doubt reluctant duty, in censuring Mr. Street's Law-courts designs. Had he produced a noble and satisfying design, you would have been the first to give it hearty recognition; but as things have turned out, it becomes a matter of patriotism, at all costs, whether of personal feeling or otherwise, to save the country being committed to what, if Mr. Street's designs are carried out, will be no case of just pride and architectural renown, such as it was a right to hope for and expect, but of humiliation at another failure such as has too often occurred before, and the loss of an opportunity which may never arise again. Mr. Street has had the fullest opportunity to prove himself the man for the occasion, and has failed. However unfortunate, there seems nothing for it but that he should call in additional aid.

NEMO.

*** We have received more than a dozen other letters endorsing the opinions we have expressed, but do not think it necessary to print them.

ORDNANCE SURVEY MAPS AND THE
BRITISH MUSEUM.

I HOPE that eventually the valuable parochial maps now being constructed in England and Wales, as well as all the town and county maps of this useful survey, will be included in the library of the British Museum; but at present, according to the red coloured catalogue there, these merely include, as to England and Wales, all the counties except the four northern English counties, which are incomplete as to eight divisions. The survey of the Isle of Man is wanting. As to Scotland, of the "outlines," 14, and of the "hills," 16 divisions, out of 120; and as to Ireland, of the "outlines," 46, and of the "hills," 10 divisions out of 205, only appear in this catalogue. The only other Ordnance map referred to in it, is that of London. I believe that all the surveys of the English and Welsh counties are now published, and included in the catalogue of Mr. Stanford, the publisher of them.

CHAS. COOKE.

FIRE PREVENTION, AND RIGHTS OF
LIGHT.

SOME fine morning, when the newspaper placards show that a fourth of London has been burnt on the previous night, we shall find people beginning to think what is to be done to get rid of fires. There will be no end of suggesting, and probably nothing even then will be done. It is therefore, perhaps, useless for me to point out what I consider the only safe way of getting out of this fire difficulty with respect to new buildings; but still, if you like to print my notion, here it is. What is wanted is a new Building Act, which shall provide that every thing in the erection of any building whatever shall be fire-proof. We should get into concrete floors and roofs, do away with wooden frames, sashes, doors, skirtings, &c.; no such thing as

a quartered partition would be heard of; we should get better buildings by far, and, yes, after a little time, cheaper buildings. Certainly it would be all up with joiners, carpenters, and Fire Insurance Offices, but the first and second could go in for metal work, and the latter exclusively for life. The occupation of the fire brigade would be gone. I would also oblige carpet and curtain manufacturers to fire-proof all their work; a man would therefore have little to set fire to except his furniture and pictures, and if he liked to have a good blow up of gas, he should pay for all the damage done to neighbouring buildings.

This same Building Act should do away with all rights of light. If two people buy plots of land adjoining each other, and can build up as high as they like, I do not see why, if one man build and the other does not for twenty-five years, he shall then be prevented from doing so because his neighbour has been overlooking his land all the time.

G. T.

THE DRAINAGE OF WINDSOR.

SIR,—I hear, but scarcely believe it possible, that the town of Windsor has committed the fate of its drainage to the A B C Company. Can it be true?

CASTLE.

*** It certainly is true that the arrangement is very nearly completed: the Local Board of Health propose to give a concession to the company for twenty-five years, and to grant them three acres of land for the sewage.

FIRE CLAY.

SIR,—I have read the letters in your valuable paper with some interest, and agree with Mr. Gibson, that the silica in the fire-bricks makes them withstand the heat the best. I wish some of your scientific subscribers would state their views, and why the clay, of which the following is an analysis, containing 74 per cent. of silica, does not make a fire-brick or crucible, but falls or crumbles after the manufacture of it.

J. NUNN.

"I have examined and now certify that the sample marked Nant-y-Gamer fire-clay, contains:—

Water of Combination	3.62
Silica	74.25
Alumina	20.60
Oxide of Iron	0.70
Lime	0.30
Magnesia	0.48
Potash	100.00

This analysis therefore indicates that the clay is of excellent quality for fire-clay purposes.

(Signed) A. NORMAN TATE."

THE PAINT AT ST. PAUL'S.

I CANNOT always praise the Builder: it is so very "considerate," as the term goes, and does not slash about enough for me and some of the other young men; but it does good at times. For example, the whole of the green paint is now cleaned off the columns in St. Paul's, and the white marble "restored." It seems incredible that such things can be attempted.

A STUDENT.

DECORATIONS OF ST. MARY IN THE
CAPITOL, COLOGNE.

SIR,—I have read with much interest your correspondent's notes upon the new decorations being carried out at St. Mary in the Capitol, at Cologne. As I have carefully watched the progress of this remarkable work for the last five years, I take the liberty of correcting two or three inaccuracies into which your correspondent has fallen. In the first place, the subject represented in the concha of the great eastern apse is not the "Coronation of the Blessed Virgin Mary" but our Lord seated in Majesty, surrounded by the five choirs of angels. The composition of this portion of the work is singularly noble and beautiful.

In the second place, the four angels over the crossing of the church do not "represent the Deluge," but the four rivers which watered Paradise,—Pison, Gihon, Hiddekel, and Euphrates (Gen. ii.).—and the whole composition of this portion of the work is a typical picture of the "Heavenly Jerusalem," with its walls, towers, &c. And (ii) had a wall great and high, and had twelve gates, and at the gates twelve angels, and names written thereon, which are the names

of the twelve tribes of the children of Israel" (Rev. xxi.).

The figures painted upon the vaulting of the choir represent the Four Evangelists and the four greater prophets. Your correspondent must surely be in error when he represents the paintings of the choir as being now in progress, for they were the first portion of the work carried out by Mr. Kleinertz, whereas the narthex, which he describes as being completed, was only being commenced when I was in Cologne two months ago. I am inclined to think that his notes, which are made to refer to the narthex, really describe the paintings in the choir, and vice versa.

H. W. B.

BUILDING PRICES.

Sir,—The book you recommended, giving the constants of labour, viz., Dobson and Tarr's "Students' Guide to the Practice of Measuring and Valuing," is a most excellent work, but it is unfortunately neither elementary in its character nor sufficiently comprehensive to become a standard authority. As to the particular information required by your correspondent "A. B. C.," Haras's "Architectural Handbook" gives full particulars; but great care must be taken in using them, as the constants for mixing mortar, erecting scaffold, striking ditto, actual building works, pointing, &c., are all given separately. The time for each item must be ascertained, and the result totalled, before the value of the labour of building a wall can be ascertained.

Q. R.

PUTRID BONES.

Sir,—*Appropos* of bad smells, as fever-producing agents, I send a word of caution to householders who may, like myself, permit their cook or housemaid to accumulate what is appropriately enough called "kitchen fee"—i.e. dripping, bones, rage, waste paper, and cheese-parings generally—in the shape of perquisites. "It is a custom," as I have found out, "more honoured in the breach than the observance," as Hamlet says of something else. Being conscious for some time of an abominable smell pervading my house, and particularly the apartments next the kitchen, I ordered one day a rigid inspection, and discovered, to my horror, a mass of nearly half a hundredweight of putrid bones carefully piled up on a shelf in the coal-closet. I need hardly say that I ordered a speedy dispersion of the *corpus vile*, to be followed with copious ablutions with chloride of lime. I have also since that occasion abrogated the privilege of *storages* on my premises—not feeling strong enough just at this moment, in point of law or equity, to put an end to the contract of kitchen fee absolutely. Others, however, may feel themselves in a better position.

A BACHELOR.

SOUND AND ECHO.

GANOT'S PHYSICS.*

In the present edition of this valuable work, a somewhat larger and finer type and a larger page have been adopted than in previous editions, with additional illustrations and new matter, though with fewer of the enlarged pages than heretofore.

In recommending this excellent work to the attention of students of physics, we shall simply give a specimen of its mode of treating the subjects in hand, which in this case relate to causes that influence the intensity of sounds; to echoes and resonances; and to refraction of sounds.

Causes which influence the Intensity of Sound.—Many causes modify the force or the intensity of the sound. These are, the distance of the sonorous body, the amplitude of the vibrations, the density of the air at the place where the sound is produced, the direction of the currents of air, and lastly, the proximity of other sonorous bodies.

1. *The intensity of sound is inversely as the square of the distance of the sonorous body from the ear.* This law has been deduced by calculation, but it may be also demonstrated experimentally. Let us suppose several sounds of equal intensity,—for instance, bells of the same

kind, struck by hammers of the same weight, falling from equal heights. If four of these bells are placed at a distance of 20 yards from the ear, and one at a distance of 10 yards, it is found that the single bell produces a sound of the same intensity as the four bells struck simultaneously. Consequently, for double the distance the intensity of the sound is only one-fourth.

The distance at which sounds can be heard depends on their intensity. The report of a volcano at St. Vincent was heard at Demerara, 300 miles off, and the firing at Waterloo was heard at Dover.

2. *The intensity of the sound increases with the amplitude of the vibrations of the sonorous body.* The connexion between the intensity of the sound and the amplitude of the vibrations is readily observed by means of vibrating cords. For if the cords are somewhat long, the oscillations are perceptible to the eye, and it is seen that the sound is feeble in proportion as the amplitude of the oscillations decreases.

3. *The intensity of sound depends on the density of the air in the place in which it is produced.* As we have already seen (199), when an alarm moved by clockwork is placed under the bell-jar of the air-pump, the sound becomes weaker in proportion as the air is rarefied. In hydrogen, which is about $\frac{1}{8}$ the density of air, sounds are much feeble, although the pressure is the same. In carbonic acid, on the contrary, whose density is 1.529, sounds are more intense. On high mountains, where the air is much rarefied, it is necessary to speak with some effort in order to be heard, and the discharge of a gun produces only a feeble sound.

The ticking of a watch is heard in water at a distance of 23 ft.; in oil, of 16 $\frac{1}{2}$ ft.; in alcohol, of 13 ft.; and in air, of only 10 ft.

4. *The intensity of sound is modified by the motion of the atmosphere and the direction of the wind.* In calm weather sound is always better propagated than when there is wind; in the latter case, for an equal distance, sound is more intense in the direction of the wind than in the contrary direction.

5. *Lastly, sound is strengthened by the proximity of a sonorous body.* A string made to vibrate in free air and not near a sounding body has but a very feeble sound; but when it vibrates above a sounding-box, as in the case of the violin, guitar, or violoncello, its sound is much more intense. This arises from the fact that the box and the air which it contains vibrate in unison with the string. Hence the use of sounding-boxes in stringed instruments.

Echoes and Resonances.—An echo is the repetition of a sound in the air, caused by its reflection from some obstacle.

A very sharp, quick sound can produce an echo when the reflecting surface is 55 ft. distant; but for articulate sounds, at least double that distance is necessary; for it may be easily shown that no one can pronounce or hear distinctly more than five syllables in a second. Now, as the velocity of sound at ordinary temperatures may be taken at 1,125 ft. in a second, in a fifth of that time sound would travel 225 ft. If the reflecting surface is 112 $\frac{1}{2}$ ft. distant in going and returning, sound would travel through 225 ft. The time which elapses between the articulated and the reflected sound would, therefore, be a fifth of a second, the two sounds would not interfere, and the reflected sound would be distinctly heard. A person speaking with a loud voice in front of a reflector, at a distance of 112 $\frac{1}{2}$ ft., can only distinguish the last reflected syllable: such an echo is said to be *monosyllabic*. If the reflector were at a distance of two or three times 112 $\frac{1}{2}$ ft., the echo would be *dissyllabic*, *trisyllabic*, and so on.

When the distance of the reflecting surface is less than 112 $\frac{1}{2}$ ft., the direct and the reflected sound are confounded. They cannot be heard separately, but the sound is strengthened. This is what is called *resonance*, and is often observed in large rooms. Bare walls are very resonant; but tapestry and hangings, which are bad reflectors, deaden the sound.

Multiple echoes are those which repeat the same sound several times: this is the case when two opposite surfaces (for example, two parallel walls) successively reflect sound. There are echoes which repeat the same sound twenty or thirty times.

An echo in the chateau of Simonetta, in Italy, repeats a sound thirty times. At Woodstock there is one which repeats from seventeen to twenty syllables.

As the laws of the reflection of sound are the same as those of light and heat, curved surfaces produce acoustic foci, like the luminous and

calorific foci produced by concave reflectors. If a person standing under the arch of a bridge speaks with his face turned towards one of the piers, the sound is reproduced near the other pier with such distinctness that a conversation can be kept up in a low tone, which is not heard by any one standing in the intermediate spaces.

There is a square room with an elliptical ceiling, on the ground floor of the Conservatoire des Arts et M \acute{e} tiers, in Paris, which presents this phenomenon in a remarkable degree when persons stand in the two foci of the ellipse.

It is not merely by solid surfaces,—such as walls, rocks, &c.,—that sound is reflected. It is also reflected by clouds, and on passing into a layer of air of greater density than its own; it is also further reflected by the vesicles of mist. When the weather is foggy, sounds undergo innumerable partial reflections, and are rapidly destroyed.

Whispering-galleries are formed of smooth walls having a continuous curved form. The mouth of the speaker is presented at one point, and the ear of the hearer at another and distant point. In this case, the sound is successively reflected from one point to the other until it reaches the ear.

Different parts of the earth's surface are unequally heated by the sun, owing to the shadows of trees, evaporation of water, and other causes, so that in the atmosphere there are numerous ascending and descending currents of air of different density. Whenever a sonorous wave passes from a medium of one density into another it undergoes partial reflection, which, though not strong enough to form an echo, distinctly weakens the direct sound. This is doubtless the reason, as Humboldt remarks, why sound travels further at night than at daytime; even in the South American forests, where the animals, which are silent by day, fill the atmosphere in the night with thousands of confused sounds.

Refraction of Sound.—It will be shown in the sequel that refraction is the change of direction which light and heat experience on passing from one medium to another. Sound has been found that sonorous waves are refracted like light and heat. He constructed gas lenses, by filling spherical or lenticular collodion envelopes with carbonic acid. With envelopes of paper or of goldbeater's skin the refraction of sound is not perceptible.

Sound has cut equal segments out of a large collodion balloon, and fastened them on the two sides of a sheet-iron ring 1 ft. in diameter, so as to form a hollow biconvex lens about 4 in. thick in the centre. This is filled with carbonic acid, and a watch was placed in the direction of the axis; the point was then sought, on the other side of the lens, at which the sound was most distinctly heard. It was found that when the ear was removed from the axis, the sound was scarcely perceptible; but that at a certain point on the axial line it was very distinctly heard. Consequently, the sonorous waves in passing from the lens had converged towards the axis, their direction had been changed; in other words, they had been refracted.

The refraction of sound may be easily demonstrated by means of one of the very thin india-rubber balloons used as children's toys, inflated by carbonic acid. If the balloon be filled with hydrogen, no focus is detected: it acts like a convex lens, and the divergence of the rays is increased, instead of their being converged to the ear.

COMPENSATION FOR DAMAGE DONE UNDER IMPROVEMENT ACTS.

IN the Court of Error in the Exchequer Chamber, on November 28th (sittings in Error, from the Queen's Bench, before the Lord Chief Baron, Mr. Justice Willes, Mr. Justice Keating, Baron Chelmsford, Baron Fagitt, and Baron Cleasby), the case of *Right v. the Vestry of St. Luke's, Chelsea*, was decided.

The case raised an important question as to whether the owners of houses or premises injuriously affected by alterations made by local authorities under their Improvement Acts are entitled to any compensation. The case had arisen thus:—Mr. Flight is the owner of a house in the parish of St. Luke, Chelsea, the premises opposite to which was raised between 2 ft. and 3 ft., so as most seriously to injure the house. He claimed compensation, but it was refused, the Vestry declaring that they acted under the Chelsea Improvement Act and the Local Government Acts, which incorporated the Lands Clauses Act, but contained no express provisions for compensation. Thereupon the owner claims £300, as compensation, and proceeded under the Lands Clauses Act to appoint an arbitrator on his behalf. The Vestry, however, declined to appoint an arbitrator on their part, and the arbitrator appointed on behalf of the owner proceeded to make his report and made his award. The Vestry refused to recognize it, and Mr. Flight thereupon applied to the Court of Queen's Bench for a *mandamus* to compel

* "Elementary Treatise on Physics, Experimental and Applied, for the Use of Schools." Translated and edited from Ganot's "Éléments de Physique" (with the Author's sanction). By E. Atkinson, Ph.D., F.C.S., Professor of Experimental Science, Staff College, Sandhurst. Fifth Edition, revised and enlarged. Illustrated by a coloured plate and 723 engravings. London: Longman, Green, & Co., 1872.

them to take up the award. That Court decided in his favour. Thereupon the Mayor brought error. The reason in delivering judgment, said the enactment which authorised the pavement to be altered was "subject to the other provisions of the Act," one of which (sec. 53) expressly incorporated the enactments of the Lands Clauses Act, which contained provisions as to compensation. It had been urged, indeed, that there was no express provision for compensation to persons whose premises were "injuriously affected," but the 22nd and 23rd sections of the Lands Clauses Act clearly and expressly conferred the right to compensation in such cases. Those sections expressly applied in cases where premises were "injuriously affected" by the execution of the works, and if the compensation claimed or offered "in any such case" amounted to more than 50*l.*, then proceedings by arbitration were provided. The bill was expressly incorporated in the Local Improvement Act, and applied to any "improvements" effected under that Act. A liberal construction must be put upon such enactments; and, taking the claim to compensation was clearly excluded, they ought to be held to give compensation to persons the value of whose property was seriously injured by the works and operations of public bodies. It had not been shown that the right to compensation was excluded in such a case as the present. It might be that in cases of slight and inconsiderable injuries, such as were contemplated in some of the provisions he had referred to, compensation was excluded; but it was otherwise in cases of serious injury, such as the present, in which the pavement might be raised so high as to block up the man's house altogether. It was impossible to imagine that the Legislature intended that in such cases there was to be no compensation to the party injured. It had been argued, indeed, that the improvements to be the subject of compensation were only such as involved the taking of land; but there was no reason why the enactment should receive so limited a construction. On the whole, therefore, he was of opinion that the judgment for the claimant was right. Mr. Justice Willes said he entirely concurred in this judgment, and the other learned judges concurred, so that the judgment of the Court of Queen's Bench was affirmed.

SEWERS OF DEPOSIT.

Str.—It would be interesting to know where the ancient sewers referred to in the following extract from the "P.P." letter in your recent issue are to be found:—
"Scores of miles of sewers of the above description, which were put down during the reigns of Charles II., William III., William IV., Mary, Anne, and George I. and II., are still in existence."

I presume "P.P." is the author of the ingenious section in your Number of the 14th of October, 1871, p. 539, in which the "P.P." letter in your recent issue is to be found. In a work as reconstructing the bottom of a sewer is necessary, an egg-shaped inverted cone should replace the old invert for the full width, so that the sides of the sewer may be properly secured.

But if there are so many miles of these flat-bottomed sewers—some with little fall, some with none, and some with the fall the wrong way—it is not quite clear how his extra 10*l.* in section is to improve them. For example, take a sewer 100 yards in length, with no fall, and falling into another in a similar position, what good could result from lowering the bottom 10*l.* in all over its length, for the section does not appear to admit of any variation in depth? In short, such works would be a waste of money, except in isolated cases, where the outfalls could be readily lowered.

"P.P." has rather magnified this subject. I know the London sewers are in a sorry state, and I also know there are certain sewers as described, but not such a vast number of them as he tries to make out, and in almost every instance they are not more than 5 ft. below the surface to the invert. Now I ask that if the cost of adding 10*l.* in sewers so shallow that they do not admit of good house drainage, especially where there are basements? In all but a few cases the sewers should be destroyed, and new ones constructed, at a depth of not less than 12 ft. below the roads at the highest point. Any other way of treating them would be a useless expenditure of time and money.
A LONDON SURVEYOR.

MEMORIALS.

The Post Cooper.—It is proposed to erect a memorial of William Cooper, the poet, in the church of his birthplace, Great Berkhampstead, Hertfordshire, of which his father was rector. It is proposed that the memorial shall be an east window, immediately over the grave of the poet's father and mother, in the recently-restored parish church. Those who are inclined to help are requested to communicate either to the rector, Great Berkhampstead, or with Mr. William Longman, Paternoster-row, London.

Villiers Memorial, Welford.—Lady Elizabeth Villiers is to rebuild the north aisle of Welford church, in memory of the late Hon. F. W. C. Villiers. Several of the friends of Mr. Villiers having expressed a wish to join with the parish in the restoration of the church in memory of him, their co-operation is accepted; but no steps already taken are considered as pledging the parish to proceed further until a sufficient sum is secured to cover the estimated cost of a new roof for the nave.

Proposed Memorial of Dr. Jenner.—An effort is being made to fill the east window of Berkeley Church with stained glass, as a memorial of Dr. Jenner. An ad hoc committee has been formed, consisting of Earl Bathurst, Earl Duncie,

Lord Fitzhardinge, Col. Kingscote, O.B., M.P., Mr. Barwick Baker, Mr. Gaubier Parry, and Mr. H. J. Scobell (Poreshore). Mr. Henry Kingscote, of 96, Eaton-place, London, is the hon. secretary.

FIREPROOF FIRE ESCAPES.

Str.—I have observed several letters in the daily papers since the lamentable accident by which the fireman Ford lost his life, asking for a reconsideration of the material with which the fire-escapes are constructed.

It appears that whenever the flames come in contact with the canvas it takes fire, and the escape is rendered useless for its purpose, and a source of danger to the brave fellows in charge. I have to suggest to the authorities, through your columns, that asbestos should be used instead of the canvas and gauze. The mineral is of a fibrous texture, and its name, signifying that which is incombustible, describes its distinguishing property. The ancients, it will be remembered, made it, particularly a silky variety of it, called *Amiantus*—into an incombustible and durable material, by which any may be rescued from a fearful death, and the lives of those preserved from unnecessary danger who so continually and nobly risk them.

E. J. L.

PATENTS, SEWERAGE, AND WATER SUPPLY.

FROM an address by Mr. R. W. Thomson, C.E., President of the Royal Scottish Society of Arts, we take the following:—

It appears to me that greater changes are impending over the world during the next fifty years than have ever taken place in the centuries that have passed. These great changes may not be due to the discovery of new powers in nature. We may not invent anything corresponding to the telegraph, or the railway, or the steamship; but what we shall do is to apply these inventions to an extent which will completely metamorphose the whole globe.

Speaking of the Patent Laws, Mr. Thompson suggested the erection of a patent tribunal, composed of scientific men, whose duty it would be to examine all applications for patents. On this tribunal would be thrown the task of ascertaining whether the invention for which a patent was applied had been anticipated by any previous patentee, or whether it was in use already without being patented. As soon as the petition for a patent was lodged, along with a description of the invention, this inquiry would be made, and the result communicated to the applicant for a patent. He would then leave the entire responsibility of taking any further steps to the applicant. By this means there was no doubt whatever that an immense number of patents would never go beyond this first stage. It would not, he thought, be a safe or wise proceeding to intrust the power of refusing patents to any tribunal whatever.

The next topic touched upon was the disposal of the sewage of large towns, regarding which he said that a careful consideration of the subject in all its bearings had led him to the firm conviction that large towns would ultimately be compelled to separate entirely their system of sewage from their ordinary drainage. The difficulty of carrying out this separation was far less than at first appears. The separation of sewage from drainage would involve some rearrangements in the pipes within the houses, as well as a separate set of channels under the streets. The cost of such channels under the streets would be comparatively small, as the matter flowing through them would be almost constant in quantity, whereas the drains, having to provide for rain-storms, must be of enormous capacity. His proposal, and the system he would suggest, would simply consist in devoting the existing sewers under the streets to the purpose of drainage, while he would lay down cast-iron pipes for the purpose of conveying sewage matter into proper receptacles, which would be entirely closed so as to prevent the escape of all deleterious gases, such as takes place when sewage matter is thrown into the great sewers.

Closely connected, he proceeded, with the suggestion which I have just mentioned regarding the separation of sewage from drainage is another suggestion which I venture to make, namely, the separation of our water supply into two qualities. The constant tendency of the increasing population to gather together in large

towns, combined with the continually-increasing consumption of water for each inhabitant of these towns, an increase, it must be borne in mind, not of water to drink or to use in any form of cooking, but an increase in the use of water for watering the streets, for bathing, and general sanitary purposes, renders it necessary to provide such an enormous quantity of water that it has become practically impossible in many large towns to procure the requisite quantity of water without lowering the standard of the quality. Water of sufficient purity for washing clothes, bathing, watering the streets, manufacturing purposes, waterclosets, and a number of other purposes, could be procured in almost all localities with very little trouble and at very little cost; but when our municipal authorities set to work to water the streets and to flush the sewers with water of the same quality as we require for drinking, then the task indeed becomes a very difficult one, and the attempt to carry it out an absurd waste of money and energy.

CHURCH-BUILDING NEWS.

Tyler's Hill, Bucks.—The new church and school at Tyler's Hill, near Chesham, have been opened by the Bishop of Oxford. The new building, which is to act in the double capacity of church and schoolroom, was designed by Mr. M. Glover, the son of the eminent composer, Mr. Stephen Glover, whose songs and ballads are well known. It was built by Mr. Spiroer, of Wycombe, very satisfactorily. The style of architecture adopted is that of the Early French Medieval, with an apsidal, or rounded chancel, a very small vestry on the north side, and a porch on the south. The roof is open and slightly stained, and the whole building, both within and without, being composed of coloured brick—red, grey, yellow, and black—a contrast of tints is maintained throughout; and the due lighting of the chancel was provided for by a corona bearing wax candles, suspended from the chancel arch. The nave is lighted by bracket oil lamps at intervals all down the church. The land and a considerable portion of the materials were given by Lord Chesham, while all the interior fittings were the gifts of persons who for the most part desired that their names should be kept secret. The font was the gift of Mr. G. G. Hill, the bell was presented by Mrs. Folkhard, and the communion-service by Miss Dora Stratton.

Walworth.—The new church of All Souls', Grosvenor Park, Walworth, has been consecrated by the Bishop of London. The building of this church has resulted from the efforts of the London Diocesan Home Mission in connexion with the Bishop of London's Fund. The site was given by Mr. Philip Urwin, of Longborough Park, Brixton, and the Misses Billiter. The amount contributed by Mr. Urwin is between 3,000*l.* and 4,000*l.* The total cost of the church, with organ and furniture complete, is over 9,000*l.*

York.—The church of St. Saviour, in this city, which has recently undergone extensive internal repairs, has been re-opened by the Archbishop. The lofty roof, which were stained very darkly, have been painted a light buff, ornamented with blue, crimson, and gold. All the pews have been re-stained and varnished, and also the front of the west gallery. This portion of the work has been executed by Mr. Webster, painter. The old reredos was a large wooden one, which has been removed, thereby opening out the lower mullions of the east window. A new reredos, the work of Mr. T. Gibson Hartley, decorator, has been substituted for the former one, the lower interstices of the window being filled with illuminated panels bearing evangelical emblems, the "Alpha" and "Omega," the cross and the crown. A corona of brass has been suspended in the chancel, and the nave lighted with brass standards. The piers and arches of the arcades have been stripped of whitewash, the stonework re-dressed, and in some places restored by Mr. Mennell. The organ-case has also been decorated, the lower portions of the walls of the chancel painted, and several other lesser improvements effected. The total cost of the restoration has been about 300*l.*

Northleach.—The restored chancel of Northleach Church has been re-opened. The restoration has brought to light traces of former features, and these remain have been preserved for the information of the antiquary and architect. The chancel (like some others in this part of the county) was originally built without any

east window. The careful stripping of the walls has solved the question of how such a blank east wall was originally treated. Canopied niches, which had contained sculptured historical groups, formed the principal features of the design, and that was completed by a system of paintings containing Scriptural subjects, the decorative painting being continued on the side walls and throughout the chancel. In restoring the chancel, the south wall, which was much shaken and out of perpendicular, has been rebuilt; the windows have been renewed; a new chancel arch has been inserted, and the gables over it have been rebuilt, retaining the old sanctus bell-cot: a new roof has been put on, of similar design to the old one; the floor of the chancel has been re-paved with stone and encaustic tile borders, and the sacarium with Godwin's encaustic tiles, made in imitation of old patterns. The stalls and reading-desk are of deal, slightly stained and varnished; the lectern is of oak. The windows (of which there are only two, and these on the south side) are filled with stained glass by Messrs. Clayton & Bell. The three-light easternmost window has figures of St. Matthew, St. Bartholomew (the patron saint), and St. Mark; and the other, a two-light window, the figures of St. Luke and St. John. The chancel is lighted at night by means of a simple corona for eight lights, of brass and painted iron, hung from the collar of the roof. In consequence of the discovery of the ancient paintings, &c., and the want of funds to restore them at once, it has been necessary to put hangings at the east end to make it fit for service.

Kenton (Suffolk).—The church of this small village has been re-opened after restoration. Owing to the neglect of bygone years the whole building had got into a very unsatisfactory condition, and Mr. Hakewill, of Bealings, having prepared plans, the tender of Mr. Cornish, North Walsham, was accepted; and in the course of the last five months the old roof of the nave, which was covered with lead, and was plastered inside, has been removed, and a new open oak roof covered with tiles has been substituted; the chancel has been re-roofed, the new roof being arch-shaped and boarded, the ribs being ornamented at their junctions with carved bosses; new windows have been put in the three chancel walls; the windows of the nave reglazed with cathedral glass, and the whole church benched, besides various minor improvements. The external walls (of flint) are to be re-pointed. The amount of Mr. Cornish's contract was 800l.

Warminster.—The new chancel erected at the east end of Christ Church, Warminster, has been re-opened. The new chancel is in the Perpendicular style, and was erected from a design by Mr. T. H. Wyatt, the diocesan architect.

Kenley (Covington).—A new church has been opened at Kenley. The edifice will seat 300 persons. The estimated cost, including tower and spire now building on north side of chancel, organ, bell, &c., yet to be obtained, is about 3,500l. The church was the design of Mr. J. Fowler, of Louth, whose plans were recommended by Mr. G. G. Scott, whose advice was asked concerning the designs sent in. It consists of nave with three bays, north and south aisles, north arch, chancels, with organ-chamber on north side; the chancel terminates with a gabled apse. The style is Early Geometrical, and the material used externally is Kentish rag, the interior of wrought brickwork, interspersed with stone. The pillars are round, of stone, and have carved capitals. The seats are of pine. The nave is lighted with gas jets round the capitals of the pillars, the chancel having standards. The pulpit on the north side is of stone, with brass desk. The floors are paved with Minton's tiles. The east window is of three lights, and at its base are five arches, the central one surmounted by a cross. The west window is of four lights. Those in the aisle (which are lean-to) are short in appearance.

Yapton.—The parish church has been re-opened after restoration. The ceiling, archways, and pillars, have been cleansed so as to show the original stonework. A new west window has been put in. The old pews have been removed, and new seats have been placed throughout the nave and side aisles. There is also a new pulpit and reading-desk, of wood. The chancel, which contains several monumental tablets, has not been touched at present. The restoration has been executed by local tradesmen.

Bradford.—The foundation-stone of a new

church, for the congregation of St. John's, has been laid by the Bishop of Ripon. The site is in Little Horton-lane. The new edifice will accommodate over 700 persons, and will cost about 7,000l. The plan consists of nave, with north and south aisles, south transept, chancel, organ-chamber, and vestries for choir and clergy. The extreme length of the church within the walls is 125 ft.; the width of the nave and aisles, 50 ft.; and the height of nave-ridge, 50 ft. above the floor. The style is Decorated. The principal entrances are at the west end of the north and south aisles, the porch on the north side towards Horton-lane being the more elaborate of the two, having a deeply recessed outer doorway, with niche for statue of the patron saint (St. John), and an arcade pierced with windows on the side. Precaution has been taken by means of double doors to exclude draughts. The principal features of the church externally will be the central tower, 23 ft. square, and rising to a height of 109 ft. above the ground. It is carried on four piers, with arches opening into the nave, chancel, organ-chamber, and transept. Large belfry windows occupy the sides above the roof, and lofty pinnacles rise from the angles. The rapid fall of the ground causes the chancel outside to be unusually lofty. The east window is of five lights, with moulded tracery in the head. The aisles are lighted by coupled two-light windows, with quatrefoil openings above them, and the clearstories contain circular windows, two in each bay, alternating in design. The west end of the nave is pierced by two coupled lancet-windows, surmounted by a large rose-window, consisting of a foliated ring, from which radiate twelve columns supporting trefoil heads. The church internally will be lined with pressed brick, relieved with bands of black brick and ashlar stone. The roofs, except those of the aisles, which are constructed of bindings and parings, are coupled rafters, those of the nave and chancel being covered on the under side with arched boarding. The seats are of pitch pine, and the stalls and other fittings of the chancel, together with the doors, are of wainscot oak. The warming is proposed to be effected by means of Haden's hot-air apparatus. The contractors are:—Formasons' and joiners' work, Messrs. Bealand; plumbers and glaziers' work, Mr. John Schofield; slating, Mr. T. Nelson; and painting, Mr. James Greenhough. The architects are Messrs. T. H. & F. Hesley.

Bromsgrove.—At a meeting of the committee for carrying out the proposed new church in Bromsgrove, plans for the church were exhibited by the architect, Mr. J. Cotton, which, after some discussion, were approved. The ground-plan provides accommodation for 600 people, exclusive of the choir-benches in the chancel. The church will comprise nave and side aisles, tower at north-west corner, porch on south side, chancel, with apsidal termination and organ-chamber, and vestries for clergy and chorists. A basement will be sunk for the heating apparatus. The easternmost bay of aisles is slightly projected and gabled in the transeptal form. The style is Early Decorated. A tower, with spire, rises at the north-west corner, its altitude being about 175 ft., the upper part of the tower containing the belfry, with ornamented double lancet lights and louvres for the passage of sound; but it is not contemplated to execute the upper portion of the tower and spire at present, owing to the limited funds. The church is intended to be built with the local sandstone, the walls lined inside with buff-coloured bricks, relieved with stone strings and bandings; dressings, arches, window-tracings, &c., in Bath and part in local grey sandstone. The church will be built upon a site adjoining the Birmingham-road, and the work will be commenced early in the ensuing spring.

Bishopscotne.—It is proposed to undertake a thorough repair and restoration of the ancient and picturesque church of Bishopscotne—the church and burial-place of Richard Hooker—under the advice and superintendence of Mr. Gilbert Scott, who has lately made a preliminary survey of the building, and presented a report on its present condition and the works which he thinks it desirable to have executed. To complete all the works recommended by Mr. Scott would, it is estimated, involve an outlay of 1,900l. or 2,000l.

Nutley.—The church has been opened for divine worship, having been enlarged by the addition of a north aisle and vestry. Besides the enlargement of the church, the chancel has been beautified by the additional gifts of Mr. and

Mrs. Merry. A parsonage has been built. The church work has been done by Mr. G. Chasman, builder, under the superintendence of Mr. W. Shaw, architect.

Horsham.—St. Saviour's Church, Colgate, more than two-thirds of which is new, has been completed with enclosed burial-ground, at the expense of Mr. James Clifton Brown, of Holmbush, on the Holmbush estate at Colgate. The building and ground has been consecrated by the bishop of the diocese. At the communion or east end is a stained-glass window.

Orpington.—It has been resolved to restore and refit the nave of the church here, and a committee has been appointed to carry out the intention.

Farningham.—The church, after restoration and consecration of additional burying-ground by the Bishop of Dover, has been re-opened. The galleries at either end of the nave have been removed, so as to display the architecture of the chancel arch and the tower opening; the high pews and higher pulpit have been replaced with open seats facing uniformly to the east, the font being placed near the north door. The roof of the nave remains coiled, probably because its extreme age, exceeding in some parts 500 years, made dangerous any alteration. That of the chancel has been entirely renewed, and displays an interlacing of oak beams, below planks of the same. The south side of the church, which was formerly inefficiently lighted (at the west end especially by mere square apertures in the wall), is now lighted at equal intervals by three windows of two lights apiece, the tracery of the most eastern being Decorated, and that of the other two Perpendicular. The painting formerly visible above the chancel arch, which represented Moses and Aaron guarding the decalogue, has been removed. The walls of the church are now uniformly of a buff tint. The pavement of the aisle and chancel is of red and black tiles. In the chancel an arch has been opened in the south wall, next the nave, for the reception of the organ, behind which is the old vestry. The architect employed was Mr. Ewan Christian. The work of renovating the chancel, at the cost of the Ecclesiastical Commissioners, we understand, was executed by Mr. Handcock, of Dover. The whole of the remainder of the builder's operations were done by Mr. W. Gumbrell, of Dartford. The gas-fitting was executed by Messrs. Dray & Co., of Farningham and London. A Gurney's stove was supplied by Messrs. Weekes & Tufnail, of Dartford. The stonework was done by Mr. Middleton, of Gravesend. We believe the expenses of repair will amount to between 1,500l. and 2,000l.

Rochdale.—St. John's Church, Facit, Rochdale, has been consecrated. It is at present only a portion of the original and complete design. The part now built and consecrated comprises:—A chancel, 28 ft. by 19 ft., with north and south chancel aisles, used as vestry and organ-chamber; a nave, 72 ft. by 38 ft.; a western porch, 25 ft. by 6 ft.; baptistery, 14 ft. by 8 ft.; and a south-west porch, which is in fact the basement of the future steeple, now only carried up high enough to take the stairs which give access to the western gallery. The complete design comprises short aisles to the nave of two bays each, marked off by arches and central pillars of stone. These will give 156 additional sittings. The present accommodation is for 457 adults; and of course ultimately for 623, but the church is so planned that, without overcrowding, 540 grown-up persons may even now be seated on special occasions, and when the church is quite finished, in the same way, about 700 may find seats. The church stands on the summit of a little hill by the roadside, and close to the village of Facit. The style is Early Decorated, the tracery and all other such ornamental features being all of geometric forms. The cost, including between 300l. and 400l. for foundations, was 3,500l. The contractor for the work was Mr. W. Storr; the foundations being put in by Messrs. Longworth & Co. The architects are Messrs. Medland & Henry Taylor, of Manchester.

Manchester.—St. James's Church, George-street, Manchester, is one of the old-fashioned city churches, built about the end of the last century, with high boxes for pews, three-decker pulpit in the centre of the nave, and no chancel, but only a very shallow sacarium. Designs have recently been made by Messrs. Medland & Henry Taylor, of Manchester, architects, for the recasting of this church. During the last few months a portion of the design, viz., the forma-

tion of a "chorus cantorum," or quasi-chancel, has been proceeded with. This consists of a tiled platform, raised three steps above the nave floor, on the north and south sides of which are ranged the choir stalls. It is inclosed by a low parclose or screen, surmounted by light iron-work. There is another step at the altar-rail, and a floor-pace for the Lord's table. A chorister's vestry has been formed at the north-east corner of the nave, divided off from the church by a suitable wooden screen. The organ has been brought down from the western gallery to the south-east corner of the nave, and the font has been moved to the west end of the central passage. The complete scheme includes a wrought-iron archway, with a lofty cross above, and also metal gates at the western entrance of the "chorus cantorum." This, as there is no chancel arch, serves to mark it off from the body of the church. The position of the "chorus cantorum" is further emphasised by a paneled ceiling above. There will be a reredos of appropriate design, and the whole of the eastern wall, by slight alterations, will be brought into harmony with the rest of the new work. The windows in the east wall are intended to be filled with stained glass. An arch is to be thrown across the present shallow recess. The central part of the western façade will be recessed externally with brickwork, and by this and other slight alterations it is intended that a fairly church-like appearance will be given to the whole front. There is also to be a simple ironwork gable and arch over the west gateway. The cost of this quasi-chancel, with its stalls, tiling, altar-rail, lectern, new pulpit, new choir, vestry, &c., is 262l. The woodwork is pitch pine and mahogany. The wood of the old pulpit is re-used as far as possible. The contractor for the work is Mr. T. Darnbrough, of Rusholme.

Colchester.—St. James's Church, after restoration, has been re-opened for divine worship. The edifice was suddenly closed, having been declared unsafe by architects who were called in to report upon the state of the roof and north wall. The rector (the Rev. R. S. Cummins) with the churchwardens and a few leading parishioners, have pursued the undertaking with some boldness, but up to the present time only about 3,000l. have been raised out of the 4,000l. expenditure. The outer walls have undergone restoration, a new roof has been erected, and the church, benched in place of the old pews. The organ is now placed in the north transept. The monumental windows and tombs have, of course, been respected. The church will seat 800 persons.

Horbury.—The House of Mercy Chapel, Horbury, the corner-stone of which was laid by Earl Beauchamp in August of last year, has been opened. The committee have found it imperative to add thereto one of the wings, planned at the outset of the building, but allowed to stand over till funds should be forthcoming to enable them to make another start. This last instalment comprises superior's room, common room, refectory, and chapel. The chapel is in the Early English style, 64 ft. by 22 ft., and 47 ft. to the apex of the roof. It is built of red brick, with stone facings on the outside, and within of red and blue bricks. Bath stone, Mansfield stone, and slate bands, with shafts of Aberdeen granite to the arcade and apse. There is a circular apse at the east end, with altar reached by five steps, sedilia, credence, and reredos. The apse is lighted by nine lancet windows, the three central ones being filled with stained glass, by Hardman, of Birmingham. There are six lights on each side of the nave, with arcade of granite shafts; and at the west end is a wheel window, filled with stained glass, by Mr. Kemp, of London. Here also is an oak screen forming an ante-chapel on the ground-floor, and a gallery approached from the outside, for strangers above. On the south side is the organ-loft, with vestry below. The roof is open-timbered, with deal and oak bases. At the sides of the nave are oak stall-fittings, with crocketed finials, whilst the aisles will be filled with chairs. The floor is laid with encaustic tiles; and the heating apparatus is by Mr. Nelson, of Wakefield. The architect is Mr. H. Woodyear, of Grafton, Surrey; and the contractors are Messrs. Speight & Fawcett, of Wakefield. The work has been carried out under the supervision of Mr. Walker, clerk of the works; Mr. Dean, foreman of buildings; and Mr. Maynard, of general fittings.

Kirkymoorside.—The Rev. E. M. Birch, M.A., the vicar, has already had promises to the amount

of 1,800l. towards the church restoration fund. Mr. Gilbert Scott, architect, has inspected it for the purpose of preparing new plans.

Kilburn.—St. John's Church has been consecrated by the Bishop of London. It has been erected at a cost of about 7,000l., and affords accommodation for nearly 1,000 persons. It consists of nave, north and south aisles, a well-developed chancel, with apsidal termination, (and two chancel aisles, one forming the vestry, and the other the organ-chamber. The style of the church is Early Decorated. The walls are faced both externally and internally with brick; in the latter case, patterns of red being freely introduced. There is a turret at the south-west corner upwards of 100 ft. high. The pulpit is of stone, with Mansfield shafts. The lighting consists of circular coronae, hung from the nave arches and chancel. Including the site, about 9,000l. have been expended on the edifice. The architects of the church are Messrs. Francis; and the builders were Messrs. Dove, of Islington.

Bycull-on-Tyne.—St. Andrew's Church has been re-opened, after enlargement and restoration. It is of twelfth-century date, and is cruciform in plan; the tower, which is at the west end, being of the Early Saxon period. The new works comprise a new north transept, built on the foundations of a former one, which were discovered during the progress of the works; also a new chancel aisle, opening into the chancel on the north side by two arches. The other works comprise a reredos, a stone pulpit, and chancel seats. The architects were Messrs. Slater & Carpenter; and the contractors, Messrs. Arkle & Fergusson.

Books Received.

The Art of Garnishing Churches at Christmas and other Festivals. By EDWARD YOUNG Cox. Third Edition. 28, Southampton-street, Strand.

THE illustrations in this edition of "The Art of Garnishing Churches" are nearly all new, and are mostly printed by photolithography. It is a considerable improvement on the first edition, and will be found very useful just now by those who desire to make their churches participate in the gaieties of the coming season.

Introductory Notes on Lying-in Institutions; together with a Proposal for Organising an Institution for Training Midwives and Midwifery Nurses. By FLORENCE NIGHTINGALE. London: Longmans, Green, & Co.

IN a quaint little dedication, Miss Nightingale, "without permission," dedicates these valuable notes to the shade of the mother of Socrates, whose illustrious son himself said, "The midwives are respectable women, and have a character to lose." Miss Nightingale hopes to be inspired with his "spirit of questioning right," and that those who read may learn, not of her, but of themselves.

The author gives an account of the experimental trial, at King's College Hospital, of a training establishment for nurses in such cases, and the causes of its being closed. Since that event it has been an anxious subject of inquiry with Miss Nightingale, whether it would be justifiable to reopen a nursing-school under other conditions. The volume is illustrated by plans of several forms of wards and institutions, including the late midwifery wards at King's College Hospital.

A National Technical University for Great Britain and her Colonies; or, How to Utilise Greenwich Hospital and the Obsolete Charities. London: Kelly & Co., Great Queen-street.

THE suggestions contained in this volume assume the form of a letter to Mr. Gladstone, including a report by Dr. John Mill, the secretary of the executive committee of the proposed National University for Technical and Industrial Training, which forms the main portion of the volume. In proposing the conversion of Greenwich Hospital into a National Technical University, it is intended that a portion of it should constitute a Naval University, or department devoted to students destined for the royal and mercantile marine, and the revenues of the hospital applied to that department. The report points out that there are large funds in existence which might with propriety be appropriated to

the founding of a new university, without interfering with the vested interests of corporations or the alienation of charities for local purposes.

VARIORUM.

We mention the receipt of several books to which attention will be given in due course:—"A History of the Gothic Revival: an Attempt to Show how the Taste for Mediæval Architecture, which lingered in England during the Two Last Centuries has since been Encouraged and Developed." By Charles L. Eastlake, Architect. London: Longmans, Green, & Co.; "The Choice of a Dwelling: a Practical Handbook of Useful Information on all Points connected with Hiring, Buying, or Building a House, with its Stables and Garden Outbuildings." By Gervase Wheeler, Architect. With plans and views. London: Murray, Albemarle-street; "Stones of the Temple: or, Lessons from the Fabric and Furniture of the Church." By Walter Ford, M.A., F.S.A. Rivingtons, London, Oxford, and Cambridge; (a pretty, interesting, but over-fanciful book); "Experimental Mechanics: a Course of Lectures delivered at the Royal College of Science for Ireland." By Robert Stawell Ball, A.M. With illustrations. London and New York: Macmillan & Co.; and "Queen Charlotte Islands: a Narrative of Discovery and Adventure in the North Pacific, by Francis Poole, C.E. Edited by John W. Lyndon. London: Hurst & Blackett, Great Marlborough-street."—"Patent Law and Practice: showing the Mode of obtaining and opposing Grants, Disclaimers, Confirmations, and Extensions of Patents. With a chapter on Patent Agents. By a Practitioner. London: Trübner & Co., Paternoster-row." This is a handy little manual, intended mainly to impress the necessity of prudence on the novice in patent matters.

—The current number of the *Art-Journal* says,—"The Commissioners of the French Department have sent in their report to the Minister of Commerce in Paris. It states that the actual sales effected by them amounted to more than 20,000l.; and that 'orders' had been received which would realise double that sum. For works of art upwards of 5,000l. had been paid. One can scarcely wonder—seeing the peculiar privileges enjoyed by French manufacturers and tradesmen, which have brought them such satisfactory results—that our countrymen have taken alarm, and are organising measures for their own future interests."—*The Garden*, a weekly illustrated journal, conducted by Mr. W. Robinson, has begun well: the first number is full of useful information.

—*The Dark Blue, Temple Bar, the People's Magazine, and London Society*, now before us, all maintain their position this month. The Christmas number of the last, *London Society*, is contributed to by Shirley Brooks, Clement Scott, G. A. Sala, Tom Hood, Lady Hardy, and several other equally well-known writers, and is a very good shilling's worth.

—*The Labour News* is a new weekly penny organ of information on the condition and requirements of the labour market for workmen, employers, societies, and all interested in national industries. It seems to be well adapted to become of great use to the working-classes generally, much in the same way that the *Era* newspaper is to persons employed in the theatrical world. The number for December 2nd contains a table of agricultural labourers' earnings in England and Wales compiled from a Parliamentary return.

Miscellaneous.

Improvement at the Embankment, Blackfriars.—At the last sitting of the Court of Sewers, the chairman of the City Lands Committee presented a plan of improvements and alterations at the corner of New Bridge-street, Blackfriars, and the Thames Embankment. The object was to obtain a small angle of ground, of about 39 ft. super, which now forms part of Chatham-place. In exchange for this, Mr. De Keyser, of the Royal Hotel, would throw into the Embankment some thousands of feet, by the reconstruction of that building. Mr. Haywood, the engineer, said, in answer to a question, that he could certainly commend the plan to the approval of the court, for there could not be two opinions as to the public improvement which it would effect. The court concurred, and the plan was unanimously approved.

The Inauguration of the New Boulevard in Brussels.—The inauguration of the great work of arching over the river Senne in its course through Brussels, and of the new Boulevard which passes over the artificial bed formed for this dirty stream, is reported by the Brussels correspondent of the *Morning Post*. The King, owing to indisposition, did not attend the ceremony. The Burgomaster only and the Town Council of Brussels went in procession from the Hôtel de Ville up the whole length of the new Boulevard to the wooden building where the sluices to admit the river into its new bed had been established. The object of these works, begun in 1868, was to cover in and purify the river Senne. Previously to their execution the sewage was discharged into the river, which had thus become a large public sewer, exhaling in its course the most unwholesome odours, and which frequently inundated the lower part of the city. Those evils have now been remedied, the sewage being collected in two outfall brick sewers, and the river being thus left to carry its waters untainted beneath the arching constructed for it, over which runs the new Boulevard for a length of one mile and a quarter. The initiation of this important work is said to be due to the present burgomaster, M. Ansapach. The works have been carried out by Messrs. Waring, Brothers, of London, who have been ably seconded by M. Louis Genis, the chief engineer; Mr. Fowles, the active English agent of Messrs. Waring; and M. l'Avocat Willomaers, their legal adviser. These gentlemen, affirms the correspondent, have performed their several functions to the entire satisfaction of the municipality and inhabitants of Brussels.

Relating to Ventilation.—Food, Water, and Air says:—Air, to be regarded as pure, should not contain more than $\frac{1}{4}$ of carbonic acid to 1,000 cubic feet; and it has been observed that when this quantity reaches to 6 per 1,000 feet, the odour of the air of the room, as tested simply by the sense of smell, becomes perceptibly tainted. Hence Dr. Parkes has rightly fixed that the limit of excess of carbonic acid over the standard of purity should not be greater than $\frac{1}{20}$ of carbonic acid per 1,000 cubic feet of air. Now, it will be obvious that the above conditions have by no means been fulfilled in the case of the great majority of mankind. In the dwellings of the labouring classes they are scarcely ever so, and but very seldom even in the houses of the rich. In bedrooms, in some cases, no doubt they are so, but very rarely in the sitting-rooms. We have next to inquire how this standard of purity of the air is to be attained. In two ways: partly by the size of the rooms,—but large rooms are not always procurable; mainly by efficient ventilation. Thus every room should be furnished with a fireplace, which should not be fitted with a mischievous register stove. The windows should open at the top, and the room should be furnished with an inlet for fresh and an outlet for foul air, appropriately placed, and of the requisite dimensions. An inlet of about 60 in. will be sufficient for three men, and an outlet of rather larger size, one of a square foot, 144 in., for six people.

The Royal Society.—On the 30th ult. the annual meeting of the Fellows of this Society was held in the temporary building at Burlington House, General Sir Edward Sabine, K.C.B., in the chair. There was a very large attendance of members. The president, in his opening address, adverted to the various scientific discoveries which had been made in past years, and regretted the losses which the Society had sustained by the death of several Fellows. Afterwards the gold medals of the Society were presented to Mr. George Bask, F.R.S., President of the Royal College of Surgeons, and to Dr. John Stenhouse, F.R.S. The Copley medal was awarded to Mr. Julius Robert Meyer, of Holbroom. Professor George Biddell Airy, D.C.L., LL.D., was elected president for the next year. The delay that has occurred in the erection of the new building for the Societies has caused much inconvenience. Is it even now going on as rapidly as it should be?

The Roman Villa at Northleigh.—The Oxford Architectural Society has been rightly urging the Duke of Marlborough to do something for the preservation of these interesting remains. A correspondent writes us, however, that nothing has been done. It would not be a creditable thing to allow them to be destroyed. We will give some particulars in our next.

Destructive Fire at Warwick Castle.—Our readers will have ere now seen accounts of the destruction of a considerable portion of Warwick Castle, including the private apartments, the baronial hall, and the banqueting hall. The salvation of the state apartments, the destruction of which at one time seemed inevitable, was due to the massive stone wall which separated the baronial-hall from the red drawing-room. This prevented the extension of the fire below, and the firemen cut the connexion on the roof. Two of Lord Warwick's youngest children had a narrow escape from the nurseries over the banqueting-hall, where they were sleeping with the governess. The chief members of the family were from home, as not unfrequently happens in such cases; but although there were workmen on the premises during the day, they were not engaged in the part of the castle destroyed; but the beginning of the fire was so close to apartments where servants of the family were, that the alarm was given by their hearing the crackling of the burning combustibles. The property saved from the state apartments, which were stripped when the advent of the fire seemed imminent, includes the whole of the valuable pictures and the entire furniture. Pictures which were torn from the frames are not themselves damaged; and the fine Brussels tapestry, taken from Queen Anne's bedroom, is only slightly torn. The whole of the property saved is stored in the County-hall. It is a sad circumstance that the invaluable works of art with which the mansions and castles of the nobility and gentry of this country are full, are at the mercy of any careless or wicked person and that even the existent proprietors, or guardians, as we might call them on the part of the public, who are also interested in them, do not provide safer accommodation for them than they but too often do. Even our National Gallery is not fire-proof, and may at any time be burnt down with much of its treasure.

New Churches for St. Mary, Newington. A meeting has been held at Newington Butts for the purpose of devising means for erecting two new churches in that parish,—one a new parish church, to be erected on a more central and convenient site than that occupied by the present building; the other a small missionary church, to occupy a position in the churchyard more removed from the highway than the present structure. The chair was taken by the Rev. Mr. MacLagan, M.A., rector of Newington and rural dean, and there were also present the Bishop of London, and a large number of the principal inhabitants of the parish. It was stated that the new churches would cost about 14,000*l.*, of which 5,000*l.* would be given by the Commissioners of Works, who required the removal of the present building; and consequently a sum of 9,000*l.* would have to be raised by public subscription. Dr. Dalby moved a resolution pledging the meeting to strenuous exertions in the raising of the funds required for the erection of the new churches. Mr. Hammond seconded the resolution, which was carried unanimously. A list of contributions was then read from the chair, including 1,000*l.* from the rector; Mr. A. B. Bryer, 500*l.*; Mr. C. Hammond, 500*l.*; Mr. P. Cazenove, 100*l.*; Mr. Tarn, 100*l.*, with several smaller contributions, amounting altogether to one quarter of the whole amount required.

Asphalte Paving and Bituminous Rock Companies.—From a tabular statement of facts compiled by Mr. Albert Sharwood, it appears that since February last twenty-three different asphalte and paving companies have been formed in this country, with capital in the aggregate of 3,320,000*l.* The *Financier* says,—“Several of the companies that have been formed have been established to supply the demand in foreign countries. It appears that the various companies deal with ten different sorts of asphalte. Three are for paving streets, &c., in London and the provinces; and two for paving in the provinces only.” It is to be hoped the cognate word, “Bit-you-men,” will not have to be applied in many cases.

Finsbury and Southwark Parks.—A long discussion took place at a recent meeting of the Metropolitan Board of Works upon the motion of Mr. Newton to rescind a previous resolution of the Board to build on a portion of the land acquired for Finsbury and Southwark Parks. Eventually the motion to rescind was lost, by a majority of 22 to 12. A vote of two-thirds of those present would have been required to carry the proposition.

The Movement and Alteration of Stone Piers and Towers by Solar and other Heat.—In reference to a paper by Mr. Rockwood, an American professor, on the influence of the solar rays on an astronomical tower, a correspondent of the *Engineer* states that previous and more minute experiments had been made at the Edinburgh Observatory by Professor Piazzi Smyth, in which he found that a series of small lamps appreciably moved the Craigleith sandstone piers at the Observatory for carrying transit instruments. Subsequent observations made by Professor Smyth led him to “recognise beyond all doubt the truth of Henderson's [his predecessor's] conclusions, viz., that there was an annual fluctuation in the level of the transit axis depending on the temperature, and not only so, but that there was a fluctuation likewise in the position of the instrument as regarded the azimuth of its axis, and to even four times the amount of level disturbance.” The lamps used gave “a decided proof of how dreadfully sensitive these stone piers are to the faintest heat emanations, and explained once extravagances of the azimuthal over the level fluctuations noted from year to year.” Professor Smyth suggests gliding the casings of the piers, and circulating air spirally between the casings and the piers. The Mokattam limestone of the casings of the Great Pyramid of Egypt, he considers, was probably the best possible stone for protecting the pyramid itself from the constant waste producible by changes of temperature, by day and night, and from season to season. The professor might try to solve the problem whether the legendary story of the influence of the sun's rays on the stone Memnon in causing sounds may have had any physical facts of this order to rest upon.

Lectures on the Fine Arts.—The introductory lecture to a course of twelve lectures, which Mr. Medford has undertaken, was given on the 4th at the Gallery of the new British Institution, Old Bond Street. At the close he said:—“Perfect beauty in art was like living natural beauty,—the sum of many conditions and qualities, not one of which could be dispensed with without injury. The real could not be separated from the ideal without loss, although it was true that poetic truth was often displayed by work which was false in many ways; yet it was so far an incomplete work. Though he had pointed out the antagonism between art and civilisation, it was not the great wars, such as those which we had witnessed in the last fifteen years, which debased art, for they increased the power of the emotions, made men serious, and formed us heroes; but it was what civilisation brought in its train,—the insidious fever of wealth and social rivalry of display and self-assertion,—that enervated art. He looked with faith to the native fertility of the intellectual soil of the race, its improbability, and the vast influence of literature and science, as well as to the culture of art as a branch of polite education, for any revival of the long-lost faculties of art.”

The Leicestershire Architectural and Archaeological Society.—The usual bi-monthly meeting of this society was held in the Town Library, Guildhall, Leicester, on Monday in last week, Mr. James Thompson in the chair. Earl Howe was elected a member and a president of the society. Various antiquities, &c., were exhibited, and papers contributed, including one by the Rev. Mackenzie E. C. Walcott, Precentor and Prebendary of Chichester, entitled “An Inventory of St. Mary's Benedictine Nunnery at Langley, co. Leicester, 1485.” Mr. John Hunt, of Thurnby, having exhibited a trayful of relics of various periods, found beneath the level of Thurnby Church, in the foundations, and about the fabric, read a paper upon the subject. Mr. T. North, the Honorary Secretary, then read a paper, written by Mr. Vincent Wing, of Melton Mowbray, on Grimston Church.

New Cattle Market at Leicester.—Yesterday, a new cattle-market, built at the expense of the borough, was formally opened at Leicester. The site, which is between the Lutterworth and Walford roads, nearly two miles from the town, covers between 17 and 20 acres, and when the abattoirs and offices connected with it are completed, will have cost from 25,000*l.* to 30,000*l.* The market and abattoirs are connected with the Midland Railway by means of sidings; while extensive cattle-docks have been constructed close by, at the sole cost of the Midland Railway Company, and at an expenditure of nearly 10,000*l.*

The New Roof for the Bristol Corn Exchange.—The iron roof, about to be erected over the quadrangle of the Corn Exchange, at Bristol, for the protection of the dealers and farmers on market days, has just been completed at Mr. Cormell's Lansdown Ironworks, Cheltenham. The design is by Mr. E. M. Barry, R.A., and the main portion of the construction is wrought iron, which is filled in with cast ornamental work, the upper part of the roof being formed into a cupola, with decorated and open panels for ventilation. The whole will be received on a stone cornice, supported by carved figures and columns, with Corinthian carved capitals.

The Vestry Hall of St. Clement Danes. The Vestry-hall of this parish must be removed to make room for the new Courts of Justice. The churchwardens appointed two gentlemen—Messrs. Cadogan and Fry—to survey the property in company with the Government surveyor. The result is, the sum of 10,000l. was offered by the Chancellor of the Exchequer for the Vestry-hall, the almshouses, and the now disused burial-ground. Certain claims of the Duchy of Lancaster are also waived, the right of user being granted to the representatives of the duchy in any future building which may be erected on the same site. The offer of the Government has been accepted.

The Proposed Loan of £2,000,000 for the Metropolitan Board.—The proposal of the Metropolitan Board of Works to apply for Parliamentary powers to borrow 2,000,000l. for certain metropolitan improvements, was under the consideration of the Hampstead Vestry, on Thursday night, and a resolution was passed, on the motion of Mr. Aspinall, seconded by Mr. Stone, expressing approval of the proposed works. The chairman (Mr. Le Breton) said the precept of the Metropolitan Board would only be 2d. or 2½d. in the pound next year, instead of 5d. as it had been. It would be ten years before anybody was called upon to pay anything towards the proposed improvements.

Escape of Gas.—A correspondent writes,—"Referring to your valuable remarks the other day on gas escape, I may send you an instance which occurred in my own library not long ago. I had been for a considerable time annoyed by a smell of gas proceeding, as I thought, from the fireplace. But on employing a gas-fitter, who had the carpet lifted, and the surface examined, we found that a joiner had driven a nail right through the centre of the pipe which supplied the gas chandelier in the room below. An explosion might have occurred had I not taken the precaution, in accordance with your advice, to leave the window open all night."

Explosion at the Railway Clearing-house.—For some time a number of carpenters and other workmen have been employed in alterations, especially at the northern end of the clearing-house, forming the corner of Bedford-street. About twenty minutes past five p.m. on Wednesday last week, nearly the whole of the clerks having fortunately left at five, a terrific explosion of gas took place, blowing the whole of the windows on the Bedford-street side into the street—portions reaching the Russell Arms and houses on the opposite side. It is believed the gas-piping had been removed or broken, causing the gas to escape.

Appropriation of a Railway Waiting-room.—The waiting-room of the Eye-lane Station at Peckham, which is the joint property of the London and Brighton and Chatham and Dover Companies, and is so very large that a considerable portion of the space occupied by it, which extends the entire distance used by the two companies respectively, is comparatively useless, is about to be appropriated to the sale of fancy articles; and in order to carry out this object, shops and stalls are to be erected by the companies, for which they expect to obtain a considerable rental.

The Purchase of Hampstead Heath.—Mr. Le Breton has reported to the Hampstead Vestry that the Metropolitan Board of Works have completed the purchase of Hampstead Heath from Sir John Wilson and Mr. Spencer Wilson by the payment of 45,000l., and 2,000l. for expenses. Sir John Wilson and his son claimed interest on the money, but Mr. Smith, the board's solicitor, resisted this, and it was given up.

Gift of an Hospital for Dundee by Sir David Baxter.—At a recent meeting of the Dundee Royal Infirmary it was announced that Sir David Baxter had offered to erect and endow a convalescent hospital in connexion with the Dundee Infirmary. The hospital is to contain fifty to sixty beds, and to be open to patients from the Infirmary, and also to the inhabitants of the town generally who may require the benefit of such an institution. The building of the hospital is to be commenced at once. It has been estimated that to carry out his intentions will cost the donor from 20,000l. to 30,000l.

The Soudan Railway.—The *Times* says that the staff of engineers sent out by Mr. Fowler, on behalf of the Government of Egypt, to survey and lay out the proposed Soudan Railway, have already commenced operations on the whole length of the line between the second cataract and Kartoom. The staff, which consists of twenty experienced English surveyors, an English surgeon, and numerous native assistants, are all in excellent health, and speak highly of the arrangements of the Egyptian Government in carrying out Mr. Fowler's programme for their progress and work. The highest importance has long been attached to this railway communication in the interests of Egypt.

Elldermister's Public Water Supply.—At a recent trial of the new well and bore-hole, by means of a steam-engine working a powerful pump, the yield was found to be at the rate of 600,000 to 700,000 gallons in twenty-four hours. The water only lowered 22 ft. after pumping at this rate, and when pumping ceased it rose at the rate of nearly 3 ft. in five minutes. The well and bore-hole are sunk 500 ft. into the sandstone. The situation of the well is on the high land near Sutton Farm. Mr. T. Tilley, of London, is the contractor for the well; and Mr. Fairbank is the engineer.

Death of the Borough Surveyor of Penzance, in Cornwall.—The death of Mr. John Matthews, who has been for many years the borough surveyor of Penzance, is announced by the *Cornish Telegraph*. It is stated that "he was elected borough surveyor in 1844, the first plans he drew for the town being by competition and for the Prince's-street market. For these he received a premium of 30l. Step by step he gained public confidence and esteem, until works of great magnitude were intrusted to him, and he has laid out at least 60,000l. for the town of Penzance."

The Brown Institution.—The new Institution at Vauxhall for the Study and Cure of Animal Diseases and Injuries, some particulars of which we lately gave, has now been formally opened. The post of Professor Superintendent of the Institution has been conferred upon Dr. Burdon-Sanderson, Professor of Physiology in University College, who is widely known, especially for his researches into the ultimate pathology of contagion and the nature of cattle plague. Dr. Burdon-Sanderson has as his assistant Dr. Klein, who was formerly in Dr. Stricker's laboratory at Vienna. The *Times* of the 4th inst. gives a history of this institution.

Conveyance of Slag to Sea.—A committee appointed to investigate the merits of Mr. Joy's plan for carrying slag out to sea at Middlesbrough, have agreed upon its being practicable and economical. It has been resolved to call a meeting of the ironmasters, and report accordingly. Could not the slag be utilised? Have not bricks or building stones, edgings for garden-walks, and other useful forms, been made with slag? Would not casting it into some such forms be a little more "economical" than casting it into the sea?

Industrial School for Criminals.—A proposition to purchase a site at Feltham for the erection of an Industrial School for Juvenile Female Criminals was discussed by the Middlesex magistrates at their last monthly meeting. It was contended by several that the proposed establishment was unnecessary, but the Bench decided by a large majority in its favour, and a committee was appointed to carry the decision into effect. It was resolved, however, that, if possible, a site should be secured with buildings already erected.

Institute of Painters in Water-Colours.—The private view of the Winter Exhibition of Sketches and Studies will be given this Saturday, the 9th.

Royal Albert Hall.—A very numerous audience was gathered in the Albert Hall, nearly filling it, on Tuesday evening last, to hear a sacred cantata, composed by Mr. William Carter, and entitled "Placidia, the Christian Martyr." Madame Lemmens-Sherrington and Mr. Edward Lloyd sang especially well in it. Mr. Carter shows in his work much learning and skill, and won the hearty praises of a large proportion of his audience. We shall doubtless hear more of Mr. W. Carter.

Leicester-square Market, Station, and other Improvements.—Parliament is to be applied to next session for power to construct market-houses and other buildings, approaches, and streets, and a railway-station and other works, at Leicester-square. The market will be for the sale of fruits, flowers, vegetables, meat, fish, poultry, butter, cheese, and other provisions. The station will be in connexion with the Central, the North-Western, Midland, and South-Eastern Railways.

Admiralty and War-Office Re-building. Notice is given that application is intended to be made to Parliament in the ensuing session on behalf of the Commissioners of her Majesty's Works and Public Buildings for an Act to authorise the Commissioners to acquire and take by compulsion or agreement, certain lands, houses, tenements, and hereditaments described, for the purpose of erecting thereon the new building or buildings at Whitehall, for the Admiralty and War-office.

The Farnborough Organ and Choir Fund. An entertainment on the 23rd ult. at Farnborough, in aid of this fund, was chiefly distinguished by the readings of Mr. C. Roscoe Smith, whose excellence as a reader, and power in delineating every shade of character, are known farther than Kent. Mr. Smith read scenes from "The Rivals," "John Bull," "Hamlet," and "The School for Scandal," with great effect.

Chorley Town Hall Competition.—At the last meeting of the Commissioners it was stated that 227 plans of the ground had been sent out. The time for sending in designs was extended to the 30th of January next. "One Who Intended to Compete," writes,—"The site to be covered has a good street on every side, and the building must have one front in stone; it embraces upwards of 1,500 square yards, and the buildings must not cost more than 10,000l."

New Police Court for Marylebone.—A new police-court is to be erected in the large district of Marylebone. Her Majesty's Commissioners of Works and Public Buildings have under consideration the respective advantages of two plots of land, of which one is in Chapel-street, near the Elgware-road, and the other in the Marylebone-road, adjoining the Baker-street station of the Metropolitan Railway.

Meteorite Masses.—The Swedish Arctic Expedition has brought from Greenland, in all, twenty specimens of meteoric iron, two of them of enormous size. One, now placed in the hall of the Royal Academy of Stockholm, measures about 42 square feet, and weighs nearly twenty-one English tons; another, which has been presented to the Museum of Copenhagen, weighs about six tons.

Lambeth Officer of Health.—Dr. MacCormack, medical officer of health for Southampton, has been elected medical officer of health for the district of Lambeth, at a salary of 500l. a year. In a Board at which more than a hundred members were present, Dr. MacCormack secured a majority of eleven in the final vote, over sixteen other candidates.

Materials for Fire Escapes.—The Metropolitan Fire Brigade Committee have reported to the Metropolitan Board of Works on the best material for fire-escapes. The committee say that wire netting is preferable to wire gauze, and that hitherto it had been found impossible to render the canvas of escapes unflammable. The report of the committee was unanimously adopted.

Architect to the Lancashire and Yorkshire Railway Company.—There were over 100 candidates for this office. The board of directors have conferred the appointment on Mr. C. W. Green, architect and surveyor, of Liverpool, who was also a candidate for the surveyorship of that borough, and was one of the nine selected.

Bradford Grammar School Competition.
Mr. Edward Simpson, of Bradford, informs us that the third premium was awarded to him, and not to Messrs. Healey, as stated.

TENDERS

For proposed additions to the White Hart Hotel, Margate, for Mr. William A. Fagg. Mr. Joseph S. Moye, architect:—

Gaskin & Godden.....	£2,631	0	0
Cooke & Green.....	2,528	0	0
Wilson.....	2,455	0	0
Spencer & Hayward.....	2,385	0	0
Buschell & Son.....	2,320	0	0
Adcock & Rees.....	2,079	0	0

For additions and alterations at Clare Lawn, East Sheen, for Mr. F. Wigan. Mr. R. P. Pope, architect:—

General Alterations.		Porch.	Kitchen.
Bowling.....	£2,369	£208	£14
Seal.....	1,761	255	14
Stimpson.....	1,725	254	16
Adamson.....	1,697	240	16
Newman & Mann.....	1,648	215	14
Sharpenden.....	1,603	230	12
Wigmore.....	1,545	350	15

For farm buildings and two cottages at Lorbottle, Northumberland, for Mr. Adam Atkinson. Mr. F. E. Wilson, architect:—

Masons' Work.	
Gray.....	£2690
Young.....	675
Bainbridge.....	600
Yeaman (accepted).....	629

Joiners' Work.	
Burn (accepted).....	281
Slaters and Plasterers' Work.	
Steel (accepted).....	201

Accepted for nave and vestry of new church at Habburn, in Jarrow-on-Tyne, for Mr. R. Carr-Ellison. Mr. F. H. Wilson, architect:—

Masons' Work.	
Green.....	£2632
Joiners' Work.	
Irving.....	475
Slaters' Work.	
Beck.....	75
Plasterers' Work.	
Good.....	34
Glaziers' Work.	
Wilkin & Dickman.....	44
Plumbers' Work.	
Hedderly.....	7

For five cottages at Ponteland, Northumberland, for Merton College. Mr. F. E. Wilson, architect:—

Yeaman.....	£247
Lishman.....	672
Dunkin & Bates (accepted).....	546

For new shop, Ravenswood-road, Balham-hill. Mr. Nash, architect:—

Dedman (accepted).....	£700
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For two cottages in Pine Apple-grove, Tollington Park, for Mr. Staunton. Mr. J. C. Turner, architect:—

Toups.....	£490
Hawks.....	550
Driver.....	543
Gregory (accepted).....	632

For two shops in the Camberwell-road, for Mr. Thos. Standfield. Mr. George D. Martin, architect:—

Allen.....	£735
Richards.....	645
Stevens.....	443
Pargeter.....	413
High.....	335

For sewer work on the Greenhill Estate, Hampstead. Messrs. E. Fox & Bonsfield, surveyors:—

Crockett.....	£1,675
Thurst.....	1,633
Mann.....	1,685
George.....	1,657
Watts (accepted).....	1,637

For additions and alterations to the Dove Public-house, Portingland, Norfolk, for Messrs. Steward Patteson & Co., brewers, Norwich. Mr. James S. Benest, architect:—

Browne & Bailey.....	£177
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For new bar to the Horse Barracks Public-house, Norwich, for Messrs. Steward Patteson & Co., Mr. James S. Benest, architect:—

Downing.....	£172
Colman.....	167
Taylor.....	157
Wright.....	164
Browne & Bailey (accepted).....	148

For alterations to the King's Head Public-house, Hoveston, Norfolk, for Messrs. Steward Patteson & Co., Mr. James S. Benest, architect:—

Browne & Bailey.....	£502
Downing.....	465
Colman.....	464
Wright.....	468
Taylor (accepted).....	475

For stabling, &c., in Catherine-street, Buckingham Gate, for Mr. A. P. Vivian, M.P. Messrs. Middleton & Goodman, architects. Quantities by Mr. Lansdown:—

Patman & Fotheringham.....	£1,376
Saunders.....	1,298
Scrivenner & White.....	1,378
Nightingale.....	1,199
Mitchell.....	1,160

For Mason's Hill Schools, Bromley, Kent. Mr. W. C. Banks, architect:—	
Cooper.....	£1,159
Jays.....	1,125
Arnand.....	1,049
Jerrard.....	1,026
Pain & Balding.....	1,035
Grubb.....	885

For new warehouses, Turnagain-lane, Farringdon-street, for Mr. J. H. Collier. Mr. Thomas Renton, architect:—

Lidstone & Son.....	£2,400
Gammon & Son.....	2,246
Newman & Mann.....	2,075
Elington.....	1,980
Foster.....	1,877
Pritchard.....	1,942

For the erection of Wesleyan Chapel, Hampstead. Mr. Charles Bell, architect. Quantities supplied by Messrs. H. Lovegrove & W. H. Barber:—

Wicks, Bangs, & Co.....	£4,875
Patman & Fotheringham.....	4,787
Dore Brothers.....	4,545
Hobson.....	4,355
Stevenson.....	4,208
Hibbins & Tralser.....	4,198
Chesham.....	4,150
Henahaw.....	4,084
Scrivenner & White.....	4,048
Nutt & Co. (accepted, subject to certain modifications).....	3,853

For teachers' residence and school, St. James's, Ponder's-end. Messrs. Paull & Robinson, architects:—

Residence.		School.	
Dore Brothers.....	£275	0	0
Child.....	680	0	0
Linzell.....	600	0	0
Ward.....	435	0	0
Field & Sons.....	638	0	0

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The Builder.

VOL. XXIX.—No. 1506.

Seed Beds of Disease.



HE public mind is occupied with a single topic. No one has room for much other thought. Wherever two or three men are seen to gether the word "bulletin" will be heard. The [blanket] countenances look grave. The most frivolous are serious. In every unexpected

sound men think they hear the report of guns. Every telegraph-station collects a little crowd. Even the daily press forgets its usual topics. While life seems to hang on a hair, when every moment may bring intelligence, which, if decisive, can be decisive only one way, the pen seems to refuse its usual office. To anticipate evil or to hope for good seems alike out of place. To wait and to look to that source whence life and death are alike dispensed would seem all the occupation of the hour, were it not for a single consideration. The illness of the Prince of Wales will force England, in spite of its reluctance, to look fully for once in the face of sanitary reform.

At no time since the accession of her Majesty, if we except that one period of unexpected sorrow which occurred exactly ten years since, has so keen and close a human sympathy been expressed by English men, women, and children, of every rank and station, for the Royal Lady who has suffered such loss as few in her illustrious position can possibly even estimate, far less undergo. Apart from those feelings of genuine affection, which may be as tender and as deep in the cottage as in the palace, the calamity which widowed Queen Victoria fell with an especial force. A delicate woman, bound by that highest noblesse which exercises the strongest compulsion on noble natures, to the constant, daily, unremitting discharge of more actual work of eyes, and head, and hand, than most men of any class habitually perform, no season ever brought to her Majesty the relief of a thorough break in the exigent routine of sovereign duty. One help and aid she had; and when He by whom kings rule struck that worthy partner from her side, the loss was irreparable. And now a fresh trouble is upon her: again lightened, let us hope, by the feeling that universal sympathy prevails, and that a nation's prayers are with her. The affection that has been manifested for the Prince of Wales will not surprise any who have known anything of his Royal Highness. It may be said with truth that the gracious kindness of his manners, an indication of a kindness of heart that no prince could feign, has endeared him to all who know his Royal

Highness. The imagination of the people,—all that is tender, and true, and noble, is not yet extinct in old England,—has been further kindled, in dwelling on the interior of the Royal household, with the grace and charms of the Princess. In the third generation, now clinging around the knees of Queen Victoria, the Princess of Wales has given to the country a very picture-gallery of historic faces, limned by a more subtle painter than Vandyke. The face of the eldest prince, a child such as that great artist would have loved to paint, very strikingly recalls the features of the last English king born of a Danish mother. The second Royal boy is almost a miniature of her Majesty's grandfather. The princesses are not less subjects for portraiture such as few painters can hope to render. Over this poetic group is now drawn that veil of sorrow which is best honoured in silence, but which influences the entire country.

The first feeling excited by the sudden change in the tone of the bulletins was one of painful surprise. Excepting those few who knew what the foe actually was, in all his hideous and deceitful likeness, people had become cheerful as to the course of the malady. Nothing, let it be said to the honour of those on whom devolved the terrible responsibility of medical treatment, could have more exactly met the exigencies of the case than the clear, measured, wholly truthful language of the bulletins. But a voice sounds from Sandringham to which we can ill afford to turn a deaf ear. That voice only re-echoes, in tones louder than minute guns, the message which, for a quarter of a century, we have been faithfully and earnestly reiterating to a heedless or a forgetful public.

If a man fires a rifle on a crowd, and kills an individual utterly unknown to him, it is murder. If a man poaching his neighbour's game kills a gamekeeper at whom he never aims, it is murder. And on individual excesses of such a nature be compared, in their actual criminality (so far as the magnitude of the evil wrought can aggravate crime), with the offence of allowing preventable diseases to range unchecked through our land? The pestilence that walketh in darkness was as terrible to the ancient world as the destruction that wasteth at noon day. Each was attributed to the invisible but fatal arrows of offended deity; and resignation to that sudden mysterious, and unavoidable evil was a part of the grandeur of Pagan morality.

But to us pestilence has another voice. It does not strike without warning. It does not, indeed, give audible signs of its subtle approach, as with the castanet-like chatter of the rattlesnake. It does not wrap itself in visible fog, such as we so diligently produce, at this season of the year, for the deterioration of the three millions and a third pairs of human lungs that, as we write, are suffering in London. But its origin, march, and food have been pointed out by the pen of science as distinctly as if the plague were visible, audible, or tangible. Indeed, to one of the senses it not unfrequently does give warning—warning neglected like those of Cassandra; or hated for its own unpleasant honesty, instead of being regarded with gratitude as a signal of preventable danger.

The question of the sanitary arrangements at Lonsborough Lodge has been fully and minutely discussed by the daily press; aroused, by this great terror, to echo what we have for so many long years urged on the public.

There is, we repeat, no doubt that the terrible and deadly malady known as typhoid, enteric, or pythogenic, fever is one entirely preventable by the sanitary engineer. Controllable by the physician it is not,—avoidable by the patient it is: not, indeed, by any personal precaution, but by that mode of prevention which it is an utter disgrace to any civilised people not to adopt. In this very character of preventability, this otherwise resistless scourge bears a strong family

likeness to several of the most deadly foes to human life. Small-pox is preventable. It might be utterly and entirely stamped out by universal vaccination. Men who have given their lives to the service of mankind have pointed out proper steps to take to this end. Even legislative action has taken place; when up rises fanaticism, and bounds on the ignorant and the ill-informed to a party-howl against the protection of society by law. An eminent physician of our acquaintance put this matter to the writer in a mode so pithy and so just that it well deserves record. "My only son," he said, "was made very ill by re-vaccination. I took, of course, every precaution; but the action of the virus so disordered him that at one time I had serious fears for his life, and he was ill for more than a twelvemonth. These things do sometimes occur,—we cannot tell why; and children do sometimes die from the results of vaccination. Notwithstanding, any man who does not have his child vaccinated is little short of a murderer."

Phthisis, again, is to a very great extent,—possibly altogether,—preventable by drainage. In some localities, where this scourge has been infamously prevalent, the death-rate has fallen to almost nil with the removal of the water from the subsoil. In one case the malady re-appeared when, in consequence of the completion of some sewerage works, the outlet that tapped the subterranean pond was dammed, and damp and disease returned together. We might extend the list; we might tell how large a proportion of the annual deaths in this country might be reduced by very simple care. All this we have said again and again. To-day we would not say anything to distract the attention from the moral of the fear which shades every countenance.

As surely as twitch-grass springs up in the neglected seed-beds of the slovenly farmer, does enteric fever rise from neglected or ill-arranged sewerage. Even in the very choice of victims which it makes, this blast of death seems to call on the manhood of the country to render its inroads impossible. While neither sex nor age, neither rank, diet, constitutional vigour, personal care, nor any similar distinction can be relied on as affording immunity from its ravages, the chosen victims of enteric fever are men in the very prime and pride of life. The more heroic the structure, the more robust the health, the more terrible, it may almost be thought, the attack. And all that the physician can do is to warn,—and usually to warn in vain,—those whom he wishes not to be his patients, to seek the timely aid of the members of another profession.

It is quite unnecessary to disguise the fact that hesitation may arise, and has arisen, between the members of two cognate and allied professions, as to whose province it is to take charge of sanitary arrangements. Strictly speaking sewerage, together with the allied questions of water supply and collection, drainage, irrigation, purification of rivers, protection of springs, and the like, come within the province of the civil engineer. On the other hand, the internal arrangements of house pipes, drains, sinks, closets, and the like, may be held to come within the province of the architect. Small outlay, small details, are involved in the perfection of this part of the circulating system of town habitation; and thus, whether to avoid expense, or from professional jealousy, or from the very general and most mischievous fallacy that it is cheapest in the long-run for a man to be his own architect and his own engineer, at all events, in small matters, the care of the keys of our life in this respect has been allowed to drop into the hands of the plumber, the bricklayer, or even far less educated workmen. In fact, sewerage is not an agreeable practical study. The rougher the workman, the less he

may be thought (perhaps very unjustly) to be personally affected by disagreeable sights and scents. Who does not know, if he, or she, or the friends of either have had the evil fortune to become tenants of some of the cheap houses reared by scamping builders, what it means to "have the growth of toadstools, what it means to "have the drains up?" The event is a sort of *Saturalia* for the very roughest of rough labourers. Of course, they make the most of it. A very little experience tells the man who is sent "to see what is the matter" of the absolute and incredible ignorance possessed by most Englishmen on all subjects in any way connected with engineering. Add to ignorance, want of time; add to want of time, disgust. When the master of the house returns from the City, his question will be, "Are the men out of the house?" If not, he may perhaps be induced by his more patient and more suffering helpmate "just to go and look them up." "Well," says he, "what is it? Have you found the stoppage? Why, bless me, you have got all the kitchen floor up!" The man explains or invents; he points out nooks or bonds, he displays rags or knots of hair, feathers, and paper; or he shows, if he knows what he is doing, how the workman has avoided a trifling loss of time by putting in a drain-pipe of about a third the proper bore. We need not pursue the subject. Happy are those readers who could not contribute a column or two of their own unsavoury experience to back our words. But the result is that constant danger, great uncertainty, vexatious cost, and manifold repetition of all these evils are the normal and unfailing result of neglect of sanitary precautions, due to the non-consultation of sanitary engineers.

Our habitual readers will not expect that we should now recapitulate the principles, far less that we should enter into the details, of proper sanitary provision. No doubt for days to come column after column of our daily contemporaries will be devoted to the publication of discoveries (new to those to whom sanitary science is new), or to the more or less adroitly veiled puffing of individuals ready for employment. We only regret to anticipate the recourse to this ordinary English safety-valve from the fact that, when people have said their say, written their letters, glorified themselves at their appearance in print, or said a bad word at the stupidity of the editor who has not given type to their lucubrations, they will feel that they have done their duty, that they may wash their hands of the matter, and will re-settle down in contented danger till the next appeal to public alarm. For the moment, we have but one word of advice to give to those who are not familiar with our pages. We can not do better than give it in the language of a London physician who has done much to alleviate the suffering of women and of children. One of those men who think themselves adroit at picking the brains of other people thus addressed this physician one day in society:—"Doctor, what should you do, now, if you felt,"—and here followed a description of symptoms. "In that case," replied the doctor, looking very gravely at his querist, "I should certainly consult a physician." That is our advice. Does the parent see his children peak and dwindle, and wonder at flagging appetite, or lost buoyancy? Does the mistress of the house perceive evil odours, or hear of trouble in the sinks? Is there a man about to take a house? Is there one about to repair, to modify one? Is there a physician who is dissatisfied with the progress of his patients? To each we would put the same question—have you consulted a practical sanitary engineer? Have you discharged your conscience in this matter? Have you duly guarded human life—your own, that of those dear to you, or that of those who entrust to your care the expenditure of their money, or the maintenance of their health? Do not take a heavy responsibility unless you can answer for its discharge before God and man. Do not let false pride stand in the way. Do not let false economy stand in the way. Remember that, if trouble arises, ugly questions will be asked. Who is responsible for the drainage? On what practical experience do you base the consideration that you are competent to deal with this vital question high-handed? If parents, and masters, and builders, and architects, would make themselves sure that they had put to themselves the same questions that might be put before a coroner's jury, if one of their family or clients were struck down by enteric pestilence, we should have taken the first step towards stamping out many a terrible scourge. Is it

necessary for yet another and another Curtius to leap into the ever-growing gulf before England sets to work in earnest to prevent preventible disease?

JOHN AHERON, ARCHITECT; AND OTHERS.

In relation to John Aheron, his patrons, English and Irish, and his works,* we have gleaned the following particulars through several channels not generally accessible. It is quite certain now that he erected Stradbally Hall, Queen's County, and a mansion at Rockforest, County Cork, the designs for which appear in his "General Treatise of Architecture," along with other buildings throughout Ireland previously to the date of his published work.

Pole Cosby, for whom Stradbally Hall was built, was a descendant of Francis Cosby, who, on the dissolution of the religious houses in Ireland, came into possession of a large property in the ancient parish of Oohmills, Stradbally. The monastery, with its mills, castles, and lands, containing 345 acres, was granted August 18th, 1592, *in capite* by knights' service, to hold of the Castle of Maryborough, to Francis Cosby, his heirs and assigns, at the annual rent of 17l. 6s. 3d. Irish money, they to find yearly nine English horsemen. On the 4th of December, 1609, a new grant was made to Richard, son of Alexander Cosby, who repaired the castle, and removed the parish church from Oohmills to the town by building a new one, which church, having gone to decay, was rebuilt in 1775 in the general style of that period. The said Richard Cosby also obtained a charter for weekly markets and annual fairs. The old parish church of Oohmills was converted by Pole Cosby, lord of the soil, into a mausoleum or burying-place for his family. There is little doubt but Aheron was engaged on this work as well as the mansion. The castle spoken of was surrounded by a fosse, but was eventually pulled down by the Cosbys, who built a fortified house in its place; but this also disappeared some time in the last century. In the year 1771, Cosby, Lord Sydney, commenced the erection of what was intended to be "a noble house," in the language of the times, a little way outside the town, south-west of the ancient castle, but he only lived to see the offices and one wing completed. At the close of the last century the estate, which comprised a highly-ornamented demesne, belonged to Admiral Cosby. In the same neighbourhood, in 1768, and probably during Aheron's life, the Earl of Roden built a family mansion, Brookley Park. This building was erected under the direction of an Italian architect of the name of Ducart. It was raised upon the site of a former one, which was burned down. Aheron gives in his work several designs for charter-schools, and we find that a charter-school was erected about his time in Stradbally. Indeed, the erection of charter-schools in the middle of the last century was very rife all over Ireland. What other particular works Ducart was engaged upon we have yet to learn; but the occurrence of his name and his presence in Ireland go, perhaps, to account for his being at least one of the band of foreign architects and artificers, Italian and German, who were both brought over and invited by members of the Irish nobility, from the middle to nearly the close of the eighteenth century. Several Italian artificers, scagliola and stucco plasterers, made Dublin famous, during the eighteenth century, by the high artistic character of their plaster-work in public buildings and the mansions of the nobility. After a short while, however, the native stucco-workers rivalled them; but the once high excellence of this class of building ornaments and enrichments died out early in the present century in Dublin. Sir Gustavus Hume, of Castle Home, in the county of Fermanagh, invited over Richard Castles, a German architect, some time between 1732-40. The German obtained extensive practice in Ireland from the nobility, and designed several public buildings in Dublin. He remained in Ireland until his death, well patronised.

Returning to Aheron, we find that another of his patrons was Sir Maurice Crosbie (not Cosby), knt., and two others of the same name, probably relatives. A branch of the Crosbie family lived at one time in the Queen's County, not far from the neighbourhood of the Cosbys, and another patron of Aheron, Periam Pole, lived at Ballyfin, in the same county. The

ancestor of Periam Pole obtained possession of the large estate of Ballyfin after the Restoration, 1663, by a grant from the king,—a Sir John Crosbie, its former owner, having forfeited it by espousing the cause of Charles I. Periam Pole died, unmarried, on the 24th of April, 1748, his younger brother succeeding him. This younger brother, William Pole, became a member of the Privy Council in Ireland, and a governor of the Queen's County. He erected several buildings on his estate; made very large improvements; formed extensive gardens, hot-houses, lakes; and in 1771 built the eastern front, consisting of a hall, dining-rooms, drawing-rooms, library, several bed-rooms, and other apartments. Great improvements were projected at the seat of Ballyfin, but they came to a standstill by the death of Lady Sarah Pole in 1780, and her husband in the following year. William Pole having died without issue, being the last representative of his family in Ireland, his estate went by will to his third cousin by his mother, the Hon. William Wesley. Thus Ballyfin passed into the hands of the Mornington family, from whom the Duke of Wellington was descended. The name and arms of the Poles were assumed and allied with the Morningtons, Wesleys, or otherwise Wellesleys. Thus became extinct the Irish branch of the Poles descended from Sir William Pole, of Shute, in Devonshire, and probably of the Cardinal Pole family.

There is every reason for believing that the improvements carried out by William Pole at Ballyfin, were part of those begun by Periam Pole, Aheron's patron, and were originally designed by this architect.

ANENT ILMINSTER.

A GOVERNMENT officer has been to Ilminster, measuring and making inquiries as to the state of that ill-drained, or rather undrained, town. We have not heard of any official statement being made since his visit, or what may be the extent of his recommendations with a view to improvements. It is several months now since we sounded the alarm, after a careful examination of the high and low places of that irregular town; and though our statements could not be denied, they were, as usual, carpeted and pock-pocked by some of the local journals.

The mortality in Ilminster during the past year, if looked into, we think, will be found rather high; but, independently of the number of deaths, we would direct inquiry to the causes. The town, from its situation offers favourable facilities for a ready and thorough system of drainage being carried out. The system of local rule in Ilminster has long needed reorganisation. As it has existed hitherto, the duties seem to have been divided between the churchwardens and the Highway Board. The latter body looked after the roads outside the town, through their district surveyor, who kept them in a fair state of repair. The former body, or shall we say the town council, on whom sanitary matters devolved, doggedly resented being lectured from London, or elsewhere, on improved drainage or water-supply. When these latter authorities were informed that fever still continued in a certain low part of the town, one among their number, who considered himself wiser than the rest, said, "fever and sickness were always in that place, and will always be there." This crushing argument had the desired effect with the majority of the "Do-Nothings in Council," and was supposed to excuse them for doing less. Perhaps the end of the tether is reached at last, and that we have not laboured in vain in honestly drawing attention to the ills of Ilminster.

THE BRIDGES OF LONDON.*

THE iron-work of Blackfriars Bridge was tested as the work proceeded by Mr. Kirkaldy. The specified strength of iron being such as will not increase or diminish in length more than 1-625th part on application of a tensile or compressive strain of 16 tons per inch area. This specification was arrived at on the principle that good iron will bear a strain up to 16 tons per inch within the elastic limit with a regular increase or diminution of dimension of 1-10,000th part of its length per ton per inch. It must be remembered, however, that at the time this specification was drawn the experiments on iron were by no means so full or reliable as those carried out by Mr.

* See p. 843, ante.

* See p. 959, ante.

Kirkaldy within the last six years. The proportion of extension and compression arrived at by Mr. Hodgkinson, from very few experiments, was adopted too generally regardless of the very different qualities of different makes of iron.

It is more usual to specify a breaking strain only; but iron has been permanently injured,—in fact, destroyed for building purposes,—a considerable time before it breaks under experiment. As soon as the elastic limit is passed, the iron is, in fact, destroyed, and the element of time, and a considerable time, too, must enter into the question of what really is the breaking weight. If weights be increased rapidly or at short intervals, the iron will absolutely bear considerably greater weight than would have broken it if left on for a length of time.

In fact, the following elements all bear in an important measure on the question of strength of iron,—namely, elastic limit, weight ultimately borne and time of bearing beyond elastic limit, and also the diminished sectional area at the point of fracture, the contraction of area marking strongly the ductility of the material.

In Southwark Bridge the thrust on the cast-iron arches is about 24 tons per inch; in Blackfriars wrought-iron arches the thrust is 3½ tons. A somewhat slighter arch would have been perfectly safe, but it was considered that there would be more and perhaps objectionable vibration with less metal in the ribs. The cross section of Southwark Bridge arches is that of a simple flat plate with insignificant enlargement at the extremities, a form very much wanting in lateral stability, depending, in fact, for lateral rigidity entirely on the cross bracing. In wrought-iron arches, on the other hand, there is great facility for placing the strength principally in the intrados and extrados of the arch giving considerable breadth and lateral strength at those parts, thus placing the material in the most advantageous position to resist not only vertical vibration, but lateral also.

The arches of Westminster Bridge are of peculiar construction; they are not what they appear to be on the external elevation, that is, arches flat at the crown, with sharp curvature at the haunches. The real arch terminates many feet from the apparent springing; the haunches are, in fact, overhanging piers, massive cast-iron work standing as part of the pier corbelled over. The iron work of the arch (not the roadway) is thus made continuous throughout, the effect of which is much to increase the vibration, a vehicle on one arch thus effecting the adjoining arches. This same effect of continuous construction may be observed very strongly in the Victoria Railway Bridge: a train at one end of the bridge causes very considerable vibration at the other end. In Blackfriars Bridge, in order to avoid this effect, the iron work of each arch is made entirely distinct from the iron work of the adjoining arches. No motion can be communicated from one arch to another except through the masonry of the piers.

The granite, the bricks, and the cement used in Blackfriars Bridge were also tested by Mr. Kirkaldy, and specimens are laid on the table. The granite used was from the De Lank quarries, near Bodmin, Cornwall. The following is the analysis:—

ANALYSIS OF DE LANK GRANITES.

Specimen D. L.	Average of Granites.			
	Maximum.	Minimum.	Ordinary.	
Silica	68.93	76.08	68.0	72.8
Alumina	23.46	17.77	11.0	15.3
Potash	—	8.88	4.0	0.4
Soda	2.62	2.60	0.0	1.4
Lime	traces	1.50	0.0	0.7
Magnesia	traces	2.00	0.0	0.0
Iron Oxide	1.19	2.60	0.5	1.7
Iron Pyrites	3.18	1.50	0.0	0.0
Loss by Ignition	0.80	—	—	0.8
100.00	—	—	—	100.00

There is little doubt that the quality of granite depends more on the amount of iron and soda contained than upon any other quality, and the suggestion is thrown out whether more attention should not be given to this point than is usually done.

Blackfriars Temporary Bridge.—This bridge, though but a temporary structure, did duty as one of "The Bridges of London" for five years and a half, and owing to the better gradient, it was found such an improvement upon the old stone bridge, that there was immediately a marked increase of traffic. It may, therefore, deserve a passing notice.

The London, Chatham, and Dover Railway Bridge being in progress, and a much wider space being required for New Blackfriars than was occupied by the old stone bridge, there was not sufficient width between the two to build the temporary bridge with carriage-way in the middle, and footpaths on each side. A two-story bridge was therefore adopted, with carriage-way below of 28 ft. width, the same as the old bridge, and two footpaths above of 9 ft. each, or 2 ft. wider than those replaced. The roadway for the carriage traffic was 16 ft.

The carriage-way was 53 ft. above the bed of the river, and the footpath 18 ft. above that, making a total height of 71 ft. Three openings 75 ft. each were left for the river traffic, the road over which was carried by wrought-iron girders.

The carriage-road was the ordinary wood pavement, which answered well with once renewing and occasional patching. It was, no doubt, slippery in certain states of the weather, and required great attention in cleansing and sanding; but, on the whole, it is felt that no other road formation would have been so suitable under all the circumstances, and the experience seemed to show that the final decision to adopt wood pavement was right in this case, notwithstanding the objections to wood pavement, and its admitted inferiority in permanent streets with solid foundations.

Much fear was expressed before the bridge was opened as to its safety and stability, but, on taking down, not a bolt or timber was found disturbed or fractured, and the vibration on the top, though it appeared considerable, was, in fact, only a ¼ in., and singularly enough, the greatest vibration was produced by empty four-wheel cabs.

All the ties and braces were notched on one quarter of their thickness, as well as bolted; this notching injures the timber slightly, but very great rigidity is thereby obtained if well done; in fact, if the timbers be notched into each other, the mere bolting admits of very considerable lateral play.

It may occur to some that the temporary bridge might have been placed on the up-stream side of the old Blackfriars Bridge, the objections to this were the much greater length of restricted river way, and the interference with property in Albion and Chatham Place.

It was thought desirable to put some limit to the weights to be taken over this bridge. Notice was, therefore, put up that loads drawn by more than four horses would not be allowed to pass. The difficulty, however, was got over, by the drivers generally taking off the third pair of horses at the commencement of the bridge; and going over with the orthodox four.

The time occupied in the erection of this temporary bridge was just over seven months.

The Bridges considered as Works of Art.—Under this fourth head much might be said, but at present it is not for an engineer to lay down the law in a paper to be read before the Institute of Architects.

If an architect has but a barn to build at an expense of a few hundreds, he proves himself a poor architect if he does not put into it some artistic feeling, be it only good proportion; it is his acknowledged duty to do his work artistically,—not necessarily expensively,—but to do it with some feeling for his art. An engineer, on the other hand, may spend millions on a railway, without having one work upon it with any real artistic feeling, either in proportion or ornament; nevertheless he may be a great and a good engineer. It has not hitherto been considered as any essential part of an engineer's duty to do his work artistically.

It is by no means intended to be said that no engineering works are artistically good, but such is not far from the case generally; more frequently it is not even aimed at,—at all events, not in the same sense or manner in which an architect's work is intended to be done. An engineer may succeed without intending it, and an architect may fail after the most strenuous efforts. For instance, Smeaton says nothing, and probably thought nothing, of beauty of outline in designing the Eddystone Lighthouse; nevertheless, the outline of that tower is as beautiful a line as can well be drawn. But to return to the subject under consideration—"The Bridges of London." All that shall be attempted shall be to throw out a few suggestions for consideration. First, with regard to London Bridge, acknowledged on all hands to be one of the finest bridges in Europe, there is one point which would perhaps give an unsatisfactory feeling to an engineer rather than to an architect, namely, the concealed skew-

back, which leaves the arch apparently standing on a point at the springing; there is no apparent support for the arch. A bold, well-developed springing or skewback gives a feeling of strength and stability, which in this bridge is left to be inferred.

One of the most important considerations in bridge-building is the adoption of a style and design suitable to the locality, and perhaps this may involve more radical and important considerations than at first appear. In the case of London Bridge, you have high ground on the City side, low ground on the Southwark side. The style adopted is Classic in feeling, if not absolutely and properly Classic. This style involves a centre and two sides absolutely alike, or so nearly so that the difference could not be discovered. The difficulty thus arising is got over to some extent by "fudging" the parapet line somewhat, and the road still more, thus acknowledging that the design does not altogether fit the situation. By this means, however, a fall of 3 ft. 6 in. is gained in the road without visible change of external elevation; but even with this gain, the value of the bridge as an engineering work is greatly diminished by the steep approach from the south. The gradient of approach is, in fact, sacrificed to the uniformity of elevation. It is not implied that some other course ought certainly to have been adopted, but the difficulty is thrown out as a matter for consideration. It is, in fact, a case of *uniformity and dignity of design versus utility*.

The gradient of the south approach is now 1 in 23; had the drop of the two southern arches been increased, the gradient over the whole might have been 1 in 31,—a difference of vast importance to this heavy traffic.

Waterloo Bridge, again, is a similar case; but there the convenience of approach has been sacrificed to uniformity of elevation, even to a much greater extent. This bridge must be considered not only as Classic in feeling, but as an absolutely Classic structure, utterly rigid and unyielding. The horizontal line is boldly carried right across the river regardless of consequences, and the southern approach is left to accommodate itself as best it can. The gradient of the southern approach is now 1 in 30; it might have been 1 in 60. London Bridge, merely Classic in feeling, can accommodate itself to circumstances to some extent. Waterloo Bridge, absolutely Classic, is rigid and perfectly unaccommodating.

He would have been a bold man who, in building across the Thames at London, would have placed the central point of his bridge as near to the northern shore as the navigation would permit, and then have inclined the sides in the manner most suitable to the ground; but there is a question whether a good engineer and true artist would not be able to build in the manner most suitable to the requirements of the case, and at the same time to make his work express his object with true, noble, and satisfactory artistic feeling.

Even the bare suggestion of a job-sided structure over the Thames is perhaps too much; nevertheless, it may serve to draw attention to the difficulties, in certain cases, of combining architectural design with utility in bridge-building.

There is one feature in the new Blackfriars Bridge which may be worth a passing notice, as it certainly is not usually adopted, and is believed to be novel. In this bridge, the springing line of arches at the piers is on a higher level than at the abutments. Had the springing line of arches been maintained at the same level throughout, the spandrels of the centre arch would have been 4 ft. deeper than they actually are, involving an awkward disproportion between the small spandrels of the land arches and the large spandrels of the centre arch. This is avoided by lifting the springing of the piers, thus letting the springing line of the arches to a certain extent follow the gradient of the road. This departure from the horizontal line in the springing of the arches probably would never be noticed; it has considerable effect, however, in lightening the central portion and bringing it into harmony with the sides.

The lifting of the springing line not only effects the object of giving better proportioned spandrels, but it gives increased headway for the navigation. This matter of headway became a vital question with the Bridge House Estates Committee in determining the design to be adopted, the question of interference with the navigation finally deciding the choice of a five-arch bridge in preference to one of three arches. At first sight it may seem strange that a bridge

with four piers should interfere with the navigation less than a bridge with only two piers; nevertheless, that is the case in this particular instance, both as regards high and low water. In a three-arch bridge, the headway under the haunches of the large arches would be so low as to render a considerable portion of the arch unavailable, as well as the space occupied by the solid pier itself, and at low water the centre arch alone would be available for navigation. There would, it is true, be a considerable space of water under each side arch, but neither thus separated sufficient for vessels to pass. Whereas, in a five-arch bridge, the higher springing line permits the whole extent of the archway to be used at high water, and at low water the whole space of the three arches are available.

In these remarks it is assumed that both in three- and five-arch designs, the headway under the middle of the centre arch is at a fixed and previously determined level, and that a large arch necessarily has a greater versed sine than the smaller arch, involving a springing at a lower level.

This paper has already occupied too much time to allow of further remarks. Something might have been said as to the various styles adopted for the different bridges, but no information could have been given by such criticisms. Every member of this Institute can form an opinion more to the purpose than anything that might have been said here. These works are before us all: they are not in a far distant country, which only few have the opportunity of visiting.

HENRY CARR.

EXPERIMENTS ON THE STRENGTH OF MATERIALS.

A VARIETY of experiments on the strength of materials were made by Mr. Kirkaldy for the works of the new bridge at Blackfriars, and were referred to by Mr. Carr in his paper. Some of these experiments gave results as follows:—

BRICKS, IN PIERS FOUR COURSES HIGH.

Description of Bricks.	Size of Pier in Bricks.	Mortar.	Failing slightly.		Entirely crushed.	
			Tons per foot super.		Tons per foot super.	
Common stock recessed	13 by 13	Lias lime	17	27		
Ditto ditto	13 by 13	Ditto	21	30		
Red Bricks, machine-made	11 by 13	Ditto	20	40		
Ditto hand-made	11 by 13	Ditto	20	36		
Gall	14 by 14	Roman cement	21	59		
Ditto	1 by 1	Ditto	64	72		
Clark's Suckbury machine	1 by 1	Portland	49	76		
Uxbridge red, hand-made	1 by 1	Ditto	14	53		

STONE CUBES OF TWO INCHES, BEDDED ON SKEW LEAD.

Description.	Failing slightly.		Entirely crushed.	
	Tons per foot super.		Tons per foot super.	
De Lank granite, Cornish	283	363		
Ditto	279	—		
Ditto	349	377		
Guernsey	276	839		
Ditto	761	1,150		
Cheesewring, Cornish	295	403		
Ditto	194	322		
Portland	166	155		

A small polished column of red Mull granite, length 6 in., diameter nearly 3 in., was cut through the middle, and the cut faces accurately ground; when tested, packings of pine were placed at each end, and the surfaces, where cut in two, were put together with a little boiled oil. This 3-in. column bore a strain of 60 tons, or 84 tons per square inch, 1,260 tons per square foot, or the weight of a column 16,380 ft. high.

An experiment was made to test the effect of a small area of iron pressing on a surface of De Lank granite. A cube of 1-in. wrought iron was placed between two blocks of granite, 6 in. by 6 in. by 5 in.; a packing of 4 in. of pine was placed between the granite and the machine, and between the iron cube and granite. One of the blocks was split with a pressure of 50 tons; the block which was not injured was again submitted to pressure with another cube: it was then fractured with a pressure of 52 tons. The iron cubes were reduced in thickness one-sixth, with an equivalent lateral extension.

It was desired to see what would be the effect of great pressure on the skewback stones. A stone was worked one-fourth scale, and a corresponding portion of arch-rib made; the two were bedded together with lead run in between, in the same manner as proposed for the arches themselves. They were then gradually submitted to a pressure of 200 tons, but without

any effect except extrusion of the lead; the iron, however, with 18 tons per inch, seemed to have quite as much as it could carry. Being all to one-fourth scale, the area under pressure was one-sixteenth the real size; the pressure was therefore equivalent to 3,200 tons in the bridge itself, the actual pressure in work being under 400 tons.

Gun-metal cramps were also tested, the result being the rejection of several mixtures of metal submitted by the contractors, and an increase of strength obtained from 17,519 lb. per inch area to 28,893 lb. (7½ to nearly 13 tons.)

In order to test the strength of timber used as struts, two whole balk, 20 ft. in length and 13 in. square, were submitted to end compression. The red timber crimped with 138 tons, or 112 tons per foot area, and the white with 147 tons, or 128 tons per foot area; the reduction in length being in one case ½ in., in the other ¾ in. Specimens of the fractures are now exhibited.

Portland cement was also tested, the standard of the Metropolitan Board of Works being adopted, 110 lb. weight per bushel, and 500 lb. tensile power on 2½ in. area; some results obtained were as high as 733 lb. on the 2½ in.

Experiments were made on the iron from time to time, but the specified strength was not fully attained; it was, perhaps, pitched rather too high for such work. The extension of ½ in. part of the length was given by strains varying from 13 tons to 15 tons instead of 16 tons, but even with this, the elastic limit is just about four times the working load, which is ample allowance for safety, taking into account a very large deterioration from time and corrosion.

The above figures are stated in round numbers. The results, as given by Mr. Kirkaldy, are in every respect most accurate and minute, but high numbers of pounds instead of tons, and long decimals are not suitable for such a sketch as this.

THE NEW FOREIGN CATTLE MARKET.

THIS week a great public institution, called into existence by the exigencies of the vast and increasing population of London, commences what it may be believed will prove a long and useful career: we refer to the opening for the reception of importations of live stock, at the new Foreign Cattle Market at Deptford, to which use the extensive premises formerly employed as one of the Royal ship-building and dock-yards are to be hereafter appropriated.

At the time this Government property was transferred it was more than whispered that, on the one hand, the vendors had received much less than its value, and that afterwards the Corporation of London had paid much more for it than they should have done. An intervening party between Government as vendors and the Corporation as buyers netted, it has been alleged, a very handsome sum by the transaction. If the Corporation lost time and opportunity in the first steps of the acquisition, they have certainly not been chargeable with laxity since. The very extensive works necessary, in connecting buildings, and internal fittings, and landing jetties, have been commenced and completed in a space of little more than six months.

The ceremonial opening will not take place for some little time to come; but the foreign cattle salesmen and importers are naturally impatient and desirous to have the market opened for the Christmas traffic, and nearly a third of the accommodation to be provided is now practically finished, and business will be commenced this week, and more fully on Monday. Visitors, unless furnished with day-signed orders, are rigidly excluded from the premises, which for several weeks past have been a scene of great activity. During the last week there have been above 1,000 men employed, with forty horses, and a number of barges, steam cranes, and other appliances.

In constructing the market, the six covered

building-slips of the old dockyard have been utilised and connected with each other by ranges of new erection. Some of the sheds are roofed with timber, and others with iron. One of them almost vies in width of span, height, and stateliness with the notable St. Pancras Railway Station. The capitals of the tall columns are connected with the principals of the roof by large well-designed open spandrels, the whole structure having internally an imposing effect. This slip is upwards of 400 ft. long and was 19 ft. deep.

The area of the cattle-market, including the space occupied by the covered pens, slaughter-houses, and offices, is a little more than 28 acres. The utilisation of the covered slips and other buildings has doubtless enabled the corporation to construct the market at a very much smaller cost than would have been necessary if everything had been done *de novo*, or if the building materials only had been used. It almost seems an open question, however, whether it would not have been better to have laid out the erections upon a plan independent of the position of some, at least, of the slips,—those particularly that radiate from the floating basin in the yard round which they are ranged. This basin is of nearly an acre in extent, and is closed at the inner end of the entrance by a caisson bridge, and crossed by another bridge at the river's edge. The irregular relative positions of the slips has necessitated numerous angles in the fittings of the plans, which cause waste of space that would not have occurred in buildings of rectangular form. One of the series of connected pens, and much the largest, has in its outline five angles, exclusive of the two on the river front. The pens for cattle and sheep respectively are intermixed, not individually but in series, throughout the whole of the covered area, so as to be readily accessible to the cargoes of cattle or sheep respectively as landed at the different jetties. All round the outer wall of the covered pens there will be a roadway 24 ft. wide, and they are all also provided with longitudinal and lateral roadways of 20 ft. wide, with gangways of 6 ft. wide intervening. With 30 ft. superficial for each head of cattle, and 5 ft. superficial for each sheep, the accommodation is as follows:—

	Cattle.	Sheep.
Block AA	1,570	3,200
BB	1,231	—
CC	650	4,550
DD	401	3,750
Total	3,892	11,510

There is, in addition, a large area of open-air yard room that may be available if need require.

The new connecting buildings are much less lofty than the slips, but ample provision is made for their thorough ventilation by ranges of dormer windows glazed with louvres of rough plate-glass; the alternate windows are hinged, and may be opened at pleasure so as to send copious streams of air through the building in any direction. These new buildings are 155 ft. wide and have bound roofs, in three spans. The columns are 15 ft. high to the bottom of the supporting beams. The cattle-pens are strong timber erections, and furnished throughout with ranges of mangers with sparred bottoms. Over the back portions of the mangers are ranges of water-troughs, also of stout deal. The sheep-pens are divided by upright posts and longitudinal iron rods, the upper rod 1½ in. in diameter, the others ½ in. Each of the sheep-pens is furnished with a water-trough and an iron feeding-rack in the centre, 9 ft. long by 30 in. wide at the top, reduced to a circle of about 3 in. radius at the bottom. Palleys are hung to spars overhead, by which the racks can be raised or lowered at pleasure.

Some of the blocks of pens nearest the river are so arranged that in case of diseased cattle being imported they may be completely detached from the others, and slaughtered and boiled down, without contact, in the buildings provided for the purpose. There is but little ground for apprehension of mischief from the importation of disease, the foot and mouth disorder and pleuro-pneumonia being alleged to be peculiar to English-bred stock.

There is, in ranges of former workshops, abundant accommodation for slaughter-houses, of which there are two, 220 ft. long by 60 ft. wide. They are fitted with the best mechanical appliances, in cranes for hoisting the carcasses, and travelling pulleys for moving the suspended carcasses from place to place. A range of buildings, formerly boat-houses, will be used as

slaughter-houses for sheep, for which they are well adapted.

The live stock will be landed at three jetties, placed at equal distances from each other on the river front. These jetties are 20 ft. wide between their strong bulwarks. At about 100 ft. from the quay the jetties fork, and form an equilateral triangle of 100 ft. on the side. The river has been dredged, so that there is a depth of about 16 ft. at low water in front of the jetty. There is a low-water landing-platform, and inclines from it to the upper level, with strong cross fillets for foothold: cargoes may thus, as may be seen, be landed at low as well as at high water. The angular roadways on the jetties may be shut off from each other, and there are means for penning a large number of sheep or cattle on the jetty if their transhipment should be desired. A foot-gangway, 6 ft. wide, gives access to the front, without need to use the cattle road. The jetties are excellent examples of strong, well-put-together timber-work, the piles, which are of sound Baltic timber, are from 40 ft. to 45 ft. long. The outer angles of the jetties are protected by strong dolphin piers, placed as avant-guards. Each of these protectors has fourteen piles, stoutly braced and bound together, so as to resist as one piece.

In addition to the buildings appropriated to the accommodation of the cattle and sheep, to slaughter-houses, and to other purposes, there are numerous other buildings in the yard for which an ultimate profitable use will doubtless be found. A long range of these is being converted into van-sheds and stables, for the accommodation of dealers and others having business at the market. A house for the provision of refreshments will doubtless be found necessary, and for this there are ample premises.

The whole works are being executed, under contract, by Messrs. Browne & Robinson, of Workip-street, Finsbury, by whom they have been completed thus far in what appears to be a very creditable manner. The remaining third of the accommodation will doubtless be ready for use as soon as required. The demands for space will be gradual; and mean time there are ample facilities provided for relieving such a fleet as may present itself of the cargoes they bring of Christmas cheer.

THE THREE SCHOOLS.

At a meeting of the Architectural Association, on Friday evening, the 1st of December, a paper was read by Mr. Wyke Bayliss, F.S.A., entitled "The Three Schools; or, the Distinctive Aims of Classic, Mediæval, and Modern Art." The lecturer commenced by stating that the truest reverence for all masters and teachers was shown, not by slavish or any following by choice of their modes and peculiarities, but by imbibing their spirit and expressing under the leading of personal delight strong and genuine feelings, such as gave the giants of other days their vigour and power. To suppose our age barren of the impulses that have made the fine arts necessary to those who could only speak out their nature by their means, or to suppose that imitation is the happiest method of strengthening new voices and rendering them firm and sure; both are contradicted by our perceptions and our hopes. The present and the future are then the best prospect for the choice of all. To the artist especially may be said,—"Look back, reverse, and learn; look around and forward, and act." Mr. Bayliss then proceeded to describe the aims of high art in general, quoting with approval the terse definition by Abbé Felix at Notre Dame,—"Expression of ideal beauty under a created form;" the seeking out and apprehending of what commends itself to our best selves as (so to speak) the reflection of a Divine beauty in persons and things, and the manifestation of that beauty to others, looking or listening. In this sense Greek art,—speaking specially of its sculpture,—the division of the un-phonic arts that strikes us now-a-days as that through which the Greek mind found some of its best expression, was one of the greatest schools the world has witnessed, marked by the pre-eminent sanity of true genius, by fine insight and creative power; a school unsurpassable within the limits of its special aims till the powers of its artists are exceeded, or their courage, what we may fairly call their heroism, has been outdone. These aims were the rendering of the ideal type rather than the individual,—the fullest exposition of special

characters of *bodily beauty*, not necessarily realised in actual mankind, but by a fine eclecticism drawn from human forms; and perfected by the instincts which saw,—in every actual example of strength, manly grace, or delicate beauty,—only some faint echo of a still more perfect beauty, with a possible infinitude of still higher grades of excellence; also, an entire elimination of passion, a subjugation of terror or wonder, or sense of physical endurance, all of set purpose; the individuality that might be exhibited by the delineation of special character or emotion being beside the aims of these strivers after a rounded perfection,—bathed in a sunny gladness, or at least unperturbed by the anxieties, sorrows, or woes that are permitted, without conveying a sense of special imperfection, to affect modern types of human character. In time this truly great art, inspired by the true nature of a most able and most refined people, began a course of decadence ending in impotence and inanity; the art, sustained no longer by the dignified self-respect, and the pure and vivid intelligence of its most perfect periods, took its lowered and still lowering tone from the society that was the public of the artists,—impressing them, as always, more strongly than being impressed by them in directions out of the line of ordinary preference,—the artist being rarely the preacher the apostle, but mainly the exponent,—the mirror of the tendency of his time. The want of power to touch and mould some of the finer qualities possible to human kind, and the absence of emotion,—the coldness,—in reality not incompatible with the extremest sensuality,—may seem to account for the corruption of the religious system, and with it of the life and then the arts of antiquity.

The lecturer contrasted, with the character and aims of the art which he had been describing, that which he ventured for the sake of broad distinction to name the Mediæval,—rising after the long twilight and even deeper glooms of many centuries that followed the downfall of Rome, and long maintaining at least a traditional hold on the habits of civilised nations becoming wholly a thing of the past only in presence of the new tendencies afterwards noticed. This second in matter of time of the two greatest extinct schools has had for its main aim the expression of *passion*, of special individual character,—not the type, but the man. Deriving its inspiration from the moral and intellectual atmosphere prevalent at the time; fall of the self-mortifying, body-despising ideals, some of the natural products of which were the Mendicant orders, with their constantly new endeavours after emaciation of the body. Thus inspired, the art manifested at first a daring disregard of beauty, and dared to bring suffering into the calm domain, and to transfigure at the same time self-inflicted pain into the natural image of true saintly virtue. All the marks of a great school of painting were, however, here,—not least, that power of the school over the individual artist, the compelling of men of great power, superbly endowed with the gifts of artistic feeling and expression, to a certain choice of subject and certain modes of dealing with it. No personal aberrations from the highest standards of moral excellence could blind the minds of some of the great Italian painters to the fact,—that in their religious art the most complete tenderness, mingled with ineffable purity, were the signs of high attainment and thorough mastery. Yet in this art,—less the amusement of the idle or the privilege of the few, the high-born or high-taught, than the common possession of church-haunting peoples,—there lurked the sources of a decay as complete as that which extinguished the once so thoroughly-living Classic art; and in the gradual decline towards an earthly sensuous beauty, or a cold, mechanical dexterity, or tawdry meretricious display, were exhibited the signs of the lessened hold of the great original inspiration that had stirred the hearts and guided the hands of the great leaders of the school.

Then the lecturer turned to Modern art; deriving its impulse from the study and love of the world of nature; affording beauty without a trace of sensuality, and all the signs of passion without suffering or sin. To Claude, Cuyt, and Paul Potter be the honour of having first looked at nature so as to obtain from the delineation of landscape beauty the expression of special sentiment, as also to state, in unmistakable terms, that the universe is, in its beauty, the expression of the mind and will of God, and thus to lead to that sympathy with the forms, the fleeting expressions, the open mystery of nature,

that has grown with the years since they died. The broad basis of this modern art, and its alliance with new types of tenderness and pity, and humble peace, and sorrow without despair; its endeavour, by landscape painting, to interpret constantly the wonderful variety, the inexhaustible vitality, and the grandeur and grace lodged in even the inanimate world, should lead us to regard not unhopefully the future in view of such a present. The existence of a distinct school with an aim of its own is a great point in any augury, showing that the old course is again being followed, and that the not-yet-perfectly-trained powers are training themselves by actual practice to attempt the ever-renewed, ever-rebegun interpretation of the world around us, the work of the true artist. Such artists nowadays, in view of their special field and task, may, by the honest labour of pure hearts, gain the right to invoke Nature in the words of Dante: "O splendor of the living light eternal! O turn thy holy eyes towards thy faithful ones; and show forthwith a power quite strange to us, the results of some of the teachings of that wonderful monitress."

A vote of thanks was passed by acclamation to Mr. Bayliss for his eloquent and outspoken lecture; and a short discussion followed on the copyism and mercenary character of modern art; on the tendency manifested to give modern painting only of all the fine arts the name of art; and on the necessity of some strong dogmatic belief and enthusiasm, to render possible a school of religious art (an assertion much disputed). Mr. Bayliss replied,—As to the painters of the English school, from personal knowledge of many of them, he could say, without hesitation, that, if permitted to pursue their art without hope of great rewards, they find therein so keen a delight that it would still remain their pursuit; and this, however regarded or explained, can hardly be called mercenary. He had been led in his paper to speak of the Classic art of sculpture, the Mediæval of painting, the Modern of painting,—as being personally better acquainted with their details, and because it seemed to him that in these arts the aims of the respective artists found some of their fullest expression. Of modern architecture, it would be impossible to speak as of a school: there did not appear to him that distinctness of aim—special to any considerable section of architects nowadays—that would lead to any large development different in nature from the old styles of architecture, dead for ever, though apparently alive, as the result of laborious endeavours after continuous resuscitation; it would be a great satisfaction to every one to see such a school, as distinguished from the imitations, followings, or caprices in the architecture of to-day. Of the dangers menacing what he had called the modern art of painting, he thought the main perils were in imitation of either of the defunct schools, introducing a confused eclecticism. The imitation of the acknowledged defects of early painters, such as bad anatomy, defective light and shadow, is most destructive to that sense of loyalty to a man's own best sight and knowledge, which is the finest test of his fitness for a leader in any art work. In the best works of the best British painters, regarded by him as by far the best set of minds now engaged in creative art in any country, he could detect the qualities that had gone to make the perfection of the older schools, and something more; and that something was—nature.

"HYGIENE PUBLIQUE EN ANGLETERRE."

UNDER this title M. César Daly has printed, in the *Revue Générale de l'Architecture*, some observations on the address delivered by the President of the Health Department at the last congress of the Social Science Association. We look to being excused for giving currency to some personal references, in consideration of the interest of the remarks themselves.—The annual meeting of the members of the National Association for the Promotion of Social Science, says M. Daly, was held this year, in the month of October, in the city of Leeds, one of the most active industrial centres in England. The Health section was presided over by George Godwin, director of the *Builder*. The sitting of the Department was opened with a discourse by the president on Public Health, a subject to which he has devoted himself for long years with most praiseworthy perseverance and merited success. This address

was essentially English, in the best sense of the word; that is to say, full of simplicity and of positive facts requiring to be known, and yet comprehensive, and recalled to the audience by the position held in the whole group of subjects by the vast and important question of Public Health. Mr. Godwin examined it successively in various points of view. Remarkably practical, the discourse was not the less essentially elevated in tone. Let us hope that the impulse given in France to local initiation by the recent reconstitution of our *conseils généraux* will lead us quickly both to habits of private initiation more active and more general than now, and to the organisation of those free societies which have contributed so much elsewhere to the useful study of those questions of public interest which the English do not fear to call by their true name,—questions of Social Science. How is it that the English have kept the primitive and exact sense of the term Social Science, while we have brought ourselves to be afraid of it? Shall we for ever be the victims of words?

Social science is the highest, the noblest, and the most useful science there is or can be: it is the science of the general interests of all human society, neither more nor less. It is because the public health is a general interest,—that is to say, social, of the first order,—that the National Association, established in favour of the progress of social science, attaches to it an importance so considerable. Let us all, then, concern ourselves with social science,—that is to say, with the study of the laws that govern the interest of man in society, and which has for its object the development of order and the general welfare as well as that of our moral and intellectual state. Let us call all disorder by its true name,—*antisocialism*.

Mr. Godwin has touched successively, in his address, on all the branches of public sanitation; but the prompt removal and useful application of the refuse of towns and the products of the sewers appear to us the capital problem first requiring to be solved. The solution of that question alone will immensely facilitate that of the others. The necessity of providing means of recreation,—healthful both physically and morally,—for the poorer classes, as well as the question how to lead them from the tavern and other evil places, did not escape the speaker. The connection of all the social classes in our day amongst civilised peoples is intimate: all are equal before epidemics and revolutions,—all are struck by them,—all suffer.

THE CLARENDON HOTEL, BRIGHTON.

THIS new building at the bottom of East-street, is fast advancing towards completion. The architect is Mr. John Giles, of Craven-street, Strand, and the general contractor, Mr. James Rankin, of Askell-crescent, Hammersmith. The ground occupied measures 80 ft. by 57 ft., and the height of the entire structure (five stories) from footings to ridge is nearly 70 ft. The general elevation, of plain Italian character, is carried out in Portland cement, with balustrade above the blocking, broken by ornamental dormers, which fall back into a Mansard roof; the ridge has an ornamental iron cresting; the one pair floor has a narrow continuous balcony, and the two-pair windows separate balconies in the same material. The principal entrance is in the centre of the East-street bow. The hall, which is almost square, is laid with ornamental tiles. On the right is the smoking-room, some 20 ft. by 40 ft., with large windows opening to the ground, overlooking the parade, with an uninterrupted view of the sea front from pier to pier. Immediately in front of the hall-entrance is a wide and handsome well-staircase, illuminated by a lantern in the roof. On the side of the vestibule opposite the coffee-room is the hotel bar, and immediately inside the door is a bell-indicator, of American invention, by which the hall porter can instantly tell what bell is rung in any part of the house, and can then, by means of corresponding speaking-tubes, communicate with the servants of that particular floor, and thus rapid attendance will be secured, and all bustle and confusion prevented. On the East-street front there are two shops, one intended as a tobacconist's, and the other as a hairdresser's, both having communication with the hotel for the convenience of its visitors. Passing by a passage at the rear of these we come to the public bar. Proceeding up to the next floor, we find a coffee-room, immediately over the smoking-room, and of the same dimensions, with a read-

ing-room attached, occupying together the whole southern front of the floor; whilst the northern front is taken up by two billiard-rooms; and the east and west by sitting-rooms, of which there are five. The furnishing throughout has been entrusted to Messrs. Atkinson, of Westminster Bridge-road, whilst the Venetian blinds were supplied by Mr. Macfarlane, East-street; the clocks and chimney ornaments—many of which are superb—by Mr. Buxell, King's-road; the chandeliers by Mr. Gardner, of the Strand; and the gas-fittings have been carried out by Mr. Stead, of St. John's-wood. For the cooking apparatus in the kitchen, Messrs. Adams, of Regent-street, have been paid 330l. Mr. W. Oldrey acts as clerk of the works and foreman.

We may add, as a novelty, that all the furniture of doors, windows, bar-fittings, &c., are plated with "pure nickel,"—a process brought by the architect and some friends from America last year. It has the appearance of silver, at less than half the cost, and will probably be much used in building operations, not being liable to tarnish or rust like silver.

DEFECTS IN THE SANITARY AND BUILDING ACTS.

DR. LIDDLE, the medical officer of health for Whitechapel, calls public attention to defects in the Sanitary and Building Acts, affecting the dwellings of the poor in the metropolis. Recently he brought before the Whitechapel district Board of Works a report, in which he intimated the fact that seven new houses were in course of formation in Nelson-court, Whitechapel-road. Being requested to make an inspection of the locality, he subsequently presented the following minute:—

"Nelson-court is entered from the [Whitechapel-road] by a narrow entrance of less than 2 ft. in width, and the width of the court opposite to the houses in the course of erection is only 6 ft. 9 in. Independently of the want of a due proportion of light and air for the rooms facing the court, the rooms themselves are very faintly constructed. In the first place, there are no passages to the houses, but the entrance doors open directly from the court into the front rooms. Secondly, From the construction of the staircases, the foul air of the lower rooms will pass directly into the rooms above, the staircases forming the ventilating shafts to the lower rooms. Thirdly, There is no other way for the inhabitants of the front and upper rooms to pass into the backyards, except through the back rooms of the houses,—a most indecent practice. For the above reasons, I consider that if these houses are completed in accordance with the plan deposited, they will be unfit for habitation. If these houses are being built in conformity with the provisions of the Building Act, then it is full time that a new Building Act was in force, so that the erection of similarly constructed houses may be prevented. No builder should be allowed to erect dwelling-houses unless the local authority approve of the plans in all their details. A power of appeal to a central authority might be allowed to the builder, if his plans were not approved by the Local Board."

Upon the reading of this report, the Whitechapel Board of Works directed that a communication should be addressed to the Metropolitan Board of Works, explaining the facts, and enclosing a copy of the medical officer's report. The clerk accordingly wrote to the architect of the Metropolitan Board, and in his letter stated that the Whitechapel Board were of opinion that houses such as those proposed to be erected are highly objectionable in such a locality.

In reply, Mr. Vulliamy wrote:—

"I quite concur in the view taken, that the erection of buildings in so limited a space should be restricted as much as possible, but I do not see how I can bring the subject before the Metropolitan Board with any likelihood of a satisfactory result. It appears to me that unless your district board take action under the 74th section of the Metropolitan Local Management Amendment Act, and compensate the proprietor for widening the existing public ways, there is nothing to prevent him from erecting a row of buildings in Little North-street to the general line of frontage thereof, nor upon the old foundations in Nelson-court, subject, of course, to the provisions of the Building Act, 1855."

Dr. Liddle, in his quarterly report on the sanitary condition of his district, just presented, observes that Mr. Vulliamy's letter would have been more satisfactory if the writer had stated, in addition to his own opinion, that the erection of houses in so limited a space should be restricted; that the Metropolitan Board intended to insert a clause in the new Building Bill which should prohibit the erection of new houses in any locality which has less space for air, light, and ventilation than 20 ft. in width; and that every newly-erected house, whether in a new or old court, should have that amount of space in front, and a space of at least 10 ft. square in the rear. So soon as the working classes are thoroughly alive to the importance of living in healthy habitations, and the ratepayers become convinced that it is much cheaper to prevent disease than to support the sick and provide for widows and

orphans, then something more effectual will be done than has hitherto been accomplished, both in the prevention of the erection of unhealthy dwellings and the taking down of such as now exist. From the letter of the architect of the Metropolitan Board, it would appear that the vested rights of those persons who embark in building speculations are protected, while the vested rights of the poor, which are their health and comfort, are disregarded. Can anything be more absurd than to prohibit the erection of buildings in newly-formed places unless such places are of a prescribed width, while new houses are permitted to be erected upon old foundations without regard to the width of the court or alley? It is either necessary for health or it is not so, to build houses which shall have a width of 20 ft. in front; but if such an open space be necessary, then it cannot signify whether houses are erected in new or old places.

Dr. Liddle adds the expression of a hope that the Bill for the Amendment of the Building Act will meet with better success on its introduction in the approaching session than has hitherto attended it. As the sanitary clauses of this Bill are, however, very defective, Dr. Liddle thinks it might be better to omit them altogether from the new Bill, and incorporate them in a new sanitary Bill, which should be taken charge of by a member of the Government. The Metropolitan Buildings and Management Bill should therefore be divided into two parts,—the one relating to the profession of an architect and the business of a builder, and the other to all the sanitary requirements of a dwelling-house. The former part might advantageously be left in the hands of the Metropolitan Board, and the latter should be undertaken by the Government. If would also be necessary to obtain provisions for giving facilities to local Boards to purchase, under compulsory powers, any property that is required for the purposes of the Acts which they are empowered to execute. The 47th section of the Sanitary Act, 1866, appears to give such power; but it is so worded as not to be easily understood, and is, therefore, not likely to be enforced. In the framing of the clauses of a new sanitary Act, relating to dwellings, it should be enacted that such structural alterations made in any property held on lease as may be ordered by any local Board for the purpose of rendering such property fit for habitation, shall not, if carried out to the satisfaction of such authority, vitiate the lease.

THE ROMAN VILLA AT NORTHLEIGH.

WE mentioned last week the endeavours that were being made to induce the preservation of these remains of Roman art and civilisation in the immediate neighbourhood of Oxford. There are few, if any, of the very few perfect Roman villas in England which can compare with this one, either as to size or as to general preservation, and there is certainly not one which is more appositely situated for being studied by those interested in the ancient civilisation and art of which it is such a valuable relic. Such, however, is the present condition of the remains, that unless some immediate steps be taken, the care and attention paid to their preservation when originally uncovered, in 1815-16, will have been in vain.

Mr. J. P. Earwaker writes to us, stating that the remains, as at present existing, consist of the foundation-walls of a very extensive quadrangle, with its adjacent rooms and porticos, and of one or two chambers, in a more or less well-preserved state. On the north side this quadrangle measures 167 ft. in length; on the east side, 212 ft.; on the south side, 153 ft.; and on the west side, 186 ft. The number of the chambers which were either wholly or partially uncovered amounts to over sixty, many of which had their tessellated floors well preserved, whilst in others only slight traces of the tesserae were discoverable. At present these walls are little more than grassy mounds; they have been neglected and uncared for, and openly exposed to the weather, and in many cases it is almost impossible to follow the plan of the quadrangle and adjacent rooms.

Of the few chambers which were discovered in a more or less perfect state, the most important is that situated in the north-west corner of the quadrangle. This room is 33 ft. long and 20 ft. broad, with walls of more than 3 ft. in thickness. Below the floor of this room is the hypocaust, extremely well preserved, and the pillars made of tiles which support the floor are still

quite perfect. The funnels in the walls by which the hot air flowed into the rooms, and the flues by which the smoke of the fire escaped, as well as the præfurnium, or place where the wood fire was made in the hypocaust, are well shown. There are seventy-nine pillars, in all, which support the tessellated pavement, and raise it some 3 ft. above the floor of the hypocaust. This tessellated pavement, which is of a very simple and elegant pattern, was, when discovered, almost perfect.

It is to be hoped that the Duke of Marlborough, on whose estate these remains are, will at once give such instructions as will insure their preservation.

BAALBEK.

We drew attention some time ago to the condition of the ruins of Baalbek, and the want of preservative measures. Mr. Tyrwhitt Drake now repeats the warning, asks for a small subscription in England, and invites "some architect or civil engineer, intending to visit Palestine during the ensuing tourist season, to stay a few days and see the thing done."

The work would require to be executed with discretion. Iron bars and bands, such as Mr. Drake suggests, sometimes prove very treacherous friends.

FALL OF A STAIRCASE, WORCESTER.

A few days ago an accident of a startling nature, fortunately unattended with serious results, occurred at the General Infirmary, Worcester. The stone winding staircase, leading from the floor of the central part of the building to the upper wards, suddenly gave way, and falling upon that portion of the staircase which passes immediately underneath it, carried that away with it also, the whole debris falling to the ground with a loud crash, from a height of something like 20 ft. Mr. C. E. Hardyman (house surgeon), and Mr. C. A. Sheppard (surgeon), were descending the staircase at the time, and finding the stonework giving way underneath them, with great presence of mind sprang upon the landing a few feet below, and thus averted what otherwise would have been a most serious casualty. We shall be glad to have some particulars of the construction of the stairs in question.

THE MEASUREMENT OF STRESSES.

In the course of a paper "On the Stresses of Rigid Arches, and other Curved Structures," by Mr. William Bell, read at the Institution of Civil Engineers on the 5th inst., the author proposed to measure stresses by direct observation of the extension or compression of a small length of the material of a structure. For a stress of 1-5th ton per square inch, the extension of a length of 50 in. of wrought iron was $\frac{1}{1000}$ of an inch, which, if magnified fifty times, would be read as $\frac{1}{20}$ of an inch by the eye. During the testing of a structure, two microscopes, magnifying fifty diameters, with scales in their eye-pieces, fixed about 50 in. apart, would measure stresses of 1-5th of a ton per square inch in the most direct manner, and the stresses could be measured at the critical points of a structure.

The author thought that this method of observation might even be useful in another way; if, as was probable, inferior kinds of wrought iron approached to cast iron in the scale of their extensibility under moderate stresses. By taking an observation where the stress could be accurately determined by calculation, the quality of the iron which had been used in a structure might be ascertained.

THE ROYAL ACADEMY MEDALS.

The medals and other prizes were distributed by the president on Saturday evening last. The following is a list of the awards:—

For the best historical painting—subject, one of the acts of mercy treated Scripturally; gold medal and books.—Miss Jessie Macgregor.

Best historical group in sculpture—subject, Ulysses drawing the arrow from the foot of Tydides; gold medal and books.—Robert Scott.

Best design in architecture—subject, design for a building to accommodate the learned societies; gold medal, books, and a scholarship of £25.—William Goldsworthy Davis.

Best painting of a landscape—subject, "Early Morning," the Turner gold medal.—Alfred Fitzwater Grace. Best copy made in the School of Painting of the Countess of Grammont, by Sir Peter Leely.—Robert William Wright.

Best drawing from the life; silver medal and books.—Frederick George Colman.

Second best drawing from the life; silver medal.—Thomas Matthew Rook.

Best drawing from the antique; silver medal and books.—Miss Julia Cecilia Threlkeld.

Second best drawing from the antique; silver medal.—Charles Edward Black.

Third best drawing from the antique; silver medal.—Miss Julia Cecilia Threlkeld.

Best model from the antique, silver medal and books.—William J. S. Webber.

Second best model from the antique, silver medal.—Edward Francis Thred.

Best restoration of an antique torso, silver medal.—Edward Francis Thred.

Best architectural drawing of a section and plan of the round portion of the Temple Church, silver medal, with books.—Arthur Hill.

Best drawing in perspective and sciography, silver medal.—Alexander Henry Kersey.

The one-year travelling studentship in architecture.—R. Selden Worum.

Best drawing executed in the antique school during the year, 1871.—Charles Edward Black.

METROPOLITAN CAUSEWAYS.

INCREASING yearly in extent, this great city discovers in its outlying portions a vastly improved character in the style of buildings, as well as in the alinement and breadth of new thoroughfares; whilst the old centres of population remain in most cases as originally constructed, in zigzags of lanes, streets, and courts, without direct lines of intercommunication, and are thus isolated from public traffic. It might be supposed that the most central districts should be of the greatest value; whereas, that portion of the great W. C. district lying between the lines of Regent-street and St. Martin's-lane, Oxford-street and Charing-cross, has sunk into slums of poverty and discredit, simply for the want of a great leading thoroughfare from north to south, to connect the leading traverse line of Tottenham-court-road with Trafalgar-square, which may be termed the head centre of London.

A new spirit of improvement is now being evidenced by the Board of Works in the proposed grand routes which are designed to permeate the metropolis, from the centre to east, north-east, and south-east, and are to extend for several miles, and to cost two millions of money. These are, indeed, stupendous works; but will they not pay better than ventures in foreign mines or railways,—many of which singly have awalled double the capital which it is here proposed to be invested in making those blemishes on the largest city in the world the abodes of health instead of disease; thus converting filthy alleys into valuable commercial quarters, and opening out free intercourse between the heart and lungs of the City? Whether the great north street be conducted *via* Crown-street and Newport Market, by the eastern side of Leicester-square, and through the barrack-yard to the west of the National Gallery, or that it issue out in Hemmings-row, opposite St. Martin's Church, matters little, provided the causeway be 80 ft., or at least 70 ft. wide, and nearly direct. Such an arterial duct in this morbid portion of the *corpus civile* would not only infuse life and health, but also lead to the ornamentation and dignity of those now sordid districts.

Of works already carried out, the most palpable is the opening out of Park-lane through Hamilton-place. Although only an outer boulevard, it is the only traverse route for a length of nearly two miles between the two great leading West-end thoroughfares, Bayswater and Oxford-street, Kensington and Piccadilly; and perhaps it may be permitted to him who, through the *Builder*, first indicated the opening of Park-lane, to suggest further that this most utilitarian improvement is still incomplete.

From a point nearly in direction with Great Cumberland-street, and proximate to the noble Edgware-road, it skirts the Park, and issues out into Piccadilly at right angles! Now, if possible, this ought not to be so; and, as Grosvenor-place presents the nearest north and south important line of communication, it is at once palpable that, by the continuation of Park-lane across the small angle of the Green Park, and a concurrent angle of Buckingham Palace Gardens as far as Chapel-street, or even only so far as Falkin-street, a grand continuation of this useful and highly aristocratic thoroughfare might be assured to the public at large.*

As a connecting link between Tyburnia and Belgavia such a route would be invaluable; and then, as to the cribbed and confined appearance

* A proposition for such a road partly in a cutting we published some time ago.—Ed.

of the Green Park on one side, and of Grosvenor-place on the other, the abatement of the hideous dead wall (for a portion of its extent) and the substitution of a strong iron railing (something similar to that near Hyde Park-corner), would lend enchantment to the view from all sides.

Excepting the small angle excised from Park and Gardens, no invasion of public or private rights need be feared, for the causeway, raised off, would not reduce apparent extent, but rather would seem to expand it.

The removal of heavy, old, and unseemly dead brick walls from the *alentours* of all our parks has cheered the public mind and enlarged their privileges; therefore, in all such cases, the improvement ought to be carried out, wherever private interests do not reasonably and legally object to it.

Whilst so near the object, it may not be thought unreasonable to allude to the unhappy position of the Wellington statue. An equestrian figure mast-headed, raised 120 feet above the visual horizon, looks like a caricature—like a vane on a large scale,—placed on the top of an arch too! Some arch wag must have suggested it, in order to discredit the sculptor, whilst appearing to elevate his work. Cannot a happier place be found, and a block of Irish granite whereupon a suitable and permanent basis may be founded, so that the valued memorial of our greatest general may safely stand to perpetuate his fame? QUONDAM.

THE MAINTENANCE OF THE CRYSTAL PALACE.

THE report of the directors, submitted to the shareholders this week, says:—"The balance would appear to justify the directors in recommending a dividend of 2 per cent. on the ordinary stock, but on looking to the large expenditure which is rendered necessary by the wear and tear of the building, and which, of course, will have to be continued from time to time, as occasion may require, they do not recommend a dividend of more than $\frac{1}{10}$ per cent., leaving a balance of 6,955l. 7s. 7d. to be carried forward.

Out of these the most considerable item of excess over the expenditure of last year is for the repair of the main building, principally in the renewal of the roofs, which could no longer be postponed. Another item, of 1,502l., is on account of the repair and re-painting of the water towers. The execution of this work was submitted to competition, and the contract let to a highly respectable firm, by whom the work is being carried out in a thoroughly substantial manner, under the superintendence and to the satisfaction of the company's engineer; so that the towers will shortly be in a perfectly sound and satisfactory condition. The restoration of the roofs of the main building, now in progress, must be continued during next year, and a considerable outlay will have to be incurred under this head, independently of the current repairs to other portions of the fabric, until the whole area of the roof has been renewed. The method adopted is, as has been already explained, much more substantial than that of the original construction; and when the repair has been effected it is not probable that any material outlay on this part of the fabric will be required for many years to come." An arrangement is said to be pending for letting a portion of the company's land at the north-west corner of the building, abutting on the main road, at an advantageous ground-rent, for the formation of a residential proprietary club in connexion with the principal London clubs.

THE VENTILATION OF ROOMS.

THE necessity of ventilating the rooms of private houses, to get rid of the foul air produced by gas-burning is so universally felt, and the failures in the usual systems are so numerous, that I feel sure you will be pleased to hear that a mode adopted in my new house has proved quite effectual, as well as perfectly simple and inexpensive.

In building the chimney-breasts, in each room a half-brick was left out at one side, next the wall, for the whole height; and on a level with the floor an opening was left from the channel through to the chimney. A length of ordinary rainwater-piping was then fitted throughout the channel, with its top open near the ceiling, and its lower end open (through a hole cut in side of stove) above the hearthstone, and under the fire. The plaster of course covered all but the

top opening, where a small grating was fixed. The total cost was about 7s. per room.

The action of the ventilator is simply that the draught up the chimney draws the air down the pipe, and consequently carries off the impure air floating about the upper part of room. It does not act while the door of the room is open, but when the door is shut (the time when ventilation is needed), the draught is so great, that a light applied to the lower end is at once extinguished.

GEORGE H. CHUBB.

ARCHITECTURAL UNION COMPANY.

At the annual meeting of this company, held at the House, in Conduit-street, on the 6th inst. Mr. Charles Mayhew presided, and a report was read from the directors, showing such a good state of the finances, that a dividend of 5½ per cent. was recommended.

The meeting carried out the recommendation, and voted the directors and auditors, for the first time, a nominal sum, thirty guineas, for attendances. Sir W. Tite, M.P., Mr. Edmeston, and Mr. S. Wood, retiring directors, were re-elected.

PORTLAND CEMENT AND LEAD.

If, as is stated in the *Builder* of December 2, Portland cement destroys the lead with which it is brought into contact, it is highly improper to use it for pointing lead flashings where turned into the joints of brickwork. Can any of your readers inform me as to the effects of this cement on zinc? II.

LESSONS FROM SCARBOROUGH.

FLUSHING old sewers will not effectually cleanse them, but will materially assist the dissemination of sewer poisons. The *Builder* has been right in strenuously advocating the appointment of respectable, well-paid sanitary inspectors, independent of local control or favour; for the houses of the upper classes require sanitary inspection as much as those of the poorer classes.

Any drains other than self-cleansing should be destroyed, or they will destroy. House-drains made on thoroughly efficient principles will save the expense of a specially-retained turncock for the purpose of flushing. Pro.

SCHOOL BOARDS.

The Barnsley Board.—At an adjourned meeting of this Board, resolutions empowering the building sites committee to purchase 2,000 square yards of land in North Eldon-street and Park-road, on which to erect new schools, were passed. On the motion of Mr. Butcher, seconded by Dr. Sadler, the clerk was authorised to issue advertisements requesting architects to send in designs for two schools.

The Reading Board.—As to the Silver-street School, a committee's report advises the erection of school buildings for not less than 200 children, consisting of two departments, namely, mixed and infants. The site which appeared most eligible was that on the east side of the street belonging to Mr. Blagrove, a portion of which is of 85 ft. depth, and some of 175 ft., the former being 31, and the latter 51, per foot frontage. If the latter be chosen, a frontage of 40 ft. will suffice; but if the former, a greater frontage would be necessary. The committee recommend the appointment of an architect to advise in the matter, to prepare plans and estimate of probable cost; and it invited the Board to consider whether the money required for the purpose should be raised by loan under the powers of the Act.

SEWERAGE OF SLOUGH.

SOME three or four years ago the main sewers for this town were laid down. Since then the Thames Conservancy Act was passed. Several ineffectual attempts have since been made to acquire land for utilising the sewage by means of irrigation, but without effect. This year plans have been deposited and notices given to acquire under the Lands Clauses Consolidation Act about forty-five acres of land, the property of Lord Harwood. Mr. Curley, of Hereford, is the engineer. The Windsor people are going in for the A B C process! Will this satisfy the Conservators of the Thames?

THE COMPLETION OF ST. PAUL'S CATHEDRAL.

SIR.—As in several letters published in the *Builder* attention has been called to the works now going on in St. Paul's, as though the permanent decorations were being carried out in mean materials, it appears worth while for me to make a few observations on them,—not for the sake of deprecating fair and wholesome criticism—for such correspondents as "A. P." for instance, December 2nd, may feel assured that their letters are appreciated, whether or no they are answered publicly,—but because there have been some unnecessary ink and paper used from want of reflection on the peculiar conditions under which the work has here to be carried on. As the church is open to everybody during the progress of the works, all those experiments which are generally seen only by persons engaged have to be exhibited to the public eye. Accidental observers, therefore, should be on their guard against forming erroneous and premature conclusions. [The "astonishment" of "A Student," in your last number, and the article to which he alludes, are of this character. If any weight were attached to such comments it would preclude valuable and inexpensive experiments.

F. C. PENROSE.

CLIFFORD CASTLE.

CLIFFORD CASTLE is the most westward of the fortresses by which the line of the Wye is protected in its passage across the county of Hereford, and which appear to have been constructed, some long before, some shortly before, and others shortly after, the Norman Conquest, for the defence of that fertile acquisition against the scarce-subdued Welsh of Brecknock and Radnor. As early as the first quarter of the ninth century the Saxons, under Egbert, had reduced Wales to a nominal subjection. And that great prince, having conquered Mercia, and exercising power over all England, is not unlikely to have strengthened the Mercian frontier, and the Saxon acquisitions generally, on the Welsh side; and to this period may be due, not improbably, such earthworks as those at Cardiff, Caerleon, Shrewsbury, Old Radnor, and Bulth, and, now partially destroyed, at Hereford, and wholly so at Worcester: earthworks which, in their main features, resemble those thrown up early in the tenth century at Tisbury, Tamworth, and Leicester by Edward the elder and his sister Ethelfleda. But whatever may then have been done, it is very certain that during the reign of the Confessor several of his Norman favourites settled in Hereford, and that, among them, Richard Fitz-Scrob had lands in the north of Herefordshire, and there set up and gave name to Richard's Castle. As this castle was a great cause of offence, it probably was something different from the fortified timber houses of the English Thanes, and may well have been of stone, after the rising Norman fashion. It was certainly a place of considerable strength, and was useful during the invasion of Prince Griffith, in 1052. The fashion, probably, did not extend among the English, for when the same prince invaded Archenfield, and burned Hereford city, in 1055, he destroyed, apparently without much difficulty, the strong place, or Gaer, attached to it, and of which no doubt the banks and ditches yet remaining, and the mount, known to have been removed, were parts. Harold retook and fortified the city in 1056. No doubt the earthworks may have been executed by him, but more probably he found and made use of them.

Herefordshire was at that time, and long afterwards, one of the most valuable and most threatened of the English acquisitions on the Welsh border. Before the Norman Conquest it was under the vigorous sway of Earl Harold, who beat back the Welsh from Rhuddlan to Gloucester and Chepstow, although he was unable to prevent Canardoc ap Griffith from destroying the hunting-seat in course of construction for the Confessor at Portskewet. That Harold encouraged fortified places on these marches is pretty certain, seeing that of the small number of castles recorded in the Domesday Survey no less than ten are named as standing in the marches of Monmouth and Hereford: namely, Wigmore, Clifford, and Chepstow, founded by Earl William Fitzosborne, and the former reputed one of the oldest honours in the kingdom; Monmouth; Ewyas, founded before the Conquest, and repaired before Domesday, by Alured de Marleburg; Arrestone; Caerleon, famous for its Roman walls and its mount;

Ferrars Castle; Herdeslie; Waterley; and others, known to have existed but not mentioned in the Survey.

These castles were, no doubt, the work of Norman lords, but whether all were wholly so may be doubted. Some certainly, like Caerleon, independently of its Roman walls, stood in the midst of earthworks likely enough to be the work of the earlier English, or even of the more remote Saxon.

Clifford Castle stands on the right bank of the Wye, at the bottom of one of those short sharp bends so frequent along the course of this river, and which add so much to its beauty. It crowns a red sandstone cliff about 150 ft. above the stream, and close to it. The scarp, naturally steep, has been recently made steeper by art, to allow of the passage of the Brecon and Hereford Railway between the castle and the river. The cliff is part of a knoll of high ground, about half a mile long, and out by the long-continued action of the river into a semilunar figure. The highest part of this knoll is converted into a narrow tongue by a broad and deep ravine, which descends from the north nearly parallel to the Wye, and terminates in the river bank. A long tapering ridge is thus isolated between the ravine and the river, and upon this stands the fortress. The ravine bounds the ridge on the south and east, and a natural depression of no great depth crosses the latter at the broad north end. The intermediate part is traversed by two artificial cross ditches, which run from the river to the ravine, about 100 ft. deep, but still considerably above the level of either.

The central and highest part thus isolated contains the inner ward. South of this a very small but strong division constitutes the out-ward, and on the north is the lower but broader expanse of the outer ward, the three being thus in a line.

The inner ward, of which alone any buildings remain, is roughly quadrangular, about 100 ft. square. Along the west or river front, are the hall and withdrawing-room. On the south front is a half-round tower and a curtain. The east, or ravine side, is destroyed to the ground level, as is nearly all the north end, in which was the gate-house. The hall, 20 ft. by 40 ft., was on the first floor. There was a store or cellar under it, of which the east and south walls are gone. Its entrance, and any light it may have had, were probably given on the court or east side. The hall had a timber floor. It was lighted by three windows in the west or river wall. Of these the recess of one remains, with a rather low pointed arch. A door in the north wall led into the withdrawing-room, and one at the south end into the mural tower. The east and south walls are gone. The withdrawing-room occupied the curved angle of the ward between the hall and the gate-house; beneath it was a ground-floor. The south end of the hall, like the west side, was an outer curtain. It abutted against a half-round tower, 30 ft. diameter, with walls 9 ft. thick, and a gorge wall, 5 ft. thick, flush with the inner face of the curtain. This tower seems to have had an under ground-floor, now filled up. The basement has a door from the court, in the gorge; another door on the west side, probably a postern, and two loops with wide recesses, opening towards the field. The upper floor also had two loops to the field, a window in the gorge, and on each side a door, one leading obliquely into the hall, and the other into a mural chamber within the curtain, and containing a garde-robe, double. The floors were of timber. There is no staircase nor fireplace.

The curtain breaks off towards the south-east angle, where it seems to have expanded and probably abutted against a tower. In it is a mural chamber, a garde-robe, single, on the first floor level, and which evidently opened from the destroyed tower. The two garde-robes mentioned open by oblique shoots in the wall, about 5 ft. from the ground, without any projection. As the whole east or ravine front is gone, it is difficult to say whether there were towers at the south-east and north-east angles; probably there were, and round ones. In the north front are two circular depressions, evidently the place of the two towers of the gate-house, and between them is the entrance. This leads from the outer ward, and crossed the ditch upon a causeway of earth, about 6 ft. broad at the top, and the ascent up which from the counterscarp of the ditch to the portal is very steep. The causeway appears to be original, and has been pitched with stones on edge. At the end of this ditch, where it opened on the river bank, it is crossed by a curtain, 6 ft. thick, intended to prevent enemies

from crawling up the river bank and surprising the adjacent gateway. This curtain is now about 6 ft. high, and probably was 25 ft. or 30 ft.

The *outwork*, south of the inner ward, and divided from it by a very narrow but deep ditch, is not easily to be explained. It is the extremity of the ridge, of a triangular figure, 60 ft. on a side, and level, showing no trace of earthwork or masonry of any kind. The three scarps are very steep indeed, and quite sharp and fresh out, the soft rock being covered with excellent firm turf. This outwork is so dangerously near to the inner ward, and at so high a level, that it must have been occupied, probably by a stockade or timber structure. It is a very curious work.

The *outer ward*, at the north end or root of the ridge, is 60 ft. or 70 ft. lower, and much broader than the inner ward. Its defence on the south is the cross ditch, over which passes the causeway to the inner ward; on the west is the river-cliff, 80 ft. to 90 ft. high; and on the east and north a steep scarp, partly of red rock, partly revetted in masonry, and from 10 ft. to 20 ft. deep. Beyond it is the upper part of the ravine, and the natural depression connecting the ravine with the river bank. This ward is something between a square and a circle, and about 300 ft. in diameter. It has evidently been defended by a curtain, probably a low one, on the east and south, or exposed sides, and the ground, usually level, rises in a sort of ramp to what appears to be the remains of the wall. This ramp is wanting on the river and south faces, which, being covered by the river and the river ward, were probably palisaded only. About the centre of the east front is a low mound, apparently the foundations of a round mural tower.

The depressed ground in the centre of the south front indicates that the outer entrance was there; and midway between this and the causeway, leading to the inner ward, are two long heaps of earth and stone, with a passage between them. They much resemble the remains of a long gatehouse, between the outer and inner gate; but if so, this must have been in the middle of a wall dividing the outer ward into two, of which no trace remains.

This outer ward, never very strong, was evidently intended for the reception of villagers and cattle during the inroads of the Welsh. The earthworks, though deeper and broader than the Normans usually gave to so small a fortress, have nothing of the character of British or Saxon work, and are probably not older than the Conquest, or the reign preceding it. But of the existing masonry none can be safely called Norman. The walls are of inferior and rudely-coursed rubble; no ashlar remains, save a bold cordon or head, which runs along the top of the lower or battering part of the wall, and this is not carried all round. The arches of the mural tower are flat pointed. On the whole, the general appearance of the buildings point to the reign of Henry III., and none of it seems of older date. Certainly no decidedly Norman work is seen.

The ditches were substantially dry, though they may have received and retained more or less land-water. At the base of the slope of the outwork the ravine has been deepened for a rectangular pond, probably a fish-stew, and an early drawing shows water here collected.

Probably the original castle, ditches included, was the work of William Fitz-Osborn, Earl of Hereford, who died 1070-1; but the present structure may well have been the work of the third Walter de Clifford, a very considerable person, who married a daughter of Llewelyn, Prince of Wales, and was in possession of Clifford from 7 Hen. III. to 47 Hen. III.

Looking from the inner ward upon the river, there is plainly seen, just above the castle, the line of the old mill-leaf, now a green ditch, and the small eyot upon which must have stood the castle mill, but ripple on the river, here somewhat expanded, shows a ford; and opposite, on the edge of a broad expanse of low, level mead, is the village of Caball's, said in Welsh to mean a horse-ford. This is seen at one view to the cliff and the ford which, under the Saxon away, gave its appellation to the parish, and from which one of the most celebrated of the great English families derived its name.

Clifford, though the cradle of a great race, could have been valuable only while Herefordshire was an unsafe possession. With the settlement of the country under Edward I., it probably fell into disuse and decay. It is far too small and too inconvenient of access, to be held, except for safety; and such history as it has is confined to a very early and warlike period.

It is reputed, with Strigill or Chetpaw, Ewmas, and Wigmore, to have been founded by William Fitz-Osborn, one of the companions of the Conqueror, and the first Norman Earl of Herefordshire. He was killed in 1070, and his third son, Roger de Bretail, who succeeded to his English lands, had forfeited them before the Domesday Survey, when the castle was held by Ralph de Toni, who, by Dagdale, is said to have married Alicia, one of Roger's daughters. However this may have been, he possessed Clifford Castle at the time of the survey, and died 1102.

How the castle passed from De Toni is unknown, but here Simon, son of Richard Fitz-Pons, was seated, and founded a priory, and he and his brother Richard are said by Dagdale, to have adopted the surname of Clifford. Walter de Clifford, son of Richard, was a great Marcher Baron, and living in 1165. His son, Walter the second, was a still more powerful man. He died 1222, having married Margaret, daughter of Llewelyn, Prince of Wales, and was father of a third Walter, and of Roger, ancestor of the great house of Clifford, Earls of Cumberland.

Walter, who died 1263, closed the elder line. Mand, his heiress, is said to have married, first William de Longespée, Earl of Salisbury, and second, John Giffard, of Brimmesfield, who held, probably during her life, Brimmesfield, the manor of Glasbury, and the manor and castle of Clifford, being seized of them at his death, 27 Ed. I. Mand's daughter by Longespée married Henry de Lucy, Earl of Lincoln, and probably, upon her mother's death, she obtained her heritage, for in the inquisition held upon De Lucy and his wife, 4 Ed. II., the manor and castle of Clifford are included. The castle probably had now ceased to be of importance, for it does not again occur in the inquisition. It is not usually regarded as having been the "caput" of an Honour, but Giffard's inquisition mentions its tenants by knights' service, and John de Solers, 4 Ed. II., holds Pantulewey manor of the "Honour of Clifford," in the county of Gloucester, which in those days was not always distinguished from other parts of the march.

The Church of Clifford throws no light upon the architect or owners of the castle. The tower, of considerable size and solid aspect, may be moderately old, but the rest of the building has been rebuilt in the churchwarden manner prevalent in 1836, the roofs, however, having been preserved. Also, from the old building, are preserved a good coffin-lid cross in a circle, placed most unwisely as a cill to the north door; a foot, or rather the octagonal bowl of one, probably of Decorated date; and in the chancel, loose on a shelf, a very fine life-sized effigy of an ecclesiastic, robed and tunsured, boldly designed and excellently executed in wood, and which deserves better care.

G. T. C.

BAYHAM ABBEY, SUSSEX.

THE new mansion, shown by the accompanying illustrations, is erected on the estate of the Marquis Camden, near Tunbridge Wells, on the north side of the valley, at the bottom of which runs the stream called the Turn, having on its southern margin the remarkably interesting ruins of the abbey said to have been built by the Premonstratensian canons, in the reign of Richard I.

The small modern house by the side of the ruins has no architectural merits, and will probably be taken down at no distant period.

The foundations for the new building were commenced in 1869, and the first stone of the plinth was laid by the Marchioness Camden, on the 13th day of January, 1870.

The materials used in its construction are as follow:—The walls are built of bricks made upon the estate, faced with Kentish ragstone from the Maidstone quarries, as a general facing, with G. Combe Down Bath stone quoins, window and door dressings, cornices, &c., and the roofs are covered with green slates from the quarries in North Wales. The ceilings of the principal suite of rooms are subdivided into panels, with moulded ribs, pendants, and enrichments, and the mantelpieces, designed in corresponding style, are composed of coloured marble, Derbyshire spars, and alabaster, executed by Mr. Earp of Kennington-road.

The character of the architecture and general arrangement of the plan resemble the examples of manorial houses existing in this country, of the latter part of the sixteenth century and the beginning of the seventeenth century, but

adapted to the convenience of modern requirements.

The principal approach is on the north side, by a new road from near the station at Frant, recently constructed, leading to a *porte cochère*, entrance-hall, and corridors, from which the reception-rooms, billiard-room, and library diverge on either side.

The dimensions of these rooms stand thus:—The entrance-hall, 24 ft. by 24 ft.; saloon, 31 ft. 6 in. by 21 ft.; dining-room, 31 ft. by 22 ft.; library, 33 ft. by 22 ft. 6 in.; drawing-room, 33 ft. by 23 ft.; billiard-room, 26 ft. 6 in. by 22 ft.; Lord Camden's room, 26 ft. by 18 ft.; Lady Camden's room, 26 ft. by 18 ft. The principal staircase is 23 ft. by 23 ft. and 34 ft. high, each flight of steps being 6 ft. wide, and inclosed with oak pierced work in panels.

The arrangement and dimensions of the offices may be sufficiently gathered from an examination of the plan.

The height of the ground-floor story of the main building is 16 ft. 6 in.; and that of the first and second floors is 11 ft. 6 in. and 10 ft. respectively. The offices being about 12 ft. high, except the kitchen, which is 21 ft. 6 in. high.

On the first floor there are eight bedrooms, and six dressing-rooms, day and night nurseries, bath-room, work-room, &c.; and on the second floor are eight bedrooms, and two dressing-rooms, and nine female servants' rooms, linen and store closets.

In the basement story are a muniment-room; wine, beer, and coal cellars; a room for the heating apparatus, supplied by Messrs. Haden & Son, of Trowbridge; clothes-cleaning room; and other offices.

Leading off the back staircase on each landing is a housemaid's room, supplied with hot and cold water; and an opening into a lift, constructed to raise 1½ cwt., which communicates from the basement to the second floor, supplied by Messrs. Bunnett & Co.

The men-servants' bedrooms are arranged over a part of the kitchen offices, on the west side of the courtyard.

On the south and west sides, following the fall of the hill, are a succession of terraces and slopes, which add much to the picturesque effect of the building, especially as seen from a distance; and command fine views of the nave, choir, and other remains of the old abbey, the church, the well-wooded park, the stream, and surrounding scenery.

The parapets on the terraces are executed in stone, and terra-cotta applied by Mr. Blanchard.

In the rear of the offices, on the north, are being erected the stabling, coach-houses, game-keeper's room, garages, and so on.

The stream before alluded to, which here separates the counties of Kent and Sussex, supplies, by means of a water-wheel, a large reservoir, constructed upon the rising ground, above the levels of the roofs of the house, from which pipes communicate through filtering-beds, with the several cisterns, and with hydrants for protection against fire. These works have been executed by Messrs. Easton, Anderson, & Co.

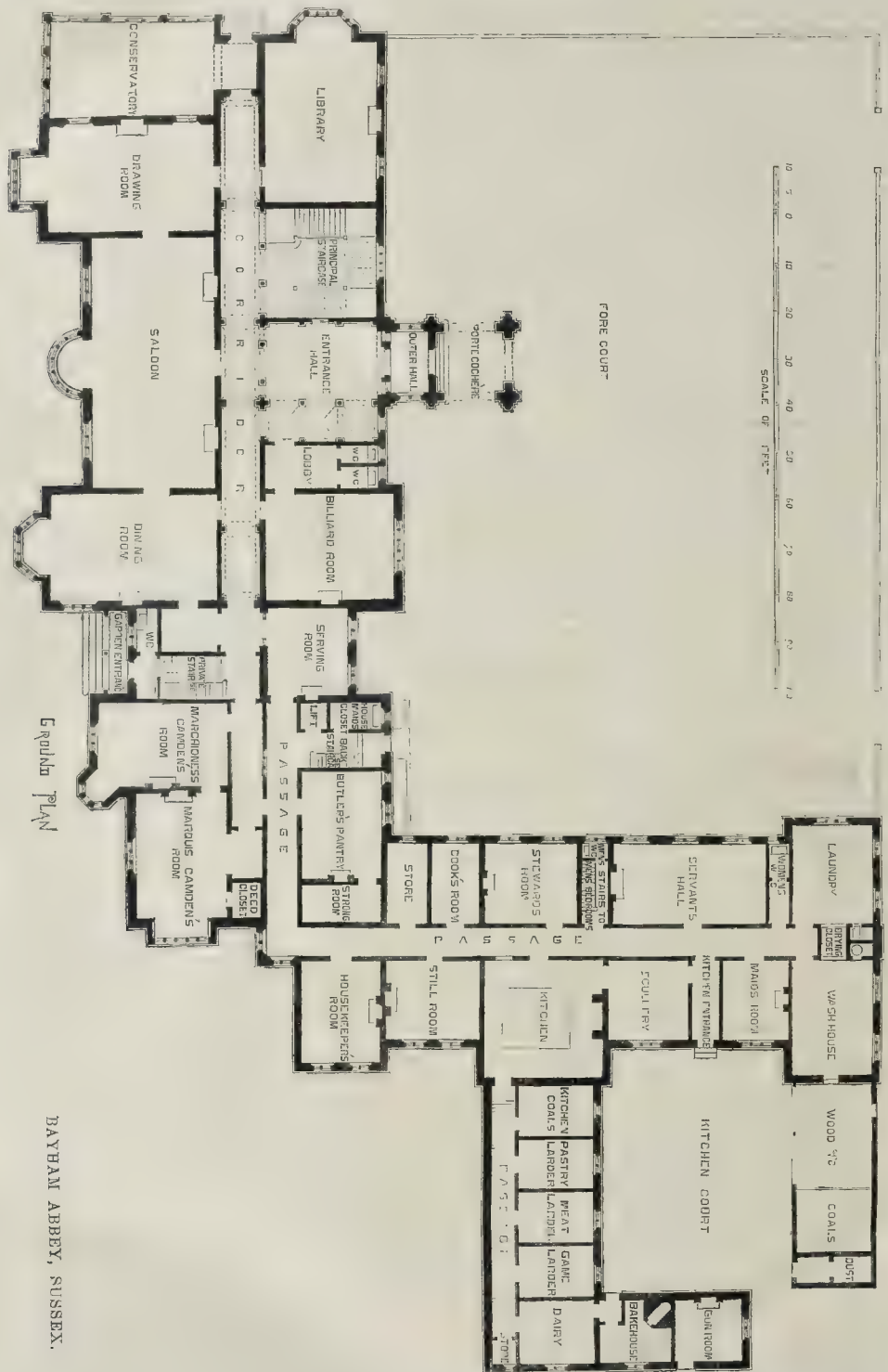
The contracts for the mansion and stables were taken by Messrs. Trollope & Sons, of Parliament street, by whom they have been nearly completed, Mr. French being the clerk of the works.

According to Shobell's "Beauties of England and Wales," in the reign of Henry VIII. Cardinal Wolsey obtained a grant of Bayham as one of the smaller monasteries. On the disgrace of the cardinal, the manor, with the site of the abbey, reverted to the king, and seems to have remained in the possession of the Crown until Queen Elizabeth granted the estate to Anthony Brown, Viscount Montague. About 1714 it was purchased by Mr. John Pratt, afterwards Lord Chief Justice of the King's Bench, and from him descended to the Marquis Camden, who derives from it the title of Viscount Bayham.

The late second Marquis Camden had in contemplation the erection of a mansion upon a site not far removed from the one now selected, but nothing was done at that time beyond the preparation of drawings.

The present buildings have been executed from the designs of Mr. David Branton, and carried out under his superintendence.

In addition to the foregoing works, a church has been built in the park between the mansion and the Abbey ruins, to accommodate 110 persons, by Messrs. Willicombe & Oakley, of Tunbridge Wells, a description of which has already appeared in the *Builder*.



GROUND PLAN

BAYHAM ABBEY, SUSSEX.

BAYHAM ABBEY, NEAR TUNBRIDGE WELLS, SUSSEX.—MR. DAVID BRADDOX, ARCHITECT.



THE INSTITUTION OF CIVIL ENGINEERS.

At the ordinary meeting of this Society, on Tuesday, the 12th inst., Mr. C. B. Vignoles, F.R.S., President, in the chair, after the transaction of the purely formal business, it was resolved unanimously, that, "considering the critical condition of his Royal Highness the Prince of Wales, and the deep anxiety which the nation is now suffering, this Institution do show its sympathy in the general feeling by immediately adjourning." The annual general meeting "to receive and deliberate upon the report of the council on the state of the Institution, and to elect the officers for the ensuing year," is announced for, and must, according to the statutes, take place on the 19th inst., being the Tuesday next previous to Christmas Eve.

THE DRAWINGS FOR THE NEW COURTS OF JUSTICE.

The President of the Royal Institute of British Architects presents his compliments to the editor of the *Builder*, and begs to state that he has received a note from Mr. G. E. Street, R.A., informing him that if any members of the Royal Institute of British Architects would wish to see the drawings for the proposed New Law Courts, Mr. Street will be happy to make arrangements for their doing so on Saturday, December 23rd, at three o'clock in the afternoon, at the architect's office on the site, the entrance to which is by a small door in the hoarding in Carey-street. Any architect presenting his card at that entrance will be permitted to see the drawings.

SOANE'S MONUMENT.

SIR,—My attention has been called to a letter which appeared in your impression of Dec. 2nd, signed "A Soane Student," in which the writer complains in very strong language of what he describes as the present state of Sir John Soane's mausoleum.

He states "with the authority of a personal knowledge" that it is "excluded and forgotten, with balustrades broken, marble capitals chipped, inscription willfully defaced, and entrance filled up with brick-rubbish, the dome mutilated, and the coping broken, &c."

This statement occasions me much surprise, because the mausoleum in question was placed in a state of complete repair, a few months ago, by the family of the late Sir John Soane, and I myself saw and examined it so lately as last month, when I found everything in a satisfactory state.

A board has, moreover, been placed near the mausoleum, offering a reward to any one who may give such information as shall lead to the conviction of any persons found injuring it, by throwing stones or otherwise.

On one point I fully agree with the "Soane Student," the state of St. Giles's Cemetery is a disgrace to a Christian country; and I do not remember to have felt more indignant than on looking round on the wanton destruction of many valuable monuments which is there permitted by the parochial authorities.

A LOVER OF TRUTH.

BUILDING PRICES.

SIR,—We feel sure you will allow us, with your usual courtesy, to say a word with reference to the correspondence, under the above head, in your columns, and in defence of our book, Dobson & Tarn's "Students' Guide to the Practice of Measuring and Valuing."

Your correspondent "A. B. C." will, on referring to p. 142 of that work, find examples of the application of constants of labour which answer exactly the question he puts, and which sufficiently prove that, notwithstanding the assertion of "Q. R.," it is unquestionably "elementary in its character." As to its "not being sufficiently comprehensive to become a standard authority," we could quote half a dozen opinions from as many professional journals, to the effect that it has long been recognised as the standard authority on the subject; and this irrespective of the elaborate and favourable notice of the new edition of the book which appeared in your own columns of the 8th of April ult.

It appears to us singular that your correspondent, who writes under the mysterious and evidently not genuine initials, "Q. R.," should not be satisfied with praising Mr. Hure's book,

but should at the same time take occasion to speak disparagingly of a well-known work which you had thought fit to recommend, and which is in reality the quarry from which much of the material for several works of a similar character has been hewn.

LOCKWOOD & CO.

THE PROPOSED REMOVAL OF ST. CLEMENT DANES CHURCH.

The local authorities of St. Dunstan's-in-the-West state that the removal of the church of St. Clement Danes, and its re-building, in order to make way for the New Law Courts, has been decided upon by the Government; and that the cost will amount to 50,000*l.*, which the Government propose shall be borne, amongst others, by the parish of St. Dunstan. This proposal is considered by the St. Dunstan authorities to be unfair, and a public meeting is about to be held on the subject, with the view of protesting against the proposed arrangement, and communicating with the Government.

MIDDENSTADS.

MR. F. C. FAIRBANKS, the medical officer of health for Doncaster, shows that in that borough there are exactly 3,015 ash-pits or middensteads, some of very large size; and that from the way in which nearly all these places are constructed they become centres for the production of morbid gases, which poison the air around, and it is feared are often a fruitful source of disease. In some of the large towns where the collecting of refuse is undertaken by the authorities, the annual expense amounts to a large sum; for example:—In Liverpool, 13,666*l.*; in Manchester, 12,500*l.*; in Bradford, 3,822*l.*; and in Bolton, 1,600*l.* Mr. Fairbank finds that the average cost of collecting per load is 2*s.* 5*d.*, and the average annual expense per head of population 7*d.* He properly urges on the committee the extreme need for some steps being taken at once; and adds, "We have at the present time a dangerous epidemic amongst us which has carried off in little more than eight weeks thirty-seven persons."

ARRANGEMENT OF CLOSETS.

SIR,—The illness of the Prince of Wales has given rise to much discussion on the subject of drainage. I believe that the rich poison themselves by having too many water-closets; they are more and more numerous in houses every year.

When space can be given there should be no closet without a vestibule or outer chamber. This vestibule should have a window for light and ventilation opposite the door leading from the interior of the house, so that the foul air, whenever it exists in the closet, may not be drawn directly into the house, as it must be without such intermediate air-trap, as I may call it. The room would be useful for washing hands and many purposes.

V. C. C.

PRECAUTIONS AGAINST FIRE AT ALNWICK CASTLE AND ALNWICK.

SIR,—The nation will doubtless be glad to learn through your columns, since the fire at Warwick Castle, that at least one of our great historic buildings is provided with ample means of precaution against fire. I allude to the ancestral seat of the Percys, Alnwick Castle. At the conclusion of the costly constructive and decorative works undertaken by the late Duke Algernon, a supply of water was brought from his grace's reservoir in the parks, about two miles distant, as a special provision in the event of an outbreak of fire at the Castle. On one occasion, a trial having been made by the surveyor of the Local Board of Health as to the efficacy of this supply, and it being found inadequate, the present Duke of Northumberland caused the pipes to be taken up, and a new 8-in. main pipe laid direct from the reservoir to the Castle, and six hydrants or fire-plugs are attached thereto to command, at full pressure, the highest and every point of the fabric. This supply is moreover supplemented by a mutual arrangement between his grace and the Local Board of Health, whereby the town's water-supply can be added to that of the Castle in an emergency. A trial made by the surveyor in practice with his fire brigade, only three or four

weeks ago, at the Castle, proved that the supply there answered every expectation of efficiency.

The advantage of a full and constant pressure of water direct from the reservoir in case of fire, without the aid of engines, was proved on a recent occasion in this town. A fire broke out between two and three o'clock in the morning in the attic of a merchant tailor's premises, caused by the tailor's stove being placed too near wood-work. No one lived in the premises, and the fire was discovered through the restlessness of a sick child keeping the parents of the tenant of the adjoining property awake. Some time necessarily elapsed before the surveyor and his fire brigade were aroused, collected together, and the hose attached to the nearest hydrant, and the fire had got pretty full possession of the roof. The force of the town supply, however, was so great that in a few minutes the fire was put out.

MEMBER OF THE LOCAL BOARD OF HEALTH.

THE CHAPEL OF ST. LUKE STUBWOOD, DENSTONE.

A small chapel has been built in a hamlet of the village of Denstone, for mission purposes from the designs of Messrs. Slater & Carpenter. It consists of a nave and sanctuary, and, with the exception of the plinth, which is of brick and stone, is entirely of wood framing and plaster, the framing showing inside as well as outside. The windows of the nave have simple oaked heads; those of the sanctuary have traceried heads. There is no east window, but the wood framing is here treated more ornamentally. At the west end is a small vestry and porch, with bell-cot over. The floor is of wood, and the sanctuary has oak steps and floor.

Messrs. Clayton & Bell, besides executing the griddle glass for the windows, are at work on a triptych, representing the Crucifixion, to be placed over the altar. The works have been executed by Mr. Stubbs, of Denstone, as well as the inlaid altar of oak.

EXTENSION OF THE QUEEN'S HOSPITAL, BIRMINGHAM.

The foundation-stone of the workmen's wing of the Queen's Hospital at Birmingham has been laid, with Masonic honours, by Lord Leigh. Connected with the old building by a glazed corridor, which will serve as a conservatory for convalescents, will be the out-patient department, with central hall; public and private consulting-rooms, a special department for the diseases of women, reception-rooms for students, and provision for the classification of sexes; a dispensary; rooms for resident surgeon and assistants, lady superintendents and nurses, and a porter's lodge and dressing-rooms. It is also proposed to have a bath-house, with sanitary and scientific arrangement for baths for in- and out-patients, specially with a view to preventing the public baths of the town being used for contagious diseases. Another glazed corridor will lead to two detached blocks of wards, each ward containing 24 beds, with convalescent-room, nurses' room, &c. On the north boundary, besides a building especially for scientific and sanitary purposes, it is intended to erect a laundry, with all necessary appliances for the thorough disinfection of the clothes-room, and the bedrooms used by persons suffering from contagious diseases. The result of these arrangements when complete will be that the building, now standing on the north boundary of the old Queen's Hospital ground, will be utilised exclusively for contagious diseases. This will involve an outlay of about 20,000*l.*

PLAN OF THE LAW COURTS.

SIR,—The discussion that has been raised upon Mr. Street's last elevation for the Law Courts building affords an opportunity, which will probably be as gratifying to that gentleman himself as to others, of reconsidering the plan.

In the instructions originally issued by the commissioners to the architects selected for the competition, the area within which the whole of the buildings were to be included was precisely defined, and among the various requirements directed or implied in them was that of a great hall, which was to be a central feature in the design. These two conditions, one of which was absolute, and the other so strongly recom-

mended as to be almost imperative, apparently so controlled the ideas of all the architects as to produce a sort of general similarity in their plans, and were so enormous in themselves that they have doubtless been the chief origin of the dissatisfaction that has since arisen with respect to both plans and elevations.

The mistakes that appear to me to be contained in these two leading conditions are, 1st. That the site was too small and of bad form for the building directed to be included in it; and, 2nd. That it was impossible that one central hall could be either a useful apartment or a suitable feature to so vast a mass of building; and the result of the efforts of the architects who have attempted to fulfil these conditions gives some confirmation to this notion. They had all more or less the same collection of small dark and necessarily ill-ventilated courtyards, symmetrically disposed in a series of concentric squares round the great hall in the middle; and as if on purpose to prevent the possible ingress of light and air within the sacred enclosure, there was generally a range of lofty and imposing offices on the south or only side on which the sun could penetrate. The bewildered suitor would wander through the endless maze of passages, as sunless nearly as the catacombs, and filled with a legal atmosphere of its own, until he would begin to suppose that the design was intended to be emblematic of the uncertainty and obscurity attending the business to be conducted in it.

The concentration of such a mass of building, in which so many people of all degrees of life were to be daily assembled, and in which no small part of them were to pass the greatest portion of their daily lives, on so small an area and in such a method, would be condemned by our sanitary engineers, and would not be permitted by a Board of Health in any ordinary public building; and this I believe to be mainly the result of those two conditions imposed on the architects.

The problem of designing a building can be put to an architect in two ways. He may either be called upon to occupy a certain piece of ground with the most efficient building he can produce; or a given amount of accommodation can be exacted on a practically unlimited area. The instructions to the competing architects endeavoured to combine the two, and hence, I believe, the failure.

If the exact extent of accommodation which is now considered necessary, and a probable idea of the wants of the future, were given to Mr. Street, and he were left untrammelled with respect to precise area (area and not site, be it recollected), or with respect to any other conditions, he would no doubt very soon produce a building which would satisfy both himself and the legal profession; and by the delay of a year, we should escape being saddled for ever with a building which appears to satisfy nobody concerned in it, either inside or out.

T. B. COLLINSON,
Colonel, Royal Engineers.

THE SEWAGE QUESTION.

A PAPER on "Sewage as a Fertiliser of Land, and Land as a Purifier of Sewage," was read by Mr. Bailey Denton, C.E., at the Society of Arts, December 6th. The object of the paper was to show that the 'fertilising value of sewage would not be fully obtained unless a high standard of purity was established and enforced, with a view to free our rivers from pollution, thus securing the two all-important objects—purification and reproduction, without loss of valuable time. Comparing the standard suggested by the Rivers Pollution Commissioners with that recommended by the chemists consulted by the Thames Conservators, it was pointed out that the latter, being much less stringent than the former (which is quite low enough), might lead to consequences which will be hereafter regretted. If sufficient land for wide irrigation is not to be obtained, or if obtained, only at a price which shall place the application of the sewage by irrigation beyond the possibility of profit, we must call to our aid the oxidising powers of an aerated soil, and regard the land more in the character of a filter, having a chemical as well as a mechanical influence, and thus realise all the advantages that can be gained from it. Land, Mr. Denton stated, might be too porous as well as too stiff, and that both extremes should be avoided. For irrigation, he considered that the sewage from sixty-two persons, with a daily water-supply of twenty gallons a head, which is

equal to 2,000 tons per annum, should not be exceeded as the average quantity to be applied to each acre of land, if the sewage is to be profitably used, as well as purified; while it has been proved by some works he has carried out at Merthyr Tydfil, that the sewage of 3,000 persons, which is nearly fifty times as much, may be purified by intermittent filtration through the same quantity of land, and prolific crops grown from the surface at the same time. Mr. Denton stated that the anticipations of the Rivers Pollution Commissioners, — who, when they suggested intermittent downward filtration as a means of purification, said that the process would be attended with formidable objections, inasmuch as it would be entirely unremunerative, and that the manual ingredients would be absolutely wasted, while the collection of the solid fecal matters upon the surface of soil, without vegetation to make use of them, would probably give rise to a nuisance, — may entirely be avoided by the growth of vegetation. Mr. Denton, having stated that the authorities of Birmingham had decided on adopting the same description of works, shortly described those of Merthyr, where twenty acres of land, divided into four equal parts, have been so deeply drained and deeply cultivated, that the sewage of that place, which amounted in dry weather to 870,000 gallons per diem, was being purified to an extent which rendered it superior to the Thames water above the intake of the water companies. Two cubic yards of soil for every square yard of surface are made serviceable as filtering material; and he mentioned that, during the present summer, at times, when the sewage was increased by rainfall to 1,000 gallons a minute, the whole was filtered through half the quantity of land laid out, viz.—ten acres, being equal to 144,000 gallons per acre, or a deposit of $\frac{1}{2}$ in. over the whole surface.

DANGEROUS FOOTPATHS.

Sir,—The wintry weather now about us suggests difficulties and danger to pedestrians. People will scrape away the snow from before their houses, and leave matters worse than they found them, — sometimes a little salt makes things smoother; but why cannot they sweep it away before passing footpaths have hardened it into lumps? Then scatter a little fine ash from the grate over the place; and will do, of course, but ashes are handiest; and that which is dirt in the festering dust-hole is not "matter out of place," where it tends to keep marrow-boned travellers right end up. I wish the *Builder* would see it.

By-the-by, if we should be snowed up this winter, and in the event of a conflagration, will the engines and escapes be able to get at us? Will water be obtainable? Have any arrangements been made for the removal of accumulated snow, which will not break down on being practically tested? INTERERX.

KINGSTON SCHOOL COMPETITION.

Sir,—In your notice, about September last, of the Kingston School Competition, you reported the result to be—"Experiments," 1st, Mr. Haslam, of 65, Great Russell-street and Henley-on-Thames; "Two Heads Better than One," 2nd; and Masonic Sign, 3rd. May we solicit the favour of your correcting in your next issue an error that then occurred, our drawings, "Masonic Sign," having been selected as the *second best*, and we are to-day (Dec. 8) in receipt of a letter to that effect (having only lost the first prize by a vote of one).

A. B. PARKES & T. PILBIDGE.

ARCHITECT AND EMPLOYER IN A COUNTY COURT.

At Eiland, before Mr. Serjeant Tindal Atkinson and a jury, the case of *Hepworth v. Lamb* has been tried. Defendant is a manufacturer at Eiland, and plaintiff an architect and surveyor at Brighouse. The action was to recover 50*l.*, as balance of an account for the preparation of plans and superintending the erection of Wellington Mill, Eiland. Plaintiff's claim was originally 80*l.*, 2*sh.* of which had been paid, leaving the balance of 78*l.* Seven pounds had been abandoned to bring the case within County Court jurisdiction.

For the defence, it was urged that on the 3rd of August, 1868, defendant wrote to plaintiff requesting him to enter his hand in preparation of plans, until he (defendant) had seen the machine-maker. After the date of that letter plaintiff and defendant met, and the latter gave to plaintiff the ground plan, showing in what position the machinery would have to be placed, as also in what position the pillars inside the mill would have to be placed, they having to be placed 20 ft. apart. If that course had been adopted by the architect, it would have been necessary for defendant to purchase other land, and to pull down the side of the wall, which cost defendant 170*l.* It was also found after the alterations had been made that the pillars were not set according to the mode in which they ought to have been, if the plan of the machine-maker had been carried out. In consequence of the plan

of the machine-maker not being carried out, there was not sufficient room for the machinery, and therefore the mill had to be widened. Thus it was owing to the default and neglect of the architect that 170*l.* expense was incurred by widening. In opposition to this, the plaintiff alleged that he did not see the machine-maker's plan until after the building had been partly erected; but evidence to the contrary was called on behalf of the defendant. Defendant also alleged that the work had not been carried out according to the contracts and specifications, and urged other objections.

The judge, in summing up, said the great point was if the jury believed that the machine-maker, Asa Lees, had made a plan showing where the pillars were to stand, and that the plaintiff had either by neglect or mistake placed the pillars in a position different to what they were shown upon the tracing which he had admitted having received; and that in consequence the defendant had to pull down the side of the wall, which was admitted to cost 170*l.*; if they believed these things, then there was an answer to the plaintiff's claim without going into the other things. It was a question for them as to whether the plaintiff (who it was alleged, and on some questions being asked, the jury expressed their opinion that the plaintiff had Asa Lees's plan given him before the contracts for the buildings were let, and that the 2*sh.* paid to the plaintiff were sufficient to cover everything he was entitled to.

SOUTHPORT TOWN-HALL COMPETITION.

Sir,—I see a decision has at length been announced in the matter of the designs sent in for the new Town-hall, Southport.

In the interest of the profession at large, will you endeavour to ascertain how that decision has been arrived at?

Was any professional non-local judge called in? Is it a noteworthy fact that the recipients of both the premiums are local men. A VICTIM.

FEEES FOR HOARDS.

At the St. James's Westminster Vestry, the surveyor (Mr. A. F. Havelly) reported that a board had been erected at No. 270, Regent-street, by Mr. Drew, of Christopher-street, Hatton Garden, without a licence. "Under ordinary circumstances," he said, "a summons would have been issued, but in this instance I am afraid it would not have been successful. The matter should be referred to the Works Committee to examine and report, and also to inquire into the legality of the practice of demanding fees or deposits of money before such licences are granted. Since the decision in the Court of Queen's Bench, in the case of the New Post-office, I confess I have no confidence in obtaining a conviction when the defence would be an alleged illegal demand for money. This matter is of considerable importance, as there is no reason to accuse Mr. Drew of attempting to evade the law, but he is using a very clever and plausible mode of evading it, and he does not apparently acknowledge the right of the Vestry to expand the requirements of the law by rules of their own, so that the time of the committee will not be wasted by an impartial investigation of the whole matter." The suggestion was understood to be adopted.

DECORATIONS OF ST. MARY-IN-THE-CAPITOL.

I beg to tender my best thanks, both on your readers' and on my own behalf, to your correspondent, "H. W. B.," for his timely correction of the errors into which I had fallen, while attempting to describe the decorations of St. Mary-in-the-Capitol. I regret that the latter agreeable task had not come to the lot of "H. W. B.," who has watched the progress of this remarkable work for the last few years, instead of its being essayed by a passing tourist like myself. At a period like this, when the completion of St. Paul's Cathedral is so much talked of, all great schemes of iconography are interesting. At the time of my visit to Cologne (about September 27th last), the decoration to the west narthex, as regards its general design, appeared to be finished, although the staging was still up, and a man at work. The roof of the choir, and the eastern apse were undoubtedly to a great extent obscured by massive scaffolding. I should have been glad if your correspondent, "H. W. B.," could have described the process employed in the colouring; also if he could have explained the subjects of the legends on the walls of the west narthex. Owing to being an indifferent German scholar, I was unable to make these inquiries while on the spot. E. B. F.

PAYMENT OF DIOCESAN ARCHITECTS: CORK.

It was proposed to the Diocesan Synod of Cork, at its last meeting, to appoint an architect at a salary of 250*l.* per annum. Ultimately, however, it was resolved that "The architect should be paid for the present according to the work to be done." The following resolutions were then passed:—

"The diocesan architect shall inspect and report upon the see-house and every glebe-house and church in the diocese at least once in every three years, an inspection and report of the glebe-house and church being always made upon the occurrence of a vacancy in the parish, unless the council shall otherwise direct."

"The diocesan architect shall furnish plans for and superintend the execution of all works ordered by the diocesan council."

"The diocesan architect shall specially inspect and report upon any glebe-house, when called on by the incumbent, at a fee of 1*l.*; and travelling expenses to be defrayed by him."

"The diocesan architect shall specially inspect and report upon any church, when called on by the

incumbent or select vestry, at a fee of 1*l.*; and travelling expenses to be defrayed by them."

"The diocesan architect shall furnish a copy of every such report to the diocesan council, and to the incumbent or select vestry, as the case may be."

In some parts of the county such a report as is spoken of would occupy three days, including two days' travelling.

Probably some revision will be needed here: at any rate, explanation.

THE PLANS FOR THE CAMBERWELL NEW VESTRY HALL.

IN answer to the invitation of the Camberwell Vestry for plans for the intended new vestry-hall in the Peckham-road, twenty-four architects sent in designs. These have been submitted to a committee of the Board, who have selected eight out of the entire number of designs sent in, from which the choice will be finally made. The eight designs selected have been placed in the Vestry Hall during the last week for public inspection. The estimated cost of the new building, which is to be erected on the site of Havil House, is 8,000*l.*

SIR,—A gross piece of jibbery is about to be perpetrated over the Camberwell Vestry Hall Competition, and your assistance is much needed to prevent it if possible. The whole of the designs have not been hung; eight of them are on the walls; the others are piled against seats and tables. Such a collection of rubbish, with one or two exceptions, has perhaps never been seen before.

The committee meet on Wednesday to settle, if possible, the award.

A COMMITTEEO.

A HINT AND A CAUTION.

HAVING seen an advertisement in the *Builder* of the 11th of November asking for plans, &c. for a dispensary and hospital combined, for the Governors and Subscribers of Louth, I set to work at the sketch plan, but found I could not do much unless I got more information than that contained in the advertisement; so I resolved to get all the information I could. The following morning I took the 8.40 train from Dublin to Dundalk (about fifty-four miles) arrived there, I had to take a car to Louth, distant about seven miles. After a dangerous journey (the roads being covered with frost and ice) I reached my destination, and immediately made inquiries for Mr. Nesbitt (the secretary mentioned in the advertisement), but no person knew any one living in the town of that name. Thoroughly disgusted, I returned to Dundalk, where I made further inquiries, but with the same bad result. Except that I gained the information that there was a Louth in England, and that I had been sold, and at the expense of 1*l.* 1*s.* 6*d.* for travelling expenses, not to talk of the chaff I got and will get, all because those who advertised did not think that there was a town or county of the name of Louth in Ireland.

X. Y. Z.

"PROJECTIONS BEFORE THE LINE OF FRONT."

BATHON v. The Vestry of St. George, Hanover-square. At the usual meeting of this Vestry, a letter was read from the solicitors (Messrs. Capron & Co.), stating that Vice-Chancellor Malins had granted a perpetual injunction, with costs, against the Vestry, to restrain them from pulling down the conservatory in Queen-street, and that they do not consider this judgment will stand on appeal. A letter was also read from Mr. J. T. Schomburg, Q.C., the Vestry's counsel in the action, stating that, in point of fact, the conservatory was not within the line of the manilla; the reason of its not being taken out earlier was because the Vestry were waiting for a decision of the Metropolitan Board; and that the summons was taken out as soon as that decision was given. Dr. Appleton deplored the manner in which the Vestry rushed into law. The Vestry decided to print the judgment and Mr. Schomburg's opinion for the use of members, and to adjourn the question till the first meeting in January next.

UNSAFE LANDINGS.

THE surveyor of St. George's, Hanover-square (Mr. H. T. Tomkins), reported on Tuesday to the committee of works that several persons in the parish, whose attention he had called to the unsafe state of their landings, had promised to attend to the matter; others had promised to do so, if necessary; while several had not sent any reply, although the surveyor had written to them twice. The clerk said there was no doubt about these landings being private property. Under the Police Act it was an offence punishable with a fine of 40*s.* to have a landing in a dangerous state. Mr. Walker thought the most dangerous case should be selected, and the owner summoned before the magistrate to try the question. The surveyor, in answer to a question, said he knew one case that certainly was dangerous. Mr. Walker then moved that the worst case be selected to try the question. Mr. J. Morris seconded. The clerk remarked that if the surveyor called the attention of the police to the landings, they could take out a summons if necessary, and the surveyor could attend as a witness. The motion of Mr. Walker was carried.

NOTES FROM AMERICA.

SIR,—The churches in the United States of America do not come up to the mark of European architecture. The fault is in a great measure due to the want of educated architects. Outside of the large cities, the "surveyor" is generally a small contractor, who probably has served his time as a frame carpenter, and whose ideas of architecture are not modelled after the fashion of the "Orders," even if he knows what the term means. But one thing the Americans are ahead of the British in is, in the manner of providing comfort for the congregation. In New York the preachers are nearly all of the Sensational school, and pour out a sermon on politics as well as the teaching of Christianity: one reverend gentleman informing his hearers that many thought and looked upon a 25-cent shin-plaster as if it was the size of a horse-blanket; but for comfort give me an American church. The seats are all cushioned; a little rack attached to each pew, with a couple of Prayer-Books for the use of the worshippers; and in most little towns the seats are free, so that the poor can worship with equal comfort as the biggest "Bag" of the place.

In regard to trade-unions, America seems not to be agitated so much as England. The employers, so far as they consistently can, endeavour to give their hands piece-work, thus obviating a good deal the reason for strikes. One society, "The Mechanical Order of the Sons of Labour," from what I could learn from an important official, was based upon the system of the mechanic being recognised with equal rights, and on the same footing as the employer of labour and the capitalist. How far a surveyor or architect may be recognised would be a question of doubt; for, in reply to a question as to the social position of the surveyor, your correspondent was told, probably in jest, that it was a gentlemanly pastime. But I fear the "mechanic" had not roughed it in the bush and prairie, with the canopy of heaven for a curtain, and had not settled and staked off levels amidst a few Red Skins.

Perhaps one thing might be amusing to your readers who contemplate moving, to follow the fashion of the New Country. An old acquaintance of mine asked if I would assist in moving his house, consisting of six rooms: as all hands available went to work, and with the aid of screw-jacks put the house on rollers, then skidded it on a *traverse* (a sort of wooden sleigh), hitched on eight horses, and so moved the house and furniture a short distance of two miles. Recollect, we have no Temple Bars to stop the way.

The wages of mechanics vary in different States. If an artisan works in the country districts, he is boarded. In towns, the wages are:—For carpenters, 2 dols. to 3 dols.; masons and bricklayers, 3 dols. to 4 dols.; labourers, 1 dol. 25 c. to 1 dol. 50 c.; plasterers, 3 dols. to 3 dols. 50 c.; painters, 1 dol. 50 c. to 2 dols. 50 c.; machinists, 3 dols. to 4 dols. Now, many of these trades cannot expect more than seven or eight months' regular work in the Northern and Eastern States. Food is reasonable, but clothing is fearful in price. A pilot jacket brought out with the writer, cost, in England, 1*l.* 18*s.*; for the like quality in the States he has paid 21 dols.—more than double the price in England.

QUERREUS.

INSTITUTION OF SURVEYORS.

At a meeting on the 4th inst., a paper "On the Cost of Conversion of Forest and Wood Land into Cultivated Land" by Mr. John Clutton, past president, was read. It gave an account of the disafforestation of three of the Royal forests, viz., Hainault, in the county of Essex; Whichwood, in the county of Oxford; and Whitelwood, in the county of Northampton; and of the works which were carried out in making the land available for agriculture; and also stated the nature of the works which were executed with a similar view, on a portion of the lands formerly part of the Royal Forest of Delamere, in the county of Chester.

The first three mentioned forests comprised an area of about 10,850 acres, in which the Crown had the forestal rights, the soil and timber; other parties had common pasture, and other rights. The land being thus held, the value of the respective interests was small compared with what it has become since the disafforestation; for each owner then became possessed, in severalty, of a property which, being

free from the rights of others, could be improved. The result, moreover, has been that, by the conversion from woodland, and the application of capital, a large amount of agricultural produce has been obtained, while a source of constant employment has been provided for the population of the districts.

The paper, which includes much valuable information, will hereafter be found in *extenso* in the Society's Transactions.

The most successful immediate return for the capital expended was from Whichwood. This arose from the fact that the clearing and buildings were the least expensive.

Hainault, from its proximity to London, will, no doubt, increase in value after the expiration of the present leases. The cost of the work of clearing was greatly enhanced by the conversion of about 90,000 pollards into a profitable form for sale.

The transactions in the case of Whitelwood were large, although only 300 acres were retained. The sale of the other portions of the allotment to resident proprietors enabled the Crown, by investing the money in the purchase of another estate, to obtain a total income of about 5,000*l.* per annum.

The works at Delamere have, no doubt, been the least successful of the operations, for the reasons before explained.

The following tabular statement shows the outlay made by the Crown in the conversion of the land acquired, and the rents obtained for it, in each of the cases dealt with:—

Forest.	Acres.	£	Acres.	£	Acres.	£	Acres.	£
Hainault	3019	486	2355	25	17	6	2	3
Whichwood	3778	1946	3319	9	18	6	1	12
Whitelwood	3021	—	303	18	10	6	1	15
Delamere	2000	—	1554	39	1	6	1	12

A short discussion ensued, and a vote of thanks to Mr. Clutton was passed. The discussion of the paper will be resumed at the next meeting, Monday, December 18th.

DOINGS IN DUBLIN.

AN Exhibition of Arts, Industries, and Manufactures for Ireland is under weigh, a proposal having been made by S. Arthur Guinness and Mr. Edward Cecil Guinness to place the Exhibition Palace, now lying idle in Dublin, at the disposal of the public for an Industrial Exhibition during the ensuing year. A preliminary meeting has been held to consider the proposal. The meeting was an influential one, held under the presidency of the Duke of Leinster, several of the members of the nobility, professors, and leading merchants taking part.

The Earl of Howth moved that the liberal offer made by the Messrs. Guinness be accepted, which, it is needless to say, was done with the highest gratification.

Lord Sandhurst moved that the nobility and gentry who are collectors of art and art manufactures be requested to contribute to the loan museum.

The Marquis of Conyngham proposed a resolution that her Majesty be respectfully solicited to contribute also towards the loan museum from the collection of paintings and pottery at Windsor Castle.

Mr. James Owen, the President of the Institute of Irish Architects, submitted by letter the great desirability of making provision in the Exhibition for the study of architecture in conjunction with the other arts, as it was admitted that at present there were no means in Ireland for architectural study.

A committee was formed from the council to carry out the programme laid down for the proposed Exhibition next year.

It is reported that the Dowager Marchioness of Bath has sent a contribution of 100*l.* towards the restoration of Kildare Cathedral, which, like Christ Church Cathedral, has been committed to the hands of Mr. Street.

St. Augustine's Roman Catholic Church, in Thomas-street, the building of which has occupied several years, is apparently approaching to completion. The want of funds explains its slow progress. It is architecturally effective without,

but it is a question whether the selection of the different stones employed affords by the contrast of colour a favourable impression as to its service in this instance.

The presentment for the improvement of Essex Bridge has been passed, and the Corporation are making a request to the Port and Docks Board that the plan for widening, lowering, and improving the bridge may be of such a nature as to facilitate the widening of the approaches from Essex Quay to Wellington Quay, by removing the quay-walls further towards the present centre of the river.

The proposed improvement of Carlisle Bridge, to which the Corporation have been for years committed, is shelved for the present. It is difficult to conceive the object of the corporate authorities in thus postponing a work that all desire. Mr. Charles Geoghegan's design seems to be the right solution of the difficulty.

TURNERS AND TURNING.

SIR.—You have lately published a letter from Mr. Olley, of Bolsover-street, recommending the Turners' Company to employ an architect to furnish drawings, and each competitor to produce two or more specimens,—a very good test of ability; but I regret to say the turners, as a rule, are not in the habit of copying drawings accurately; the price the work is done at renders a perfect finish out of the question. You will, perhaps, hardly believe that a good workman, working in a shop where drawings are accurately copied, cannot earn more than 3s. per day, working on chair-work, so badly is that class of work paid for. In a cheap shop, where drawings are unknown, he would probably earn nearly double: so there is a great difficulty in getting men to do good work. I wish the turners would combine to produce good work, and stand out for fair wages. Let them cease to brag of the quantity they can produce, and stick to quality. I have been a turner twenty years, and never yet heard a man talk of the good work he has done; but have heard plenty of brag of the quantity,—cheap balusters, for instance, like bundles of wood-sticks, only fit to be burned.

It is a great pity so many apprentices are taken by men who never employ journeymen, and, in fact, do not know how to teach them. I have met with several young men after serving their time that have had no notion of working to drawings, or fitting templates. These are the men that ruin the trade. In the course of time they become masters from necessity, as no good shop will employ them, and the rubbish they produce is disgraceful. A WOOD TURNER.

ADULTERATED CEMENT.

At a meeting of the Chemical Society of Newcastle, not very long ago, the president of the society (Mr. John Glover) read the following statement, which calls for further publicity:—

"During the last few days I have learned that large quantities of blast furnace slag is being ground with Portland cement in this district, and as in the analysis of such cement great stress is very properly laid on its percentage of hydrated silicic acid, I have thought it well to draw your attention to the fact, as blast furnace slag, on being treated with hydro-chloric acid, yields a large percentage of hydrated or gelatinous silica, although it has not the slightest value as a cement. You will see from what I have said that a chemist, proceeding to the analysis of a cement so adulterated, might be misled if he were not aware of such adulteration. As a proof that such adulteration is a fraud on the purchaser, I have caused the following experiments on the cohesive power of a pure cement, and of the same cement mixed with slag, to be tried:—The average of a number of bricks of pure cement carried a weight of 485 lb., and broke with a weight of 492 lb.; while the same cement, mixed in the proportion of equal parts of cement and slag, bore a weight of only 301 lb., and broke with 308 lb. A mixture of the same cement, in the proportion of three of cement to one of slag, bore 375 lb., and broke with 382 lb., and each brick was made in the same mould, and was allowed seven days to harden. You will see from these tests that a purchaser of such cement will not be able to mix with it the same amount of sand as when he buys the pure article, as the slag already mixed with it has taken the place of so much sand, and is really of no greater value than sand,

as bricks mixed with sand in the same proportions as when slag was used, gave nearly the same results. If slag gives a better appearance or colour to Portland cement, a fair trader should state the fact of its presence, so that his customer might know the price he is paying for such qualities. If our analytical chemists would undertake to test the physical properties of cement, such as cohesion, hardness, &c., as well as its chemical composition, they would supply a want, as there is no such public tester, at least in this neighbourhood."

CHURCH-BUILDING NEWS.

Hadleigh.—The church here has been restored and re-opened. The pews which blocked up the view have now been removed, and in their place are open benches. Former restorations did pretty nearly all that could be done to the external walls and the roof, and the work, which has now been going on for about seven months, has been confined to the interior of the church, the appearance of which, as may be gathered, has been completely altered, whilst additional accommodation has been secured, and more than 1,000 persons could now find sittings. New oak benches cover the whole area of both nave and aisles. They are made with sloping backs, and ample space is left between them. The ends are thick, moulded and carved, representing flowers, fruit, and foliage, but throughout the whole number no two are precisely alike. The iron brackets, painted with bright blue and gold, which served to support the tie-beams of the nave roof, have now been cased in oak supports, which spring from carved stone corbels. The roofs of the north and south aisles have also been repaired with timber braces, and stone corbels have been inserted where they were required. The stonework of the piers of the nave was in an unsatisfactory condition in many places, and these defects have been remedied, and the mouldings of the capitals and piers repaired. The two chapels at the east end of the chancel aisles, separated from the church by ancient carved oak screens, have been repaired and restored, the most noteworthy part of the work being the restoration of the creasing or brattishing. The paving of the church has been replaced with coloured tiles, laid in a variety of patterns. In the passages of the nave and aisles the colours are simply a deep warm red and black; but proceeding eastward the patterns become more elaborate, and glazed tiles of one or two other colours are introduced. The patterns in which the tiles are laid were designed by the architect, and the tiles were supplied by Mr. Godwin, of Hereford. The altar-rail is of oak. It is shafted, moulded, and carved. Sunken panels contain little bits of carving, representing the emblems or instruments of the Passion, executed by Mr. John Spruogon, of Stowmarket, who also executed the carvings on the bench-ends. A new pulpit, prayer-desks, and lectern have been contributed by various friends. The pulpit is of carved oak, the panels being of dark pollard oak, on which is tracery carved, of oak of a lighter colour. It stands upon a base of clustered shafts, composed of verd antique and other marbles, round a massive centre shaft. The coloured shafts are in contrast with their polished capitals of white Caen stone, from which springs groin-work, and the upper ribs of the groining are terminated by carved angels. The pulpit was executed by Messrs. Farmer & Brindley, of London. The prayer-desk fronts have open tracery, and the ends are carved, with sunk panels, the work being by Messrs. Rattee & Kett, Cambridge. The lectern is of brass, by Messrs. Hardman, of London. The whole of the works have been carried out from the designs and under the superintendence of Mr. J. Drayton Wyatt, of Holloway, who is the consulting architect to the Church-building Society of the Archdeaconry of Sudbury. Mr. J. A. Pettitt, of Hadleigh, was the contractor. The total cost of the work is about 1,500*l.*, including 187*l.* for the completion of the restoration of the roof. Mr. J. Darkin, Bury St. Edmund's, has acted as clerk of the works.

Hooke.—All Saints' Church, which was opened for divine worship four years ago, has now been consecrated. Mr. S. W. Danke, of Westminster, was the architect. The edifice is of the Late Pointed style. It is built of the red sandstone of the district, the coigns only being of faced masonry, and the other parts left rough. The roof is covered with Westmoreland green slates, which contrast with the colour of the stone. A

tower, containing six bells and surmounted by a lofty spire, terminates the south-west angle of the building. The interior of the church consists of nave, chancel, north aisle, with organ-chamber and vestry; the design allowing of the addition of a south aisle when found necessary. It contains sittings for 650 persons, all of which it is desired should be free if a sufficient endowment can be obtained for the support of the minister. The cost of the church has been about 6,000*l.*, exclusive of the tower and spire, which, with the bells, were the gift of a benevolent lady of the locality.

Gorton.—The new church at Gorton has been consecrated by the Bishop of Manchester. The church, which has been built by Mr. Charles Frederick Byer, from designs by Messrs. G. & J. Radcliffe Shaw, architects, St. Chad's, Saddleworth, is a stone edifice, in the style of architecture of the time of Edward III. It consists of chancel, nave, two side aisles, vestry, organ-chamber, tower, spire, and porch, with transept terminations of north and south aisles. The east and west windows are very large, and are filled with tracery, as are all the windows. The pillars and arches of stone are high, and support a lofty clearstory, upon which again rests the open-timbered roof with its arches. The church measures in the inside 114 ft., namely, the nave 83 ft., and the chancel 26 ft.; and in width the chancel is 24 ft., and the nave, including the aisles, 52 ft., and is calculated to hold from 800 to 900 people. The tower and spire are 150 ft. high, the latter being surmounted with a gilt cross. The pewing and benching are of pitch pine, and the pulpit, prayer-desk, and altar-table are of oak, carved, with perforated and canopy work. The chancel is paved with encaustic tiles, and the rest of the church with red, buff, and dark tiles in octagons and squares. The cost of the building is 6,000*l.*

Stalybridge.—It is proposed to enlarge St. Paul's Church, Stalybridge, by the addition of 500 sittings, at a cost of 3,000*l.*, 1,000*l.* have been subscribed by four gentlemen connected with the parish. The committee appointed by the parishioners to carry out the enlargement have approved and adopted plans submitted to them at their request by Mr. W. H. Brakspear, architect. Mr. Brakspear was a pupil of the late Sir Charles Barry, and is, perhaps, best known as having carried out the restoration of Bowdon parish church.

SCHOOL-BUILDING NEWS.

London.—A new school is to be built in Hackney, and another in Lambeth, each to hold 1,000 children.

Mill-end.—A new school-building, erected in connexion with the Congregational Church in Church-street, Mill-end New Town, in lieu of the schools in Gascoigne-place, Shoreditch, has been opened. The school was removed for the purpose of providing space for approaches to Columbus Market. The new schools have been mainly built from the funds received from the Baroness Burdett Coutts for the building in Gascoigne-place, and are provided to accommodate about 500 children. The building is situated on the north side of Church-street, and consists of a school-room for boys, 58 ft. by 29 ft. and a height of 15 ft., with a classroom 21 ft. by 15 ft., of equal height, the main school-room having an additional area of 26 ft. by 8 ft. in the front portion. This school is approached by a distinct entrance, and the boys have a separate play-yard in the rear. The school-room for girls is on the first-floor, and contains 58 ft. by 29 ft., by 12 ft. to the wall-plate, and 25 ft. to the underside of the ridge of the roof; there are two class-rooms attached, one 21 ft. by 15 ft., by 14 ft. high, and one 26 ft. by 14 ft., by 12 ft. in height. This room is approached by a passage and stone staircase on the different side of the building to that of the boys' entrance. There is also a playground in the rear. Accommodation is provided for washing, and for the service of the establishment, on the second floor, where the keeper of the building will reside. The design of the building was furnished by Mr. Thomas Chalkfield Clarke, of Bishopsgate Within, and the works were executed by Messrs. Hill, Keddell, & Waldram, of Shoreditch.

Chatham.—The new schools and halls of study for the School of Military Engineering at Chatham are to be erected by Mr. G. Sollitt, of Strood. There were twelve tenders sent in to the War Department by builders selected, and

Mr. Sollitt's was the lowest. The amount is 23,000l. The buildings are to be erected near the Brompton Barracks, occupied by the Corps of Royal Engineers, on the site of the Huts Barracks, the huts having been removed to St. Mary's.

Kingscote.—The new schools for the parishes of Kingscote, Bagpath, and Lasborough have been formally opened. Mr. Norris, of Uley, was the contractor.

Winslow.—A little school-room has just been completed at Hoggston, near Winslow, Bucks, in the centre of the village, to meet the requirements of the parish, under the new Education Act. It is built of red Aylesbury bricks, relieved by grey bricks, and Bath stone has been sparingly used. Internally the walls are faced with grey bricks, truck-pointed, and plaster has been entirely avoided. The roof is covered with plain tiles, and ceiled with stained and varnished boarding at the collar-beams. There is also a lining of similar boarding, 4 ft. high, around the walls of the room. There are separate entrances, offices, and playgrounds for the two sexes. Mr. W. Matthews, of Winslow, was the builder employed, and the Messrs. Spencer, of Aylesbury, were the architects. The site was given by Earl Stanhope, and the cost of the building was defrayed chiefly by his lordship, who is the patron of the living, and the rector, the Rev. J. G. Villar.

Lewes.—The new school-house for the parish of St. Anna's has been opened. The school has been built upon a suitable and healthy site on the Paddock-road, leading from Ireland's-lane to the Spital Farm-buildings. The architect was Mr. C. J. Berry, of Lewes; and the builder, Mr. J. Peakes, of Eastbourne. The style is Gothic, and the building has three gables, two entrances porches, and a bell turret. The material principally made use of is large white flints, relieved by quoins and dressings of red brick. The principal apartment in the school-room is 58 ft. long, 22 ft. wide, and lofty, with open roof, showing the rafters and stained timber; at each end are one small circular and two pointed windows. On the north side is a class-room, 16 ft. by 20 ft., with raised tiers of seats. The entrance - porches for girls and boys are fitted up with pegs for caps, bonnets, &c. The seats and desks in the school-room are so constructed, that by a simple movement they may be converted into benches with backs. The outer walls are hollow, to prevent damp, and attention has been paid to ventilation, and that the whole place is warmed with hot-water apparatus. The front is enclosed by dwarf wall and iron railings. The work has cost 800l.

Maidstone.—The new boys' school, recently erected in St. Peter's parish, adjoining the other schools at Fank, has been opened. The school is 70 ft. long and 20 ft. wide, with a class-room 20 ft. by 14 ft. The walls, internally, are lined with white bricks, with arches of red bricks over the windows; the roof of the school-room is lofty and open, with stained and varnished timbers. Objection is raised against open roofs, on account of their acoustic effects, but in this case the objection does not hold good. The work of erection has been carried out by Messrs. Clements & Wallis, of Maidstone, under the superintendence of the architect, Mr. Hubert Bensted.

Newcastle-upon-Tyne.—The formal opening of the Bath-lane Schools took place on Friday, the 24th ult., when Mr. Edward Miall, M.P., delivered an address on Education. They are in the Early English style of architecture, of simple character, and built of local stone, with ashlar dressings. Accommodation is provided for 600 children, at a total cost of about 3,000l. Mr. Thomas Oliver was the architect, Mr. Henry Andrews the clerk of works, and Messrs. N. & R. Reed and Messrs. J. & W. Lowrey were the contractors.

Ardwick (Manchester).—St. Matthew's Middle Schools, Ardwick, have been opened. The schools are more especially adapted for children whose social position is above that of those who usually attend the national schools. Being the first middle-class schools erected in this district, more than common interest attached to the undertaking. The schools have been erected mainly through the liberality of Mr. Hugh Birley, M.P., and some others, and no pains or expense have been spared to make them as complete and perfect as possible. The architects are Messrs. Medland & Henry Taylor, of Manchester. The building is of two stories; the lower one contains the boys' school-room, 41 ft. by 30 ft.; two large class-rooms, master's book-

room, latrines, &c.; the upper story contains the girls' school-room, the same size as the boys', three class-rooms, cloak-room, latrines, &c. One large upper class-room is devoted to a separate department for the younger boys. A stone staircase leads to this upper story. There are separate playgrounds for the boys and girls, the former having a gymnasium. All the offices are contained within the main building, and are approached from lobbies on the staircase. Thus any exposure to wet or snow, after the children have once entered the school, is rendered unnecessary, and the tramping in of dirt or snow avoided. While the departments for boys and girls are quite distinct—the entrances, even, being from different streets—there is for the managers, and on special occasions internal communication. The upper room opens to the roof, and from it are suspended four gaslight coronas. The material of which the schools are built is bright red brick, with Yorkshire stone dressings. The walls internally are lined, to a height of 11 yard from the floor, with white glazed tiles, finished on the top with an ornamental band of encaustic tiling, containing Shaksperian mottoes. There is a skirting of black tile next the floor, running all round. The brickwork above is coloured buff, with pink round the windows. Over the fireplaces in the two school-rooms are panels of a large size, which are to be occupied by paintings in oil, representing "Caxton in Westminster Abbey," and "Palissy, the potter." The internal doors are panelled with framing. The glass generally is thick partially-obscured plate; but the tracery and some other parts of the windows contain a little coloured glass, arranged in patterns—in some cases, a sort of flower on a diapered ground. The outline of the building, as it stands on the ground is very simple, hardly breaking out at all beyond the lines of a simple parallelogram. There is enough variety to prevent stiffness. The elevation facing Devonshire-street has three centre gables, with pointed windows, flanked on each side by a smaller one. The principal entrance is by an arched gateway from Devonshire-street, and the main door faces Hyde-road. It is a simple stone moulded doorway, with a gabled projecting canopy, supported on corbels. In the gable above the door is a sex-foiled circle, filled with ornamental glazing. There are massive chimney stacks of moulded brick, relieved with stone strings and other dressings. In the centre of the main roof is the belfry and spirelet, covered with green slates. There are also a few green slates in the roofing. The boundary walls are surmounted by a light iron cresting, and the gates, which are of wrought-iron (that to Devonshire-street being the most ornate), are not easy to climb. There is accommodation for 430 children. The contractors were Messrs. J. Robinson & Son, of Hyde.

Miles Platting (Manchester).—St. Luke's Schools, Miles Platting, have been opened. The upper room, which is about 18 yards long by 10 yards wide, and lofty in proportion, has temporary fittings suitable for the Church of England ritual. The building is approached from the Oldham-road, through Albion-street. The outline of the new building is a parallelogram, simply treated, with recessed windows, and doors with splayed jambs, from which spring moulded and recessed arches. The heads of the doorways are occupied by a kind of diapered brickwork. A good deal of variety is obtained by the mezzanine stories at the ends of the building, the windows of which, differing in size, height, shape, and treatment from the regular schoolroom windows, indicate the arrangement within and aid the external effect. The straight line of the two long fronts is interrupted by four large gables over the arched heads of the schoolroom windows. Above, there are three large dormer ventilators in the roof. The fireplaces are so grouped as to gather into two chimney-stacks. From the centre of the main roof rise the belfry and clock-turret, the lower part of which is square in outline and slated. The stage above contains the four clock-faces. Above this is the bell-chamber, with twelve arched openings. At the corners are three wooden pinnacles. Each of the cardinal faces is gabled. The whole is covered with an octagonal spirelet, roofed with green slates, and surmounted by a simple metal cross. There are brick cornices in the eaves, gables, and elsewhere; and round the building, at the level of the upper floor, is a brick string, with encaustic tiles at intervals. The iron holdfasts to the water-pipes, the door-hinges, the air-gratings,

&c., simple as they are, have all been specially designed and adapted to the building. The schools will accommodate 516 children,—boys, girls, and infants. On the ground floor are the infant schoolroom, 53 ft. by 30 ft.; class-room, 24 ft. by 15 ft. 6 in.; and separate offices within the building, at both ends. The boys and girls have separate stone staircases leading to the schoolrooms above. These rooms are each 26 ft. 6 in. by 30 ft., or convertible into one large room. In the basement there is a kitchen, with full appliances for tea-parties, &c. The schools are fitted with Richardson's convertible fittings, which can in a few minutes be changed from desks and benches, suitable for day-school purposes, into tables for tea parties, or into forms with backs for the Sunday-school or public meetings. There are playgrounds unusually large for a town neighbourhood, though not at all too large for their purpose. This is through the liberality of the dean and chapter, who gave the site. The building is of red bricks, with dressings of stock bricks, in arches, bands, the tympana of the doors, &c., and a little stone, but not any white, black, or blue brick. There are spacious stone staircases, lobbies, and entrances. The external walls are 2 ft. 3 in. in thickness, with a cavity for warmth and dryness. The glass is thick and strong, to provide against stone-throwing. The internal walls are painted to a height of a yard and a half, and coloured above. The contracts for foundations and for the completed building amounted in all to about 2,400l., and the building has been finished for a sum within the contract. Messrs. Medland & Henry Taylor were the architects, and the contractors Messrs. Rotherford & Darabrough.

FROM SCOTLAND.

Forres.—The new United Presbyterian Church of Forres is now finished and opened for public worship. The ground-plan covers an area of 80 ft. by 62 ft. in extent, and is an oblong square, with nave, transepts, and side aisles. The north gable, the facade of the building, fronts the High-street. There are two square porches of entry at each side, approached by several steps, and finished with ornamented parapets and centre turrets. On either hand is a pinnacle, rising the entire height of the roof, and on the apex of the gable, which is enriched with open-work, there is an Ionic cross. The window in this north gable is proportioned after the model of one of the chapter-house windows of Elgin Cathedral. It measures 25 ft. by 12 ft., and is divided into five lights and flowing tracery at the top, which is filled in with stained glass. The lower lights are filled with cathedral glass, with floriated coloured borders. The clerestory windows are gabled over the roof, and set off with ornamented finials. In the south gable, immediately over the platform, is a rose-window, 13 ft. in diameter, divided into compartments, in flamboyant tracery. This window is filled in, by Messrs. Heaton, Butler, & Bayne, of London, with stained glass, in the style of the fourteenth century, five of the centre openings containing figures of angels in the attitude of adoration. The large west transept window, composed architecturally of four upright compartments, terminating in an arch, with flowing tracery, is filled by Messrs. Ballantine & Son, Edinburgh, with stained glass. These compartments are occupied with figures of the four Evangelists, and the other portions are filled with ornamentation. Along the aisles are a series of small lancet lights, which have been filled with memorial stained glass by various persons connected with the congregation. The prevailing ground-work is of a light silvery grey, dispersed with various designs. Each light is surrounded with a narrow foliated border, executed in colours, and has a centrepiece of a scroll with a Scriptural text. The ornamental plaster-work, capitals, and embossing of the intersections of the aisle-roofs were by Mr. Adam Ross, after Goodwillie's designs. The heating and gasfitting were by Mr. Taylor. Mr. Rhind, of Inverness, was the architect.

Salted Wood.—In the *Polytechnisches Journal* von Dingler for October, Dr. Dingler states that wood, impregnated with a strong solution of common salt, resists decay, and answers well for underground work in mines and coal-pits.

PROVINCIAL NEWS.

New Swindon.—The 11th Wilts drill-hall and gymnasium has been opened. The new building, which is of dark blue stone, with freestone quoins and dressings, is situated in the north-west corner of the cricket-field or park. Being set back about 20 ft. the building admits of a series of three entrance-gates and iron palisades being placed in front, inclosing a pitched entrance with flower-gardens on either side. In front, the building consists of a large entrance-hall, which is approached through a pair of large folding doors, the drill-hall opening immediately from the entrance-hall. On either side of the entrance-hall there are orderly-rooms, on the right-hand side for the officers, and on the left for the sergeants. Forming wings to the centre building, there are two dwelling-houses for the officers in charge of the building. The drill-hall itself, which corresponds in width with the front building, is 80 ft. wide, by 100 ft. long. Externally the walls are of the same material as the front, the inside wall-lining being of brick limewashed. The whole of the space—8,000 square feet—is covered by two roofs, the top portions of which are of glass, and by means of which light is obtained. The gutter between these roofs is supported by two iron bressumers, the ends of which rest on the top of an iron column fixed in the centre of the room. The existence of this column is an objection to the room; but it was considered advisable to have some such support to a roof 80 ft. by 100 ft. The floor, which is raised several feet from the level of the surrounding ground, is of wood. The roofs are left open with the various iron girders showing. The Great Western Railway Company provided a share of the cost, and receive a yearly rent of 20l. for the building; but whether that converts it into the company's property may be a question.

Bradford.—The foundation-stone of a new workhouse for the Wharfedale Union has been laid at Newall, near Otley. The site is about a mile from Otley, and cost 600l. The extent of the site and union grounds will be about six acres. The new workhouse, offices, and out-buildings, are to cost about 10,000l. The architects are Messrs. G. S. & A. J. Nelson, Leeds, their plans having been selected from twenty competitors. The style of architecture is of the general plan consists of an entrance block—comprising offices, board-room, vagrant and probationers' wards—lying parallel with the road. Behind this there is the workhouse, and still further in the rear, and entirely separated from the rest of the building, is the infirmary. To the east will be situated the stabling accommodation. In the new workhouse accommodation will be provided for about 100 paupers, and in the infirmary there will be room for about 40 patients. This calculation is exclusive of accommodation for vagrants. The buildings will be of local stone, lined with brick. Provision has been made for the future addition of wards in which to treat infectious diseases.

Dorking.—The foundation-stone of the new public hall for Dorking has been laid by Mr. Cubitt, M.P. The architect is Mr. C. H. Driver, and the contractor Mr. W. Shearburn. The trowel with which the lime was not laid is to be forwarded to Mr. Cubitt, as it was not forthcoming at the ceremony.

Rusholme.—St. Mary's Home for Female Penitents, Rusholme, the foundation-stone of which was laid last May, has been formally opened by the Bishop of Manchester. The building is situated in its own grounds in Dickinson-road, Rusholme. It consists of two floors, the lower containing the day-rooms, and the upper the bedrooms. The dormitories for the inmates are two in number, one containing eighteen beds and the other ten; the larger one is provided with two large stoves, and the smaller one with one stove. At the east end of the building is a small chapel, with a chaplain's room adjoining. Several of the windows of the chapel have been filled in with stained glass, while the aisles and altar space have been laid with encaustic tiles. The glass has been done by Messrs. Lavers, Barrand, & Westlake, of London and Manchester, and represents the Crucifixion (in the triple east window), and SS. James and Andrew, the Good Shepherd, and the "Noli me tangere." The staircase window, which forms the central feature in the front elevation, is also filled in with stained glass, arranged in geometrical patterns, and the gable over it is terminated with a wrought-iron terminal. Adjoining the laundry is a drying-stove, while the washhouse

will be fitted up with all the latest improvements. The buildings are of brick, the front being finished with "white headers," with stone dressings to the main entrance and staircase gable. The roofs are covered with slates of two tints, and are finished with red ridge tiles. The total cost of the buildings and boundary walls is about 3,000l., exclusive of gifts. Mr. George Napier was the general contractor for the work, the sub-contractors being Hodgkinson (brick-work), Fleetwood & Co. (gas-fitting), Nickson (plastering), Barrow (slating), Leigh (heating); and the whole has been carried out under the superintendence of Mr. John Lowe, architect, Manchester.

Gainsborough.—The new Temperance Hall has now so far approached completion that it is about to be formally opened. The large room is capable of seating between 700 and 800 persons, and is suited for the holding of public meetings, entertainments, &c. The edifice is of brick, but has facings of freestone and coloured tiles, and its situation is central.

Books Received.

The Royal Institution: its Founder and its first Professors. By Dr. BENGE JONES, Honorary Secretary. London: Longmans, Green, & Co. 1871.

This volume recalls some interesting passages in the early history of the Royal Institution, which was founded by Count Rumford, and made celebrated by Sir Humphrey Davy, whose grand discoveries were made in the Royal Institution, as most of our readers know. This history of the earlier years of the Institution includes a life of the founder, because his career and character determined its original form. Then follow brief accounts of the earliest professors, because the spirit that has shown itself in them has up to this time been the life of the Institution. Dr. Garnett and Dr. Thomas Young had comparatively little influence there, because the founder took the most active part in the establishment of his Institution; but when Count Rumford and Sir Joseph Banks had left, and Mr. Bernard and Sir John Hippesley were the leading managers Professor Davy gradually became the main supporter of the place, and to him chiefly it owes the form which it now retains.

During the last half-century the name of Faraday has been so blended with that of the Royal Institution that few people know what Davy made it; and fewer still have heard what Rumford at first intended it to be.

The secretary's account shows that the Institution owes its origin entirely to Rumford, and would certainly have failed but for Davy. Moreover, it shows that before Faraday came there, it had been the home of Dr. Garnett and of Dr. Thomas Young; Dr. Dalton had lodged and lectured for weeks there; Sydney Smith, Cole-ridge, Sir James Smith, Dibbon, Dr. Crotch, Campbell, Landseer, Opie, and Fitzman had also lectured there; Sir Joseph Banks and Mr. Cavendish had been managers, and Dr. Wollaston and Dr. Jenner had been members.

For the life of Sir Humphrey Davy Dr. Jones has met with some new facts in his laboratory note-books. These books give most of his daily work at the time when he was making his great discoveries regarding chemical electricity, the alkalis, and chlorine. He has also had the use of the notes by Faraday of four of the last lectures given by Davy at the Institution. This is the manuscript volume sent to Davy by Faraday when he asked to be employed at the Institution. It consists of 386 small quarto pages. Davy at this time was thirty-three, and Faraday was twenty-one. The one was full of energy to profit by the excellence he could follow, or to shun the evil he could foresee; the other had long reached the climax of his success by his youthful popularity as a lecturer and his early renown as a discoverer; and was about to make a rich and an unsuitable marriage; and before long was to suffer from the restlessness of the failing health that ended in fatal disease.

"Whenever a true comparison between these two nobles of the Institution can be made," says the author, "it will probably be seen that the genius of Davy has been hid by the perfection of Faraday."

Uncomparably superior as Faraday was in unselfishness, exactness, and perseverance, and in many other respects also, yet certainly in originality and in eloquence he was inferior to Davy, and in love of research he was by no means his superior."

Davy, from his earliest energy to his latest

feebleness, loved research; and, notwithstanding his marriage, his temper, and his early death, he first gained for the Royal Institution that great reputation for original discovery which has been and is the foundation of its success.

The work under notice, it must be remembered, is not a history of the Royal Institution down to the present time; but so far as it goes it is full of interest.

Picturesque Architectural Studies. By WILLIAM YOUNG, Architect. Parts 2 and 3. London: Spoon.

MR. YOUNG has issued two more parts of a work we have already alluded to. For some reason not obvious paper of two sizes is issued, which will render binding awkward. The title "Picturesque Architectural Studies," scarcely describes the work, which consists, so far as it goes, of designs for lodges, cottages, and so forth, by the author, some of which have been carried out. Mr. Young in the present parts includes plans and elevations for cottage hospitals. A design for a vicarage-house is not without merit. Mr. Young has a free fancy and a freer pencil. The sketchy style of drawing adopted leads to want of precision.

Experimental Mechanics. A Course of Lectures delivered at the Royal College of Science for Ireland. By ROBT. STAWELL BALL, A.M. London: Macmillan & Co. 1871.

It is easier to learn through the eye than through the ear; and Mr. Ball, having to deliver a course of evening lectures, upon "Experimental Mechanics" to artisans and others unable to attend the ordinary classes at the College, made copious use of experimental illustrations, using for the purpose Professor Willie's admirable system. The well-printed and fully-illustrated book now before us contains these lectures, the illustrations having been drawn from the apparatus. The book is well calculated to open the mind to a knowledge of the mechanical powers: knowledge is conveyed with simplicity and clearness.

Flint. A Paper read before the Geologists' Association. By M. H. JOHNSON, F.G.S. Printed for private circulation. Bacon, Printer, Lewes. This paper was read in June last. It treats of the deposit of flint or silex in chalk, and suggests a theory to explain how sponges, &c., produce the flint nodules in chalk mud. The author proposes to utilise such a process in the arts and manufactures, by coating perishable surfaces with silex while embedded in calcareous or argillaceous mud, with the help of soluble silicates and decomposing organic matters. An engraving is given of a specimen of orbicular silex, the flints having been deposited in concentric circles, the markings of which curiously resemble the concentric circles on the rocks of Northumberland and Argyleshire, as well as the "spectacle ornament," as it has been called, upon the standing stones in Scotland. Still, we are far from suggesting anything like identity. The concentric circled markings on rocks, on the stones at New Grange, on the Scottish and other stones, are associated with other markings more obviously carved, but the coincidence is curious.

VARIORUM.

The Publishers' Circular for December (S. Low) gives particulars of the Christmas books, and makes a bulky pamphlet. The wood engravings, printed as specimens from the various works, show anything but an advance on the part of book illustrators.—*The British Almanac and Companion* for 1872 stands at the head of its like. Amongst the essays in the *Companion*, those on the "Fine Arts at the International Exhibition," by Mr. Arthur Locker, and the "Industrial Results of Photography," by John Plummer, will be read with pleasure. Mr. James Thorne contributes a more than usually interesting resumé of Architectural and Building progress.—*De La Rue's Indelible Diaries and Memorandum Books* have appeared in their usual varieties and luxury of binding. Their *Desk Diary* is a neat book, suitable for library or counting-house. We may add here that Messrs. Thos. De La Rue & Co. have adopted the nine-hours movement, and that this reduction of the working hours originated with the firm themselves.—*Blackwood's Diary*, No. 5, gives a little more room than De La Rue's for each day's entries.—"Everybody's Year Book" (Wyman & Sons) includes much amusement as well as information, and gives illustrations of the Royal Albert Hall, School Boards and Board Schools: Practical

Suggestions. By A. Sonnenschein. Williams & Norgate, Covent-garden. The author of this pamphlet appears to be a teacher, and his remarks are practical, and relate to methods of school-keeping, as connected with the structure of school-rooms and furniture discipline, school-books, aims and methods of teaching, and training and appointment of teachers and inspectors, or examiners.—"The Twenty-seventh Annual Report of the Ragged School Union of London. Society's Offices, 1, Exeter Hall." The direction of charitable subscriptions to foreign needs during the last year has materially retarded the progress of our Ragged Schools; but still they are reported to have held their own; and there is hope that the forthcoming year will be more favourable to their progress.—"The Religion of Health: a Lecture by Dr. Elizabeth Blackwell. Second edition. Partridge & Co., Paternoster-row." This is an able and philosophical as well as practical little threepenny treatise on the divine laws of human development and health, as something more than a merely figurative branch of religious salvation. Dr. Blackwell announces an endeavour that is being made to form a Health Society, and gives her address in reference to it as 6, Barwood-place, Hyde Park.—"Economic One-rail Railway for India, the Colonies and Sparsely-populated Countries. By J. L. Haddon. Stanford, Charing-cross." The author of this project is director of public works at Aleppo, in Syria, and late of the G. I. P. Railway. The scheme is similar to Mr. Samuel's panner railway. Mr. Haddon proposes the construction of a stone wall or a wooden erection (why not also use iron?) along the route, with light locomotives and carriages to run upon a single file of vertical wheels along the top of the structure, the vehicles being at either side, with horizontal wheels, those of the locomotive being made to grip the wall with regulated force. Mr. Haddon states that such lines of light railway could be executed in many cases at from 500l. to 1,000l. a mile, and lighter ones still at 300l. a mile. One of this latter kind is being constructed in Aleppo. Each carriage conveys four passengers, and each wagon $\frac{1}{2}$ of a ton in weight.—"A useful table, in colours, titled 'An Illustration of the Proportionate Patterning and Flesh-forming Qualities of nearly all the Feeding Substances in general Use by Farmers; also the Manurial Value of the Residue from each Article,' has been issued as 'A Supplement to the Agricultural Economist for December, 1871.' It is accompanied by a sheet of relative letter-press.

Miscellaneous.

Restoration of Ragley Hall, Alcester. The mansion called Ragley Hall, near Alcester, which recently came into the possession of the present Marquis of Hartford, has been restored. It was found necessary to take off the roof, and entirely change its construction, adding a new story, with fourteen servants' bedrooms. The old lead and slates were found unfit to remain, and on the new roofs nearly 50 tons of new lead have been laid. A large part of the west front wall was found weak and untrustworthy, and it has been entirely taken down and re-built. In the basement new kitchens, sculleries, and larders have been made, and fitted up with modern appliances. An extensive system of heating by hot water has been carried out by Mr. Gale, of London; and hot and cold water has been laid on in every part of the mansion. The laundry and washhouses are newly fitted; part of the stables are fitted with Barton's ironwork walls, lined with encaustic buff tiles. A new carriage-way has been made from the mansion to the stable-yard, and at every part of this large edifice great improvements are made. Gasworks have also been erected. The entrance hall, which is about 80 ft. long, 45 ft. high, and 40 ft. wide, is full of carving, and ornaments on the walls and ceiling. On all parts of the estate the owner is giving special attention to cottage repairs and improvements. His lordship has given a dinner to the workmen employed under the contractors, Messrs. Clark & Smallwood, of Wooten Wawen. A good portion of the work is complete for the present. Mr. W. Tasker, of London, is the architect.

Marylebone Police Court.—A new police court is to be erected in Marylebone. Her Majesty's Commissioners of Works have under consideration two sites,—one in Chapel-street, near the Edgware-road, and the other in Marylebone-road, adjoining Baker-street Station.

The Serpent Myths of Egypt.—At a meeting of the Victoria Institute last week, Mr. Cooper read a paper on "The Serpent Myths of Ancient Egypt," in which he said that while much has been done for the elucidation of the Ophiology of India, Greece, and Rome by many most able scholars, yet the serpent myths of Egypt—the oldest, most abundant, and best preserved of them all—had been but little attended to since the time of Champollion and Wilkinson. On the Continent, it is true that M. Pierret, Brugsch, and Lenormant had published a few isolated papers upon parts of the legends of hieroglyphy, but these had never been translated into English, and even the originals were but little known. He then described the three serpents peculiar to Egypt, two of which were objects of worship, and with one or other of which all the ideographic theology of Egypt was involved. In the discussion which followed, Mr. Ticombe drew attention to the serpent symbolism existing amongst the rude tribes of North America, and a large Egyptian drawing from a tomb was explained. Mr. Keesam and Dr. Pritchard described the various serpents of India, and the Rev. G. Henslow those found in a fossil state.

Warwick Castle.—The work of clearing the desolated apartments is nearly completed. Workmen are engaged in removing the damaged woodwork from the corridor leading from the great hall to the gilt and other state rooms, and otherwise preparing generally for the repairs shortly to be commenced. The quantity of debris is enormous. Everything is carefully examined, and the exhausted articles assorted and placed in different heaps. They consist of masses of lead, iron, &c., melted by the intense heat; relics of costly furniture, valuable ornaments, broken curiosities, &c. The work of restoration, though expensive, will be far less costly than has been anticipated; and when completed, the castle will only appear to have been thoroughly renovated throughout the private apartments. The exterior will be wholly unaltered. It is understood that the old battle-axes, tomahawks, and ancient weapons of warfare formerly hanging in the corridor, near the great hall, were of great service in wrenching the pictures from the walls and getting them down. But for the fact that they were there, and came handy as crowbars and jemmys, a great deal of the property would not have been saved.

The City Churches.—The Church of St. Mildred's, Poultry, opposite the Mansion House, is closed. The valuable site of 4,000 ft. or 5,000 ft. is now for sale by the Ecclesiastical Commissioners. Part of the proceeds will be appropriated for a church in St. Paul's, Clerkenwell, with 8,000 souls, where the Rev. A. Styleman Herring acts as incumbent. About 1,000 ft. of the site are bought (for a nominal sum) by the Commissioners of Sewers, to enlarge the public road and footway. In addition to St. Mildred's, Poultry, arrangements will in all probability be made for the removal of some other City churches, St. Antholin, Watling-street, and that of St. Martin Outwich, which stands on a valuable site at the junction of Bishopsgate-street and Threadneedle-street. It is proposed to unite it with the vicarage of St. Helen's, Bishopsgate, the Rev. Dr. J. E. Cox, vicar of St. Helen's, being the vicar of the joint parishes. The Church of St. James, Duke's-place, Houndsditch, a locality inhabited almost exclusively by Jews, is to be removed and united with that of St. Catherine Cree, Leadenhall-street.

The Proposed New Royal Mint.—At a meeting of the vestry of the parish of St. Bride, City, the chairman (the Rev. C. Marshall) said the plans and notices of intended application to Parliament relating to the new Mint building site had been deposited with the vestry. The site of the proposed new Mint was at the bottom of Dorset-street, Salisbury-square, facing the Embankment. It was proposed to take the gasworks away. Mr. Patterson said that, in the process of gold-refining nitric acid and muriatic acid were used, and the fumes of these would, if the Mint were erected where proposed, be floating in the atmosphere all over the neighbourhood. It was well known that the neighbourhood of the present Mint was very unhealthy. After some discussion the chairman said he was glad the vestry agreed with him that the Bill should be opposed. The matter was then referred to the Estates Committee, with instructions to watch and oppose the Bill.

Partial Destruction of the Borough-road Schools.—A fire has taken place in the British and Foreign Normal College Schools, Borough-road. Nearly 100 young men were sleeping on the premises at the time. They all escaped, with much difficulty, as the flames spread with amazing rapidity. By the time the engines arrived the conflagration had got beyond all immediate control, and the normal schools were entirely destroyed, together with the young men's effects. The front block of the buildings was saved. Strenuous efforts were being made to enlarge the college and train a greater number of teachers for the new elementary schools. The schools and college were insured. The official report describes the damage done as follows:—A building of five floors, used as kitchen, classrooms, and dormitories, 60 ft., and 15 ft. wide, nearly burnt out, and roof off. Dining-rooms seriously damaged by fire, and rest of front building and contents damaged.

New Vestry Hall, Springfield.—A meeting of the parishioners of Springfield has been held in the vestry at All Saints' Church, the rector, the Rev. Arthur Pearson, in the chair, "for the purpose of receiving plans and estimates for building a vestry and receiving-room." The plans were prepared by Mr. C. Pertwee, architect, Chelmsford. The proposed vestry-room is to be 32 ft. and 21 ft. by 14 ft. in height, and attached thereto is a small yard with out-building and conveniences. The building is to be of red brick and tiled. The tenders for the same were:—Mr. Thorn, 267l.; Mr. Barnard, 266l. 13s.; Mr. Bloomfield, 236l. 4s. 10d. It was agreed that Mr. Pertwee's plans be adopted, and that the tender of Mr. Bloomfield of Springfield, for carrying out the work at 236l. 4s. 10d. be accepted, subject to the approval of the Poor Law Board. Arrangements had been made for the purchase of a piece of land in the village for 71l. 10s.

Appointment of Surveyor to the Liverpool Corporation.—At a recent meeting of the town council, Mr. Pictou moved the following recommendation of the finance committee:—"To appoint Mr. Thomas Sheldermine as surveyor of the corporation during the pleasure of the council, at a salary of 700l. per annum." He said that every possible care had been taken in the selection of Mr. Sheldermine. Although only twenty-nine years of age, he had had great local experience, and had a knowledge of the leasing of property in and about Liverpool. Mr. P. H. Rathbone, moved, as an amendment, that the title of the new officer should be "Land Steward and Surveyor to the Corporation." There was great misunderstanding throughout the country from the fact that the term surveyor was used as synonymous with engineer. Mr. Yates seconded the amendment, which was accepted by Mr. Pictou, and agreed to.

The Crypt in Bruton Church.—During the progress of the work recently undertaken for the restoration of the parish church of Bruton, the workmen accidentally opened a large vault, which was recognized by the sexton as the family vault of the late Lord Berkeley. It appeared from autographs and dates scribbled on the walls to have been opened in 1847, although no interment has taken place in it since 1773. Some gentlemen versed in archaeology pronounce it to be a crypt of beautiful proportions, and of ancient date. It is situated slightly to the north of the middle aisle, and lies partly beneath the chancel, and partly beneath the nave; it is about 30 ft. long by 18 ft. broad, and 8 ft. high. The roof, which is groined and filled in with twigs, is supported by ten octagonal columns—two on each side, and two in the centre. It seems to have formed part of an older church. A crypt beneath a parish church is of unusual occurrence.

Water-Colour Drawings.—With a view to the completion of the collection of water-colour paintings illustrating the history of that art in the South Kensington Museum, Mr. William Smith, Vice-President of the National Portrait Gallery Trustees, has allowed Mr. Redgrave to select from his collection a number of rare specimens to illustrate the early period of this national art, and has presented them to the nation.

Disposal of Land.—On Monday evening, the 18th inst., Mr. Jacob Waley will read a paper at a meeting of the Social Science Association, "On the Devolution, Transfer, and Disposition of Land."

Death of the Eccentric House-owner, of Stamford-street.—For some years past a row of uninhabited houses in Stamford-street, at that end facing the Blackfriars-road, has excited general notice. The houses in question were the property of a Miss Read, who has just died. The cause of the miserable condition of the houses was due, some allege, to an impression prevailing in the neighbourhood that they were "haunted." The deceased lady, who lived in one of the houses, apparently was careless as to its cleanliness, her dwelling being in a miserable state. The windows were covered with accumulated dirt, notwithstanding the valuable articles of virtu she had placed in it.

Vault in the Rock near Lincoln Cathedral. The workmen in rebuilding part of the choir occupied by the cathedral organist, have come upon a large subterranean vault, situated under the children's nursery. It is believed to be an old stone quarry, though it presented to view a well-shaped chamber, 16 ft. long, 10 ft. wide, and 40 ft. in depth. It was covered in with artificial stone, except a good-sized man-hole, which had been fitted with a piece of natural rock. A layer of earth now conceals the quarry from further inspection.

Proposed Public Building for West Vale and Greetland (near Huddersfield).—A crowded public meeting of the inhabitants of West Vale and Greetland has been held, for the purpose of considering the desirability of erecting a public building in West Vale, capable of affording accommodation for a mechanics' institute and newsroom, and in which concerts could be given, and lectures delivered, &c. Mr. James Law was called to the chair, and it was unanimously resolved to proceed with the object in view. A committee was appointed. The probable cost was said to be about 1,500l.

The Breathing of Dust by Workmen.—The Société d'Encouragement of Paris having offered a prize for an invention to protect the cutters of mill-stones from the dust produced in the process, which produces distressing diseases of the lungs, M. Catelliers and a commission have been making a series of experiments on the effects of ventilation. By means of a fire and a tall chimney, a current is produced in the dressing-shop, having a rate of 10 ft. per second, from the men, and it is found that by this simple method all the dust is removed. But the remedy seems to be as bad as the disease, unless the men are to be protected from the draught. Such remedies are not new in this country.

Turning on the Air.—A Washington paper states that among recent improvements at the Capitol are some changes in the ventilation of the Senate Chamber suggested by the experience of last session. It is believed that the entire body of air in the hall can be renewed every five or six minutes without perceptible currents. This register is also arranged for summer use, so that by the turning of a brass cap in each compartment, which can be arranged by each senator to suit himself, a current of cool air can be directed under the desks and into the faces of their occupants.

Disaster to Leith Pier.—Between 800 and 900 yards of the west pier at Leith have been destroyed by fire. The pier, which was to a great extent of wood, was being covered with pitch, when the pot containing the liquid boiled over and set the pier in flames. Four or five fire-engines were got on board steamers, from which they were worked. The fire lasted all day. The communication with the docks was cut off, so that the shipping escaped. The loss is supposed to amount to about 15,000l.

American Diamond Drills.—The machinery employed by Leschot to propel his drill was very imperfect, and the method of fastening the diamonds has been improved by the Americans since the introduction of his invention into the United States. The principle of working the drill through a sleeve, held in position by a brake, has been adopted with advantage, and the American Diamond Drill Company are now taking a large number of orders. It will drill 12 in. per minute in sandstone, and 2 in. per minute in hard blue limestone.

The Literary Fund.—His Majesty the King of the Belgians has graciously consented to preside at the anniversary dinner of the Royal Literary Fund, which will be held in May next.

Gallery of Illustration.—We are very glad to hear that Mr. and Mrs. German Reed have induced Mr. J. R. Planché to supply them with an entertainment for Christmas, under the title of "King Christmas, a Fancy-Full Morality." Mr. Planché's reputation for refined wit and pungent joke has, we hear, been well preserved, for the humour of the novelty is as genial as the season it extols; the dialogue sparkles with *jeu d'esprit*, at the same time that it is easy and flowing. Mr. Corney Grain, too, will bring out a new musical sketch on Boxing-day.

A Park in Southwark.—An effort is now being made to secure the open space in Southwark, familiarly known as Southwark Park, as a permanent recreation-ground for the public. The Bermondsey vestry are taking action in the matter, with the view of obtaining the sanction of the Metropolitan Board of Works to the proposal; and it is expected that the last-named body will comply with the request intended to be made to them to convert the locality into pleasure grounds.

Hampstead Heath.—Anxiety is expressed as to the steps that may be taken by the Metropolitan Board of Works, with a view to having the heath laid out in a worthy manner. We agree with those who think it a fit subject for a competition, but the Board, if they adopt this plan, must manage it better than they did their competition for a fountain, which ended very unsatisfactorily. They should form a proper jury of selection, including in it some professional artists.

Letter-Boxes.—A letter has been written by the Postmaster-General to the Metropolitan Board of Works, calling attention to the expediency, in the coming session of Parliament, of inserting in the Buildings Regulations Bill a clause for the purpose of compelling builders of houses to provide all their tenants with letter-boxes, for the purpose of facilitating the delivery of letters. It is not intended that such compulsion should extend to houses below a certain class.

The New Covered Market, Bradford.—The ornamental facade of the new market in Kirkgate has been uncovered. There is carved masonry over the main entrance. An archway opens into the market, and above that the building rises to a moderate height. Rising from the roof is a sort of belfry, with a compass and weathercock arranged on the top.

Reading Architectural Association.—An essay was read in connexion with this Association, last week, at the Athenaeum, by Mr. Joseph Morris, "On our Parish Churches: their Local and General Interest." There was a good attendance.

New County Court Offices, Durham.—The first clerk of the works was Mr. C. E. Barker. The name given in our recent notice was that of his successor.

TENDERS

For Wesleyan day-schools, Red Hill. Mr. A. Lauder, architect:—

Godard	£1,452 0 0
Cook	1,403 0 0
Sherwood	1,363 0 0
Barnes	1,129 0 0
Russell	1,108 0 0
Taylor	1,040 0 0
Brown	1,025 0 0

For wharf-keeper's house, Fish Quay and Jetty, Low Lights, North Shields, Contract No. 4. Mr. J. P. Spencer, architect:—

Sopwith & Kent	£745 10 0
Campbell	745 0 0
Bolton	730 0 0
Robson (accepted)	680 0 0
Elliott (withdrawn)	665 0 0

For constructing shops, &c., at 2, 3, and 4, Bedford-place, Hastings. Mr. A. Cross, architect:—

Jones	£767 0 0
Geary	723 0 0
Howell	719 0 0
Parks	710 0 0
Vidler	675 0 0
Russell	645 0 0

For erection of new parochial schools and teachers' residence, St. Andrew's, Hastings, for the Misses Sayer. Messrs. B. Habershon & Brock, architects:—

Rodda	£2,728 0 0
Nightingale	2,666 0 0
Woods	2,600 0 0
Brigland	2,493 0 0
Avis & Roe	2,375 0 0
Catt	2,335 0 0
Howell	2,247 0 0
Vidler	2,212 0 0
Parkes	2,123 0 0
Hughes	2,140 0 0

For house for Mr. W. Brooks, Wisbaw. Mr. W. Swift, architect. Quantities by Messrs. T. C. & J. P. Sharp:—

Briley	£1,180 0 0
Langley (Walmley Ash)	1,168 0 0
Claxson & Son	1,120 0 0
Langley (Munro)	1,087 0 0
Townsend (accepted)	1,025 0 0

For alterations at 117, Newgate-street, for dining-rooms. Mr. J. H. Rowley, architect:—

Nind	£1,171 0 0
Crabb	1,125 0 0
Kilby	947 0 0
Newman & Mann	863 0 0
Heaps (accepted)	827 0 0

For new meeting-house for the Society of Friends, Colchester. Mr. H. Baker, architect:—

Dobson	£1,574 0 0
Lee	1,676 15 0
Brown (accepted)	1,570 0 0

For alterations to No. 90, Fenchurch-street, for Messrs. Cassell, Smith, & Co. Mr. E. H. Horne, architect:—

Sparks	£2,150 0 0
Brass	2,076 0 0
Hill, Keddell, & Waldram	2,060 0 0
Wicks, Bangs, & Co.	1,892 0 0
Eaton & Chapman	1,886 0 0
Scrivenor & White	1,963 0 0
Williams & Son	1,847 0 0
Sewall & Son	1,644 0 0
Foster (accepted)	1,574 0 0

TO CORRESPONDENTS.

H. E. H.—H. de A.—F. C.—Capt. J.—T. D.—J. L.—R. F.—Nemo.—Rev. W. N.—C. C.—R.—C. I. R.—E. L. T.—H. C.—F. C.—J. G.—Dr. E. R.—C. C.—R.—Messrs. H.—A. R.—H. & E. F.—A. D.—W. & G.—W. R.—A. O.—H.—R.—A. D.—J. R.—T. L. T. S.—"Bauzit" (some correspondents ask where samples can be obtained).—F. G. B. (an advertisement in the *Builder* would certainly reach them).—Landlord and tenant (a type).—We are compelled to decline putting out books and giving addresses.

All statements of facts, lists of Tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication. Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

NOTICE TO SUBSCRIBERS.

Advertisements cannot be received for the current week's issue later than **THREE o'clock, p.m., on THURSDAY.**

Bath and Other Building Stones of Best Quality.—**RANDELL, SAUNDERS, & CO. Limited,** Quarriesmen and Stone Merchants. List of Prices at the Quarries and Depôts, also Cost of Transit to any part of the United Kingdom furnished on application to Bath Stone Office, Corsham, Wilts.—[ADVT.]

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Turret Clocks.—Mr. Streeter, 37, Conduit-street, London, W., Manufacturer of Turret Clocks (with gravity or dead-beat escapement) for Churches and Public Buildings. Estimates and plans on application. Price.—Village clocks, from 15l.; church clocks, from 40l. The wheel-work throughout these clocks is of best hard brass or gun-metal. No iron wheels used. Timekeeping and durability guaranteed. Wholesale Entrance—Burlington Steam Works.[ADVT.]

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The Builder.

VOL. XXIX.—No. 1507.

The Choice of a Dwelling.



ROBABLY, if a dozen works on the choice and construction of dwellings were to be published at the same instant, they would all find a welcome from the public, for it is a matter that comes home to everybody; but the work now before us* has a separate interest, which must place it apart in the general estimation. It is noticeable as the result of American experience applied to English buildings and materials; for the author has practised more in America than in England, and his book shows as many American houses as London dwellings. This is no drawback; for, on the principle that two heads are better than one, experience gained on both sides of the "big water" must be worth heeding. At all events, few compilations could be plainer, clearer, or more concise than Mr. Wheeler's directions how to proceed to choose or build a house. Much of what can be said upon the subject has already been said; but to this he has added more, and so divided and docketed, as it were, his advice and information, that the issue is a very compact and suggestive manual. It is intended for the general public, rather than for the professional student; but the office-shelves of architects would be all the more complete for its presence.

Looking to the chief points of difference between a New York house and one in any of the best new streets or squares in London, we note there is greater depth in the former; the dining-rooms occupy the position of our front kitchens, leaving the chief floor, therefore, exclusively for reception-rooms, or drawing-rooms, and "extension" or tea-rooms; and below the basement-floor there is collage for the warming apparatus, ice-closets, larders, and storerooms. These points are the result of local circumstances; the comparatively moderate value of land in the new city, which gives 100 ft. in depth to a frontage of 25 ft.; the scarcity of domestic servants, which causes need of labour to be diminished as much as possible; and the extremes of the climate, calling for ice in summer and heat in winter, to make existence enjoyable. The verandah is another result of the climate. Mr. Wheeler's plans show verandahs to the back drawing-rooms, or tea-rooms, as they are called. They are constructed with close panelling, as high as ordinary window-openings, and they may be quite closed in by the lowering of Venetian blinds

arranged to work in grooves in the pillars that support the roofs. This, on sultry evenings, would give very considerable additional space for company proceedings. The London drawing-room, or first-floor, in New York, is devoted to bed-chambers, toilet-rooms, and so on. With these exceptions, the rules and advice that apply to the one citizen about to buy or build are equally appropriate for the other.

Before turning from the New York houses, however, we must mention the writer's treatment of one of the basement dining-rooms. He has made it octagonal; and this he thinks is an improvement, because it leaves more space for the entrance from the street. The principal doorway is on a level with the principal floor by means of flights of steps; consequently this lower one is only used by the tradespeople and servants; but it is a matter for consideration whether the adoption of this form of room for the front parlour in small English houses would be a slightly cure for the narrow, mean entrance-passages with which they are now constructed.

Mr. Wheeler thinks that London houses, intended for healthy, substantial residences, should be built in pairs; not so thoroughly apart, perhaps, as our semi-detached villas, but with as much as 6 ft. of space between each pair. This arrangement would lessen danger from fire, permit side-lights to central rooms, ensure ventilation, and allow of more architectural effects than can be obtained from a continuous row of houses, he contends. The plan furnished to illustrate this idea shows the front room on the ground-floor treated in the octagonal manner mentioned above. The canted angle nearest the street-door leaves room for a small window to light the entrance-passage. At the end of this passage ascends the principal staircase, which is lighted by a dome on the roof. It must be explained that the two doorways of the houses adjoin, and are in the centre of the principal front. The staircases are, therefore, on either side of the central party wall. The front octagonal room is intended for the library. Immediately behind it is a gentleman's toilet-room. Behind this again is the butler's pantry, with stairs to the basement floor; and in the rear of all, extending the full width of the house, with a circular window abutting into the rear garden or court, is the dining-room. The first floor of such a house would have a front and back drawing-room, with a room between them, also provided with a fireplace and windows, and which could be thrown into one suite for receptions. On the upper floors the side spaces would admit of ample light to all the bed-chambers. The drains, too, are more accessible where there is a space left between pairs of houses, for the pipes can be laid in these side areas, and all the house-drains, soil, and waste-pipes conducted into them. "In erecting such houses," says Mr. Wheeler, properly, "the upright pipe, for relief of the head of the drain from pent-up gases, and the discharge-pipe from the soil-pipes, should by no means be lost sight of."

The little back-gardens of London suburban houses are voted unwise. All such harbours of damp should be paved and drained, and recourse had to shrubs and flowers in boxes and pots for ornamental effects. Many an inconvenient and insufficient London house might be improved by the sacrifice of part of these undesirable possessions. We are shown a plan in which, without disturbing the front part of a house, the frequent small back room on a ground-floor is extended into a fine, cheerful dining-room, and large bed-chambers, all lighted, are obtained on the upper floors. As this is supposed to be in a continuous row of houses, there would be none other than borrowed light for the central rooms, between those looking front and those looking back, but for a contrivance, which is to form a well or recess on one side of the house, at this central point, from the roof down to the ceiling of the

rooms on the ground-floor; but we are bound to say that the allowance of light thus obtained would be but scanty. But whether to admit of improvements to existing houses, or in the laying out of new plots, Mr. Wheeler would banish the scrap of garden mould or turf, and give in its place a paved court, brightened with vases, boxes, and pots of greenery. He is not averse, however, to the addition of a conservatory to a house; nor has he passed over the subject of a winter garden, though how the construction of such a large object bears on the choice of a dwelling we do not exactly see. Mr. Robinson's enthusiastic advocacy of the culture of "hardy flowers and Alpine plants" in all possible localities may, however, have had some share in the introduction of the topic.

In the matter of choice of site we are surprised to see the following remark:—"One good thing about a clay soil is, as an old digger used to say, 'you know your worst,' for the bed once reached, there are certain indications to show a builder its character, and to let him know how far its stability and depth may be relied upon." Surely, the experience of the old digger in question is of a very exceptional kind. The tenor of professional experience runs in an exactly opposite direction, and it is extremely difficult to take precautions that will counteract all the contingencies that may arise when building on clay. There can be but few professional experiences that are not stored with memories of the treachery of clay.

There is another remark in the next section of the work that we can endorse more unreservedly. After describing the different kinds of stone available for building purposes, deploring the general ignorance upon the order of their respective excellence, and the scant amount of information yielded by the Geological Museum, Mr. Wheeler asserts,—"What is wanted is the appointment of a special commission of competent men, consisting of an engineer, an architect, geologist, chemist, sculptor, builder, and stonemason, with special powers to examine thoroughly all the sources of supply, and then draw up a careful comprehensive report, such as the French Government recently made by their chief engineer." Such a commission could, doubtless, do the State some service, should the undertaking of public buildings on a large scale warrant the cost of its services. But there would have to be more than one mason. Each of the stone districts should be represented by one; for the mason of one locality cannot work, much less judge, the stone of another. To buyers of ready-built houses a year's occupancy is advised before purchase, that defects may be ascertained in good time. Houses that have stood unlet for some time are to be regarded with scrutiny, and neighbourhoods where there are many such long unlet houses carefully examined before chosen. Those who build for themselves have plenty of excellent advice as to points to be secured and errors to be avoided. The best local materials are recommended for use; the style is allowed to be chosen by its accordance with the site and the position of the person building; the assistance of an architect is advised; non-interference with the design after building operations have commenced is insisted upon, and the most careful deliberation recommended to be given beforehand; payment of the architect for a second set of drawings, which are to belong to the employer, is urged; and, in fact, every reminder is made that is likely to bring to a successful issue the preparation of a dwelling. So completely is the client initiated in the value of the services of an architect, as the means of keeping him out of pitfalls, that the professional man could place no better book in the hands of any one about to build.

Most of the houses with which Mr. Wheeler deals are handsome, costly residences in London and New York, or still larger mansions in the

* "The Choice of a Dwelling: a practical Handbook of useful information on all points connected with Hiring, Buying, or Building a House, with its Stables and Garden Outbuildings." By Gervase Wheeler, Architect. With plans and views. London: John Murray, Albemarle-street, 1871.

suburbs of both cities, but he makes an exception in favour of a class of house to be built for as small a sum as 500*l.*, suitable for summer quarters. Many would build themselves small, picturesque houses, for the shooting and fishing seasons, in beautiful and healthy districts, if they found that the outside of the cost would not exceed this sum, he thinks; and he shows a pleasant-looking little place containing sitting and dining rooms, with two bedrooms and a dressing-closet over them, and kitchen and servants' rooms in the rear, which has been erected in a "romantic situation" for less than the money mentioned. There is no plastering for the summer season only is borne in mind. The underside of the floors is planed and polished; the walls of the best rooms are covered with canvas from base to ceiling, on which hangings are suspended when in use; those of the kitchen and offices lined with narrow boarding; and all woodwork is oiled and varnished, instead of painted. "Half an acre of land," the author affirms, thinking of the annual exodus from London, "in a healthy and accessible site, near enough to a farm for all supplies of food, and in the midst of attractive scenery, or within reach of the sea, perhaps in a neighbourhood affording sport for rod and gun, would be the requisites to be sought for, and could be found readily at a small outlay." A country parsonage is another variety of dwelling treated. A plan is provided carrying out the author's opinions concerning the requisites of such a dwelling. A parsonage-house should be able to accommodate an "unexpected number of occasional guests," besides the numerous parishioners of various grades who may wish to consult the clergyman, we are informed: hence we are not surprised to see a wide roomy plan, with about a dozen divisions on it, and a dozen chambers on the floor above it. On the left of the centre of the broad broken front is a large hall, which, bearing the unexpected number of guests in mind, is, perhaps, not too large, though it is 21 ft. by 18 ft.; opening out of this are the four chief apartments,—drawing-room, with a bay window; morning room, with a conservatory abutting from it; dining-room, with rectangular bay and a serving-room adjoining it; and the library, with a circular reading room, which is the base of a turret to be carried up above the roof. In the rear of the library, with a separate entrance from the grounds, is the room in which the homelier parishioners are to be received. Opening out of the hall, too, is a corridor, dividing the other side of the house, from which it is easy to step into the kitchen, scullery, larder, servants' hall, or into the one bedroom placed near the back entrance of the house, for a man-servant, for protection, and convenience. A charming place for a young curate to dream about, surely. But there is no need to wait for the exceptional luck of the gift of a living rich enough to maintain such an establishment, and yet, curiously, unprovided with a parsonage-house; for Mr. Wheeler allows that the same arrangements would answer equally well for any English country gentleman. The Ecclesiastical Commissioners wisely place a limit upon the expenditure upon English parsonage-houses, which boundary-line Mr. Wheeler would have to take into consideration.

After descending upon matters applicable to all houses, such as site, soil, drainage, water-supply, and materials, Mr. Wheeler, as we have hinted, admits the possibility of advice being required in the smaller matters of buying a house and of renting one, and gives it sensibly; but he quickly passes on to the real gist of his book, which is, how to build a residence. He explains how to estimate the cost by cubic foot, the square, and quantities, and gives the quaint advice to the employer to be ready with his money directly it is due. The several parts of a house are described, and their decoration and furniture discussed. Finally, outdoor adjuncts are treated, such as stables, approaches, the dairy, garden out-buildings. It is in this section that we come upon the winter garden.

As we close the book, and turn from its alternate references to New and Old England, we feel it is a gain.

Newcastle-on-Tyne School Board.—Mr. Thomas Oliver (Newcastle), Mr. R. J. Johnson (Newcastle), and Mr. F. R. N. Haswell have been appointed the architects to the Newcastle-on-Tyne School Board.

SOCIAL PROGRESS AND SOCIAL SCIENCE.

NOTWITHSTANDING all that has been written, we constantly hear questionings as to the meaning of the term Social Science. The gathering of those earnest men who strive to rescue from the province of vague and uncertain opinions, and to place on the firm basis of understood fact, many of the most pressing problems of civilisation, is apt to provoke not only the sneers of the unthinking, but the more definite hostility of those who regard what we commonly term politics as the great subject of study. The difference between the social laws which the members of the Association that lately met in Leeds, endeavoured to discover and apply, and the political questions that occupy the main attention of the Legislature, and fill the columns of the daily press, is indeed wide and profound. Personal and party questions have no room in the realms of science, while they form the main attractions to the politician. But the effecting of what is called a political reform; the enacting of some great measure, causes arising under which will occupy our Courts of Justice for years before the actual relation of the new law to the great body of our uncertain legal decisions can be ascertained; or the seizure of the reigns of Government by party A or party B, is as nothing in the progress of mankind, to the establishment of a single instance of those natural laws affecting the well-being of mankind, at which it is the object of the social philosopher to arrive.

We may so far agree with the French philosopher Comte, as to hold that the maturity of Social Science is lost in the distant future—that even the very outline of the subject has yet to be delineated; and yet, at the same time, may believe that there are many details and branches of the study in which we already can not only collect and co-ordinate facts, but can attain a very considerable amount of certitude in dealing with co-ordinated results.

The trading politician, or the unthinking many who form what they call their opinions from the utterances of such politicians, are the natural, if not the most formidable, assailants of the social philosopher. He has another class of opponents who will also long give him trouble, as knowing that, if his views be established, their own extinction must follow. We refer to that very numerous group of persons who not only are content to sit with their hands crossed, but who eagerly denounce those who are more hopeful than themselves, on what they erroneously state to be religious grounds. Misery, they tell us, is the deserved and necessary lot of mankind. Any effort, then, to show that, misery is the offspring of ignorance, and that the light of truth, in dispelling the latter, will greatly diminish the former, they stigmatise as profane. Reasoners, or rather speakers and writers, of this class are to be found to oppose every great step ever taken to benefit mankind. The greatest boon, in the opinion of many, ever given to our race was the discovery of Jenner. Nothing has been more fiercely opposed by those who see the propriety of their neighbours submitting quietly to suffering than the endeavour to render vaccination compulsory. In the same way,—we can hardly find patience to state the fact with due composure,—the application of anæsthetic remedies has been attacked, on the ground that pain is the proper consequence of sin, and that it is impious to attempt to evade the curse. Thus was Franklin accused of impiety, when he drew down the electric fluid from the clouds. Again, measures which, if rigidly followed out, would go far to extirpate diseases that form the most fatal scourge of modern times, are the objects of an hostility, on the part of persons who term themselves religious, which passes not only the bounds of ordinary political opposition, but those of public decency.

At all periods of human history down to our own, not only has the area of human science been held to be definitely limited, but persons have shown great alacrity in pointing out those limits, shifting as they have ever proved to be. The fate of Galileo is only one example of the mode in which the majority,—that is to say, the worst part,—of mankind, have welcomed their chief benefactors.

The assumption that any cause or any form of human evil is irremovable is absurd; that it is, to say, it is unscientific and unphilosophical. It is at least as wrong as the assumption of the reverse. The spirit of unbiassed inquiry into fact is the only spirit consistent with the love of truth,—the only intelligent homage to the source

of truth. Many objects, once regarded as entirely hopeless, have been triumphantly achieved, when the hour and the man arrived. Those, then, are the enemies of humanity who bid us to sit down despondently, or even contentedly, in the presence of any form of disease, physical, moral, or mental. To assume the perfectibility, or the indefinite progress of the race, is unphilosophical. To attach the hopes of such perfectibility to the spread of the doctrines of any existing schools, is simply childish. But to think to stop where we are, is even worse. Change, which means progress in one direction or in another, is the law of the Aryan races. Whether the direction be the right one or not, it behoves us all to consider. We may guide the movement; we are powerless to arrest it.

It may be that, as the apparent motion of the planets is now direct, now retrograde, as observed from the flying standpoint of the earth, while all the heavenly orbs are actually moving in the same rapid and unbroken course around the radiant centre of our system, so may the apparent misfortunes and disasters through which our own and other countries pass from time to time, be in reality but changing phases of a steady and determined progress. But those who have travelled in the east, or even in many parts of Europe—nay, those who have visited the gigantic relics of a high and utterly forgotten civilisation to be found at Avebury, at Stonehenge, at Karnac, in Bretagne, and on so many other spots now deserted, can never feel quite at ease as to the certitude of a brilliant future. Nations have so passed away that their memory has perished with them. And there are many reasons, physiological as well as intellectual, to support the opinion of those who hold that some families of the Anglo-Saxon race are verging towards decrepitude.

All laws, and almost all religions, are founded on the axiom that the highest duty of man is that which he owes to his race. Crimes tending to the extinction of individual life, or, still more, those which tend to the arrest of race, or to the destruction of national organisation, have been always those visited by the severest penalties. At the point in civilisation at which we have now arrived, the investigation of the laws that regulate the welfare of man as a social being, with a view to practical results, has become an integral part of the duty of the guides of thought. The subject must be approached with the dispassionate love of truth. What may be the result obtained by such inquiries, in each portion of the wide field of inquiry, it is idle, and worse than idle, to attempt to anticipate. One thing is a very certain outcome of the experience of the past; and that is, that very frequently, if not most frequently, light is shed on the darkest questions from an entirely unexpected source. Such is the unity of truth, and such the power of philosophical investigation, that an apparent anomaly in one department of science often proves the key to the most brilliant discoveries in another.

There is no more remarkable illustration of this unity of scientific truth than occurs in the study of the laws of health and disease. No subject has a more permanent human interest, or an interest which, at one time or another, more certainly and more pointedly comes home to every one of us. The care of our health has been committed, in the gradual upgrowth of society, to a body of men who yield to none among us,—to none whom the world ever saw,—in patient study, in cultured intelligence, and in unselfish devotion to their pursuit. We know the history of medicine for more than two thousand years. We know the change of opinion, as to the nature of disease, that has accompanied the advance of general knowledge. We can look back to the time when disease was attributed, as it is now among the Esquimaux and other wild tribes, to demoniacal possession, or agency. Passing from the supernatural stage—the most hopeless, as it is the least self-helping of all—disease came to be considered as a sort of separate entity, or rather group of entities. It was said that, in each instance, it must have its course. It was attacked, and is to this hour attacked in Italy, by the "Laws of Art." The sufferer, truly called the patient, has been almost left out of sight. It was not his temperament or condition that was regarded as the object of the study of the practitioners, but the nature, the name, and the formal treatment of a definite disease. It was this that was attacked by the lancet, and by the use of drugs, so powerful in their operation, that they were expected to kill the disease, and very often did kill, and do kill, the patient. It was thus that the

counsels of Europe were robbed, when the loss could least be afforded, of the wisdom of Cavour. Sir James Hudson, in whose arms the great Italian minister died, in vain pleaded that the advice of an English physician should be taken. Such, the friends of the murdered count replied, was not the custom of the *Casa Cavour*. So the Italian men of art had their way. They attacked the fever, brought on by toil and anxiety, with the lancet. Seventeen times did they use it. What would have been the verdict of an English jury?

From the supernatural, through the metaphysical, stage, medical science has advanced to the positive. It is the patient we now regard, not the abstract and intangible evil from which he suffers. Loss of vital energy—not excess of vital energy—is now known to be the cause of fever. The specific action of many remedies is also much better known than was formerly the case. In diagnosis of disease, and in knowledge of the *materia medica*, we are far advanced beyond the time of Galen. Yet any enlightened physician will deplore the want of an equal advance in the science of therapeutics—the real aim and knot of his study.

On this ancient, time-honoured, and difficult study who would have expected that light should be thrown by the labours of the engineer, the surveyor, or the builder? Yet so it is. We have little doubt that the most important contributions that have ever been made to the practical knowledge of therapeutics have been the statistic records of sanitary measures; and it will be observed that we do not speak alone of measures adopted for a direct sanitary purpose. The incidental advantages, for instance, of the introduction of a well-organised system of sewerage into a large town have sometimes even exceeded the direct advantages. We have learned by experience that while certain diseases, such as fever, are intolerant of uncleanness, no amount of delicate care in this respect seems to affect the progress of others. But the dampness or dryness of the soil is with them the efficient cause of decline or of recovery. The drying-up of subterranean deposits of water, in pot-holes of sand or gravel, one of the most capriciously local, is also proved to be one of the most dangerously fertile, seed-beds of death. The cure of phthisis depends almost implicitly on dryness of soil. There is another or greater fact, the importance of which it is hard to exaggerate, which has been revealed to the students of medicine by the painstaking men who have sought to form maps of the locality of disease.

It is probably the case that sanitary questions are those, out of all matters discussed at Leeds, on which we are now in possession of the most definite knowledge, and as to which, there can be no doubt, imperative legislation is a duty of any civilised State. The amount of dull obstinateness that sanitary reformers have to encounter affords ample proof of the necessity of educating ordinary Englishmen in those rudiments of social knowledge. Some other subjects of discussion, on the other hand, are as yet unripe for anything approaching to scientific treatment. In fact, an easy laugh is raised at the expense of such gatherings as that of the present year, by describing them as occasions for the public airing of hobbies. We are willing to accept the phrase. The hobby is a creature of extremely prolific vigour, and the race is not likely to die out among us. While frequently idle or worthless, it is yet indisputable that the hobby has won the most important prizes in the industrial race. We owe the excellence of our mail-coach roads, as we have before had occasion to remark, entirely, in the first instance, to a hobby of Mr. MacAdam. Even the iron race of coarsers, who have improved so much in their breed since the time of the famous "Puffing Billy" (now to be seen in the Patent Office Museum), may be said to have originated in a hobby of George Stephenson. To drop the metaphor, an opportunity afforded to an earnest, painstaking man to bring fairly before the notice of those qualified to form an opinion on the subject the result of his long study may prove of great public service. Even in the contrary case, where the supposed discovery is actually worthless, the demonstration of that fact may save much valuable time, and bend the inventive faculty of the disappointed inventor in a new and practicable direction. It is, therefore eminently desirable that the provision of the list of safety-valves for the results of patient inquiry, or of happy discovery, which such congresses afford, should receive due support and encouragement.

The great point for the successful issue of such meetings,—that is to say, for the most useful and satisfactory results,—is attention to the proper character and due subordination of the objects discussed. There are some which it is attempted to urge before a body of investigators of truth which are only suitable for the atmosphere of a debating society. They may be brought forward as matters of personal display, or of wrong-headed ingenuity; but, based on no facts, and leading to no results, they should be rigidly excluded from a really scientific gathering. The decision of what it is to discover, and of what is the general value of any detailed branch of study, is thus a most important duty of the managers of such an association. Questions that are of importance in their proper sphere may be invested with a mischievous vitality if they are elevated above it. Thus the investigation of the laws which regulate the production and distribution of manufactures, when regarded as commercial and industrial questions, may be extremely valuable; but so soon as the laws of trade are regarded as being, not a small part, but the whole or the main part, of the forces which move society, a grave mistake is committed; and the man who is a reputable authority as a statistician becomes a pestilential nuisance as a political theorist. He argues from the part, in which he is at home, to the whole, in which he is not; and the result is to discredit the real value of his labours. Again, you see men who consider that logic,—the *organon* of the pleader, or of the demonstrator,—is a method of scientific analysis. This was the great error of the school-men, and the main cause of the utter barrenness of their multiplied labours. In our time we see this Medieval process of investigation applied to certain inappropriate subjects, such as that of the tenure of land, with the amusing result of bringing forth both grave and angry dogma in favour of the reverting to the modes of tenure (and consequently of culture) that belong to people emerging from barbarism. Or again, on the important question of education, and from the observation of the almost utter want of any comprehensive system of proper female education in this country, such a training as should make girls good mothers, good mistresses, good housekeepers, good nurses, good helpmates for men, and good trainers for children, grows out the exorcism of what is called women's rights. It may be amusing enough, for those who have time on their hands, to hear arguments intended to show that the dignity, charm, and utility of the female character will be enhanced by laying aside that which has always been considered by the best authorities as the chief charm of the sex. Such a line of argument is as old as the time of *Æsop*, and comes under the general code of laws propounded by the venerable fox who had lost his tail. We fail to see the excuse for discussing such a question in the name of science.

But where the object actually sought is the discovery of truth, where collected facts are made the sure basis of all hypotheses, and where proper subordination of general and of detailed law is regarded, the progress of civilisation and the welfare of humanity are involved in the development of social science. We have referred to that which is perhaps the most advanced branch of the subject,—sanitary law. But, with all that has been of late acquired on this subject, what an immense and original field lies open to future discoverers! What a hard and tough battle is to be fought before we can make the world accept and act upon what we know to be undeniable truth. Small are the contributions that the best of us can offer to the service of civilisation; but those offerings may be most usefully made when they are brought together with common purpose, and accepted, classified, and made public by the common consent of thoughtful and impartial men.

LUTETIA REDIVIVA.

AMONG the many signs which indicate a disposition on the part of the French to return once more to the cultivation of the arts of peace, so long neglected for the destructive arts of war, not the least assuring is the re-appearance of the artistic and technical journals, the publication of which were suspended during the siege of Paris. We have already noticed the re-issue of several serials which had been discontinued on account of the war, and to those already given we have the pleasure of adding the *Gazette des*

Beaux-Arts, with its Supplement, *La Chronique des Arts*, whose re-appearance has been delayed from it not having conformed with some formalities necessitated by the present position of affairs in Paris.

We take from this last publication such items of intelligence as we think may be interesting to our readers, and first we may notice as a gratifying fact that the picture sales are considered by the editor to have been very successful this year, and that the prices realised have exceeded those obtained in the preceding year. We notice, however, that at a recent sale a study by Ingres for his celebrated picture of St. Symphorien fetched only 65 francs; at the same time a picture by Léopold Robert,—a peasant woman of the environs of Naples, weeping over the ruins of her house, destroyed by an eruption of Vesuvius,—was sold for 780 francs; a portrait by Tintoretto, life-size, said to be that of Martin van Heemsecker, the Dutch artist, for 210 francs; and two portraits of Luther and his wife, Catherine von Bora, by Lucas Cranach, for 1,080 francs, which induce some doubts as to the prosperity of the picture trade.

Messrs. Morel announce a second series of the "Encyclopædia of Architecture," published originally under the superintendence of Messieurs Callist & Lamo. The new issue will be in monthly parts, each part to contain six engraved or coloured plates, and will be edited by a committee of architects and engineers. The first two parts have been already published, and contain an interesting account of the monuments in Paris destroyed under the *Commune*, plans for the rebuilding of the Tuilleries and the Hôtel de Ville, a paper by M. Viollet-le-Duc on the restoration of ancient Italian buildings, and other matters of importance.

It was expected that the condition of political affairs in France would prevent the award of the *Grand Prix de Rome* this year; but, thanks to the energy of M. Guillaume, the director of Fine Arts, the competition has taken place as usual, although it was somewhat delayed. The *Grand Prix* in architecture was won by M. Ulmann, a pupil of M. Lobas and M. Ginain, with a design for a Palace of Representatives. There were ten candidates; M. Coquet *proximo accessit*, M. Barnier followed next, and M. Langlois obtained honourable mention.

It is proposed to rebuild the Protestant church at Strasburg, destroyed by the Prussians during the late siege, and prizes of 5,000, 2,000, and 1,000 francs, are offered for the three best designs. The committee of selection will consist of seven persons, the president of the Consistory or governing body of the church, with three of his colleagues; M. Boeswillwald, architect, inspector-general of historical monuments; M. Caeset, architect to the Palace of Versailles; and M. Semper, architect. The composition of the committee is calculated to inspire confidence, and contrasts favourably with the manner in which similar bodies are constituted in England. There is no restriction as to style, but the committee point out that the building should be suitable for a Christian Protestant church. The designs should be sent (carriage paid), addressed to the president of the Consistory, Strasburg, not later than the 31st of January, 1872. Further particulars may be obtained at the office of the "Revue générale de l'Architecture et des Travaux publics," No. 6, Rue de la Sorbonne, Paris. The competition does not appear to be limited to French architects.

A competition is also announced for the design for a monument to be erected in the town of Nuits (Côte d'Or), in memory of those who perished in the engagement that took place in the neighbourhood of that town on the 18th of December, 1870. This competition is restricted to native architects and engineers.

The commission formed for the purpose of setting up a statue to Lamartine at Maçon his native town, have decided upon the erection of a bronze statue of the poet upon the Place de la Barre. The sculptor designate is M. Adam Salomon, whose selection has occasioned some dissatisfaction among the Parisians. The people of Maçon have already subscribed 57,000 francs (2,280*l.*) towards the monument.

It is, besides, in contemplation to erect in the same town an allegorical statue of the Vine in one of the public squares, and the Administration of Fine Arts has granted a block of marble for the purpose.

The committee constituted to honour the memory of Félix Duban, honorary and corresponding member of the Institute of British Architects, whose funeral, and the graceful

address of Professor Donaldson on the occasion, we lately noticed, have resolved to erect a statue to the deceased artist. A subscription has accordingly been opened, and contributions for the object of the committee will be received at the office of the Central Society of Architects, No. 23, Quai de l'Horloge, or at the Secretariat of the School of Fine Arts, Rue Bonaparte.

A subscription is also opened at the latter place for the purpose of erecting a monument to the young painter, Henri Regnault, whose marvellous picture of the Moorish headman in the late International Exhibition, and the premature death of the artist at the very onset of life in the defence of Paris, must have made his name familiar with most Englishmen.

The annual exhibition of pictures (*le Salon*) will be held as usual, next year, in the Palais de l'Industrie, in the Champs Elysées. The opening will take place on the 1st of May, as heretofore. Some important modifications will be introduced with regard to the admission of works to be exhibited. There will be two classes of medals, and a single grand medal for the most important work in the four sections. The jury will consist of the members of the Institute, with whom will be associated a certain number of artists. The admission to the exhibition will be free.

A portion of the Museum of the Louvre has been re-opened to the public, and the principal entrance removed from the Pavillon de l'Horloge to the Pavillon Denon. The rooms which are now accessible to visitors are those comprising the museum of antiquities, under the Apollo Gallery, formerly the apartments of Anne of Austria, the ceilings of which are decorated by Francesco Romanelli; the fine gallery of Roman Emperors, at the end of which is the statue of Augustus (the antique statue of Germanicus, which was in the Salle des Cariatides, is now placed in the centre of the Gallery of Emperors); the "small room," containing the bas-relief of Diana with the fawn, which connects the old Louvre with the portion built by Louis XIV.; and finally, the suite of rooms on the first floor, occupied by the Campana collection of ceramic ware.

The works are being carried on in the interior of the new Opera-house by gaslight. The walls are being plastered, and the paving of the corridors and the flooring of the various rooms are being laid down. The grand staircase and what was called the *Pavillon de l'Empereur* are in course of completion, as well as the inclined plane by which the chief of the executive can ascend in his carriage to the first tier within a few steps of the royal box. The dwelling-house for the director, on the north side of the theatre, is very nearly finished, and will be shortly habitable.

An appeal has been made to the Minister of Public Education and Fine Arts to order the restoration to the National Library of Paris of the famous cup known as the Chalice of St. Remi, formerly in the library, but removed thence in 1861, and now in the cathedral of Reims. This cup, which is of gold, ornamented with precious stones, with its paten, which is also of gold, was formerly used at the coronation of the kings of France. Its date is considerably later than the time of St. Remi; but it is affirmed to be a remarkably fine work, and one of considerable interest from an historical point of view. It was given by the Republic to the National Library. The legality of this gift was contested by the clergy of Reims, at the restoration of the monarchy, on two occasions, but without success. Under the Second Empire the claim of the clergy was again urged, and, backed by court influence, was this time successful, and the cup was restored to the cathedral of Reims, where it is supposed to remain. Some doubt has, however, been thrown upon the existence of this relic, and it is urged that it was only deposited in the cathedral, and that it would be safer in the National Library than in the hands of the priesthood.

The Abbé Cochet gives an account, in his annual report to the Prefecture of the Seine-Inférieure, of the Merovingian Cemetery discovered at Neule-Hodeng. Ten tiers of graves, each tier consisting of from fifteen to twenty-two interments, have been opened. The graves had evidently been plundered in the Middle Ages; but, notwithstanding this, there have been some interesting relics recovered.

The spoils consist of thirty-eight vases, thirty-six of earthenware, and two of glass-ware, a large number of glass beads forming a bracelet, and four necklets. The articles found of iron are buckles, a sword, eight axes fourteen lances,

and other implements. The bronze articles consisted of a vase of hemispherical form, a triangular ornament for the girdle, a ring remaining on the finger of one of the bodies, and fibulas, some of a cranciform type, and others representing birds of prey. Five coins of Hadrian and three of Tetricus were also found. The gold articles were very numerous, and embrace a circlet ornamented with a cross, portions of a necklet, a hair-pin inlaid with lapis-lazuli, and two magnificent fibulas ornamented with flagree work.

HOLBORN VIADUCT STATION.

The design and arrangements for the construction of this station are in such a forward state as to admit of forms being sent out for tenders for the work. This is being done, and a commencement will be made early in the year. The connecting junction-lines may be proceeded with at once, and the arrangements touching the acquisition of the property necessary, and the clearance of the site, are in a satisfactorily forward state.

This project has been referred to in the newspapers, and otherwise, as an intended "enormous central station,"—with the adjective emphasised. The site acquired for the station is scarcely sufficient for the erection of an enormous structure, as regards extent; and the engineers have no intention, we believe, to emulate in style the enormous roofs of St. Pancras, Cannon-street, or Moscow Riding School. One of these roofs, by the way, plays sad havoc with the sky-line of the City of London, from certain points of sight. The Holborn Viaduct Station is intended to be as elegant and substantial as is compatible with common-sense economy, and will be roofed in such a manner as will give ample head room, plenty of light, and thorough ventilation, with side-walls in the ordinary manner, that will convey the idea of being on the ground floor, and not in a giant's attic, as is the impression produced under a roof that springs from a station platform.

The fine frontage of the property will be utilised and put to profitable use by the erection of a large hotel, with its principal façade to the Viaduct, from which it will be entered direct and on the level. The ground-floor will be, in part, appropriated to carriage and other entrances to the station, for booking-offices and other station uses. Mr. L. H. Isaacs is architect for the hotel; Mr. T. Marr Johnson and Mr. Mills are joint engineers for the station works.

An important project will come before Parliament in the ensuing session for a connecting physical junction between the London and South Western and the London, Chatham, and Dover lines between Waterloo and Charing Cross Stations. By the construction of this link Holborn Viaduct, Ludgate, and Blackfriars stations would become practically stations of the London and South Western Railway.

WORK AT HOLDENBY HOUSE.

THE name of Holdenby is so inseparably connected with English history through King Charles I., that it is never likely to be forgotten, even were it not celebrated for its once magnificent "palace," which was the grandest and largest of all those grand houses built in Queen Elizabeth's reign by John Thorpe. Unfortunately its former grandeur no longer remains; only a small portion of the palace is now standing, and this is enough to show what the whole once was; and this, together with the great architect's original plan, is sufficient to enable some idea to be formed of its magnificence and grand proportions. The palace, as originally built for Sir Christopher Hatton, was 354 ft. from west to east, and 225 ft. broad, built in the form of two quadrangles. It stands on the top of a hill overlooking the woods of Althorp.

Entering the palace from the east through the "Great Green," the double gate-house was reached; and having passed through this is the Green Court, about 300 ft. by 250 ft., with a broad road leading up to the grand entrance. On each side of this court was a long wall with a fine arched gateway in the centre (these still remain perfect); that on the north opening into the Base Court; that on the south on to King Charles's Walk, the terraces, and the great bowling-green. The palace itself is described in the particulars of the survey and valuation made by the Surveyor-General's assistants in 1650,

which is reproduced in Miss Harlestone's interesting book on Holdenby. They speak of—

"The chief mansion-house, the inward court whereof being laid with stone on every side, and accompanied about with a fair gallery on the east, on the south with the stately lodgings commonly called the King's Lodgings, on the north with the lodgings called the Queen's Lodgings, on the west with the hall and kitchens; there being likewise at every corner of the said inward square four magnificent towers or turrets, and in the said house many costly and rare chimney-pieces, many other spacious chambers, and wain-drawing-rooms to them belonging, fit being a house of very great receipt alone."

Besides this account is an interesting letter of Lord Barleigh to Sir Christopher Hatton:—

"But approaching to the house, being led by a large, long, straight fair way, I found a great magnificence in the front or front pieces of the house, and so every part answerable to other, to allure liking. I found no one thing of greater grace than your stately ascent from your hall to your great chamber; and your chambers answerable with largeness and lightness, that truly a Momus could find no fault. I visited all your rooms, high and low, and the contentation of mine eyes made me forget the infirmity of my legs. And where you were wont to say it was a young Theobalds, truly Theobalds I like as my own; but I confess it is not so good as a model of a work, less than a pattern, and no otherwise worthy in any comparison than a foil."

From the existing remains and old drawings of the ruins we may see that Lord Barleigh's praise is well deserved. Built in the mixed Classic and Elizabethan style, which Thorpe used at Longleat, Kirby, Audley End, and Burghley, it exceeded them all in scale and magnificence. The principal fronts were three stories high; the south front was perfectly symmetrical; the projecting bay-windows of the chapel and stair formed a centre, on each side of which was a row of eighteen windows, mullioned and transomed, with pilasters between these and rich cornices between each story, surmounted by a balustraded parapet; at each end was a large projecting block, with great bay-windows. The hall was centrally placed between the quads; the other side of the quads was plainer in detail, and the north block of the west quad was used for offices (this block alone was spared when the other parts were ruined). With the exception of the hall, the buildings were double, with the chimneys invariably in the centre wall; most of the rooms opened into one another, and some into the open air alone, after the fashion of those days. From documentary evidence from the State papers it appears that Holdenby House, its manor and parks, were purchased by King James in 1609 from Sir Christopher Hatton, Knight, for the Duke of York, for whom it was repaired, some of the parapets, vanes, and some chimneys being blown down; the hall, lantern, and certain partitions and roofs being decayed. Later still further works were carried out on the north side of the offices, where a court was formed with an entrance gateway towards the north, and some additional buildings on its west side.

Such was Holdenby Palace at the time when King Charles I. stayed there in royal state, before his seizure by Cornet Joyce and the Parliamentary troops. Soon after the death of King Charles I., the trustees for the sale of the crown lands sold Holdenby to a Yorkshireman for 22,299l. 6s. 10d., the materials of the house being reckoned at 6,000l. after taking down. By this man the palace was made a ruin, excepting the north side of the inner quadrangle, which was retained as a farm-house; the materials were carted away to Northampton and elsewhere, but for nearly a century after great portions of the ruins existed. After the Restoration, Holdenby came to the Duke of York, then to Baron Holdenby, Earl Faversham, from him by purchase to the Duke of Marlborough, and finally to Viscount Clifden. During this time the remains of the palace were used for a farm-house only, but in 1869 it was determined by the trustees of the late Lord Clifden to restore a part as a residence for Viscountess Clifden. With this object the architects, Messrs. Slater & Carpenter, carefully examined the existing buildings and foundations, and prepared plans for the work. It was found that the old portion was much modernised, the double roof was altered to a single roof of a lower pitch, a portion of the front wall had been rebuilt with common square windows, and many mean and inconvenient buildings had been attached for farm purposes. It is obvious that the completed rebuilding of Holdenby Palace, however desirable it may be from an antiquarian point of view, would be too great a scheme to undertake, but in designing the enlargements of the existing block, great care was taken to build the new wing on the old foundation lines, so that they might not interfere with a possible reproduction of the other sides of the quadrangle.

For the purpose of further preserving the lines of the original buildings, the new gardens will be laid out on the site of the two great quadrangles between the houses and the bowling-green and terraces.

The northern quadrangle is retained as the entrance quadrangle, the road being brought through the ancient gateway. The greater portion of the old south wall, with its square-headed mullioned and transomed windows, has been preserved; the east and north modern walls have been rebuilt to harmonise exactly with the ancient work; the grand old groups of chimneys have of course been retained. The ground plan of the ancient portion now consists of a great drawing-room, 40 ft. by 26 ft.; dining-room, 24 ft. by 20 ft.; library, 24 ft. by 22 ft.; morning-room, 24 ft. by 17 ft.; hall, 21 ft. by 15 ft., and principal stairs, together with pantry and other rooms, while the kitchen and offices are placed in a new wing at right angles to it, and joining the west side of the entrance quadrangle.

On the first floor are bedrooms both in the main block and wing, and in the roof is another story, and for the purpose of lighting this, stone dormers are introduced, surmounted by pediments, and flanked by scrolls. A new porch of stone is built in front of the garden door, on the south side, the proportions and details of which are adapted from a porch at Kirby, designed by John Thorpe. The works are being executed by Messrs. Smith, of Northampton; the rich red-coloured old stone is used for the facings, and Weldon stone for the dressings, as it is in the ancient work.

THE INTERNATIONAL EXHIBITION.

The arrangement by which foreign exhibitors are to be enabled to sell their goods on the premises is causing considerable ill-feeling, and is likely, we should think, to interfere with the success of the Exhibition. We give the commissioners full credit for desiring to act for the best, but we can scarcely avoid coming to the conclusion that they are showing here an error in judgment. However, the arrangements are going on to carry out their views, for we learn that for the erection of the Belgian Court, for "La Société belge pour l'Encouragement de l'Art et de l'Industrie aux Expositions Internationales de Londres et Bruxelles," the tender of Mr. S. W. Aries, Atlas Building Works, Putney, under revised plans and specifications, is 2,400*l*.

We understand that the new machines for printing, composing, and distributing type, which have been recently perfected at the Times printing-office, will be exhibited in work at the Exhibition of 1872. The Mail newspaper will be printed three times a week, and, if possible, the daily supplement of the Times.

NOTES FROM AMERICA.

AMERICA is one of the places of the globe where pedlars do mostly congregate. In every county, village, and town, there is sure to be a bevy of patent-right men. America goes in strong on washing-machines, churns, and sewing-machines. In one State I counted no fewer than eleven different pedlars of different kinds of washing-machines; but the churn knocks the washing-apparatus "higher than a kite." The writer, while boarding in an hotel, was puzzled "mudily" to discover the use of what appeared to be a small flour-barrel, with a piston-rod and a rocking-chair attached, lying near the entrance of the hotel; but was soon enlightened by a tall, gaunt, beeswax-face gentleman, who accosted your correspondent by remarking,—"Wal, stranger—economy of time, labour, and expense. Lady, you see, sits in a chair,—rocks baby to sleep,—does a little sewing or knitting,—at the same time churning butter. Good idea, stranger. 5 dollars for the lot. Sell you a county right dirt cheap. Novelty,—everybody buys one,—makes a fortune, and—"

Your correspondent's time was precious. In the sewing-machine business there is something rational and useful; scarcely any family is without one; and not only does it give a large profit to the manufacturers, but it is astonishing the number of real mechanical hands it employs.

Your correspondent had the run of the factory of the Davis Sewing-machine Company of Watertown, New York. The factory is a very large four-story brick building and employs no less than between 200 and 300 hands. To enter the factory, and to see the belting and bands whiz-

zing round, one would hardly think that so small a machine, to make a finish, would require several hundred different kinds of lathes, punches, borers, &c.; in fact, an innumerable quantity of machines, each whirling from a large or small leather belt.

The factory is well lighted, ventilated, and heated, and the greater portion of the hands are from Old England. Men from Penn's, of Greenwich, working as adjusters; from the Enfield Gun Factory, filing away; Manchester and Glasgow machinists,—in fact, the writer thought he was in a well-conducted English machine-shop. The writer was also shown the testing-shop, where the machines undergo the process of labour. The very pretty lady with a beautifully chiselled face undertook to explain what the machine could do. There was the leather, the cloth, the silk and muslin fabrics, stitched all over in geometric devices; and what with tucking, basting, back-stitch, cross-stitch, the writer's head became confused. Probably the two gold engaged rings (which, if only of wrought-iron, would have made good holofists) brought your correspondent's head to its proper equilibrium. Watertown is a city of about 10,000 population. It contains eleven churches, of various denominations, none of which possess any particular merit of architecture,—in fact, ornament or beauty appears to have been avoided. There is a County Court, built of brick. The business portion of the town is situated in a place called the public square,—a very wide street, with a patch of grass enclosed by a few ugly wooden posts and iron bar, with a fountain about the size of one a gentleman would put in his front garden. If this patch of green were enclosed, and a neat iron railing placed around it, and kept in good order, it would look really pretty, and be attractive. The shop fronts are sadly behind the age; but the private residences in a great many places are decidedly very picturesque, and not without some pretensions to taste.

Your correspondent intended to give a description of a Limberger Cheese Factory; but the olfactory organs could not stand it,—a cesspool is nothing compared to it! However, tastes differ. Limberger cheese and Lager beer are as necessary and essential to a Dutchman (all Germans are called Dutch) as a pint of half-and-half is to your London Cockney.

While I write, a great fall has taken place in the barometer,—several degrees below zero; and firewood being dear, and business dull, it is as well to take the example of my patent churn man,—economise fuel and labour, and so for the present end. QUERCUS.

ARCHITECTURE IN ITS RELATION TO MODERN LIFE.

UNDER this title, Mr. H. H. Statham, who has just been elected an Associate of the Institute of Architects, read a paper at the last meeting of the Liverpool Literary and Philosophical Society, illustrating his remarks by references to diagrams, with the object of awakening public interest in the construction of buildings. He pointed out that archæology is not architecture, though at times mistaken for it, and that for the last century or two architecture has consisted of copying or borrowing some portion of buildings which prevailed at some previous time in some other country. After reviewing various styles of architecture, Mr. Statham said:—"If we look at the relation between architecture and national life from a practical point of view, we can discriminate certain definite influences which the temper and manners of an age exercise upon the character of its architecture, and must exercise, wherever that architecture is an honest and unfettered exponent of the practical wants and wishes of the age. Where a nation was chiefly occupied in great commercial enterprise, and in the enjoyment of commercial prosperity, there would be sure to arise exchanges, offices, banks, and such-like buildings, expressing in their outward aspect and decoration the superfluous wealth, if not always the good taste, of the owners; and in almost all countries and times, till within a comparatively recent period, the architecture has thus been the product of the wants and feelings of the time, further influenced as I have hinted by the effect of climate and atmosphere; and every style which has thus been the expression of genuine needs has always an interest of its own, historic if not artistic; but in our own day, and in England especially, we have almost entirely 'changed all this.' In one-half of our erections we ignore architectural expression

altogether; in the other half we have made it a mere sham and plaything. We have reduced architecture to a dilettantism. Not long ago, as I observed at the commencement of these remarks, Greek architecture was in vogue, and the consequence remains with us in such a costly experiment as St. George's Hall, where the outside was designed first on the model of a Greek temple, and then the problem was how to get the inside arrangements to fit; and so we have a grand south portico which no one goes in at, and passages where gas has to be burned all day; and because a Greek temple was lighted from the roof, and had no side windows, therefore the hall must have no windows on the show side, and the windows are put at the back, where it is hoped no one will notice them: and so on. Now the tide has turned, and everything must be Gothic. Now, in one sense, there is more to be said for the Gothic revival, because it is the revival of a style which arose on our own soil, and so far as climate is concerned it is just as suitable now as then. And there is no doubt that the age which produced the great cathedrals of England and France was the greatest age of building of which we have any record. But now just see how we are using this great style. Instead of studying its principles, and working them out in reference to our modern wants, we are engaged in a blind and wholesale imitation of the forms of its principal monuments, without consideration whether they are suitable or not. We are covering the face of the country with churches which are mostly mere copies,—often very poor ones,—of similar buildings of 500 years ago, and which are considered by many people to be admirable, exactly in proportion as they are wholly imitations of old work; and until a year or two ago there was in existence a society, supported by wealthy and influential men, for the express purpose of keeping a check upon all originality in church building, and holding up to ridicule every departure from the smallest details of the Middle Age churches.

KENSINGTON.

Proposed Public Hall for Kensington.—At the Kensington Vestry, Mr. H. F. Gibbons moved, according to notice, "that a committee be appointed to consider the advisability of erecting a public hall for holding meetings of the Vestry, the sittings of the County Court, the Police Court, the meetings of justices, parish officers, and other public purposes; what sites are available for the purpose; the cost of erection; and generally to report on the subject." He reminded the Vestry they had just decided that the hall could be used for purely parochial purposes only. This motion was therefore appropriate. The Vestry adopted the motion.

The Railway Hoarding in the Fulham-road.—A memorial, numerously signed by inhabitants of the Fulham-road, was read at the Vestry, complaining of various nuisances in connexion with the railway hoarding, and asking the Vestry to interfere. Mr. Wilkins said the memorial was infinitely signed, and he could himself testify to the nuisances. He would move that the clerk and surveyor be instructed to communicate with the railway company, and report to the Works Committee, which motion was adopted. We must add our own expressions of astonishment that the parish has put up with the annoyance so long. An improvement should at once be enforced.

THE LATE MR. HAYLEY, ARCHITECT.

NEARLY fifty years ago there appeared upon the list of Manchester architects the name of William Hayley; for years after, as Hayley & Brown; and, later still, as Hayley, Son, & Hall, the name was well known in Lancashire and the adjoining counties. In 1850, after a most successful career, William Hayley died, and was succeeded by his son, William Henry, who continued the practice under the name of Hayley & Son, Mr. Leigh Hall having retired from this firm, and commenced practice in Bolton, where he died a few years ago. In the year 1855 the firm became known as Hayley & Dawes, and remained so until the year 1869, when Mr. Hayley retired into private life, leaving the practice to Mr. William Dawes, who is now the only representative of the old firm.

Mr. William Henry Hayley, the subject of this notice, was seized, shortly after his retirement, with a serious illness (disease of the heart), and after lingering a long time, he died on the

9th inst., aged forty-four, and was buried in Southport Cemetery.

The deceased gentleman inherited a large property from his father, but still, as we have before stated, continued the practice, reluctant to withdraw from a profession in which his earlier years had been spent. Those who knew him as a friend have reason to lament his death.

Amongst his works may be named St. Margaret's Church, Bowdoin, for Lord Stamford; Christ Church, Bradford; church, Sale Moor; Wesleyan chapels at Southport, Blackpool, Liverpool, Rusholme, City-road (Manchester), Longsight, Stafford, Broughton, &c.; schools at Gravel-lane (Manchester), Longsight, Broughton, Bowden, Stafford, Liverpool, and many other places.

WOODEN STAIRS AT THE COURT THEATRE.

Will you inform me whether there is not a law requiring the stairs in public buildings to be made of incombustible materials? The reason of my asking is, that there is a flight of stairs made of wood, leading from the street down to the pit of the Royal Court Theatre, Chelsea. Whether there are any other stairs of similar material in the same building, I did not go to see, for I was too much taken up with the thought (knowing how hurriedly chapels and other buildings are now converted into theatres, and, perhaps, with a little oversight on the part of some of the workmen as to fires and gas) that, should a fire happen, which we are told is the fate of all theatres, and these stairs were to burn, the pit audience would find it difficult to effect their escape. I was also reflecting should there be any alarm causing a sudden rush upon these said stairs, what would be the number of persons required to prove their breaking weight? Y.

* * * The Building Act expressly provides (Clause XXII.), that in every Public Building, "The floors of the lobbies, corridors, passages, and landings, and also the flights of stairs, shall be of stone or other fireproof material, and carried by supports of a fire-proof material." The stairs referred to by our correspondent are illegal, and must have escaped the attention of the district surveyor. The building in question affords in other respects an example of the impropriety to which we have before now alluded of allowing theatres to be constructed on sites manifestly insufficient and improper.

THE LATE HERR JOSEPH KRANNER, ARCHITECT.

At the last meeting of the Institute of Architects, Mr. Alfred Strong, associate, drew attention to the decease of Herr Joseph Kranner, architect, of Prague, and latterly of Vienna, an honorary and corresponding member of the Institute since 1850. Herr Kranner's chief works were the buildings of the Austrian "Lloyds," at Trieste, the monument of Archduke Charles at Vienna, and that of the Emperor Francis I. at Prague. In 1851 he was called to Vienna to remodel the School of Architecture and to superintend the art classes in the higher schools in that city. He superintended the restoration of Prague Cathedral, and latterly was executive architect to the Votive Church carried out from Professor Ferstel's design. Mr. Kranner died at the age of seventy years.

THE LATE MR. W. G. NICHOLL, SCULPTOR.

"On the 8th December, at Acton, William Grinell Nicholl, sculptor, aged 75, formerly of Grafton-street East, London University."

Under this modest announcement in the daily obituary, a man has passed away who has done good service in his time, and of whom I should be pleased to read some record in your journal, written by some kind hand better acquainted with his history than myself. I can only vouch for his assiduity, his talent, and his worth.

When I first became acquainted with him, he had, I think, never lost his courage; but patrons to humble sculptors are few and far between, and I suspect that his progress was little better than a struggle for dear life, until one day Cockerell, R.A., found him out,—happily for both, one requiring a most important work to be done, and well done, under his own eye; and

the other sighing at once for fame and money, apparently so distant.

Now might be seen the modest ground-floor (since converted into a draper's shop) of No. 1, Grafton-street East, extending itself rearwards over the yard, and another workshop even over that. Still the place was not half large enough, for Nicholl was now entrusted with the execution of the sculpture for the pediment of St. George's Hall, Liverpool.

Too much praise cannot be given to Cockerell for selecting so able an assistant, and for his constant personal attention to the matter in hand; but who will mete out the praise to Nicholl for his suggestions, modellings, and finished sculpture? HENRY BAKER.

CAMBERWELL VESTRY-HALL COMPETITION.

As already mentioned, eight sets of designs were selected by a committee out of twenty-four sent in. At a recent meeting of the vestry, the favoured designs, we are told, appeared to be "Clive" and "Well Considered," after which came "In Foro" and "Thorough." The adoption of the first two was opposed on the ground of cost, and the decision of the matter stands adjourned for a month.

The selected eight alone are hung, and those so inconveniently that a proper examination of them is impossible. The rest are huddled together on the floor. Fair criticism under such circumstances is out of the question. We shall content ourselves with reminding the vestry that the amount of expenditure honest competitors thought it necessary to adhere to is 8,000*l.*, and that notwithstanding the irregular form of the site, the vestry should see that the apartments are of regular form. Some of the selected plans are perfectly preposterous in this respect. If the vestry wish to act fairly and save the parish from difficulties hereafter, they will obtain some good professional assistance in making the selection.

Sir,—Will you permit a few remarks to follow up those by your correspondent in last week's *Builder*? I have heard that some of the best-planned and designed sets are among those not on view, and, according to the *South London Press*, six out of the eight designs selected could not be placed on the site, which is very irregular. One design is described as in a "Portland cement Classic style," while the committee report that they eliminated all designs in which cement was used. As far as cost is concerned, a building may be architecturally treated in mass, and yet compare in price with another which looks plain; and I believe the committee may have been thus misled, and that of those rejected some of the best designs would not cost more than one of the selected eight.

Why do not the Vestry in this difficulty call in the aid of a professional man of ability and high standing, who would compare the merits of the plans, elevations, reports, and estimates of the whole twenty-four sets one with another, and with the instructions issued by the Vestry. This course would give satisfaction to the competitors and stop the hints of interest on behalf of individuals; for it is acknowledged that the names of the authors of several designs are known. ANOTHER COMPETITOR.

"DRAUGHTS."

In a recent review of a new work on ventilation, I think you stated the author did not have a single chapter on "draughts," which you thought was quite an omission.

But if he has found some way of ventilating without creating draughts, I think it would be a splendid thing. One of the greatest difficulties with engineers of ventilation generally is, they think of nothing but draughts.

It seems to be the first idea of most young engineers in commencing the study of ventilation to see how they can get up the greatest draught. The first thing they want generally is a steam-engine and a fan, and they soon learn they can easily get up a draught; but they are like the man that won the valuable elephant,—the next thing is, what to do with it.

Dr. Hall, editor of the *Journal of Health*, after writing a great deal about ventilation for several years, became so annoyed with draughts, that he said he believed more persons were killed by draughts than by foul air.

Of course, the *Builder* will not admit of such doctrine as that. There seems to be a great difference of opinion somehow about draughts: sometimes we enjoy them, and at others we do not.

For instance, of a summer's evening how often we hear, "Oh, isn't this breeze lovely?" Now the air in this case may be 70°, or even lower, and we would feel no inconvenience from it; on

the other hand, in a church heated by a hot-air furnace, if the air is 70°, and in rapid motion, how liable we are to hear, "Oh, what dreadful draughts!"

There seem to be two or three causes for this difference of sentiment under apparently similar circumstances: one is the different hygrometric condition of the air.

In summer the air is very nearly saturated with moisture, and the dry and wet bulbs of the hygrometer would show but five or six degrees difference in temperature; but in very cold weather, in a room warmed by currents of heated air, we very frequently find a difference of 12° or 15°, and sometimes as much as 20° difference in temperature; that is, where the ordinary thermometer indicates 70°, the bulb with moisture around it only indicates 55°. Now, we really are equivalent to the wet bulb, because in such an atmosphere there would be a rapid evaporation of moisture from the body, so that the real temperature for us would be 55° instead of 70°, as indicated by the ordinary thermometer.

Another point is the difference of temperature of the solid substances around us. On a summer evening, when the sun has been shining all day, the surface of the earth and most solid objects become heated to a temperature of 80° or 90°, and even at times 98° (this, we must remember, is just the temperature of the body, and feels neither warm nor cold); then with these warm surfaces underneath and around us preventing the radiation of the animal heat from our bodies, we can have, and are refreshed by a current of air (especially if not dry) at a temperature of 70° or 65°.

But in the case of the church, heated by currents of warmed air (particularly where the usual custom is adhered to of starting the fires only a few hours before the assembling of the people), the room is filled with warmed and dried air, but the floors and walls, and all the solid substances, are much colder than the air, instead of warmer, as in the other case.

Thus, while we are taking into our lungs this warm, debilitating, insipid air, so nearly the temperature of the blood that almost stagnation occurs, the cold walls and surrounding solid bodies are absorbing that little of animal heat can be excited while breathing such air.

This is the condition that makes the cold draughts descending from the thin glass windows, the cold walls, and sweeping across the cold floors, so distressing and really so dangerous.

I think the great remedy for this uncomfortable condition of things (which, unfortunately for us, has become very fashionable in this country,—almost universal), is to warm the floors and the exterior walls, and especially under the windows.

I am giving special attention to the best practical methods of securing these results in all classes of buildings, the object aimed at as seeming most desirable to be gained being a gentle well-diffused warmth, easily controllable over the whole surface of the floor in buildings of ordinary construction.

I have tried a great many experiments during our late war in hospitals and tents, and since in many permanent buildings, to ascertain at how high a temperature the floors can be heated to give the most satisfactory results.

At first I thought that they might be heated to the temperature of the body, so that there would be no action either from the floor in absorbing the heat from the feet, or the reverse; but this seemed too hot, either because we are accustomed to such cold floors, or for some more substantial reason.

A temperature of 80° or 85° for the floor, and a temperature from 110° to 130° according to the external temperature for the outside walls, seem to give much satisfaction.

Now, this seems to me to be the most perfect solution of that difficult problem of how to get ventilation or a constant motion of the air in all parts of a crowded room without those "dreadful draughts;" because if the floors are warmed to a temperature of 80°, and the outside walls to 110°, then it is very comfortable to have the air 50° or 55°, and that cooler air lying above this warmed floor is kept in constant gentle motion over the entire surface of that heated floor.

This system of heating will also put to rest our chronic dispute about floor ventilation and ceiling ventilation. Because if we adopt this natural mode of heating in accordance with the example set us by the sun, we can then afford at all times to have the escape for the foul air in

the place where it ought to be,—from the ceiling, which, with our miserable system of getting our warmth by over-heating all the air, we could not do.

Such a system of heating would, in a great measure, completely overturn our traditional notions of warming, as nearly all classes of heaters, from the old Russian ovens, the chiming English open fire, and even the American cast-iron stove, are universally placed in the warm corners of the room. All our hot-air furnace men, and steam-heater men, when left to their own discretion, invariably put the registers or radiators in the same position.

But if our present practices are incorrect, and there is a better way, even if it do involve very considerable modifications in our general practices, the sooner we recognise the fact, and set about a general reform, the better.

Many of our leading architects have already recognised the value of these general principles, and are making designs for such arrangements as will facilitate their introduction into the buildings under their charge.

The physiological fact that the breathing of warmed air is debilitating, not from any alteration in its component parts by the various methods of heating, but simply because it is warm instead of cold, seems to be attracting some attention at last. But I notice that in a paper read at the Social Sciences Congress at Leeds, the matter was referred to, and the advantage to be gained by breathing cool air was attributed to the greater density of the air, which enabled you to inhale a larger amount of oxygen with the same volume of air. But this does not seem to meet the case at all, because the difference in the amount of carbonic acid exhaled and inferentially the increased circulation of blood and physical activity are double when breathing air from 10° to 20° what they are when breathing air from 90° to 100°. Now this difference in temperature would only change its relative bulk about one-sixth; therefore, we must look for some other cause for this increased action. I have thought it might be due to the stimulating effect or excitement, so to speak, of the introduction of this cold air into the lungs when it comes so closely in contact with the warm blood.

LEWIS W. LEEDS.

New York.

BUILDINGS FOR MUSIC.

Sir,—Perceiving that the columns of the *Builder* are still open to communications on the above subject, I venture to submit some calculations in addition to those which obtained insertion at p. 543. (See *Builder*, No. 1484.)

The proposition being laid down, that distant echo is injurious to music, the question arises, how much distance makes a distant echo?

Echo produces a mixture in the ear of sounds emitted at different instants, so that they seem to the hearer simultaneous. They may happen to be dissonant rather than coincident; and it is then chiefly that they are objectionable.

Now, musicians constantly use dissonances purposely. Let us next examine what amounts of time they give to them, as well as to concords.

I select four cases: I hope sufficiently typical ones:—

I. Belonging to the sixteenth century is the madrigal,—

"Lady, see on every side."

In the course of the first three bars I find, 1stly, a pure sound enduring 4 seconds; 2ndly, a discord enduring 2 seconds; 3rdly, a concord enduring 2 seconds; 4thly, a rest, or cessation, enduring 1 second.

II. Early part of the eighteenth century. I take from "Acis and Galatea" the conclusion of the first recitative on the word "love":—1stly, a strong discord between voice and instruments, $\frac{1}{2}$ second; 2ndly, a concord of instruments, $\frac{1}{2}$ second.

III. Of the close of the eighteenth century—Chorus, "The heavens are telling," half of 168th bar:—Discord between voices and instruments, $\frac{1}{2}$ second; concord of ditto, $\frac{1}{2}$ second; discord as before, $\frac{1}{2}$ second; concord as before, $\frac{1}{2}$ second.

IV. Of the nineteenth century—opening of the "Inflammatus," from Rossini's "Stabat Mater":—1stly, the initial vocal note, in gross discord with instrumental accompaniment, $\frac{1}{2}$ of a second; 2ndly, voice and instruments in mitigated discord, $\frac{1}{2}$ of a second; 3rdly, ditto in concord, $\frac{1}{2}$ of a second.

Let us conceive a drawing-room performance of any of the above specimens where no echo was felt distant enough to be objectionable. Imagine, in a room 50 ft. long, that an auditor was 45 ft. from the source of sound: at the Newtonian rate of 1,142 ft. per second, the hearing would be $\frac{1}{4}$ of a second later than the utterance. On the base 45 ft. erect an isosceles triangle reaching to the ceiling, which imagine to be 20 ft. above the ear, each leg would then be 30 ft. An echo from the ceiling passing to the hearer along the two legs would occupy $\frac{1}{5}$ of a second; so it would only linger behind the direct sound one-hundredth part of a second. Let that portion of time be compared with the divisions in our musical illustrations, with either 4 seconds, or $\frac{1}{2}$ second, or $\frac{1}{4}$ second, or $\frac{1}{8}$ second: it is obviously very small and inconsiderable; but, on the contrary, let a triangle of sound be set out within a large building; let it extend in height 200 ft. instead of 20 ft., inside St. Paul's; or let it extend horizontally to the remote end of a Gothic cathedral, the same base of 45 ft. being preserved as the distance of the auditor from the source of sound, it will then result that the echo will occupy 0.35 second, which time, diminished by 0.04, as before, to 0.31 second, will be so great that the echo will appear, when set against the actual musical divisions, to assert its place to be more than equal to some of them, and materially to confound the proportions of others. Thus the echoes of the discourse in our third musical case will be superposed on the whole of the quarter-second concord. It would then seem well to enlarge a music-hall on a parallel principle to that on which a prison is enlarged, by multiplying elements of established magnitude, not by magnifying established shapes.

I send a plan for a building adapted for working out the above principle. From a comparatively contracted central area a series of grottoes or Dionysian's ears are made to radiate, like the sticks of a fan, each like a separate chapel or drawing-room, having its own private systems of echoes independently of its neighbours. Thus the curved back of each grotto will intensify without confounding the distant sounds of the solo-singers' voices, as an opera-glass brings their faces near to the auditor; for if the direct lines from the central point, A, to the foot of the echo, E, C, F, be deducted from the infected lines A B C, A D E, A M F, and the differences viewed with regard to the speed of sound, 1,142 ft. per second, they will seem small and trifling, though the whole plan is so extensive that, at a rough estimate, 5,000 persons might be accommodated. Should this not be sufficient, additional grottoes might be added, until a whole circle was completed.

G. M.

ART-WORK AND HANDICRAFT.

It is becoming every day a more and more difficult task to the many to distinguish or define the lines that separate art-work from handicraft. The inability to understand what constitutes true art-work will be no great difficulty to those possessed of an advanced, educated opinion, embracing a nice discrimination as to the fitness and use of objects produced, or a cultured intellect that can at once detect and analyse the laws of proportion, the harmony of parts, and the beauty of the whole,—whatever the object may be. Art-work, so-called, of every species, in the present day, is often a most multifarious and incongruous assemblage of creations, or rather productions, owing their existence to the most varied, vitiated tastes. Let it be understood at once that handicraft can and does proceed from the studio of the sculptor, the easel of the painter, and the drawing-board of the architect, as well as from the carpenter's bench, the blacksmith's anvil, or the potter's wheel. Why does it happen? Simply because the said sculptors, painters, and architects are not artists, in the true creative sense, but merely handicraftsmen, imitators of others in everything,—students once, who learned to draw, but who have failed to grasp the subtle faculty of design. The faculty of invention is a prime essential to every artist who is ambitious to produce original art-work; but invention of itself would die of inanition if it lacked the power of development and embodiment that comes through a concentration of the thinking faculty. It is not sufficient only to give life or infuse a soul into the child of your brain, but you must help it to live. The child of art—i.e., the creation of art—must be the production of a creative mind, and not an imitative one: a mind fully imbued

with the principle that constitutes it. To make ourselves understood, let us say that no man yet ever produced impromptu, so to speak, a work of art. Educated, or in part educated, or self-educated, his tastes had their first dawn and gradual development. Many young minds have been possessed of an innate and sometimes marvellous power of ingenuity; but each and every one of these juvenile manipulators will be found to be imitators, unskilled craftsmen, though possibly incipient artists. We will even go further, and boldly assert that every human individual, no matter how perfect an artist he may become in after-life, has been once a plagiarist. Plagiarism, to some extent, is the primal and normal condition of all first efforts, be they in the region of literary thought or artistic creation.

Unfortunately for the interest of true art-work, this condition of pupillage lasts during the whole lifetime of some men. The boy leaves off his hoops and kites, and the girl her dolls, but some of our artists stick to their first copies all their lives. Their models and automata are the crutches they lean upon; deprive them of these helps, and their individual resources are insufficient to lift them or their works into a lasting public notice.

The goldsmith and the ironfounder produce works of an ornamental nature, artistic in execution (we are to believe), and yet when we examine into the nature of these works we find it is entirely destitute of art. What might be art is nothing more than the craftsman's superior skill,—a work begot of moulds and templates of many processes, and the outcome of many fingers.

The stone-carver and the plasterer in the building trade often execute pieces of workmanship of very high merit to which the term art is applied very often by themselves, as well as others; but the chiselling of a stereotyped capital or corbel, or the casting and fixing of so many yards of interlaced enrichments of egg and dart, or oak leaves and acorns, is not art,—it is pure handicraft, rote, and practice, through several generations, from father to son. The workmanship of a house in all its branches is simply nothing more than handicraft, as the design of a house may also be. Yet, on the other hand, the architecture of a house or public institution in its original and thought-out design of proportion, fitness, and beauty, may constitute it a work of art. In the cathedrals and churches of the Middle Ages, and in a few of our public buildings of the present century, we have perfect works of art. There are architects, too, in our midst who are labouring to make architecture, as a whole, an art. Until this idea is accomplished, and the legislation and spirit of the times imbibe it, art-work and handicraft will be undistinguishable by the many.

A CRAFTSMAN.

SEWAGE IRRIGATION AT ABERDEEN.

The *Builder*, at page 283, ante, gives an account of a successful experiment in sewage irrigation carried out last year on the Spital lands at Aberdeen, and it states that an extended experiment would be carried out this year. A report of this experiment has appeared in the *Scotsman*. The success which attended last year's experiment on eleven acres, or thereabouts, induced the owners of the land to lay out thirty-three additional acres, making forty-four in all, during the spring of this year. The land, which was admirably adapted for testing the utility of town sewage as a fertilizer, was laid out in patches, varying from one-fifth to three-fourths of an acre each, with numerous main and catch drains, and sluices interspersed. The surface sloped gently to the north-east, and though it was generally even, yet a good deal of labour was necessary to prepare it for receiving the sewage, 3 ft. or 4 ft. of the gravelly subsoil at the higher parts being obliged to be removed into the lower parts, so as to bring the surface to the required gradients. Ample road accommodation was also made at the same time. At first it was supposed that grass produced from sewage was unwholesome food for cattle. But last year's experience has proved this idea to be groundless. Cows were fed with it very extensively, and carters fed their horses with it, mixed with old hay. This mixture the horses relished and thrived upon. Hence all the sewage grass that was grown on the farm last year sold at a fair price. Seventeen out of

the forty-four acres have been under grass this year. Since May five heavy crops of grass have been taken off some parts, and four off the rest. The common prices obtained for these crops have been 7s. and 12s. per acre, and the highest price 17s. Five good crops of grass in one year are convincing proof that sewage irrigation is very valuable, both for increasing the produce of the soil and for disposing of the sewage of towns. As the grass is appreciated, and the demand for it is increasing, it is intended ultimately to lay out the whole farm in grass. As much of the additional land prepared for irrigation this year was overrun with wild grass, this portion was put under the kind of crop best adapted for cleansing it. Seventeen acres, therefore, were devoted to the growth of potatoes, and ten acres to turnips. The potatoes are an excellent crop, the tubers being large, numerous, and of good quality. Where the soil is naturally dry, the yield is very heavy. Of the ten acres of turnips, four acres (Swedes) are good, and are expected to realise from 16s. to 20s. per acre. The remaining six acres are devoted to the production of yellow bulbs, two-thirds of which promise a heavy return, but "finger and toe" have made havoc in the other third, and here and there a few ill-favoured patches are to be seen. This failure is owing to the natural wetness of the subsoil at these parts, and to the turnips happening to be grown on much of the previously unproductive land. With these exceptions the yield is really good. Where the soil is naturally dry, and not too thin, the bulbs are large and plentiful, and the tops long and heavy. At a public sale, on the 7th instant, the yellow turnips realised from 12s. to 16s. per acre. By this experiment it appears that where the soil is naturally wet, it is unsuitable for sewage irrigation. But the remedy for this is deep drainage. By this means not only would the stagnant water in the subsoil drain away, but the sewage would filtrate down to the drains, leaving its fertilizing constituents behind in the soil as food for the plants, and the liquid would pass through the drains into the recipient watercourses pure and bright. It is also apparent from this experiment that grasses is the most suitable and remunerative crop for an irrigation farm, especially if the farm be situated as this one is, on a cold soil, in an uncongenial climate; for while four or five heavy crops of grass can be raised in one year, with scarcely any labour, only one crop of potatoes or turnips can be produced during the same period, with much costly labour. On the whole it is gratifying that the owners of the land are likely to be handsomely rewarded for their enterprising experiment, and it is fortunate that the civic rulers of Aberdeen should have practical illustration of the advantages of such a scheme. It should be stated, that while the sewage was flowing over the farm, no offensive smell was found in the neighbourhood, and that by the time the liquid reached the outflow ditches it was almost clear and pure.

SCIENCE AND ART SCHOOLS.

Leeds Schools of Art and Science.—The annual distribution of prizes and certificates to the pupils attending these schools has taken place in the hall of the Mechanics' Institution. Mr. Thomas Dawson, the president, who occupied the chair, said he rejoiced to find that the School of Art occupied such a position under the able superintendence and teachership of Dr. Puckett, the head master; that the Department of Arts in London had awarded Dr. Puckett a master's prize of a creditable character, thus testifying at once to the quality of his teaching and to the efficiency of the school over which he is master. He (the chairman) found that the school was making indeed good progress. There was a considerable increase in the number of pupils from those which stood on the books at this time last year. He noticed a falling off in the number of those who had passed the examination in the elementary grade, but that was satisfactorily accounted for by the fact that so many drawing classes had been established in connexion with other institutions. There was, however, an increase, which was indeed gratifying, in the number of those who had passed the examination in the advanced section. The school of science was evidently in a state of satisfactory success on the whole. Nineteen prizes and 118 certificates had been obtained by fifty-eight pupils. But whilst some of the classes in that

department of the institution were so well attended, and whilst so much success resulted from the labours of those who superintended those classes, yet he noticed that there was one class—and he noticed it very much to his surprise—which consisted of eight pupils, and which he should have thought, in this great iron town of Leeds, would have numbered at least eighty. He meant the metallurgy class. When they remembered how essential a knowledge of metallurgy was to workers in iron, it was calculated to astonish them when they compared the number in that class with the number of workers in this town who ought to have the knowledge which they could get if they would attend that class.

Hanley School of Art.—The annual meeting of this institution has been held in the town-hall. The mayor presided. The hall was well filled, and the meeting was in all respects a satisfactory one. A selection of the works of the students for the past year was displayed in the room, and these remained on view the following day. The committee reported that since the appointment of the present master (Mr. Bradbury) the confidence they ventured to express in their last report, "that every vacant seat might be occupied," has to a large extent been realised. Mr. Bradbury read his own report, in which he said:—"I regret that we cannot carry to the extent I wish the drawing and painting of flowers and foliage from nature, believing it to be one of the most useful departments of study that any school of art can cultivate. Our non-success in this is attributable almost entirely to our inability to obtain suitable plants, either as gifts or loans, for the use of the students. The number attending the classes during the year ending July, 1871, was 155, and during the year ending July, 1872, 174, while the average monthly attendance of artizan students in the former year was 75, and in the latter, 82. The modelling class, though not large, has obtained results highly encouraging. A room previously assigned to the head-master I have resigned to the exclusive use of the modelling students. I give here a summary of Government results of examinations:—

	1870.	1871.
Number appointed "Free Students".....	6	5
Number of students' works examined at South Kensington, and considered satisfactory.....	38	38
Number of students' works that obtained prizes.....	18	18
Number of second-grade subjects passed.....	38	38
Number of second-grade prizes obtained.....	10	11

In 1870, two bronze medals and one Queen's prize of books were obtained; in 1871, one silver and two bronze medals, and a special prize of 10l., offered for a design of a vase or other large object, and opened for competition to students of the entire kingdom, was awarded by the Science and Art Department to Jos. Ellis, of the Hanley School. This year, in a total of 117 schools, only 12 stand before the Hanley School in number or quality of medals obtained, while there are 41 schools having a larger attendance of students, and 59 situated in towns of larger population. The importance and benefit of the local scheme of prizes cannot be too highly estimated, as being a most efficient means of giving a specific direction to the studies of the pupils."

Technical Education in Scotland.—Efforts are being made for the promotion of science and art instruction in Scotland. The local papers report a series of meetings in the large towns, which appear to have been fairly successful. Mr. Buckmaster has pointed out what is required in the education of working men; and that their masters, instead of teaching boys abstractions and metaphysical ideas, as if they were all to be parish ministers, must teach them things. A knowledge, he said, of the laws and properties of matter by which the earth is subjugated to our use, is the proper education of men who have to work on matter. Several local committees have been appointed to co-operate with the Science and Art Department in promoting scientific instruction in Scotland.

The Dublin School of Art.—In the annual report of the Royal Dublin Society the Committee of Fine Arts thus alludes to the head-master of the school:—"We feel bound to call attention to the report of the judges, who awarded the prizes, and to express their high approval of the manner in which Mr. Edwin Lyne, M.R.I.A., has conducted this great establishment. At the annual awards in the National Competition this school was much distinguished by the number of prizes received by its students."

Mr. Lyne, who was several years a resident at Rislly, in this county, also received one of the bourses offered by the Department of Science and Art for successful management and teaching."

Cork School of Art.—The annual distribution of prizes to the successful pupils of this school has taken place, in the Theatre of Cork Institution. The mayor presided. There was a large attendance of ladies and gentlemen. Mr. Brennan, master of the school, read the report. The attendance at the school (which this time twelve months showed a slight decrease as compared with the corresponding period of the preceding year, according to the report), has increased considerably, particularly in the evening class. The total number of students who passed through the school last year was 188; this does not include an average attendance of 23 boys from National Schools. Instruction in drawing has also been given to the Blue Coat School, and various National Schools, by means of the pupil teachers of the Schools of Art, and some teachers of the National and Model Schools avail themselves of the instruction afforded by the School of Art. The science classes in plane and solid geometry have not, until this winter, been availed of as they ought, and yet those who attended have been successful. Three students obtained classes in 1870, and one in 1871. At present there are fourteen students in the class. A knowledge of this subject, as the master remarks, is invaluable to the carpenter, engineer, &c., who wishes to understand the principles that govern the construction of the drawing from which he works, and not trust to mere rule of thumb, as is too often the case.

NEW SCHOOLS AT STOCKWELL.

The British and Foreign School Society have just completed the erection of additional new schools, in connexion with their Students' Training College, at Stockwell. These schools, which have been built upon a piece of land belonging to the Society, a few yards distant from the college buildings, are two stories in height, and uniform with the college itself in architectural design. They are intended for both boys and girls, and are large enough to provide tuition for 130 children. These schools, which have cost 2,000l., form the third block which has been erected within the last few years in connexion with the Society's establishment at Stockwell. Simultaneously with the erection of the schools, the college has been undergoing an enlargement, the works having been finished within the last fortnight, and there are now private apartments and sleeping accommodation for 135 students; the capacity of the building before the additions were made being limited to 102 students. The works have been carried out under the superintendence of Messrs. Beek & Lee, of Finsbury-circus, architects.

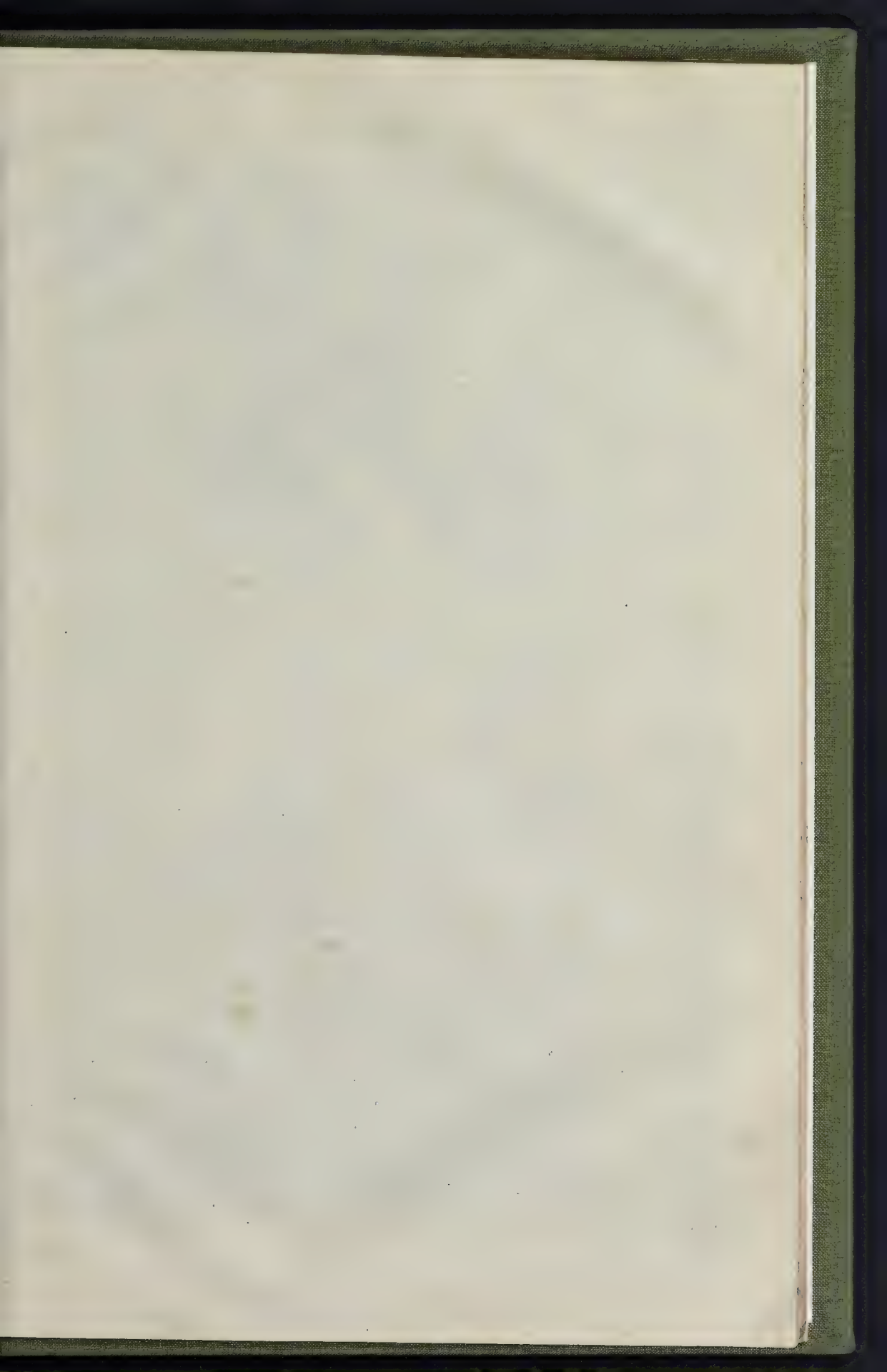
RUINS OF BAÅLBEEK.

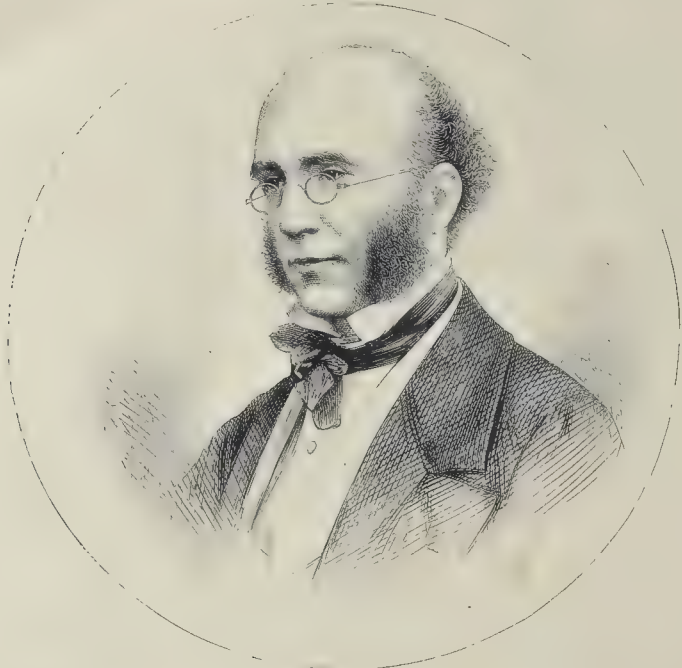
SIR,—I have but just returned from abroad, and have therefore only to-day seen your notice of Mr. Tyrwhitt Drake's warning as to the state of these magnificent remains. I beg to add my testimony to the fact that the finest portions are threatened with speedy destruction if no steps be taken to ward it off. It is, however, of no use to invite subscriptions to this end until the proper course of action is agreed upon.

How easily a mistake may be made, is evinced by the suggestion to employ metal bars or bands. Why, the very reason that the six great columns (only six remain) are now so precariously resting on but half their diameters is, that the Arabs have cut away the other half to abstract the metal domes! What has been done once by these ignorant savages would be done again.

Cannot the Institute of Architects direct their "Monument Conservation" Committee to collect evidence upon the state of those parts of the temples which are most immediately threatened with destruction, and then draw up a report upon the steps most desirable to be taken? The assistance of French and German architects who have visited the spot might also be invited. Then an appeal might be confidently made. Hardly a year elapses without the visit of some architect to Baålbek, and such a visitor would surely, if entrusted with proper powers, accept the charge of the necessary works with no little enthusiasm and pride.

J. D. CRACE.





MR. EDWARD T'ANSON, ARCHITECT.—*Surveyor to St. Bartholomew's Hospital.*

ST. BARTHOLOMEW'S HOSPITAL SURVEYORSHIP.

THE voting took place on the 18th, and Mr. Edward T'Anson was elected. The contest was very severe.—Mr. Clifton polling 84 votes, and Mr. T'Anson, 87.

FLOORS FOR WORKSHOPS.

GROUND-FLOORS for large machine-shops are very often made with the plank resting on the surface of the ground, the sleepers to which they are spiked being imbedded in the ground. A writer in the *Journal of the Franklin Institute* says,—I have been informed that white pine planks last longer than oak for the same purpose, and it is, in fact, considered the best wood for the purpose. Some attempts have been made to prevent the decay of such floors, but the question has at once arisen as to the economy in each case.

Floors where heavy machinery is erected are subject to very severe wear, and it is asserted that a 2-in. white pine floor will wear through in such a place before it has rotted out. On the line of the Georgia Central Railroad floors have been laid in a peculiar manner, which is deserving of note. The ground is levelled off for the floor, and ditches dug to receive the string-pieces or joists; these are coated with melted rosin, before being laid, on the three sides in contact with the ground. The floor is then laid, with a space of $\frac{1}{2}$ in. between the surface of the ground and the under side of the floor planks. After the floor is all down, holes are bored, at intervals of say 3 ft., over the whole surface, and melted rosin poured into the space below the floor, to entirely separate the planks from the ground. Mr. Wm. M. Wadley, the president of that road, says that floors so laid show no signs of decay, after many years use, in places where

the floors usually rotted out in a short time. The asphaltic pavement was adopted in one large shop in this city, but I have not heard how it has stood the test of wear. It was made of spawls from granite mixed with coal tar and asphaltic.

In the establishment of Messrs. Wm. Sellers & Co., of Philadelphia, the floor upon which the tools rest is made of iron, secured to foundation walls of bricks, while the part of the floor upon which the workmen stand is made of pine plank, readily renewed if it rots out. The asphaltic pavement seems to be admirably adapted to the flooring of stables, and in one instance I have seen plank laid upon a floor of asphaltic, in the stalls of a modern stable, the proprietor deeming the asphaltic composition too hard for the horses' feet.

In connexion with the decay of floors it may be well to note that reliable builders state that on outside walls the ground-floor joists are likely to rot off in about fourteen or fifteen years. My attention was called to this by the sinking of the floors in two houses in West Philadelphia, which had been built about fifteen years. An examination of the case showed that all the joists which had so rotted had been built into the wall at the ends, and the rot had occurred where the timber was excluded from the air and submitted to the moisture of the outside walls. Examining houses in the country which have been erected for at least fifty years, I find the joists still sound, but in no instance have I observed the practice followed of carrying up the cellar wall flush between the joists, as is now the custom in cities.

It seems evident that the best plan is to make an offset in the cellar wall to receive the joists; and, if the space between the joists is to be filled up for the looks, to let the filling-in fall back from the face of the wall, below the joists, say 1 in. or 2 in.

THE CASTLE GARDENS, ROCHESTER, KENT.

In the spring of the present year designs were invited for laying out the grounds around the Norman castle of Rochester, so as to form public gardens for the city. From the designs sent in, six were selected, marked "Norman," "R," "Garden of the Medway," "Nature and Art," "Ioh Dico," and "Nil sine labore," and ultimately the committee awarded the first premium, 40l., to "Norman;" 2nd, 40l., to "R;" and 3rd, 20l., to "Garden of the Medway." The gentlemen whose plans were thus selected were: 1. "Norman," Messrs. H. Barnett & H. Hook, Vernal Buildings, Gray's Inn-lane, London.

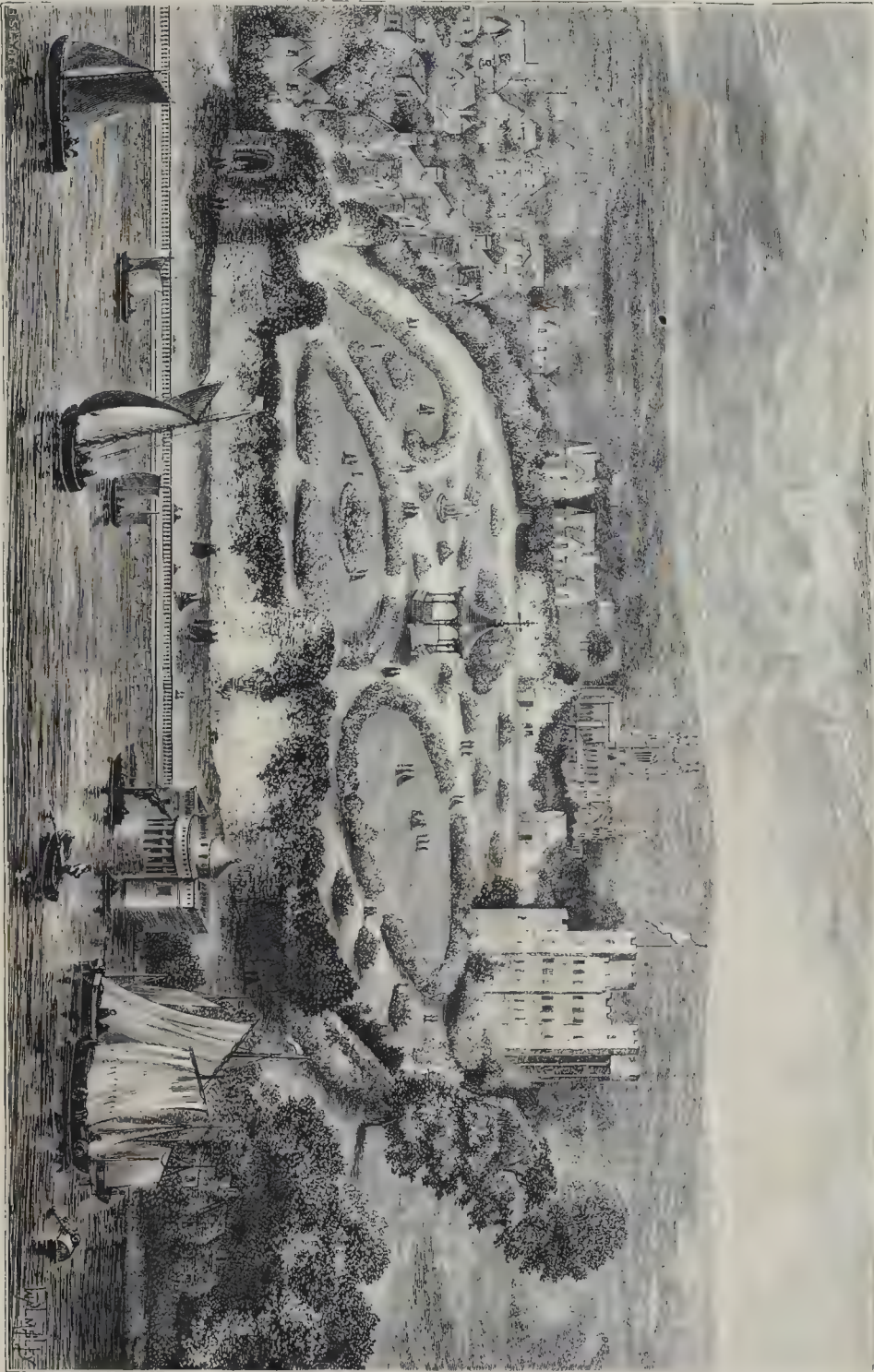
2. "R," Mr. William Gay, of Bradford.

3. "Garden of the Medway," Mr. John Drake, of Chatham.

The accompanying engraving represents Messrs. Barnett & Hook's design, which is now being carried out by Mr. Sollitt, of Strood, under their direction: the amount of the contract is 2,000l.

The main entrance will be by means of an archway in the Norman style (seen in the view) and an ascending tunnel, through the ancient bastion which faces the visitor as he enters on the esplanade from the bridge. Looking from the centre of the bridge, the entrance is in full view, and it is also in a line with the centre promenade on the plan which leads to the castle. Persons arriving from London will at once see the entrance to the gardens. On ascending the steps of the tunnel, the castle will be fully in front of the spectator.

It can scarcely be doubted that these gardens when completed will, in connexion with the grand old ruin now in the hands of the corporation, prove a great attraction to visitors, as well as a place of pleasant resort for the inhabitants. The remains of the castle demand the most careful conservation.



ROCHESTER CASTLE GARDENS.—MESSRS. BARRETT & HOON, ARCHITECTS.

ON CHARITIES.

THE question of the best manner of benefiting the suffering from the blight of poverty is one of great difficulty, in the face of danger to independence of character, imposture, and so forth. Yet there are, doubtless, many ways in which efficient benevolent aid is needed; e.g.,—

1. Relief for the destitute—temporary.
2. Charities on a large scale (as hospitals, &c.) endowed.
3. Improved dwellings for labourers.
4. Asylums for lunatics, and homes for educated classes, reduced.
5. Authors and artists—encouragement.
6. General educational assistance.

1 and 2. England has immense charities, in the distribution and management of which great abuses exist, and it would require a large sum to put an end to such abuses. A very considerable proportion of the money subscribed to each charity is at present absorbed by salaried managers, secretaries, touters for money, &c.; so that not half the funds subscribed by benevolent persons find their way to the objects for which they are given. If a Central Voluntary Contribution Board were established for the sole purpose of receiving and distributing money among established charities on application, in proportion to the good actually performed, as shown by inspection of their books, &c., so that the whole efforts of each institution should be directed to the work of relief, and not to collecting money, a vast amount of abuse would be put down, and a corresponding good effected. Such a Board having a solid nucleus by way of guarantee to start with, and publishing periodical reports of their method of distributing funds, would command the confidence of the wealthy, and receive contributions commensurate with their wants.

3. I have been twenty years intimately associated, as shareholder and auditor, with the Metropolitan Society for Improving the Dwellings of the Industrial Classes, by whom about 100,000. have been invested to great advantage. Mistakes have been made and corrected, and all the consequent experience gained. More good might probably be done by taking a large number of shares in this association than by starting a new management, besides that there are several others of the same kind instituted since the original pioneer association.

4. Probably the greatest distress suffered in this country is experienced by educated people in reduced circumstances, either by their own mistakes, or those of their parents, trustees, or friends, or the numerous mischances and injuries incident to civilised life: e.g., lunacy largely prevails, and is increasing; yet there are no asylums between private establishments, which are very expensive, open only to the rich, and free institutions for the "pauper" poor. A middle-class lunatic must be kept at home, to the injury or ruin of the entire family. Again, supernumerated or employed governesses, clerks, &c., have no homes to save them from absolutely sinking, or aid their recovery from unavoidable sickness.

5. Encouragement and assistance are often wanted by qualified authors, artists, musicians, &c., having no means of proving their talents before the world. The Royal Literary Fund has saved numerous decayed authors from starving; but they must have published works of merit or genius. Many men may write such without the power of publishing, and a Board who, under proper restrictions, should find means for the publication of such works as were deemed by them sufficiently meritorious, might prevent much destitution, and preserve works of genius from being lost.

Money might also be advanced by such a Board on pictures of sufficient merit to be exhibited for sale in a free gallery provided for the purpose.

For musicians, especially organists, encouragement is greatly wanted as a stimulus for improvement and the cultivation of the national taste. England abounds in splendid organs on a grand scale, but there can be few players adequately to match them, so long as no encouragement exists for young artists. The services of the Church require so small an amount of musical knowledge that every clergyman and churchwarden, where a vacancy exists, has a friend capable of just performing what is absolutely requisite, and consequently, in their opinion, eligible to fill the post; so for that lifetime, at least, the improved powers of the modern organ are practically thrown away; whereas were an annual organ festival held, at which the best performers, to be decided by

umpires, should be awarded a purse and a medal, a stimulus would be furnished to the highest cultivation of the art, the appreciation of our noble instruments, and the elevation of the public musical taste.

6. Perhaps the chief general educational want is an instructive and interesting sound literature, not too difficult (the fault of the Chambers publications) for school and especially home reading. I have made an attempt with a specimen volume of short "plain papers, by Pikestaff," published by Trübner; but, not having been advertised by him, it has not become generally known, and the original intention of supplying such a library has not therefore been further proceeded with, on account of the outlay required to bring it into the market.

T. BAKER.

VISIBLE MATHEMATICAL LINES.

"THERE is no such thing in the material world as length without breadth." These words are to be found at page 281 of Messrs. Abbott & Seely's interesting book, entitled "English Lessons for English People."

I do not understand the statement I have quoted as intended to signify merely that "length without breadth" is not substance; but rather, as the context indicates, that "length without breadth" is not to be apprehended by the senses. I submit, however, that this proposition is erroneous.

Visible mathematical lines are among the most common appearances in the material world; for the material world is visible only as an aggregation of variously-shaped patches of colour, and the boundaries which separate these patches of colour are mathematical lines,—lengths without breadth. Let any one, for example, place upon a scarlet table-cover a sheet of writing-paper. Let him, looking towards the light, observe that edge of the paper which is most distant from his eye, i.e. the boundary between the white and the scarlet; he will perceive that boundary to have a definite length, say 5 in., but he cannot see its breadth; and his reason will assure him that immediately the white ceases the red commences, or that there is no distance between them. He may endeavour to explain away the evidence of his sense, but surely the fact remains,—he has seen length without "breadth."

The truth is, that the thing really not to be found in the material world is the mathematical line when defined as straight, circular, &c.; not that we know that it does not so exist, but that we have no means of finding it, and it is not at present to be apprehended by the senses.

In a mathematical point of view it is, doubtless, of little importance whether the proposition in question is true or not; but I think it is of service to investigate it, because it is frequently employed as an illustration, in which capacity it appears in the place quoted.

S. C. ROGERS.

A CONCRETE WHARF.

A WHARF wall and basement-story of a warehouse have been lately constructed of concrete on the bank of the River Thames under the direction of Mr. R. M. Ordish for the Patent Plumbago Crucible Works. The wharf is about 60 ft. square in plan, and consists of a storage vault and a building of three stories, which has been carried up in brick and iron above it. The floor of the concrete wharf is at the level of Trinity high water, the floor of the vault being 10 ft. below it. The foreshore of the river was excavated to the hard gravel, upon which a bed of cement concrete 3 ft. in thickness was laid. The roof of the vault, which forms the floor of the lower part of the superstructure, is also of cement concrete, and is carried on 24 brick piers. The vault roof is groined, and at the crowns the concrete is 1 ft. thick. Openings have been left in this roof for communication with the wharf floor above, and are closed with wrought-iron flap-doors hinged to cast-iron frames. The floorings of the vault, and of the ground-floor of the wharf are both paved with 2½ in. York stone.

The concrete walls are 3 ft. 6 in. thick at the base, and 2 ft. 9 in. at the top, the front wall having been carried 15 ft. below Trinity high-water mark, and all the walls terminating 3 ft. 3 in. above that level. Ordinary fender piles, provided with mooring rings, are held by 1½ in. anchor bolts, 6 ft. long, and which are built into the front and side walls of the structure. In

constructing the wharf, the foreshore was first excavated, about 2,000 tons of stuff being removed. Fender piles were then driven, and afterwards a row of piles on the inside of the site of the proposed walls. Mould boards were then fixed horizontally against the piles, and the concrete was tipped in from staging. As the works were submerged when the tide rose, the construction could only be carried on between tides. As the work advanced, additional mould boards were placed in position, and were removed as the structure progressed, and the concrete set; in this way the walls were raised to their proper level. The concrete consisted of 1 part Portland cement to 4 parts Thames ballast and sand, and about 1,000 cubic yards were used in the structure. The cost of this portion of the work was about 2,000£, showing a saving of something like 25 per cent. in cost as against brickwork.

CEMENTS AND ASPHALTE: MILAN EXHIBITION.

A CORRESPONDENT of the Society of Arts, giving an account of the Milan Exhibition, says,—

The manufacture of hydraulic limes and cement in Italy is most important, and although it is but poorly represented at the Exhibition, it should not be passed over without remark. Hydraulic cement is comparatively a new product in this country, as Pozzolana has been hitherto almost exclusively employed in the preparation of mortars to resist the action of water. In 1848, the rich deposits of marly limestone existing in northern Lombardy were first brought into public notice by the Society of Encouragement of Milan, but it was not until 1858 that the lime and cement works at Serravalle, in the Venetian provinces, and at Palazzuolo, near Brescia, were established. These works, now the property of the Alta Italia Railway Company, are the most important in Italy. In 1864 a company was formed at Bergamo, for the manufacture of hydraulic lime and cement, and in the short space of six years the "Società Bergamasca" has attained considerable importance. Large quantities of this lime and cement have been employed in most of the public works that have been recently carried out in Italy. Amongst the most important may be mentioned, the Canal Cavour, the port of Ancona, the Victor Emanuel Gallery at Milan, the bridge over the Adda at Rivolta, built entirely of concrete, with the exception of the facings of the piers, which were of stone. The new sewers at Milan are being constructed entirely with concrete made with this cement.

The lighter coloured beds produce the slow-setting cements and lime, which are best adapted for concrete blocks of large dimensions, whilst those of darker colour, containing a larger proportion of clay, furnish the quick-setting cement, which, if not as quick-setting as the Roman and Portland cement, is still of excellent quality, and is produced at about one-quarter of the price. These works, which employ about 300 workmen, produce annually 6,000 tons of hydraulic lime, and 10,000 tons of cement.

Among the various applications of the Bergamo cement exhibited, are an arch of eight mètres span, built entirely of concrete; a bath, pipes, and a short length of the sewer recently constructed under the Via Carlo Alberto, at Milan. The Alta Italia Railway Company does not show such a complete collection of various applications of lime and cement as the former company, and has contrived only a few blocks of concrete, made with the lime of Palazzuolo. Concrete blocks, or "grismi," are extensively used in Northern Italy, as a substitute for stone in river embankment works.

One of the best limes in Italy is that of Casale. It is being principally used by the contractors for the important branch canal of the Canal Cavour, now in course of construction between the Ticino and the Agogna, for the irrigation of the Lomellina.

The specimens of asphalt, and pavements in this material, are numerous; and now that asphalt is likely to come into more general favour in England, it is probable that some of the rich deposits which are abundantly met with in Central Italy, and which hitherto have remained unworked, will be turned to profitable account. Amongst the principal exhibitors of this substance are the Società Generale degli Asfalti, of Rome, Praga and Erba, both of Milan. This last-named exhibitor has discovered a pro-

cess by means of which he is able to colour both asphalt and lava, and to produce, at very reasonable prices, pavements of any design and colour. This material is unaffected by the heat of the sun, and has no unpleasant smell. The price of these pavements varies from 2 fr. 50 c. to 4 fr. per square metre, according to the pattern required.

The fire-bricks and articles in fire-clay, exhibited by Ginori and Richard, and the crucibles of Bondi, of Rome, will bear comparison with those of English make. With regard to "timber for construction," which enters into the second section of Class L, we have but little to say, as the show is poor in the extreme, and gives no idea of the resources of the provinces of Piedmont, Lombardy, and Venice, which furnish excellent timber for ship-building and other purposes. Timber is also plentiful in Sardinia; and the larch from this island is remarkable by its absence.

STATE OF NEW BROMPTON, CHATHAM.

I SEND you a few facts respecting the sanitary state of this place. New Brompton has a population of over 8,000, yet there is not a drain in it, each house having a cesspit sunk in the back yard or garden. A large number have also a well, from which the water supply is drawn. In several streets, although they have been built several years, no road has yet been made; and at this time of the year there are 6 in. of mud to wade through in passing along them. In one of the latter streets smallpox is now raging, and at one house two men are lying dead. At the back of the house I am told that a cow and pig are kept; so, considering the surroundings of these unfortunate individuals, it is not to be wondered at that the disease should prove so fatal. The doctors recommend that the schools should be closed; might not they recommend that the place be thoroughly drained, the cesspits be filled in and closed, and good roads made?

If your sanitary inspector should visit this neighbourhood, he would find abundant material to furnish a report as bad in its details as any I have yet read in your valuable journal. C.

PROFESSIONAL BRAIN-PICKERS.

"Would you be surprised to find?"
The Attorney-General.

SIR,—I would like to know, first of all, have you attentively read the *Times*, *Telegraph*, *Standard*, and *Daily News*, since the date when the Prince of Wales was struck with his most serious illness?

Presuming that you have read all these papers, particularly one of the number, I dare say you were not at all surprised to see that your brains and the volumes of the *Builder* have been picked to some advantage by doctors, "Our own correspondents," and amateur sanitarians.

You are not surprised to find that your very maxims anent disease and health have been swallowed down piecemeal, digested, and are again disgorged for the edification of the ignorant British public.

You are not surprised, neither am I, at the cool audacity of some medical men and borough engineers, who were babes when the *Builder* began to preach the truths of sanitary science, presuming to lecture their superiors while coolly ignoring the labours of those whose writings first gave them an original idea upon the subject on which they write.

You are not surprised to find that doctors' assistants and doctors *in globo*, have constituted themselves, or are trying to constitute themselves, authorities in drainage matters, inclusive of course of plumbers' work, bricklayers' work, glazed-tile work, and the whole sinuosities of the sink and effluvia trap and water-closet up-and-down pipe-system.

You are not surprised at the wonderful pseudo-sanitary volubility of our daily, and some of our weekly, journals, nor am I, although I remember it is not many moons since they ridiculed the very mention of objects they are now strenuously advocating.

You are not surprised that political journalists begin to believe in pure water, plenty of air, decent dwellings for the working classes, and the necessity for removing all dung-heaps, knockers' shambles, bone-yards, and injurious trades far out from the city.

You are not surprised to hear that the Jews and Gentiles are both agreed in believing that

typhus and all kinds of zymotic diseases are preventible; that dirt is not only a disagreeable, but a dangerous thing; and that the expense of the preventive process do not reach to one-third the cost of the drugging, blistering, and pill-swallowing methods of cure.

You are not surprised to hear, too, that others as well as yourself, heretofore believed that some architects, *bona-fide* sanitary engineers, and practical builders and their foremen, knew something about sanitary affairs, although the medical officers of health do not believe it possible.

Perhaps you are really surprised to find that "one righteous man" can be found in the doomed city who would act fairly by his neighbour, and give to Caesar what belongs to Caesar.

Well, sir, do not be surprised when I tell you,—I know you will not,—that I have many faults, but among them I hope will never be reckoned the low and unprincipled practice of plagiarism and brain-picking.

C. C. H.

ARCHITECT'S POWERS AND LIABILITIES.

SIR,—In the Rolls Court, 6th December, was argued, and judgment given, in a case of some interest to the profession,—*Little v. Moore*.

The case has been in the court two years. The main points appear to be,—what are the powers of the architect under a building contract; in fact, the extent of his agency (there is no precedent for this case); and whether orders for payment given by the contractor to merchants on the architect be valid?

The plaintiff in this case was a merchant, who declined to take an order on the architect, but obtained one from the contractor on the building owner of a later date. The architect had accepted prior orders.

His Honour decided that the prior orders on the architect were valid, and that the orders must be paid according to the priority of date.

From this decision, it would appear that, although the architect's power is limited by the agreement to granting certificates, he is to all intents the agent of the building owner, and that a notice served on him in the shape of an order is as good as a service on the building owner, the architect being cognisant of the time when payments are due.

I am very desirous of knowing the reasons for the decision. E.

ADULTERATED CEMENT.

SIR,—Observing a complaint on this subject in your number of the 16th inst., by Mr. Glover, of Newcastle, I beg to inform him that he will not find his locality to be singular in the dishonesty of mixing slag and metallic *debris* in the manufacture of Portland cement. The mixture is made for two purposes: it gives colour and weight. It undoubtedly diminishes the strength of the cement, and deceives the consumer and engineer. Weight is some indication of strength in good cement, and it is therefore often desired that a bushel shall be of a certain number of pounds. It is like buying chicory when you mean to have coffee! If Mr. Glover will wash a little cement in a basin with plenty of water, he will soon discover the adulteration in the "grouts" at the bottom of it,—an impalpable dirt.

The best remedy, wholesome for consumers and manufacturers, will be to transfer the demand to reputable makers at the same price.

BITTEN.

THE METROPOLITAN SCHOOL BOARD.

At a recent meeting of the Board Mr. W. H. Smith, M.P., moved—"That it be referred to the Statistical Committee to consider and report to the Board as to the proportion of children in any system of schools to be provided for in the four school departments respectively, viz., the infant, the junior, the senior boys, and the senior girls." The motion was agreed to.

The Rev. Dr. Bigg moved "That it be referred to the Scheme of Education Committee to consider and to report to the Board as to the due proportion of class-rooms to be provided for the schools built by the Board, and as to the dimensions proper for such class-rooms." He urged that the Board should make such arrangements as would favour the system of education by which not more than 40 or 50 scholars were taken in classes at one time.

At the suggestion of the clerk the matter was referred to the School Management Committee.

Miss Emily Davies moved "That it be referred to the Scheme of Education Committee to consider and report to the Board as to the expediency of attaching residences for masters and mistresses to the schools established by the Board." The mover agreed after a short discussion to the reference of the subject to the School Management Committee.

The Statistical Committee have recommended that, upon a site already selected in the neighbourhood of Petticoat-lane, a school be built to accommodate 1,100 children, but that the plans be made with a view to extra accommodation hereafter for 400 children more. Canon Cromwell said the site ought never to have been purchased at all. Still less ought a large sum to be spent in the erection of a school upon it. Hereupon Mr. Buxton remarked that the Rev. W. Rogers, who probably knew as much of the educational wants of Whitechapel as did any member of the Board, had himself advised the purchase of the particular site, and had protested against the number being lowered from 1,500 to 1,100. Seven or eight members spoke to the point; but as no one supported Canon Cromwell, it was agreed that the erection of the new school be as soon as possible commenced. The Works and General Purposes Committee have recommended the Board to accept the transfer of certain schools, and to take various buildings for the purposes of schools, *ad interim*. The recommendations have been approved, and it has been stated incidentally that the Board has now upwards of forty schools in full work.

STATE OF THE STREETS.

DISCUSSION has of late been raised as to the state of our streets; in fact, for many years about this time the same tale has been recited. Let me make another suggestion to add to the many. In Paris the contrivance adopted to water the roads is by a movable hose fixed to water-plugs at certain distances apart. Why should we not have the same to water our roads, do away with the cumbersome water-carts, and at this muddy time to serve the purpose to wash down the pavements every morning? There are many able-bodied paupers in every parish that could be told off to act, even in place of stone-breaking in the yards, before obtaining a loaf. And why should not each parish appoint such paupers to sweep the most frequented crossings? Y.

LOOK TO YOUR COOKING UTENSILS.

SIR,—It may not be amiss to warn Father-families and Mother-families at this festive season that there is another source of poisoning, besides that from sewer gas or overcrowding. When a house is unusually full of company, every available culinary utensil, old and new, is pressed into the service, as well as temporary kitchens erected, as at Lambethborough Lodge. Diarrhoea, or more serious complaints, may be produced by the incautious use of tinned vessels. It is on record that a whole family was rendered seriously ill, and one member nearly fatally, through the presence of 18 per cent. of lead alloyed with the "tinning" of some iron sauce-pans. A tinned copper vessel is a sure source of poisoning, if it have partly lost its tin surface. Your readers should look to their cooking utensils. CHEF.

DECORATION OF ST. PAUL'S.

SIR,—In the expression, at the conclusion of one of my letters which you did me the honour to admit into your columns, viz., "Has Mr. Shone nothing to say about the windows?" I was referring to them, not as works of art, but as to their cost,—so far beyond what the donors were led to expect.

I had been showing how much money had been wasted in needless, and I must add, improper alterations; how many were the mischiefs which had resulted from the committee's disturbing Sir Christopher Wren's work; that 1,050*l.* had been needlessly spent in buying a new organ; that a large sum had been expended in putting it up; that, having been erected, it was found to be a mistake, and that it was to be taken down again and sold; that 700*l.* have been wasted in lowering the stall-work,—that this also was found to be a mistake, and another considerable expense was to be incurred in

raising it to its original height. The sinking of the old Father Smith organ in one of the ladies' closets was found also to be a mistake, and was to be removed again. And here comes another hitch. The committee, contrary to the judgment of all musicians, determined not to put it back into its old place, but to divide it into two sections, and put one half against the one pillar as you enter the choir, and the other against the other pillar. I still maintain that, both as regards music and architecture, this is wrong. But what is the discovery now? Why, that the organ cannot be worked, as was intended, from the crypt below, for want of head space; and the consequence is, a new determination is come to: another mutilation of Wren's work is not only proposed, but actually being carried out. The floor of the choir is being raised 18 in. to accommodate the machinery of the organ, and thus the proportions between the stall-work and the floor are to be brought back again to that very state which was condemned, and which the raising of the stall-work aimed at its original position was meant to remedy. All this comes of not leaving Wren's work alone. And who is responsible for these things? A committee of taste is a hazy body. No responsible head is to be seen in it; but this I do know,—Sir Charles Barry entered his protest against their proceedings before he died; and I know that another eminent artist has sent in his resignation since, because, like Sir Charles Barry, he was dissatisfied with their proceedings.

But what of the windows! It was suggested that private individuals or City companies might make presents of them. Individuals and companies fell in with this suggestion; and were it not for what has taken place, as to the windows already given, by this time probably much more progress would have been made, and more of the windows illuminated. But public confidence is shocked. Mr. Brown, one of the partners in Longman's great house, put down 1,000*l.* for the large window over the west door. The committee determined that this window, and all others that might be given, should be made at Munich. The English artists were shut out. I considered this wrong, both in a national, economic, and politico point of view. Individuals were not likely to give their money to be sent to Munich. Besides our own English artists have friends. Was this the way to conciliate them? Was not the church built by a native artist? Do not we boast that Sir Christopher Wren was one of ourselves? And is it impossible for the decorations of the church to be devised and carried out by English artists?

But, be this as it may, it was determined that Munich should have a monopoly of the windows. And what is the result? After three years' delay the window was put up at the west end; and then, instead of the 1,000*l.* covering the expenses, the old man was asked for 500*l.* more, and he paid it. He is now dead, and his complaints are hushed. The Drapers' Company gave the window immediately over the altar. I am not informed as to the original estimate and its final cost; but I do know something of other two of the windows in the apse, over the altar-table, and there are living witnesses as to these which may still be appealed to.

The Goldsmiths' Company gave the one in the north-eastern corner,—“Our Lord's Agony in the Garden.” Of this the estimated cost was exceeded; and though the Goldsmiths' Company paid the bill, they paid it in a reluctant spirit. They are too gentlemanly a body to make a loud complaint. Of the window over the one given by the Drapers, my friend, Dr. Rogers, was the donor. He had been led to believe that 500*l.* would cover the expense of this window; he, however, put down 650*l.* When the window was completed he was asked for more, and the ultimate sum paid by him was 820*l.* I ask, is this the way to encourage donors? Does it not show a carelessness in making estimates and a recklessness in expending money; and are not such facts as these sufficient to prevent those who would be donors committing themselves to so loose and misleading a system?

I pretend not to a knowledge of art; but I am persuaded that nature and art cannot be antagonistic the one to the other. St. Paul was struck blind on his way to Damascus, in the open pathway across the country. Our Lord was crucified on Golgotha. How comes it, then, that St. Paul is represented in Mr. Brown's window as struck blind whilst passing through a triumphal arch; and that our Lord is represented, in the window given by the Drapers, as being crucified under a stone canopy, supported

by pillars, and the witnesses of this crucifixion standing or kneeling about these pillars? And again, why should the figures in the mosaics in the spandrels round the dome be made so much larger than life; whilst our Lord, as crucified, is represented as less than life? Are these gigantic figures meant to dwarf the building? If this is the committee's intention they have succeeded; but, apart from the size of these figures, I cannot forget an expression made by an eminent artist when these figures were first unveiled,—“*He never knew before that I might be short-sighted.*” The prophet is represented peering into the scroll spread before him by the angel, just as Dr. Johnson, with his short sight, is represented reading a book, his nose nearly close to it. J. LUTON.

AN INDEX TO THE “BUILDER.”

SIR,—Is it not possible to compile and publish an Index to the *Builder*, say for the thirty volumes which next year will see completed? It is a difficult matter, as it is, to refer to any subject one may want. C.

HOUSE DRAINAGE.

SIR,—I would hereby suggest that corporations should undertake the construction of all house drainage and sewers into their own hands, by working on the same system as gas and water companies, with their own men set apart for that special purpose; for I firmly believe we shall never have good and satisfactory drainage until they do so. There is scarcely a week passes, but some one is promulgating his complaints in your paper about defective house drainage as executed by speculative builders. I have seen villas in which all the pipes have had to be lifted and relayed after being shortly occupied, thereby causing great inconvenience and much expense to the proprietor. But what else can we expect when the execution of the drainage of houses is invariably left to the judgment of an unskilled labourer? That is the only remedy I see which will put a veto on inferior drainage, and the quicker corporations take it in their own hands the better will it be for the health of the nation at large. D. A.

KINGSTON SCHOOL COMPETITION.

SIR,—May we again trespass upon your kindness to insert the following in your next issue relative to the above competition, in explanation of our letter you have just published.

When we wrote you our letter of the 6th inst., we were in possession of information to the effect that the votes on committee were, 7 for, and 7 against, the chairman giving his casting vote in favour of “*Experientia*,” as against ours, “*Masonic*.” Again, when before the full Board the votes were, 7 for, “*Masonic*,” 7 for, “*Experientia*,” 6; but although so nearly obtaining the first premium, we were eventually awarded the third.

At the time of writing to you we were in receipt of a letter from the Board stating we had been awarded the second premium, and enclosing a cheque for the amount. We were, therefore, led to believe that the Board had rescinded their resolution, but we have since received a letter from the Board stating that the clerk had committed an error in forwarding the cheque for the second instead of the third premium. We can scarcely see the justice in awarding us the third premium after so nearly obtaining the first; but in fairness to “*Two Heads better than One*,” we must again solicit the favour of your inserting our letter. J. R. PARKER & J. T. PHIDRICK.

* In other words, our original statement is correct, though the writers had what seemed good reason for contradicting it.

IMPROVEMENTS WANTED AT CROYDON.

ALLOW me to make the following suggestions to those whom they concern:—

1. Set back the general line of fronts on the western side of Northend, between Mr. Cleaver's surgery and Crown-hill; to range with the frontage of Nos. 39 and 40, Northend, and widen the footway.
2. Remove the whole of the triangular group of buildings between High-street, Surrey-street, and Crown-hill. Lay out the site to widen High-street from Crown-hill to the “*Three Tuns*,” and the remaining ground as an open space, a marketplace, or site for a new general market, town-hall, and head post-office; the demolition of the buildings which at present serve these purposes being involved in the proposition.
3. Whenever opportunity occurs by reason of building, rebuilding, or otherwise, to set back the general line of frontage, wherever requisite to obtain a wide line of foot pavement of at least 8 ft. on the eastern side of Northend; also on both sides of High-street, from Scarbrook-hill to Coombe-street, and on both sides of Southend, from Coombe-street to the “*Swan and Sugar Loaf*.”
4. Form a new road commencing at the lodge entrance to the Old Palace-yard, at the south-western angle of the old churchyard, and terminating in Surrey-street, between the “*Three Tuns*” and the waterworks.
5. Extend Tanworth-road towards the old church.
6. Extend Land-street and Sheldon-street to Duppas-hill-lane.
7. Extend the new road on the eastern side of Duppas-hill (made, but never used) to Warham-road on the Haling Park estate.

8. Extend Katherine-street to Fairfield-road, Park-hill.

9. Set back the fence wall, and widen the foot-pavement and roadway near the Friends' Meeting-house in Park-lane.

10. Make the return fares between all railway stations in Croydon, and London Bridge, Cannon-street, Charing-cross, Victoria, and Kensington 3*s.*, 1*s.*, 6*d.*, and 1*d.*, instead of 2*s.*, 6*d.*, 1*s.*, 9*d.*, and 1*s.*, 2*d.*, as at present charged by the local trains of the L. B. & S. O. R. Company, and 3*s.*, 6*d.*, 2*s.*, 6*d.*, and 1*s.*, 6*d.*, by the main line trains of that company, and the S. E. R. Company. Make the tickets available by either company's trains, and allow passengers going direct to or from Croydon, and any of the above-mentioned London stations, to travel by main line trains at the reduced fares above proposed.

Note.—Although there is direct railway communication from all parts of Croydon to Cannon-street and Charing-cross, it is practically unavailable to the majority of Croydon people. The Brighton Company deposit passengers near to Guy's Hospital if they want to get to the City, and at Finsbury to Charing-cross; while the South-Eastern Company run main line trains only, and charge main line fares.

11. Extend the Addiscombe line to a junction with the main line at East Croydon, and reduce the fares as suggested in proposition No. 10.

12. Reject from all the ordinary trains of the L. B. & S. O. Railway Company, all the third-class carriages of old design, and replace with carriages of improved construction. Attach springs to all the door sashes.

Note.—Some of the new third-class carriages are commendable, but still open to improvement. They have a convenient width of seat and knee space, clear view, are well lighted, and have a good appearance; but they are very noisy from the rattling of the sashes.

13. Convert the Central Croydon Railway and station, and the Surrey and Sussex abandoned line, into useful and profitable purposes.

14. Regulate the chimneys of the old church clock.

A. S. C. B.

REMOVING TENANTS UNDER THE BUILDING ACT.

AT Greenwich, Mr. Napier made an application on behalf of the Metropolitan Board of Works, for an order to compel the occupants of the house, No. 283, Rothchild-street, Rotherhithe, to remove out of such dwelling, under the following circumstances:—The application was made under the 80th section of the Metropolitan Buildings Act (18 and 19 *v.* c. 10, esp. 123), which gives the magistrate power to order the removal of persons from buildings in which it is dangerous to remain; and in the event of such persons having no other habitation, to remove them to the nearest workhouse. Mr. Napier stated that in consequence of a report made, and signed by Mr. Vulliamy, the superintending architect to the Metropolitan Board of Works, Messrs. Cooke & Green, the contractors for the work, had been instructed to take down a wall left standing from the fire that had been raging since the previous Wednesday, at the King and Queen Gunpowder Store, Rotherhithe. One wall of the granary had fallen, and damaged adjacent property, and the present wall was 80 ft. in height, greatly out of its upright, was liable at any moment to be blown down by the weather, and there was danger of taking down the wall, of what was technically termed “*knocking out*,” the effect of which would be that the whole mass would fall upon and smash in the houses below. The occupants, one of whom was an old fireman, had been spoken of to the danger of remaining in the house, and were told that their removal would only probably be required for two or three days, but they had refused to leave the place.

Mr. Cooke, one of the Board's contractors, acting on a suggestion made by the magistrate, said he would most willingly compensate the occupants for any loss they might sustain in removing, but that he was most anxious to secure himself from any consequences that might arise by the loss of life if the wall fell upon the house.

Mr. Maude having examined Mr. Vulliamy's certificate, and also the Act of Parliament, made the order asked for, and which was placed in the hands of a constable to execute.

A REVIVER FOR SOUTHAMPTON.

REFERRING to your article in the *Builder* (p. 962) thus headed, I should like to offer a few remarks, with a view, if possible, to point out that the proposed South Midland project, though so ably planned by Messrs. Brunel & Pann, is not the only or the best means of obtaining for Southampton a direct route to South Wales and the North, and at the same time to materially improve the South Wales communication with London.

Assuming that this is all that is really required, it seems to me that one scheme, which would afford in every respect both of these improvements, using as much of the present lines of railway as may assist a direct route, and so economise the expenditure, and avoid extensive and lengthy works, is what the public ought to be most widely and clearly laid before them. The Southampton people have been neglected so long, that now they gladly seize hold of the first prospect of an amelioration of their condition, and forget to go into the matter in a thoroughly business point of view.

It is proposed to construct an entire new railway from South Wales over the Severn, by a lofty bridge, and across country, via Wootton Bassett, Hungerford, and Maidenhead, to the present Andover and Southampton branch, with sundry spurs to “*pick up*” the adjacent trunk lines of traffic. The saving in point of distance is, I admit, considerable, but the expenditure will be enormous. Every one who remembers the last project for bridging the Severn, knows what the cost was to be, and the difficulties to be encountered; the Admiralty restrictions, and the rapid tides are not insignificant enemies, setting aside the cost of the 70 odd miles of new railway. If these matters are candidly considered, I fear that the possibility of this scheme being carried out is very remote. As to crossing the Severn, there are several new plans proposed, tunnels, and bridges; but, with one exception, their general utility is very small, little more than local, and only tends to show that the point and manner of crossing shall be well fought out.

Now, I know the country very well, and have taken an interest for several years in a direct South Wales communication, and with the means at hand afforded by existing lines of railway, it appears, upon close observation, that the most suitable plan of opening up Southampton is very

nearly as follows:—Adopt the Severn tunnel from Rogit to Piling; the South Wales and Great Western lines will be thus wholly connected; then by a short loop outside Bristol Station, to avoid going into that, the broad gauge would be opened up to Salisbury, the most direct way to Southampton. As the narrow gauge is becoming a matter of necessity with even the Great Western main line, the question as to gauges need not be raised. Assuming the connexion as complete, Cardiff and Southampton would be nearer by 6½ miles than by the present route via Gloucester, and the Midland interest; this would be well served by extending their Bath line to the Great Western,—a not difficult task. They then would pass over that company's system via Salisbury, as previously shown, for the tunnel route; the cost of this added to the tunnel would not be very considerable,—not four miles of new line.

Their distances on comparison will be:—

	Via Tunnel	Via South Line	Via Midland
Cardiff to Southampton...	64½ miles.	64 miles.	43 miles.
Cardiff to London.....	24 miles.	24 miles.	17 miles.

And seeing that the tunnel scheme would equally serve the interests of the Great Western, Midland, and South Western systems, the ground for opposition on their parts would be wholly removed; indeed, it would be a joint interest to promote its being carried out; as it is, their interests must clash, and in the clash Southampton will be the loser for many years to come.

We want a good and direct North West and North communication at a reasonable cost, and without affording the slightest chance of stirring up the old rivalries of these three powerful companies.

With a good map any one may easily trace the course of the various routes, and will see at once the advantage of the plan I have shadowed out.

ARCHIBALD D. DAWNAY, C.E.

PREMIUMS TO MASTERS OF SCHOOLS OF ART.

THE Lords of the Committee of Council on Education having, by a Minute, dated the 3rd of January, 1868, offered prizes,—viz., one sum of 50*l.*, three sums of 40*l.*, five sums of 30*l.*, ten sums of 20*l.*, and twenty sums of 10*l.*,—to the head masters and mistresses of the Schools of Arts in the United Kingdom in which the general amount of work, considered with reference to the number of students under instruction, should be found after the examinations to be most satisfactory, and having had the results of this year's examination laid before them, have awarded the above prizes as follows:—

John Parker, St. Martin's, Castle-street, 50*l.*; Louisa Gann, Bloomsbury, 40*l.*; J. S. Rawle, F.S.A., Nottingham, 40*l.*; W. J. Muckley, Manchester (Royal Institute), 40*l.*; Charles D. Hodder, Edinburgh (male), 30*l.*; George Stewart, West London, 30*l.*; D. W. Raimbault, Birmingham, 30*l.*; John E. Fawcett, Salisbury, 30*l.*; W. H. Soules, Sheffield, 30*l.*; Robert Greenlees, Glasgow, 20*l.*; John Sparks, Miller's-lane, Lambeth, 20*l.*; W. H. Stopford, Halifax, 20*l.*; W. Cosens Way, Newcastle-on-Tyne, 20*l.*; A. A. Bradbury, Hanley, 20*l.*; Walter Smith, Bradford, 20*l.*; B. F. Mills, St. Thomas's, Charterhouse, 20*l.*; Walter Smith, 9, South-parade, Leeds, 20*l.*; John Menzies, Aberdeen, 20*l.*; R. C. Ruckett, F.R.S., Leeds Mechanics' Institute, 20*l.*; John Anderson, Coventry, 10*l.*; T. C. Simmonds, Derby, 10*l.*; J. P. Bacon, Stoke-upon-Trent, 10*l.*; Herbert Lees, Carlisle, 10*l.*; John Kemp, Stroud, 10*l.*; Edwin Lyne, Dublin (Royal Society), 10*l.*; D. Smith, Saltire, 10*l.*; Edward R. Taylor, Lincoln, 10*l.*; John Bentley, Birkenhead, 10*l.*; J. S. Goepel, Frome, 10*l.*; J. C. Thompson, Warrington, 10*l.*; Susan A. Ashworth, Edinburgh, 10*l.*; Wilmet Pughbury, Leicester, 10*l.*; W. Cosens Way, Sunderland, 10*l.*; T. M. Lindsay, Belfast, 10*l.*; W. Stewart, Paisley, 10*l.*; Henry N. Geoffrey, Penzance, 10*l.*; Charles Swineston, North London, 10*l.*; A. Stevenson, Kighley, 10*l.*; John N. Smith, Bristol, 10*l.*

THE SOUTHPORT TOWN-HALL AND MARKET COMPETITION.

THIRTY-SEVEN designs were sent in for the new Town-hall and wholesale market at Southport. The design bearing the motto, "We fight to win," has been chosen by the committee as entitled to the first premium, of fifty guineas. It is by Messrs. Maxwell, Take, & Co., of Southport and Bury. The design with the motto, "Fidelis," has been chosen for the second premium, of twenty-five guineas. It is by Messrs. Mellor & Sutton, of Southport.

The Town Council had secured a site immediately adjacent to the present town-hall, upon which they propose to erect the new building.

The first design occupies the front of the land, running parallel with Lord-street with a building 130 ft. long by 72 ft. deep, having an entrance upon each side to the wholesale market, which is situated upon the unoccupied land immediately behind the proposed building, and lying in close and convenient proximity to the present market.

The ground-floor of the building is devoted to providing entrances for the assembly or concert hall above, with all necessary cloak-rooms and retiring-rooms.

The architects have prepared an alternate plan, providing accommodation for the General

Post and Telegraph Offices, leaving two rooms that can be used as a public reading and lending library, or utilised as offices for the Corporation.

The first floor is entirely devoted to a large assembly or concert hall, with orchestra, and retiring-rooms for performers, and promenade.

The principal elevation, fronting Lord-street, is a Franco-Italian design, intended to be faced with fine Yorkshire stone.

The principal entrance is in the centre, fronting Lord-street, and has an open carriage-porch, supported upon Irish marble columns, with carved capitals. Besides this there is an open promenade, 84 ft. long, running between the projecting wings at each end of the building.

At the end nearest the present town-hall there will be two auxiliary entrances, with stone staircases 4 ft. in width.

The assembly-hall, with orchestra, occupies the entire length of the building, 126 ft., and 49 ft. wide. The orchestra, which is situated at the end furthest from the present town-hall, will accommodate 110 performers, exclusive of space for a large organ.

There are retiring-rooms on each side of the orchestra, with lavatories, &c.

Preparations for galleries round the hall are made, but at present it is intended only to have a gallery at the end over a refreshment-room.

The wholesale market, situated immediately behind the building, occupies the whole of the otherwise unappropriated land, and has five entrances. The market consists of a centre portion, 120 ft. by 36 ft., uncovered, whilst it is surrounded by a covered shed 15 ft. wide.

UNSAFE LANDINGS.

THE St. George's, Hanover-square, Committee of Works have discussed with the parish solicitor (Mr. Capron), the case to be submitted for the opinion of counsel respecting the repair of landings forming the public footway, and the covering of private vaults. Mr. Fawcett said there were cases in which the parish took to streets, and a single stone, over which the public walked, formed the roof of the cellar underneath. The question arose, was the parish liable to keep these vaults in order? A paving-stone might do to walk over, and not be a sufficiently sound roof for the vault. The question was, had the parish to keep the paving and the vault-roof in order? He would suggest that the opinion of counsel, Mr. Poland, be taken.

Mr. Capron (Messrs. Capron & Co.) suggested Mr. Keene. The question was a very large and nice one. The opinions of the late Sir William Follett and Mr. Vaughan Williams had been taken years ago, and were against the trustees of the Grosvenor-place district calling on the owners to repair the landings. This district was handed over to the vestry by Act of Parliament, while the parish took to Cabitt's district voluntarily in the state it was at the time.

After considerable discussion, Mr. Capron was instructed to draw up a case for the opinion of counsel.

LANDLORD AND TENANT.

SIR,—However amazed and slowly ready to "take up the cudgel" "A. M." may be, the law cannot, as he seems to fancy, be questioned away, but still remains clearly as reiterated at page 892. A landlord is not implicitly at law liable to his tenant in respect of repairs, nuisance, unfitness, or duration, which, consequently, do not, in the absence of stipulation, nullify their contract. There was nothing in my communication, although there may be *alimide*, to indicate the abstract proposition that "no essential repairs are to be initiated by the tenant," as few landlords would object to so gratifying a procedure when not themselves amenable, and the burden of repairs is generally, by the common law, thrown upon occupiers. But if a landlord has undertaken, and, after notice, neglected reparation, then, if urgent, the tenant may forthwith execute it; but he must proceed lawfully if desirous of recovering the cost, for there is no implied stipulation that he may deduct from the rent, and a cross debt will not prevent the landlord from distraining. As to the question, "What is an essential repair?" if the point is not plain it will be prudent to pause, for otherwise a jury may be asked to answer.

Probably "A. M." may also "be enprised to hear" that, quoting Woodfall, if there is not an applicable proviso, "a tenant has no equity to

compel his landlord to expend money received by him from an insurance office, on the demised premises being burnt down, in rebuilding the premises, or to restrain the landlord from suing for the rent until they are rebuilt." As Sir John Leach explained, "there was no principle on which the tenant's situation could be changed by a precaution on the part of the landlord with which the tenant had nothing to do." But, in his "Handy Book on Property Law," Lord St. Leonards, expressing an opinion, which is a different thing from law, says to the landlord, "If you have insured, although not bound to do so, and received the money, you cannot compel payment of the rent, if you decline to lay out the money in rebuilding." This dictum, however, Lord Campbell, in the Court of Queen's Bench, refused to follow, observing, "With regard to the opinion expressed by Lord St. Leonards, his book is a most valuable publication, and I pay respect to it; if it were proposed to make it law, I might be ready to support it; but it is only the opinion of a learned judge, and it is contrary to a solemn decision and my own opinion."

"A. M." complains that it is a legal paradox to make a man pay rent for premises after their destruction. Unfortunately our jurisprudence abounds with paradoxes; but, fortunately, it does not consider tenants generally as requiring exceptional protection, like minors or lunatics, because of their own indiscretion and neglect of prudent precautions on entering deliberately into a voluntary contract.

E. L. TARBUCK.

THE ARCHITECTURAL ASSOCIATION.

THE meeting of the Architectural Association was held on Friday evening, the 15th of December; Mr. J. D. Matthews, V.P., in the chair. Eight new members were elected, and two proposed. Announcements were made that the prize of books offered by the Association for the best set of studies from the antique had been awarded to Mr. H. Gaye; the second prize, offered by Mr. E. W. Godwin (design for a London house), to Mr. T. E. Hudman; and the prize for detail drawings (class of design) to Mr. J. A. Reeve. The drawings that gained the medals of the Royal Academy were exhibited in the rooms; and attention was called to the fact that the medallists, Mr. W. G. Davie, Mr. A. Hill, Mr. R. S. Wornum, and Mr. A. H. Kersey, were all active members of the Association.

The chairman took occasion to express the sentiments of the meeting on the news from Sandringham of continued improvement in the health of the Prince of Wales. Without exaggeration, he could say, he believed that the members had shared the universal anxiety, and were then conscious of a feeling of real relief. The apparently impending misfortune seemed to have been felt as a personal sorrow. Architects had come in, as seemed usual, for a good deal of unmerited obloquy,—regrettable manifestations of prejudice that would have deserved a very different kind of regret if the reproaches had been just.

Mr. H. L. Florence then read a paper on the Mediæval architecture of some parts of Italy, illustrated by numerous drawings and sketches made last year, during his travels, as holder of the Soane Medallion. We shall take another opportunity of presenting an abstract of Mr. Florence's paper.

BRITISH ARCHÆOLOGICAL ASSOCIATION.

At the last meeting of the Association, on the 13th instant, Mr. George Godwin in the chair, Mr. Syer Cuming exhibited a very interesting specimen of an ancient Greek mask, in fine clay, for tragic plays, and some earthen crucibles of a Roman type lately discovered in London.—Mr. Leven read a paper, communicated by Mr. Thomas Cole, of the discovery on the beach at Hastings of the trunk of a tree and some hazelnuts, in an all but fossilised state, indicating the remains of an ancient forest, well known from other finds to have existed far out to sea, on the south coast so far as the villages of Pett and Fairlight from Hastings.—Mr. E. Roberts then read a paper "On Leominster Priory Church," in which he sought to prove that the present so-called nave of the church was intended for the choir of the building, the nave being never erected. This result of his investigations and measurements he

(Mr. Roberts) thought accounted for the difficulties raised by various writers as to the original intention of this portion of the church. Mr. Roberts founded his theory on this subject from drawings and plans he had made of the famous remains of Reading Abbey, which was the parent church, as Henry I., in 1121, when building it, added the then small Saxon Church at Leominster to its possessions, and afterwards was the means of a new monastery, in imitation of Reading Abbey, being erected upon its site. The writer also sought to explain the original appearance of the main arcade, which has at either end a block of masonry on both sides.

The Chairman drew the attention of the meeting to the condition of the Roman remains at Northleigh, and it was resolved that a representation should be made to the owner, with the view of inducing steps for their preservation.

A SAD ACCIDENT.

SIR,—Perhaps some of your readers will regret to hear of the death of Mr. W. Randall, whose letters under the signature of "Jack Plane" you have often printed. He was a carpenter by trade, and, in the pursuit of his business, was hanging a picture in a gentleman's house, but by some means his foot slipped, and he fell off the ladder on his head. He lingered for a few days in great pain, but died at the end of last week. He has left a wife and seven children to mourn his loss. His life was an example in many respects to his fellow-workmen, by the use he made of his leisure time: instead of wasting it in the public-house, he spent it in trying to obtain all the information he could on questions affecting his class. Although his mind was not sufficiently trained to enable him to make the best use of his materials, and although one might differ with his conclusions, as I often did, still no one could doubt the sincerity and earnestness of his convictions, and the courage he had in opposing the prejudices of his fellow workmen. Although taking part in various movements for the general benefit, he never neglected his work or his family, but brought them up respectably.

J. R. GOUVER.

. We regret very much to hear of this sad event. The letters in question displayed much ability and clear-headedness.

TWELVE YEARS' EXPERIENCE OF "THE BUILDER'S FIRE."

SIR,—The *Standard*, a fortnight ago, contained an able article on the "Waste in Combustion" of Coal. It stated that the quantity used in the United Kingdom for domestic purposes absorbs nearly one-third of the entire production, and that the open fireplace is the cause of a consumption so unnecessary that Sir W. Armstrong says, a proper stove placed forward in the room would have five times the effect of an open fire. Nevertheless, says the writer, the ordinary fireside of an Englishman is an institution too powerful to be easily overthrown; he will let three-fourths of the heat go up the chimney, so that he may have the pleasure of seeing a blazing fire in the grate; yet, "could a simple fireplace be constructed which would burn its own smoke and economise fuel, while presenting an open front, a good many persons might adopt it, and by degrees it would come into fashion."

I was using, twelve years ago, Dr. Arnott's grate, fed by winding up coal from a reservoir below the fire, and consuming the smoke of all the coal so wound up, when I read of "The Builder's Fire," lighted at the top. I followed your instructions, and found the grate, once filled with coals, so enduring, that the rack of the reserved coal getting out of order, I never cared to have it repaired.

As the fire, thus treated, answers all the conditions called for by the *Standard*, I wrote to that paper (but it has not inserted my letter) that, instructed by your newspaper—

1. I save one half of my former consumption of coals in sitting-rooms.
2. The smoke is reduced to a minimum.
3. I have the satisfaction of always finding a warm room after many hours' absence (and every one knows the misery in the house when "the fire is gone out").
4. I can then obtain, if desired, by a very thorough stir, a fire better than I ever see elsewhere, a mass of clear and lively incandescence.

Why, then, has not a plan so cheap and excellent come into general use? I answer, from want of perseverance and tact, and from a very unwise impatience at not having the very best condition of the fire at an early breakfast hour.

Now, even if the fire could not be fairly got up by breakfast time, it would be worth waiting for to save one half of the coal-merchant's bill; but it is not so: my own fire is not black at 8 a.m.; and it is surprising, if a speedy bright fire be desired, how very soon it burns downward if laid hollow and cleverly; but I recommend a medium course.

Do urge upon your readers the duty of mitigating the London fog, and making the metropolis more sunny and healthy. Mind and body, as well as the pocket, can be benefited if the Englishman would but so will it. Can he be persuaded by your means to try a middle course at first? If so, let him cover the bearing bars with sheet iron, place 5 in. or 6 in. of coals thereon, then the wood, then 5 in. or 6 in. of coals (and ashes) above the wood. He must perforce admit that 6 in. will be kindled more quickly than 10 in. or 12 in., and he will see enough of the saving effected to convince him that you have given to the public a direction of the utmost importance and benefit, namely, that the nearer to the top you kindle a common fire, the less the smoke, and the less is the consumption of coals.

I am afraid of lengthening my letter, but on another occasion I should like to explain my way of using (and saving) fuel in a kitchen range of the Leamington make.

W. G.

THE TRADES MOVEMENT.

Blackburn.—The dispute between the operative brickmakers of Blackburn and their employers, which was referred to arbitration, has been settled, both parties having accepted the following terms:—1. That the usual price for wheeling be paid to the depth of 7 ft., and one penny per foot for every foot below that level. 2. That the time of working be as follows:—In the depth of winter, from light to dark, with half an hour for breakfast and one hour for dinner. 3. The remainder of the time for casting clay to be from six o'clock in the morning until half-past five in the evening, when there is sufficient daylight; but when there is not, then from light to dark. Meal-times as above. 4. The only exceptions to the above regulations to be, starting work on Monday morning at eight o'clock, and leaving off work on Saturday at one o'clock.

Ayr.—The operative slaters, who are at present paid at the rate of 5d. per hour, with 8d. per day extra when working in the country, have applied to their employers for an advance to 6d. per hour after the 1st of March next.

Crieff.—The navvies employed in the construction of the Loch Turret Waterworks at Crieff, have struck work on account of the contractor refusing to pay the men employed on the higher grounds near Loch Turret the same wages for eight hours' work as the navvies in the town had for nine hours' work, the former having to travel six miles going to and returning from their work.

"CLOSETS."

SIR,—It is for the benefit of the public, and even of the nation at large, that I venture to express my views on this matter, having had many years' experience with closets at home and abroad, ashore and afloat, and I deeply regret that a circumstance so grave as the illness of our noble Prince should be the cause of bringing this important subject so prominently before the public.

If I mistake not, it is stated in the report of the surveyors that the closets in use at Londesborough Lodge are of the ordinary pan construction; that the door of one opened into the apartment of the Prince; and that there was also one on the floor above, with the soil-pipe carried up through the cistern into the air, the trap of each closet branching into the stack-pipe.

In the first place, the "pan" closet is, of all others, the very worst of its kind; especially when fixed in any situation that is subject to tidal influence; or even in any other place liable to what is technically termed "back pressure of foul air; and" why pan-closets should be used at all is a mystery to all experienced therein.

It seems to amount to this: they have been in use for so many years; are known to all; have become an established apparatus, rarely questioned as to efficiency and construction; often specified by architects "to be the best pan closets, with water regulator, opal handle, &c.;" and never going into the consideration as to their fitness for the position in which they are destined to be fixed and used.

I do not hint at defective mechanism, when we have such eminent manufacturers as Jennings, Tylor, Warner, Lambert, Underhay, and many others (yet there are pan closets sent out of the most defective and flimsy construction by some makers): what I wish to show is

that it is in the principle of the pan-closet that the evil exists.

Men of practical experience all know that when the handle of the closet is down, and the copper dish is consequently "home" under the basin, and charged with water (of course, presuming that that basin is firmly seated on the iron pan or receiver, and that all the joints are air-tight), the whole closet is, for the time being, hermetically sealed. But the large cast-iron receiver or pan becomes charged with foul air, and often to such an extent that, on lifting the closet handle, a kind of explosion of water and foul gas takes place, bursting both water and effluvia to sometimes a considerable height above the seat. It is true that this can in some cases be partially remedied by an air-pipe from the pan, but it is not always effective.

I have seen a pan-closet become self-acting by the following, so to speak, of the water and air in the receiver, between the trap and the copper pan, thus becoming an actual pump, and admitting the foul air into the compartment. Again, the system of carrying the overflow or waste from the cistern to the heel or side of the trap, is not at all times beneficial.

Then, the plan of branching the trap-pipe into the vertical stack-pipe, where one closet or trap is fixed above another, is very often attended with various results, although an air-pipe is sometimes introduced. Thus, where the soil-pipe is also serving as the rain-water pipe, and the upper closet is flushed, the rush or impetus of the downward stream will sometimes draw or carry off the water out of the lower closet trap, leaving them empty, or so nearly so that it becomes an open channel for foul air to escape into the cast-iron receiver or pan, and onwards, at the first opportunity, viz., the lifting up of the closet handle.

With regard to drains and drain-pipes that are subject to tidal influence, we in Bermuda are troubled with this, and the power the confined air or gas has upon the drain joints and pipes is astonishing. It has been known to blow the cement out of the socket joints of a 9-in. earthenware glazed pipe, laid 3 ft. under ground, and to drift vertical holes to the surface for vent, thus causing under the floors a most powerful and obnoxious effluvia, the injurious effects of which are too well known to be repeated by me.

T. BURNERS.

CHURCH-BUILDING NEWS.

Midway Park.—The Church of St. Jude, Midway Park, has been consecrated. The church has been built partly upon the site of the original church of St. Jude, a portion of which is embodied in the new building. By the reconstruction of the whole building as now carried out, about 400 additional sittings are obtained. The only portions of the original church now remaining, almost *in statu quo*, are the tower and spire, and the north and south transepts. A great part, however, of the old stone dressings, the nave and chancel windows, nave roof, pewing, and various other items have been re-used, and, where necessary, re-adapted in fresh positions in the new building. The present nave, with clearestory over, is entered from a new porch at the west end; it is erected upon the foundations of the former one, and is 93 ft. long, 25 ft. broad, and 48 ft. high to the apex of the roof; the columns and arches on either side are of moulded Bath stone, the capitals being of carved Caen stone. These arcades communicate with the new north and south aisles, the former being 53 ft. long, 20 ft. broad, and 35 ft. high to the ridge. In addition to four three-light windows, it is lighted by a clearestory and a rose-window in the west gable. There is a gallery along the west end of the nave and this aisle. The organ has been enlarged, and re-erected in a chamber built for it, opening into the nave by means of a lofty arch. The chancel, which is divided into three bays by detached red Mansfield stone columns carrying the principals of the roof, is 25 ft. wide and 30 ft. long. In each bay of the south side is one of the stained glass memorial windows taken from the old apse. The east end is filled in with a large five-light window. On the north side, and opening out of the chancel, is the vestry, which is 14 ft. by 12 ft., with lavatory, &c., adjoining. Throughout the church the roofs are of open timber, boarded and covered with felt. They are stained and varnished, the boarding being kept much lighter than the principal timbers. The pews are of deal, also stained and varnished. A width of 20 in. is allowed for each sitting. The aisle and chancel floors are all laid with red, black, and buff tiles, arranged in patterns, and relieved by encaustics. The glazing, where not of stained glass, is executed in different tinted cathedral glass. The heating is by hot water, on a principle arranged and carried out by Mr. Z. D. Berry, of London; and the lighting (from designs by the architect) by Messrs. Stevens & Sons, also of London. The carving has been executed by Mr. Allen, sculptor. The whole of the works have been carried out by Mr. C. N. Foster, contractor (Mr. Bagden being foreman of works), from the designs and under the superintendence of Mr. Edwin Clare, of London, architect. The total cost, including cushioning the seats throughout, will be about £5,000.

Gravesend.—St. Andrew's Waterside Mission Church has been consecrated. The church is

erected in memory of Rear Admiral Beaufort, K.C.B. It was built from designs furnished by Mr. Street, architect, by Mr. Thomas Blake, of Gravesend, and will accommodate about 200 persons, chairs instead of pews being used, and all the seats being free and unappropriated. The church is paved with tiles. Lady Franklin will shortly place three stained-glass windows in the church, in memory of the petty officers, sailors, and marines lost in the Arctic expedition. The vessels for the Holy Communion were offered by Admiral Ingfield, who has also given the four bells. The altar-cross and vases were given by Miss Holland. An organ will shortly be placed in the church, the fund for this purpose having now reached nearly 80*l*.

Hullavington.—The parish church of Hullavington, near Chippenham, has been re-opened for divine service, having been closed for six months. During this time a restoration of the chancel, nave, and south aisle has been effected, under the superintendence of Mr. A. W. Blomfield, his plans being well carried out by Messrs. Light & Smith, of Chippenham. From want of sufficient funds it has been impossible to rebuild the tower, which, from being in a dangerous state, it was necessary to pull down. For the same reason the north aisle has only been repaired and made safe. All ornament, such as carving, the lectern, and other furniture of the chancel, has had to be left to future generosity. The Pevsot and Fellows of Eton College, the patrons of the living, gave 200*l*.; Sir John Neeld, bart., 200*l*.; the Rev. Canon Jackson, 50*l*.; a font was kindly given by Miss Carter; and other offerings have been made. The whole restoration cost about 1,100*l*.

Sutton.—St. James's, Higher Sutton, has been consecrated. For some years past it has been regretted that the accommodation was so limited. The subject of enlarging the church had been repeatedly discussed, and the work was begun about eight months ago. It has now been completed. Built about thirty-five years ago, the church consisted originally of a nave and western tower, with a very limited altar-space railed off at the east end. A commodious chancel has now been added, and other internal alterations and improvements effected. The chancel is constructed in the Early English style, and has an apical termination. The roof externally is finished with wrought iron, while internally it is plastered and divided into panels by ribs of moulded woodwork. The body of the chancel is raised two steps above the nave, the altar being raised on three additional steps. The flooring is laid with coloured tiles. The apse is lighted by three large windows, filled with stained glass, at a cost of 100 guineas, the work of Messrs. Edmundson & Son, Manchester. Partly inscribed on each are the following words,—"Erected by his Masonic brethren in memory of John Smith, of Langley, who died January 8th, 1870." The windows contain nine Masonic emblems, which are supported by Scriptural representations. In the nave the old cumbersome pulpit and reading-desk have been removed. This has allowed room for the substitution of several open benches. The new pulpit is of light pitch-pine and oak, and is situated on the north side of the nave, in full view of the congregation, on the south side being a lectern. The mason-work was executed by Messrs. Solomon Longdon & Son, Sutton; the other work being contracted for by Messrs. W. Lea & Son, Sutton; the entire being carried out from the designs and under the superintendence of Mr. C. Hogson Fowler, architect to the Dean and Chapter of Durham. Exclusive of this addition, the church has been fitted up with gas, and there are other internal improvements being executed. Two windows of cathedral glass, costing 50 guineas each, in simple patterns, have been inserted,—one on the north and the other on the south side. The north window, which was erected by Mr. Macey, one of the churchwardens, has for its subject the Raising of Dorcas, illustrative of benevolence and Christian charity. The organ has been improved by the addition, at an expense of 50*l*., of a new "swell," and bourdon pipes, besides other requisite renovations. This part of the work was executed by Mr. Wadsworth, organ-builder, Manchester. The improvements have been executed at a cost of between 600*l*. and 700*l*.

Middlebrough.—St. Paul's Church, Middlebrough, has been consecrated. The edifice stands in Newport-road, North Aclam. The site was presented by Mr. Thos. Hustler, lord of the manor of Aclam, and the foundation-stone was laid by Mrs. Hustler, on the 25th of June, 1870. The architect was Mr. Robt. J. Johnson,

Middlebrough; and the clerk of the works, Mr. J. Sturdy, North Ormesby. The materials are brick and stone, and the cost exceeded 6,000*l*, exclusive of the site.

DISSENTING CHURCH BUILDING NEWS.

Bingley.—The foundation-stone of a Wesleyan Chapel has been laid at Bingley. Advantage is taken of the unusually steep slope of the site to obtain schools and class-rooms under the chapel, which will, however, not be cellars, but entirely above the ground adjoining. On this floor there will be a schoolroom, 55 ft. by 45 ft.; infant-school, 33 ft. by 26 ft.; two class-rooms, each 23 ft. by 13 ft.; two class-rooms, each 15 ft. by 11 ft.; and a tea meeting-room, 28 ft. by 13 ft. All will be 13 ft. high in the clear, have abundance of light and air, as well as special means of ventilation. Three flights of stairs lead up to the chapel, which has, on the principal floor, a vestibule, 23 ft. by 13 ft.; two staircases, each 12 ft. by 12 ft.; nave, 81 ft. by 45 ft.; two transepts, each 26 ft. by 11 ft.; chancel, 28 ft. by 13 ft.; and two vestries, each 16 ft. by 11 ft. The stairs continue to the galleries, which have three seats and a passage at the sides, but are much deeper in the front and in the transepts. The seats, which will accommodate 1,200 adults, are all low and open, with slanting backs, and vary in width from 2 ft. 9 in. to 3 ft. 6 in. The roof is an open hammer-beam, to be of the best pitch-pine timber, moulded and varnished. The fronts, doors, and all other woodwork will also be of pitch pine, moulded. The chancel and transept arches will be all of cleaved ashlar, moulded and supported by corbels, having marble shafts, moulded bases, and carved capitals. The large west window and the east rose-window will be filled with stained glass, and all the rest with cathedral tinted glass, having painted borders. The passages and vestibules will be paved with mosaic tiles. The night-lighting is intended to be by large ornamental pendants, supplemented by brackets under the galleries. The warming and admission of fresh air are to be by Lewis's patent warm-air apparatus for the church and large schoolrooms, and by the same maker's patent "warm-air chamber," open fireplaces for the vestries and class-rooms. The extraction of vitiated air is to be effected by the erection of a Bunsen's gas-furnace in the spire, to secure an upward current in a large syphon, working from the roof of the chapel, and with which numbers of fines from every part of the building connect, with the view of making the tower and spire, which are a main feature of the design, useful in a sanitary point of view. This tower and spire stand at an angle of the building, and rise to a height of 160 ft. The principal front adjoining has in the centre a doorway, deeply recessed, with three pillars on each side, intended to be of polished Shap Fell granite: above this is shown a five-light window; and this is surmounted by a gable, rising to a height of 80 ft. above the ground: the rest of the front is occupied by a staircase, finished by a hipped roof. At the sides, the transepts are surmounted by lofty gables, occupied by four-light windows; the other bays being filled by three-light windows, divided by buttresses. The building is designed by Mr. J. P. Pritchett, of Darlington, and the works will be carried out under his superintendence. The contractors for the masons' work are Messrs. Foulde, Brothers; and for the joiners' work, Mr. Wm. Whitley, all of Bingley. The other works are not yet let. The total cost, including site, fencing, and professional charges, is estimated at about 11,000*l*.

Stone.—A new Congregational chapel and schools have been erected and opened at Stone. Mr. Bidlake, of Wolverhampton, was the architect, and Mr. Nelson, of Dudley, the builder. The site is at the junction of the Longton-road with the Granville-terrace-road, and was a gift from the late Mr. Thos. Boatook. The outline of the site was irregular, and the buildings have in their plan been adapted to it. They consist of a chapel and school premises, the main point of the former being to the Granville-terrace-road, from which road are the main entrances. The plan of the chapel is a nave, 63 ft. long by 38 ft. 6 in. wide, with central entrance-lobby and staircase wings, each with separate entrance. A gallery is continued on the sides and across the south end. At the north end is an organ-gallery, recessed from the nave, but open therefrom by an arch. Under the organ-gallery, and on the ground floor, is the minister's vestry. Behind

the chapel, but connected therewith, are the school-buildings, providing, on the ground floor, an infant-school, 27 ft. by 14 ft.; four class-rooms, each about 12 ft. by 13 ft.; and a room for the use of the deacons or for committees. On the first floor, over these rooms, is a school-room, 44 ft. by 27 ft. There are also outbuildings, providing for boiler-room and other requirements. The principal fronts of the chapel are faced with Hollington stone, laid in random-work, with level beds. The style is Geometric. The principal front has a central gable, with a five-light tracery-headed window, under which is the main entrance to the ground floor. At the south-western angle rises a tower and spire, to a height of 80 ft.; and at the south-eastern is an octagon-ended staircase wing. The western and eastern sides are divided into five bays by buttresses, having two tiers of windows. Internally, the chapel is open-roofed, the ceiling being carried about half-way up the rake, and then across at the collar. The timbers are stained and varnished, and the spandrels picked out in colour and stencilled. The glazing is in church lead, of Geometric forms, filled in with cathedral-tinted glass. The accommodation on the ground floor and in the gallery is for nearly 700 persons. The cost of the buildings, including gas, service, and heating, is about 3,700*l*. The general contractor is Mr. Nelson, of Dudley, builder; the sub-contractors for the glazing are Messrs. Done & Davies; for the staining, &c., Messrs. Grant; for the gas-fittings, Messrs. Thomason. The whole work is from the designs and has been executed under the superintendence of Mr. George Bidlake, of Wolverhampton, architect.

Tunbridge.—The memorial-stone of a Baptist chapel has been laid, on a site chosen for the purpose, in High-street. It is estimated that the building will cost 1,400*l*. The architects are Messrs. Searle & Son, of Bloomsbury, and the contract for building, &c., has been taken by Messrs. Powell & Everest, of Tunbridge. The chapel will be in the Gothic style, with a circular window in front and another at the back, there being eight windows on each side. The walls will be of red brick, with white bindings; the arches, of white and red interspersed. The interior of the building will have a ceiled roof, with open principals, stained deal benches (opening the width between the two walls, 52 ft. 6 in. by 34 ft. 8 in.), a gallery over the entrance, a platform instead of a conventional pulpit, underneath which is to be the baptizing; a large vestibule on each side, with vestries adjoining,—one for the pastor, and the other for the congregation; and a class-room. Accommodation is to be provided for 400 persons.

Prince's End, Tipton.—Two memorial stones of a new Baptist Chapel have been laid here. The site is in Newhall-street, on the spot where an old chapel stood for many years. The new building will accommodate 700 people, and is estimated to cost 1,200*l*. The architects of the new building are Messrs. Waller & Prond, of Wolverhampton and Birmingham, and the builder is Mr. Haffner.

Islington.—On Wednesday evening last a new chapel and schools were opened in Britanniarow, Islington. The chapel, which is built in the Gothic style, and will accommodate about 470 people, has been erected by the Congregation at Harecourt-chapel for their Elder-walk branch. Messrs. Finch Hill & Paraire were the architects; and Mr. J. Grover, of Islington, the builder. The carving was executed by Mr. W. S. Hicks. Mr. A. P. Collings was the foreman in charge of the works.

STAINED GLASS.

Northleach Church.—The screen which for so many years has disfigured the east window of this church has been recently removed, and the large five-light window (previously bricked up) opened out, and embellished with stained glass. This has been executed in accordance with the period of the church—the fourteenth century. The window, which contains upwards of 200 ft. of stained glass, was designed and executed by Mr. Alex. Gibbs, of London. A correspondent of a local paper remarks that "the maker's name appears in full, with the address and even the postal district letters, W. C., attached in a conspicuous part of the middle lights." The whole of the colouring is done to represent old glass. The drawing of the figures is also carried out to represent the type of the early masters, while preserving more correctness of drawing. The window contains large subjects taken from our

Lord's life—1, Nativity; 2, Christ blessing little Children; 3, Crucifixion; 4, Last Supper; 5, Resurrection. It also contains smaller compartments above the principal lights, which are filled with angels bearing the emblems of the Passion, while others are in adoration and bearing musical instruments. The angels are surmounted with canopies on diapered ruby grounds, the canopies being relieved with a golden hue similar to some of the old glass remaining in the other windows, and have appropriate bases to each.

Selby Abbey Church.—A stained-glass window has been erected in the nave of this church by the family of the late Mr. James Audus. It is of three lights,—the centre one representing our Lord rising from the tomb, while on the foreground is the Roman soldier who was set to guard it; to the right are St. Peter and St. John looking at the sepulchre, and on the left the women bringing the spices; the rest of the window being filled up with conventional tracery, and in the upper lights are three angels. The window was executed by Messrs. Clayton & Bell, and the subject corresponds with those of the adjoining ones; the west window commemorating the Crucifixion, and the adjoining one westward the descent from the cross.

Eaton Church, Rutland.—A stained-glass window has been erected to the memory of the Hon. and Rev. L. Noel, in the western end of the nave of this church. The subject selected is that of the Good Samaritan, forming coloured panels, the general background of the window being of a light grisaille treatment, intersected by coloured bands, the whole enclosed by borders of colour. A floriated Latin cross is conspicuous in the tracery. The lower and western end of the nave being chiefly lighted by this window, and admission of light being a necessity, the general tone of the colouring is treated, in accordance with such requirement, of a light tint. The artist was Mr. Freedy, of London.

St. Martin's, Scarborough.—Messrs. Morris, Marshall, & Co. have recently added four windows to the series in stained glass in this church. They have been placed in the chancel. The subjects have been taken from the description in Revelation iv., of the four living creatures, "fall of eyes," both before and behind; these are the lion, the calf, that with "the face of a man," and the eagle. The windows are memorials of four persons connected with the church. Mr. Bodley, architect; Mr. Parr, vicar; Mr. Lister, curate; and Dr. Sloman, organist. The same glassmakers have recently placed a three-light east window in the Church of Brighouse, having executed it from designs by Messrs. Rossetti, Madox Brown, and E. Burne Jones.

St. John's, Golden-hill, Tunstall.—A few months since Mrs. Williamson undertook the responsibility of erecting a stained-glass window in the chancel of this church, by public subscription. A geometrical window of four lights has been erected. The ground-work is grisaille, heightened with gold, and relieved with bands of ruby and blue, with coloured ornaments, and surrounded by a coloured border. In the centre of each light is a medallion with a ruby ground, and coloured ornamentation. The two centre ones contain the text, "Believe on the Lord Jesus Christ, and thou shalt be saved." Mr. T. W. Camm, of Smethwick, near Birmingham, was the artist.

St. Andrew's, Norwich.—The testimonial window, which has just been placed in the chancel of this church has been formally presented, on behalf of the parishioners, to the Misses Stone, in the presence of the committee and other friends. Previously to the uncovering of the window, an address was read by the vicar, and a copy of it inscribed on vellum, accepted by the ladies, in recognition of their services rendered to the church and parish through a long series of years, and, in particular, of the benefaction of £500, lately presented in augmentation of the endowment of the benefice. The window was painted by Mr. Hughes, of London, the same artist who supplied the other two windows in this church. There are three lights, the subject of each being an incident in the life of St. John the Baptist.

St. Chad's, Headingly.—A stained-glass window, by Mr. Wailes, of Newcastle, has been placed in the south aisle of this church, in memory of the late John Metcalf Smith, of Kirkstall Grange. In the left compartment the Good Samaritan is represented as ministering to the wounded stranger; and in the right, as commit-

ting him to the charge of the host on leaving the inn. The trefoil above contains the figure of an angel with a scroll exhibiting the words, "Go thou, and do likewise."

Burlington Priory Church.—This edifice, since its partial restoration, has been further beautified by the restoration of the window over the door in the south side of this church, and the insertion of a stained-glass window, painted by Mr. J. W. Knowles, of York. It is of three lights, with a cinquefoil opening in the tracery, flanked on either side by pointed trefoils, and is of an Early Decorated character throughout, the glass painting being treated in harmony with that style. The subjects chosen are Faith, Hope, and Charity, with their respective emblems, and are represented standing under canopies, the bases of the canopies and backgrounds of panels being filled with foliated design. In the tracery is an angel bearing a scroll; the remainder of the tracery is filled with similar ornament to the bases of the canopies. The work has been executed from drawings by the artist, made for, and approved of by, the architect, Mr. G. G. Scott, under whose care the whole of the restoration of this church has been carried out. The stonework has been restored by Messrs. Westherby & Rymer, of York, who have retained as much of the old stone as could be consistently preserved, and reproduced a copy of the old character where new stone was used.

Whitley Church (York).—The south aisle of this church has recently received three stained-glass windows, containing the figures of the apostles Matthew and Thomas, Andrew and Peter, James and John, with angels, in tracery, bearing texts. The windows are memorials of deceased members of the Earnshaw family, of that neighbourhood, and were executed by Mr. T. W. Camm, of Smethwick, near Birmingham.

St. Luke's, Maidenhead.—This church, which has within a very short time been built by voluntary efforts, and already had an east window of stained glass, another on the north, and a third on the south side of the chancel, has now had another added on the north side of the building. This window is divided into two lights, one of them containing "The Agony in the Garden." Somewhat beneath the kneeling figure appear the three sleeping disciples, while Jerusalem is seen in the distance. The picture represents moonlight. The second light is occupied by the figure of "The Good Shepherd" carrying a lamb, while other sheep are at the Saviour's feet, drinking of the "Water of Life." The window has been placed in the church by the Rev. R. F. G. Smethwick, in memory of his mother and sister, and was executed by Messrs. O'Connor, of London, who are also the artists of the east and north chancel windows in the same church.

Bishopston Church.—Two stained windows, by Messrs. Lavers, Barnard, & Westlake, have been lately presented to this church, and placed in the chancel. One, the gift of the Hutchinson family, in memory of their mother, represents the Virgin Mary; the other, the gift of Mrs. Atkinson, of Hurworth-on-Tees, is in memory of her brother, Mr. Head, and of her mother, a resident in Bishopston, and represents "The Walk to Emmaus."

Books Received.

The Rule of the Law of Pictures. By ARCHIBALD BROWN, M.A., Barrister-at-Law. London: Butterworths, 7, Fleet-street.

The author has here sought "to gather up in one manageable formula all the numerous factors or elements requiring to be considered in advising upon modern cases;" an attempt is also made, and with some success, to arrange these elements in the order of their relative importance. The result of Mr. Archibald Brown's labours will be found useful to those who have occasion to master the subject. The author seems to have omitted reference to the important case, *Martin and Another (executors) v. Roe*, decided in the Queen's Bench January 24th, 1857.

Character. By SAMUEL SMILES. London: John Murray. 1871.

The author of "Self-Help" has produced another little book which will soon run over the face of the land, and help to inspire the rising generation with ennobling sentiments. In our hunger

for facts, we must not overlook the value of ideas; while we are striving to give our young people technical information, we must not omit to teach them to be truthful, high-thoughted, noble men and women; foster their abilities, but do not forget character. As Mr. Smiles truly says, "Stability of institutions must depend on stability of character. Any number of depraved men cannot form a great nation. The people may seem to be highly civilised, and yet be ready to fall to pieces at the first touch of adversity. Without integrity of individual character, they can have no real strength, cohesion, or soundness." They may be rich, polite, and artistic, and yet hovering on the brink of ruin. If living for themselves only, and with no end but pleasure,—each little self his own little god,—such a nation is doomed, and its decay is inevitable. Character is property; and men of genuine character invariably command respect and confidence.

Mr. Smiles in this very charming volume, has brought together the opinions and sayings of good and wise men of all times, on the various qualities which go to form character; the result of much reading. But this is not done in a paste-and-scissors fashion; the whole is assimilated and made the writer's own, and the result is a charming and valuable book, calculated as well to give delight as to do good.

VARIORUM.

"A Complete Course of Problems in Practical Plane Geometry," by J. W. Palliser, has been published by Simpkin & Marshall. Mr. Palliser is a master and lecturer on geometrical drawing at the Leeds School of Art and Science, and the work is especially designed as a text-book for students in art and science schools and night classes connected with the Science and Art Department. It contains constructive and descriptive problems in plane geometry, to prepare candidates for any of the Government examinations in this subject; and is to be followed by one on "Solid Geometry." It is clear and cheap.

—Cramer's "Christmas Carols, Ancient and Modern," gives fourteen carols with pianoforte accompaniment for 6d., some of them the best known and some of them the least known. What can we say better?—"The City Diary and Almanack" (Messrs. W. H. & L. Collingridge) contains in addition to the ordinary almanac matter, the names and addresses of the members of the Court of Aldermen, Common Council, and officers of the Corporation, and valuable information as to the various business offices of the Corporation and the City generally.

Miscellaneous.

"An Unwritten Chapter on the Metallurgy of Iron."—Under this title there is an interesting article by Mr. R. Mallet, in the *Engineer* of the 15th inst., mainly on the extant evidences of ancient iron manufacture on a vast scale in India. The article is illustrated by engravings of the well-known ornamental iron pillar at the ancient Mosque of the Kutub, near Delhi, and of one of the ponderous iron beams used in temple construction alluded to by Mr. James Fergusson. The iron pillar at Delhi is believed to be 17 tons in weight, and in all, below and above the surface, perhaps nearly 60 ft. long, and ranging from about 12 in. to 16 in. in diameter; yet there is now no trace of any native process whereby iron could be thus manufactured in India. The question how such a work could have been done is discussed in the article, and whether it was wrought or cast. Mr. Mallet thinks the importance of such works with reference to the ancient history of the iron manufacture has never till now been appreciated; and he feels compelled to admit that the *modus operandi* is still an enigma.

Windsor.—A new mess establishment and commanding officer's house are about to be erected in connexion with the Cavalry Barracks, at Windsor. A meeting of contractors was held at the Royal Engineer office on the 14th inst., when they appointed Messrs. Strudwick & Mennie, surveyors, to take out the quantities for the work in conjunction with the Government surveyor.

The Vienna Exhibition.—The report that the proposed Vienna Exhibition will be postponed until 1874 is untrue. The Exhibition will positively be opened on the 1st of May, 1873.

The Terrace-Garden Question.—It is most unfortunate that in the present stage of our horticultural progress we are blessed with a number of landscape gardeners, who, having had few opportunities of acquiring a love for nature except where she is trained into true geometrical properties, and having little or no knowledge of art, fix their minds upon the terrace-garden as the some of perfection in garden design. It is the one tangible thing, about the propriety of which there can be "no mistake." Hence the many absurd terrace gardens seen all over the country, and the violations of that repose and grace which should characterise the immediate surroundings of country residences and villa gardens. Terrace gardens are made in all sorts of positions. Considerable expense is incurred in the removal of masses of earth, where it would have been in much better taste to have left the ground as it was; and an immense amount of trouble is taken to produce ponderous eyesores, which our descendants will be at considerable cost to remove, should they desire to peaceably inhabit the same abodes. Undoubtedly we may here and there find associated with some princely mansion, and where the sweep of pleasure-grounds is so wide that terraces seem merely to form a resting-place for the mansion, a terrace garden not offensive to taste, and we know that in some cases the nature of the ground commits us to the style. But we also know that even in connexion with the most princely mansions terrace gardens are often not only made where they are not required, but where they are positively destructive to the beauty of the scene. The costliest and most pretentious delusion in all ornamental gardening is the making of an elaborate terrace garden in a place where, from the size of the grounds or the portion of them devoted to ornamental gardening, the terracing and geometry, and all their accompaniments, constitute their chief or only features.—*The Garden.*

Covent Garden Market.—A meeting of the salesmen, shopkeepers, and others interested in the covering of Covent-garden Market has been held for the purpose of settling this long-standing question of covering Covent-garden. It appeared from what transpired that the market-gardeners, or a portion of them, are anxious to have the market covered in for the protection of their persons and goods from the weather, whilst some of the salesmen and shopkeepers are opposed to the covering of the market on the ground of health. Mr. Davison, the agent of the Duke of Bedford, said the subject was a difficult one. He would not give his opinion for or against the covering, but he thought the sanitary and structural objections which had been raised might be met. What he proposed was that the meeting should appoint a committee to confer with him on the steps it would be desirable to adopt. In conclusion, a committee of twelve was appointed.

"George's Calorigen."—In this stove, whether heated by gas, or by coal or other fuel, the cold air from without is conducted into the room by a pipe, which is contained through the interior of the stove, in a coil, to the top, where the pipe ends in an opening through which the pure warmed air escapes into the room. The air for gas combustion also enters the room by a pipe from without, and the products of combustion have a similar exit. There is also an exit pipe for this purpose in the stove for coal or other fuel. The stove is "so constructed," says the patentee, "as to retain a deposit of carbon, thereby preventing the absorption of oxygen, and emission of hydrogen and oxide of carbon, some of the deleterious products resulting from the use of cast-iron stoves. It works with a very small amount of fuel,—20 lb. of coal for sixteen hours." Messrs. Farwig & Co. manufacture them.

Gigantic Sewage Scheme.—Application is intended to be made to Parliament for powers to appoint Commissioners, and to confer upon them as a Board powers for providing main outfall sewers and drains at certain places along the Thames, amongst which are Chobham, Chertsey, Egham, West and East Molesey, Eton, Datchet, Horton, Windsor and Old Windsor, Hampton, Twickenham, Isleworth, Southall, Teddington, Staines, Ealing, Brentford, and Hounslow, and to empower the Board to make and maintain a reservoir in Chobham on a piece of waste land there. The obvious intention of the promoters is to intercept the sewage of the towns, and to carry it to Chobham-common.

Tramways in Oxford-street.—The traders of Oxford-street seem determined again to resist the attempts of the Metropolitan Street Tramways Company to run a line along the surface of that thoroughfare, and a numerously attended meeting, presided over by Mr. Peter Graham, has been held on the subject at the Marylebone Court-house. A resolution was passed, declaring that the tramways in Oxford-street would prove injurious to the ratepayers; that the vestry of St. Marylebone be memorialised again to oppose the scheme; and that the committee which acted during the last session be re-appointed to give all the aid in its power to such opposition. The inhabitants of Oxford-street are quite right in their opposition: tramways there would prove very inconvenient to the general public, and do an enormous amount of damage to the trade of the street.

The Salt Library.—There is a prospect that the county of Stafford will not retain the valuable library collected by the late Mr. William Salt. A letter has been forwarded to the Earl of Lichfield, in which Mrs. Salt expresses her great disappointment at the apathy shown by the county in not taking advantage of the proposed gift made more than three years ago. She withdraws the offer, and expresses her intention to present the library to the Bodleian Library at Oxford, the custodians of which are ready to comply with her wishes. The county will, however, have another opportunity of securing these treasures of literature, and one of the new conditions is, that the county shall raise in three months the sum of 6,000*l.* as a permanent endowment.

The Advent of Sanitary Reform.—At the meeting of the Association of the Medical Officers of Health, on Saturday evening last, a paper was read by Mr. Michael on the question, "What shall be our future legislation with regard to sanitary law?" An opinion was expressed by the writer that it was the duty of the Government to take measures for the protection of the public health. He condemned the system of permissive legislation which at present prevailed in regard to sanitary matters, and urged the importance of a constant supply of water in large towns, and a close supervision of drainage. A discussion followed, in the course of which a general belief was expressed that sanitary reform could not be much longer delayed.

Archaeological Researches at Ephesus.—A Chatham correspondent writes:—A number of the most intelligent and experienced non-commissioned officers of the Royal Engineers have been selected to proceed from the school of military engineering, Chatham, to Ephesus, for the purpose of superintending the excavations which are now being carried on, under the direction of Mr. Wood, for the trustees of the British Museum, to open up the Temple of Diana, a considerable portion of which has already been brought to light.

The Royal Polytechnic.—Just as the new entertainments are ready, we hear with regret that, owing to differences between Professor Pepper and a section of the directors of the Polytechnic, the professor has sent in his resignation, and unless an arrangement is arrived at the long-continued connexion between him and the Institution will be speedily terminated. If the directors are wise they will let well alone, and not quarrel with one who has long been the mainstay of the Institution.

An Unharmonious Blacksmith.—Mr. Redford complains that his lectures on the Fine Arts at the New British Institution in Old Broad-street have been abruptly stopped by a blacksmith, underneath the Gallery, who accompanied them purposely by an anvil chorus in response to the "attempt to lecture on the Fine Arts over his head," which Mr. Redford, he said, "had no right to do, even with the permission of the proprietor of the gallery."

The Crypt in Bruton Church.—Some of our contemporaries have stated that it had been determined to destroy the crypt recently discovered by lowering the nave of the church. This is a mistake; or rather, such a resolution was only come to by a sub-committee by a majority of one; and the general committee have repudiated it, and resolved to preserve the crypt.

Bayham Abbey.—We are asked to state that the plastering and modelling were executed by Mr. William J. Taylor, of Chelsea.

City Improvements without Cost.—It is suggested by Messrs. H. & R. Powell that in rebuilding houses in narrow streets, the owners ought to be restricted from raising them to a greater height than heretofore unless set further back; thus providing for at least the same amount of light and air, and also in many cases for the widening of the streets. The result would of course be great irregularity of frontage for a time.

Good Feeling.—Some extensive alterations having been made in Col. Tomline's mansion, Carlton-gardens, by Messrs. George Smith & Co., under the direction of Messrs. Burn & Anderson, architects, Col. Tomline gave a dinner to the workmen on the 15th inst., when pleasant things were said, and all seemed very happy. On the motion of Mr. Griffiths, foreman of the job, Mr. R. Clarke was made chairman.

New Station, Maidenhead.—The works for the erection of a new station on the Great Western Railway, between the recently-opened station at Maidenhead and Slough Junction, commenced on Monday, the contractor being Mr. Lovett, of Wolverhampton, the builder of the stations at Reading and Slough Junctions. The station will be built of brick and stone, at a spot about half a mile nearer Slough than the present Taplow Station.

Chapel for St. Pancras Workhouse.—The chaplain of the St. Pancras Workhouse recently presented petitions to the guardians, asking that a chapel might be erected at a cost of 1,500*l.* for the inmates. One of the petitions was signed by about 800 inmates, a second by the officers of the house, and the third by the Ladies' Visiting Committee. After a discussion, the subject was postponed *sine die*.

Fees for Hoarding Licences.—The St. James's, Westminster, Vestry have decided to obtain counsel's opinion as to the legal power of the vestry, on application being made by builders for licences for hoards, &c., involving a probable relaying of paving, to demand a deposit of money, such deposit to be deducted when the account is discharged.

Liability for Damaged Plate Glass.—The Vestry of St. James's, Westminster, have informed the National Provincial Plate-glass Company, that it does not hold itself liable to pay the sum of 3*l.* 1*s.* claimed by the company for damage to a plate-glass window, at No. 10, Tichborne-street.

Rapid Rock-boring in Cleveland.—One of the Cleveland ironstone companies is at present engaged in "prospecting" for ironstone, with a view of sinking a shaft, and has employed Captain Beaumont's diamond boring apparatus. The work was commenced on the 7th of October, and the depth reached already is more than 650 ft.

The New Law Courts.—Members of the Institute and other architects who may wish to inspect Mr. Street's designs for the New Courts of Justice are informed that the drawings will be on view at the Carey-street site this afternoon (Saturday), between *twelve* and *three o'clock*. Those who require admission should present their cards at the entrance.

Fall of a Wall in Dundee.—In Dundee on Monday the gable wall of a building in the course of erection fell during a gale on two small buildings adjoining, burying in the ruins a family named Connolly. All were got out alive except a girl, aged three years, who was dead when rescued.

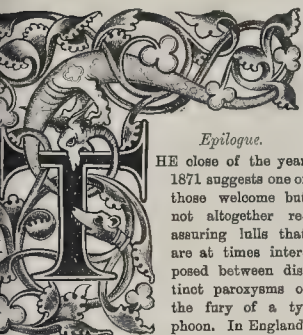
The Covered Way at the Albany.—The application of Mr. Hemaley (secretary to the Albany) for permission to place a covered way across the pavement to the road at the Savile-row end of the Albany has been refused by the St. James's, Westminster, Vestry.

Institute of Painters in Water-Colours. The Winter Exhibition now open consists of 360 drawings and sketches. Several well-known members have not contributed, but the collection, as a whole, is nevertheless very satisfactory and attractive.

Mansfield, Price, & Co.—Messrs. Barnard Clarke, McLean, & Co., have announced that a third dividend of 4*s.* in the pound is payable to the creditors of Mansfield, Price, & Co., contractors, who stopped payment in January last with debts amounting to about 40,000*l.*

The Builder.

VOL. XXIX.—No. 1508.



Epilogue.

HE close of the year 1871 suggests one of those welcome but not altogether reassuring lulls that are at times interposed between distinct paroxysms of the fury of a typhoon. In England, indeed (and we never been sufficiently thankful for the fact), seem to have lain towards the outer limits of the atmospheric disturbances. The storm-path is not held its deadly way across our shores, nor have we had to gaze upon the devastated crops, uprooted forests, and roofless dwellings, that we borne witness of its visit to our neighbours. Yet we have not been without menacing symptoms of our proximity to the central line of the cyclone. Nor is the illustration thus drawn from the storm-chart purely allegorical. Vessels have been known to sail within the course of one of these great atmospheric revolutions, dipping in and out of the whirlwind from their ignorance of these laws of the wind which we are only beginning to comprehend; and there is very much in our present position to recall this unsatisfactory afflicting of the ungeomeric mariner.

As compared with the Christmas of 1870, however, Europe may now be said to be at peace. When the year 1871 began, the great German host lay leagues around Paris. The humane sympathies of the English people were stirred by the sufferings of the gay and beautiful city, by the distress of the peasant farmers, whose agriculture bore only blasted crops, and by the unavoidable sufferings of the wounded soldiers. Our sympathy took a material expression that many have good cause to remember; although it was charity of that species that can only be its own reward; and although it is in contradiction to the most generally accepted theories, that war will most rapidly burn itself out if left to its own course, to attempt to diminish its pressure at the same time on either side.

The mingled feelings of sympathy with the conquered, and of half admiration, half indignation at the conquerors, that filled almost every mind at the commencement of the year, were banished by events of an order that pale the crimson lightnings of war. Resistance against overpowering odds has always a certain claim on the respect of the generous mind. But when the blind fury of political passion was carried to an extent that caused the German foe to be regarded as a respecter of humanity, and a protector of order, our ears ceased to tingle with the news of each succeeding morning, only because the faculty of horror has its limit, like every other human faculty. The conflagration of Paris by the Commune, the civil war, waged for no object intelligible to the ordinary mind, urged with a ferocity, and avenged with a cruelty that might have been expected among the slave-dealing tribes of Africa, are events without parallel in history,—unless it be sought

in the madness of the elder reign of terror, or in the frenzy of the factions that tore asunder besieged Jerusalem.

With the slow toleration won for that armed truce which is called Provisional Government in France, the effect of that constantly-growing interdependence of the various nations of the world, which is the consequence of steam transit by land and by sea, became sensible in our own social condition. Different, and unexpected, phenomena appeared in this country, each of very significant nature. The flow of money to the support of enterprise, which, since the shock given to public credit in 1866, has never regained its normal course, was, for a short period, arrested by the fears of peace, even more rigidly than it had been confined by the fact of war. The enormous ransom which France had to furnish dazzled the judgment even of the most astute financiers, by its unprecedented magnitude. People came to the extraordinary conclusion that, somehow or other, Germany would not be paid without the cellars of the Bank of England being emptied by the process. The increasing importance of the commercial and financial power of London in facilitating the monetary transactions of Europe was perhaps not overestimated. But the fact that the circulating medium could not be made to flow from its reservoirs contrary to the laws which regulate the gravitation of trade, was overlooked.

From unnecessary fear, the tone of the public passed rapidly to unbounded confidence, on witnessing what was called the success of the new French loan. The eager haste with which the population of a country bleeding at every pore rushed to inscribe their names as *rentiers*, when the Provisional Government had recourse to the mode, invented under the Empire, of borrowing at first hand from the public, instead of applying to them through the highly-paid agency of the great financiers, was a sign that produced anything but a feeling of security in the more reflective mind. With the annual expenditure of the State, to be drawn from a diminished territory, swollen to 50 per cent. more than the total budget of Great Britain—with the details and incidence of the requisite new taxation entirely unsettled,—with the main questions that affect national life, or, at all events, national welfare, postponed, because they were *trop brulantes* to be discussed except at the point of the dagger,—the eagerness of every one to secure a possible premium on these applications, or to draw an income from the State, no matter how raised—was not an omen of good promise for the future welfare of France.

The surge of the French storm—not the effect of the military collapse, but that of the occasion which it afforded for the triumphant activity of the enemies of every social tie, and of every object of human veneration,—spent its force on our more rugged shores. It is true that we heard much talk of the establishment of an international league of the producers against the chief consumers. It is true that an actual industrial revolution, in respect to the diminution of the ordinary hours of labour, is in course of accomplishment. But the unexpected occasion of the dangerous illness of the heir to the throne of Great Britain called forth such a sudden, universal, and long-sustained burst of loyal affection as few living Englishmen had witnessed, and as, perhaps, not one would have expected. While for the first time in the history of mankind consensuous prayer has been offered in the four quarters of the world and in the sanctuaries of every creed, for the recovery of the same individual, the unconscious ejaculations from every rank and class in this country have displayed the depth and vitality of the roots which our time-honoured institutions have struck into our very hearts.

There is some reason to hope that the manner in which the public mind has been compelled, by

the anxious desire to know all that can be known of such fearful scourges as enteric fevers, to give attention to the great subject of structural sanitary precaution, may not be without beneficent result. Meantime, slowly but surely, the principles of common sense in regard to this subject are filtering into men's minds. Bit by bit reforms are attempted; and although we see as yet but insufficient promise of the systematic and general occupation of the profession of the civil engineer or the amply remunerative operations of sewage application, irrigation, drainage, water store and supply, and agricultural engineering, we are yet aware that the stone has been set rolling. The annual appeals of Mr. Mechi and his fellow-labourers, in respect of the latter, to the enlightened self-interest of the intelligent farmer are more effective than many persons imagine or than can be inferred from the newspapers. Hardly an eminence that commands any range of cultivated arable prospect can now be ascended without enabling the visitor to trace one or more steady tails of smoke or curling wreaths of silvery steam, defined on the sky or on the earth. These do not come from factory chimneys or from the stacks that denote the scene of the labours of the miner. They betray the presence of a sort of locomotion that is of comparatively recent origin, a locomotion as important as a minister to national wealth as its elder brethren whose pulsating breath moves at a speed of forty miles an hour along the landscape. The steam plough, the steam elevator, the steam thrashing-machine, the "drudging goblins duly set" to discharge the work, not of "the day-labourers" alone, but such as man and horse would occupy long and precious weeks in effecting, quietly and with little parade are being naturalised in our rural districts.

The architectural outcome of the year, if marked by less activity than the steady progress of commercial prosperity might have induced, and less advance than might be hoped for, is not without some noticeable features. In the metropolis we have had an important restoration carried out, in the Chapter-House of Westminster. The reverent care evinced by the Dean and Chapter for the protection of those priceless monuments of which they are the responsible guardians, and the skill and learning of the architect, Mr. Scott, have been happily combined. The result is the rescue of one of our most interesting national relics from neglect and decay.

The effort that has been made to raise funds for the decoration and ornamental completion of the Cathedral Church of St. Paul has been duly chronicled in our pages. Although the large sum asked for has not been forthcoming, a portion of the works contemplated has been undertaken. The character of some of the work done, and the indecision displayed, have not so far given that confidence to the public which is necessary if large sums are required from them. While speaking of St. Paul's, we may remember the attack made on Mr. Stevens, the sculptor, and not without some cause. It is to the honour of the profession of the sculptor, that no artist would stoop to take Mr. Stevens's work out of his hand. The arrangements ultimately made, with the efficient aid of Mr. Collman, are such as to give fair promise of the completion of this long-delayed monument.

Her Majesty the Queen in person, opened the new St. Thomas's Hospital, on the 21st of June. The situation of the building on the southern embankment, opposite to the Palace of Westminster, its unusual size, and the repetition of the same form in so many distinct blocks, make this edifice one of the most striking in the metropolis, though its details certainly admit of discussion.

London, during the past year, has also witnessed the opening of a building which, in the

magnitude of the audience for which it can find room, within reach of a single human view, under permanent roofing, is unrivalled in the world. Notwithstanding the many architectural defects of the Albert Hall, the loss of an opportunity, if proper deference to the experience of the best informed architects had been shown, of building a thoroughly satisfactory amphitheatre, and the difficulty still in course of investigation in the acoustics of the building, this noble room is a great acquisition to London. The rapid progress which is now being made in musical taste and education is such, that the oratorios and concerts given immediately on the opening of the hall attracted visitors in sufficient numbers to fill its ranges of seats. The Queen in person, accompanied by the Prince and Princess of Wales, and other members of the Royal House, gave sanction to the opening; and there could hardly have been an ear in the crowded assembly on which the remarkable melody of her Majesty's voice did not fall with the crispness of a silver trumpet.

Adjoining, or at least neighbouring, the Albert Hall, the new buildings for the Science Schools have reared their lofty structure, rivalled only as to height by the gables of the new courts of the museum itself. To these buildings, to the experiments made in their ornamentation, in *terra cotta* and in *gypsum*, we have from time to time called the attention of our readers.

The New Law Courts, the Strand elevation of which we have engraved, appear to have been placed under the protection of Discord herself. Themis was, in the first instance, outraged, by a breach of faith with the architect entitled to the charge of the work. Then followed a stormy discussion as to the abandonment of the site. Questions of cost were raised. At the present moment, the foundations are settling themselves, while questions as to plan and elevation are yet fiercely debated. We have been forced to assert that the erection of the building next the Strand, as designed, would be a lasting discredit to the age and the architect. If no disposition be shown by the officials who have the work in hand to remedy the error, Parliament must be appealed to. The objection is much too serious to be condoned for the sake of personal feelings.

Railway communication has added another link to the metropolitan chain, by the pushing on the subterranean line from Westminster to Cannon-street. A threatened contest between the two companies which, for public reasons, ought to be one, was happily averted at the last moment; but the punctuality of service, which was a feature of the line up to a certain time, has now altogether disappeared. Parliament will be applied to in the ensuing session for powers to make the much-needed railway communication from Charing-cross to the lines running north of Oxford-street. A new central subterranean line is also projected; and there are more schemes than one for making the much-needed covered communication between the South Kensington Station and the Museum and Hall.

In London and its suburbs the returns from the first-opened tramways have been such as to stimulate public attention, and projects for what are in fact light railways, under another name, not only in different parts of this country but in Portugal and elsewhere abroad, have found, or at least have sought, subscribers. The public have heard less of the subject for the last few months than in the earlier part of the year; but it is one that is sure to come to the fore in 1872. The great railway companies meantime have at last allowed common sense to outweigh personal spite, or personal interest; and a series of amalgamations has commenced, which must lead to a very important revolution in the conduct of our internal traffic. The immediate result of this common utilisation of common interests, on the dividends for 1872, has been anticipated in the increased value of the stock of the amalgamating companies. Even independently of this, the steady improvement of railway traffic throughout the country has reached a point at which the original shareholders have begun to receive the full benefit of future profits. The interests of the public will call for protection.

The ancient abbey church dedicated to the proto-martyr of England began, early in the year, to threaten collapse, from the unsleeping action of the weight of its massive tower. But for the prompt measures taken, a few days, or even hours, might have witnessed the fall of a large portion of that venerable building. The evidence afforded in the examination of the

structure of the manner in which the architects of more recent times hewed away the ancient piers and walls as though they had been living rock, is most remarkable. Our columns were freely open to aid the claims of the conservators of St. Alban's Abbey on the support of all who venerate ecclesiastical antiquity, and we gave a full description of a minister which presents a veritable museum of the historic development of English architecture.

The opening, on the 5th of August, of the new Indian Engineering College, at Cooper's Hill, had much more importance than that which attaches to the architectural features of the building. To the important question of the provision of a proper engineering staff for the wants of our great Indian empire we duly called the attention of our readers. The report on the professional education of the civil engineer in this country was a further contribution to our acquaintance with this important subject.

Among the most important architectural works completed in England during 1871, of which we have furnished to our readers elevations, plans, and other particulars, we may recall the church of St. Bridget, at Waverley, Liverpool,—architect, Mr. E. A. Hoffer (pp. 544-547); the Morgan Hospital, Dundee,—architects, Messrs. Peddie & Kinnear (pp. 817, 326-327); the new buildings for the Countess of Huntingdon's College, Chesham,—architects, Messrs. Lander & Bedells (pp. 667, 669); the Trent Bridge, Nottingham,—engineer, Mr. M. O. Tarbotton (pp. 857, 867); the completion of Elvedon Hall, Suffolk, the mansion of his Highness the Maharajah Duleep Singh,—architect, Mr. John Norton (pp. 904-907); the Foreign Mission College, Mill-hill, Middlesex,—architects, Messrs. Goldie & Child (pp. 934-936); and Bayham Abbey, near Tunbridge Wells,—architect, Mr. David Brandon (pp. 985-987). For illustrations of important works in course of execution, of current examples of street architecture, of colonial and foreign architectural works of magnitude, including the new opera-house of Paris, and specimens of some of the best works of the architects of Germany, we must refer to the index to our newly-completed volume.

Among the other features of the year which must not be passed in silence ranks the serious introduction of asphalt as a roadway pavement in London, to the immense relief of the nerves, the increase of quiet, of cleanliness, and of facility of traffic. The question of comparative expense, yet unsettled, is of less importance. But the terrible conflagration of Chicago has suggested a doubt as to the mode in which a great fire in London,—a calamity which is far too much within the limit of possibility,—would be increased in its terrors by such roadways. We have had to call attention to improvements in stone-cutting machinery; and at this moment two inventions for this purpose require further illustration and experiment. One of these is a diamond-faced concentric drill, for the purpose of testing borings through rocks; and the other being the application of fine silex or corundum, impelled by a violent blast, with a result that is described as perfectly magical. Here also we may repeat our reference to a machine, exhibited at the International Exhibition at South Kensington, designed to obtain motive power from the rise and fall of the tide,—a source of enormous dynamical agency, the ultimate application of which we have some time since pointed out as a probable result of the mechanical progress of the future.

Finally, among the characteristics of the year, we must note the new phase which International Exhibitions promise, or threaten, to assume. A display of this nature is now being organised to take place at Vienna, some sixteen months hence. While this scheme is, to our mind, too vast, and likely to some extent to collapse from its own weight, the orderly and systematic classification already indicated is such as to lead us to blush for the heterogeneous, rule-of-thumb character of our own attempts at programmes or at catalogues. Of the very interesting progress of Russia, especially of the building arts in that empire, and its international competition with other nations, we have been almost singular in giving any detailed account. The attempt to render an extraordinary competition part of the regular annual routine, which has been made at South Kensington, has already raised a storm, of the more menace because it threatens to separate those who ought to be the advocates of the purely educational character of any quasi-national exhibitions from the practical, substantial, interests of trade. We have also to refer

to the unprecedented manner in which the vivid public interest which we were among the first to direct to the important national question of the probable duration of our coal measures, has been stifled by a feeble report, drawn up with the half avowed purpose of making things pleasant, and to which we must refer at length hereafter.

A word may be permitted to recall the fact that, as one of our opening numbers gave a sketch of the history of the great railway contractor, Thomas Brassey, so does the closing one chronicle the death of the once famous railway king, George Hudson. The difference between railways in fact and railways on paper, between practical industry and speculation, is illustrated by the different close of the careers of these two remarkable men.

To resume:—the close of 1871 calls on the English nation for grateful hope. If the sky be not gilded with that rosy brilliancy that gives promise of a splendid morrow, yet at no corresponding period for many years has it been so free from even the smallest cloud indicative of storm, so far as our own country is concerned. At no time has there been such a golden opportunity for wise administrative improvement, for those social reforms which it is in the power of each parish and each district to effect. At no time has there been less excuse for diverting the attention of men from practical work to the attempting theoretic revolutionary change. Our work, at home, is immense. Public education has been rendered possible, and that is all. We must put our own shoulders to the wheel, or the ruts of routine and the stones of indifference will retard all useful effort. Above all, if we are only wise enough to devote some of the great accumulated profits of an unexampled trade to the systematic aid of agriculture by engineering, we may bring under cultivation immense tracts of at present useless land, and may be able to inaugurate for Old England a new and durable era of health, wealth, and happiness.

THE STRENGTH OF PORTLAND CEMENT.*

ABOUT five years ago, Mr. Grant read a paper to the members of the Institution of Civil Engineers, informing them of the results of a series of experiments he had made to ascertain the strength of Portland cement. There were three lines of inquiry that he considered should be followed further. In the interval he has made a number of additional experiments in these directions, and in April he read an account of them and their results to the members of the same Institute.

This second paper is now published. We understand that the first point upon which Mr. Grant endeavoured to obtain further information was the strength of adhesion between bricks and cement, under varying circumstances; the second was on the limit of its increase of strength with age; the third, the relative strength of concrete made with various proportions of cement and ballast. He re-arranged these heads for his new experiments thus:—A. On the strength of Portland cement tested by tensile strain at different periods, from one day to twelve months. B. On the adhesion between bricks cemented with Portland cement and lime mortars, tested by tensile strain at the end of twelve months. C. On the strength of Portland cement bricks, neat, and with different proportions of sand, tested at the end of twelve months by compression in a hydraulic press. D. On concrete blocks of different proportions of Portland cement and lime, with gravel, sand, and other materials, tested at the end of twelve months by compression. Mr. Grant gives about 50 tables setting forth the various results of his different experiments. Builders about to use cement for constructional purposes will consult their own interest by studying these tables for themselves. It is sufficient for our purpose to give an outline of the experiments, and of their results. We referred to them recently in our remarks upon the effects of cement upon metals.† Though they do not throw new light upon this question, they afford, as will be seen, valuable information concerning the

* "Further Experiments on the Strength of Portland Cement." By John Grant, M. Inst. C.E. With an Abstract of the Discussion upon the Paper. Edited by James Forrest, Assoc. Inst. C.E., Secretary, by permission of the Council. Excerpt Minutes of Proceedings of the Institution of Civil Engineers, Vol. xxiii, session 1870-71, part ii. London: Printed by William Clowes & Sons, 1871.

† Vol. xxix, p. 897.

behaviour of cement in conjunction with brick-work.

Mr. Grant ordered about 40 bushels of Portland cement, weighing not less than 112 lb. per bushel, to be sifted through a sieve having twenty holes to the lineal inch. The bushel measure was to be filled from a hopper 2 ft. above its mouth; and each struck bushel was to be weighed. The whole quantity was then to be put together again, and turned over many times. With cement thus treated, which weighed 110.66 lb. per struck bushel, all the experiments were made. Equal weights of cement and water were to be used when a paste of neat cement was required. Forty bushels of clean sharp sand washed and dried completed the preparations. Equal weights of the sand and cement were also used. The first experiment tested the advantage of sifting the cement. Five moulds of sifted and five of unsifted cement were placed in water. The first, at the end of seven days, broke at 959.4 lb. = 427 lb. per square inch; the second at 842 lb. = 376 lb. per square inch; showing a gain of about 14 per cent. by sifting. Another prominent fact brought out in the course of the further experiments, is that concrete made of broken stone or broken pottery is stronger than that made with gravel. A third is the necessity of soaking all absorbent bricks in water before cementing them together to prevent them from withdrawing from the mortar the moisture required for its crystallisation.

It was ascertained by the experiments made in the first branch of inquiry that mortar mixed by hand is stronger than that ground in a mill. "The maximum strength of that mixed by hand," says Mr. Grant, "seems to have been attained at five months, and that ground in a mortar-mill at one month, the greatest strength of the former being nearly double that of the latter." That which was ground by hand maintained its strength, while that which was ground in the mill declined, owing, he thinks, partly to the interruption of crystallisation by the grinding, and partly to the destruction of the angularity of the particles. In the second line of inquiry it was ascertained that the more absorbent bricks, provided they have been thoroughly soaked, adhere better than the non-absorbent. The third series of experiments shows that the denser Portland cement bricks are the greater is their strength. Bricks made of neat cement bore a pressure equal to that borne by Staffordshire blue bricks, or by the best Wareham red bricks. The fourth line of inquiry showed that concrete cubes that are made of the largest proportion of cement to ballast are the strongest, and that compressed blocks are stronger than uncompressed blocks.

The Albert, or southern embankment of the Thames is the field chiefly quoted by Mr. Grant as the site of his observations. He gives a plate showing the manner in which Portland cement is used in the sewers of the main drainage, sometimes as a foundation or backing for brick-work, and sometimes for the formation of sewers by itself. A concrete sewer costs half the price of one made of brickwork, unless it is rendered inside with cement, when it rises to about the same expense as when lined with half brick. Upwards of 5,000 ft. of sewers in this part of the Metropolitan drainage have been made of concrete, lined with half-brick; and upwards of 6,000 ft. constructed entirely of concrete. And Mr. Grant urges that not only sewers and outfalls of any size might be advantageously made with the material that he has taken so much pains to perfect, but docks, piers, breakwaters, roads, and dwellings, and even great aqueducts through the sandy districts of Africa.

In the discussion which took place among the engineers present at the reading of the paper, Lieut.-Col. Scott pointed out a danger of expansion in Portland cement when too much chalk is used in its preparation; and related that he found on examining some cases of cement in which great strength had been aimed at, and the clay reduced from 22 or 23 per cent. to 18 or 19 per cent., that extraordinary expansion had occurred. He considered a new mode of using lime adopted at South Kensington preferable, and described his method of making mortar there, by which grey lime yielded more strength with six parts of sand than Portland cement with four parts of sand.

Mr. Latham pointed out another danger from the presence of chalk in cement. The ammonia contained in sewage changed its character when brought into contact with lime. It was converted into nitrous and nitric acid, which formed nitrates and nitrites, so soluble as to be washed out

either by the sewage or by the infiltration of subsoil waters, leaving nothing but sand in the joints. Under these circumstances, sewers fell in. He had examined sewers that had so fallen in, and found that every particle of lime or cement had disappeared from the joints. He therefore proposed that tests should be made to ascertain the powers of resistance to nitric acid in different materials. There was a danger in carrying the manufacture of Portland cement to a point where the quantity of chalk in it would render it unable to resist the chemical action of the matters brought in contact with it.

The practical bearing of Mr. Grant's efforts to obtain a high strength in cement will be best seen when any great engineering operation is undertaken, such as the irrigation of the interior of Africa by canals, when it will be desirable to send cement in a concentrated form to the distant site of operations, to be there mixed with sand. The smaller the bulk of the cement, the less would be the cost of freight.

THE WORKSHIPS AND WORKSHOPS OF THE POOR.

A WALK through the ever poverty-stricken localities of East London, extending from the heart of Shoreditch, embracing Bethnal-green, and including portions of Whitechapel, reveals such sights of nature and human nature, and affords such impressions of the inner working life of the skilled and unskilled poor, as can never be effaced from the memory. True as when it was first uttered, and as applicable to-day as ever, is that pregnant truth,—"One-half of the world does not know how the other half lives." Without a touch of the cynic, we might add, "nor does it care to know." Men and women among the humbler classes must of necessity work to live; and, failing to obtain work, have either to run the risk of entering the workhouse, drifting in amongst the dangerous classes, or of starving on sufferance in some wretched lodging. There is a very large class of workpeople,—men, women, and children,—who obtain their living in the east of London by making various small articles for domestic or public use. This class of persons are, in fact, small manufacturers, and they work for other small manufacturers of a different description, who can bring to the development of their business the application of a little capital. When entirely without orders, these poor manufacturers, if they can scrape together by hook or by crook a little money, by borrowing or selling some household possessions, commence the making of a little stock of articles on "spec," &c., on chance that they may be able to dispose of them at remunerative prices; or, if failing that, to get the first cost back. Christmas time, though it may be productive of many orders to some classes of trade in which the poor are employed, brings on the cessation of a great many more little dreams of by the majority of the well-to-do members of society. The class of the working poor that form the subject of our notice are to be found in rooms, cellars, attics, and small improvised wooden sheds, or so-called workshops in backyards, working under conditions that cannot be contemplated without melancholy, for in their struggle for life disease is running a hard race with them, and there is little doubt who will be the worsted party.

In our visits to the haunts and workshops of the poor in the localities named all were found absorbed with thoughts on Christmas and the preparation of work that would enable them to tide over their difficulties to the New Year. In wretched and darksome cellars under the footways of some back streets, the broken-down joiner and cabinet-maker was found making some article or other of household furniture, for sale; in some cases it was for a public stall in the street, such as Brick-lane; in other cases the daughter was to hawk it through the streets from door to door. A clothes-horse, a kitchen form, a child's chair, a salt-box, a small step, or bed-room rack for hats or coats, window rollers, or a wooden coal-scuttle,—these were among the divers articles we found in course of manufacture by the poor broken-down mechanics and the "handy men" who could find no other means of employment, and who were unfitted otherwise from many causes for obtaining work in the ordinary workshops of the City.

Their stories of the past and the narrative of

their struggles would be a tedious recital. In other branches of skilled or handy labour of a fallen and impoverished kind we found the brazier and tin-plate worker, the wire-worker, and the smith's helper or strike hand, busy in forging or forming some little article of tin-plate, wire, or iron for street-stall sale, or on an order from some humble room-keeper. Among these articles were griddles, toasting-forks, flower-stands, ordinary requisites, tin tea-pots, and trenchers; and various children's toys, and baby tea-services, rattles, money-boxes,—in fact, the articles in the baby amusement line were innumerable. Among the women and girl workers in many a dark room we found the struggle for life to consist in making various paper patterns for children's clothes, ornamental paper flowers, a device for Christmas decoration, knitted and crocheted work, anti-macassars for backs of sofas and chairs, little dollys and mats for placing under lamps and trays, hearth-rugs, hassocks, pin cushions, smocks for windows, mittens, cuffs, and a legion of similar things. In other homes we found family groups engaged in colouring pictures and prints, or executing ornamental letter-writing and figures for shop display, and like work.

Among the latter class there were some who were working to order, as were a few whom we found as busy as the proverbial nailers, in manufacturing pill-boxes for the chemists, hand-boxes for hatters and millinery establishments. Brace-makers and strap-makers, and makers of other articles in web and leather work, we found in the vicinity of the former class. The poverty-pinched looks, and the desolate homes and surroundings of these latter classes, were mournful to contemplate, and the thought of the pittance they were in the habit of earning gives rise to painful feelings.

In the vicinity of Spitalfields, and in that street of ill omen, Flower-and-Dau-street, Fashion-street, and the courts about a little industry was found by us making spasmodic struggles for life and living. A few fancy comb-makers were struggling with the aid of their wives and children in preparing what they called tortoiseshell specimens for sale. Some of the patterns were very beautiful, but we have a doubt that they were what was represented. When the combs were slit and serrated, the work of polishing and finishing fell to the hands of the junior members of the family. In one instance, a little girl of twelve was the deputed saleswoman, whose business was to trudge into the heart of the City, and effect a sale of those tortoiseshell articles of the toilet by calling at the different commercial chambers and offices, and soliciting the young gentlemen, clerks, and others to purchase. The poor father at the bench at home in his miserable lodgings was but a skeleton in rags, and wretchedness was the sum total of the possession of the household. A few of the antique weavers in the Spitalfields quarter were busy over wool and web of silk and satin, or more plebeian stuffs, but the weavers in general in the district are steeped in the lowest dregs of poverty, and the race is nearly decimated.

The ill-ventilated and dust-covered rooms of the majority of the weaver class are heavy and suffocating to remain within for any length of time. The miserable creaking and antiquated old machines whose frail shuttles must have been flung upwards of a half century ago, are in many cases only fit for firewood; yet, deprived of these looms, the weaver and his wife might at once enter the workhouse. The bread that is earned by them is only sufficient to keep life and soul together. Some of those who had not an order to execute were making a pattern for chance sale, or in view that Mr. So-and-So would take it off their hands.

While down in these wretched localities, where extreme indigence always reigns, we heard of others who were making their extraordinary workshits for Christmas. Several men of the working and labouring classes, out of employment, had gone on a march down into Essex, for a supply of holly and ivy, mistletoe, and other evergreens, for street sale. The usual outer class, with their donkeys and barrows, were in the trade, too, and were gone in search of cheap suburban proboscises from gentlemen's gardeners and land stewards. The large markets of the City do not supply more than a definite quantity of the evergreen shrubs for Christmas decorations for shops, churches, and the houses of the people. Small farmers' carts and wagons bring into London from all quarters large quantities of these Christmas

decorations, independently of those who make it a speciality. This, however, is a branch of industry that any of the poor may take to who are anxious to earn an honest shilling, and obtain a Christmas dinner for their family, independently of the out-door relief of the district workhouse.

The work-shifts of the honestly-inclined poor out of employment are innumerable and many-phased. We come across instances, in our East-end tour, of most respectable families, whose means were so straitened through various mishaps as to oblige them to enlist the whole services of their female family circle (mother and daughters) to prepare articles of wearing apparel, millinery, embroidery, crochet, lace blinds, curtains, ornamental work, and so on, to help them through this festive time of the year. Let it be known to all who read our words, that there are thousands of sick and indigent, honest room-keepers, who are living in a state of semi-starvation, who will not ask for relief, and, if asking, would not, perhaps, obtain it on account of their genteel poverty. These people would labour in many instances at work they know how to do, but they are ignorant how to look for it, or are unable to fight the rough battle of competition for work outside doors with hundreds of others. They are, in truth, to be pitied, particularly the delicate females amongst them.

The professional thieves, cadgers, and impostors who are so numerous in the eastern districts of London, are even impelled to perform some species of labour about Christmas time,—not from their love of honest labour, but from the facility that exists in certain channels for improving the occasion by a ready and profitable stroke of business. The extra lazy, hulking fellows of the world of labour who will only work from sheer necessity, and who drink and smoke half of their time away, while allowing their unfortunate wives and children to starve and labour for them, are now to be found doing "heavy jobs," such as cleaning windows, whitewashing rooms and kitchens, going errands, helping salesmen and brokers, in loading or removals, or "lending a hand" to anybody who can trust them to perform anything right. There are hundreds, however, of builders' labourers and other general labourers who are glad to earn a shilling about Christmas time, and who are worth their salt.

The case of the London Dock hands is truly pitiable: they are not half employed, nor are they more than half paid for their labour when they have it to perform. The weary, anxious watching and waiting for a call at the dock-gates is a most killing and crucifying suspense,—a dismal vigil in cold, hunger, and dirt. Let those who may enjoy and can enjoy a happy and merry Christmas-time, think on the deplorable condition of the London poor.

Want and suffering are pressing down thousands of our fellow-creatures, honest and dishonest. Deadly disease has taken hold of them indiscriminately, and they are falling, falling to earth by the force of combined evils, which are preventable. The well-inclined poor make many efforts to help themselves, not alone at stated times like this, but throughout the year; but they are overwhelmed by an ocean of seething misery. Not to-day or yesterday are the things that we have witnessed new to us. Alas! no. These are chronic pictures of city back life and desolation, which have been again and again encountered and described. The homes and workshifts of the industrious poor of this metropolis present pictures of life that can never be faithfully portrayed. They must be seen to be known, and almost realised in person before painted, because they exceed the bounds of all ordinary belief.

What are wanted for the present are personal examination, sympathetic advice, and assistance; and, for the future, the most earnest consideration as to the means that should be adopted to alter such a monstrous state of things as now exists.

SCANDINAVIA, AND ITS ARTISTIC AND NATURAL CAPABILITIES.

In the present state of things architectural and artistic, it is not a little interesting and even important to give a little thought from time to time to what is going on, not only in this realm of England but also on the Continent. There is of course a general sort of progress, as it is called, being made everywhere: we are not certainly in the same condition or way of living as were our ancestors of the Middle Ages. Yet are there out-of-the-way spots on the surface of

Europe, wherein may be found a state of things belonging to the past not only in form but in spirit, and to be appreciated only by those who are willing to look into that Past, and to compare it with the Present. Not a little of the theology and politics, as well as of the ways and modes of living, and of social life and art, and what is mere system of art action, will be found to prevail in some portions of Europe which belong entirely to the past, and which are indeed the remains of it and come directly from it. Let us dwell for a moment or two on these strange things, and on their significance. Nature, too, in some out-of-the-way places still holds her own, and seems to defy the ingenuity and the mechanical skill of man; she holds her own, and cannot, or at any rate has not yet been, conquered. Thus may the history of Europe be divided into three epochs and divisions answering in some sort to them, *i.e.*, there are parts of Europe wherein things are in precisely the same state as before the advent of man into them. Art there is none, for man has been able to do nothing. Next there are spots, happily for artists, architects, and painters, wherein the past is present, and where the modern man, with his system of art-manufacture and machine-work, has as yet made no visible impression. We see in them the hand and brain-work of our forefathers. In such places is found the real art of Europe,—rude it may be, but still good and true of its kind. In other places,—the great majority of places, indeed, in the modern world,—all is new, and is to-day a partial revival and copying of the past, though not its reproduction, as is sometimes supposed. The true expression of nature is blotted out,—the very improvement itself does it, so that nowadays there come into existence daily spots wherein there is neither fine art nor the nature out of which it grows. This is, it must be confessed, a somewhat novel way of subdividing the world, but if by it any light can be thrown on things, some little good,—at any rate, novelty of information,—may come out of it.

No sort of doubt, of course, exists as to the fact of the doings and existence of the modern world; neither can there be of the existence of the remains of the past, such as the Middle Ages have left us; but there may be a doubt, and more than a doubt, in some minds as to the reality of a primeval state of things in modernised Europe. But such is the fact, and it is so curious, artistically looked at, that we may perhaps be even thanked for calling a little attention to it.

The city of Christiana, the capital of Norway, is almost wholly modernised; indeed, it is needless to say that the all-pervading influence of Paris has ruled, and does rule, its social and fashionable existence. It was founded in 1624, and is for the most part of the regular straight street build. It is rapidly growing, and contains, as the guide-book tells us, a "goodly many new and pretty buildings, private as well as public." The king's palace, the Parliament-house, and the university are at the west end,—there seems a sort of magic in the west end of the town,—and, of course, congregated round them are the residences of the Lothbairs of the northern city. We need hardly say that there are a multitude of churches, and that more are to be built. We might say something of the streets of this somewhat out-of-the-way city, so well "paved," as the quaint guide says, and in the night "lightened with gas," but our object is to tell of the strange "surroundings" of the place, and the artistic doings of the common sort of people, not yet under the influence of French fashions and ways of living. Christiana lies in a valley, and close to the sea on the shores of the Bunde Fjord, and for some few miles round it to the north, east, and west the ground is cleared and cultivated; but immediately to the north of the city, and at the distance of a few miles, there begins a primeval forest,—not, be it observed, a park, or what is here called a forest, such as that at Windsor or the New Forest, but the untamed work of Nature, an impenetrable barrier of great trees and underwood, so thickly grown together that to pass through it is impossible: so much so, that the great Baron who owns one vast estate some thirty miles in length, has never seen his own land. In this strange place there are lakes and watercourses worth the painting, improvement not having yet set in. It is not a little singular to find the two most opposites of the things of this world so close together, and within sight of each other,—nature as it existed and looked thousands of years or ages ago, and modern

fashionable life and ways, and building and art manufacture, as they are in Paris and London. It may be of some interest to note that this special bit of the earth's surface is the property under feudal tenure of the Baron Wedel Jarlsberg, who lords it over some twelve to fourteen thousand people. But a few of these people have farms leased to them; the great majority simply live and work, and know nothing,—perhaps happily for them,—of the nature of rent and the profound theories of political economists. It is a curious thing to find, as it were, the *middle ages in the present*, not only in form, but in pressure: it realises to us in no slight degree the state of things in this country during the times which gave birth to our cathedrals and churches, now so puzzling to us, and the full meaning of whose forms and method of construction are yet problems waiting to be solved. And here may we not ask, in the first place, and before speculating on the building of a cathedral, or a royal palace, or baron's castle, how the cottages or huts of the husbandmen came into existence? Little has been thought or said on this point; but it is in reality the key to the whole system of building and architecture; for houses of some sort were built to live in before churches. Here the huts of the tillers of the soil are built of the timber which grows nearest to the spot whereon the future house is to be built, and the method of construction is simply traditionally constructive, *i.e.*, the last cottage or hut is like the one before it, and in the same style, if that important word may be used as descriptive of such rude work. This, which at first sight may seem but of small importance, is in reality not a little explanatory of the way in which the old architectures were worked out; the old pattern suffered little from man's hand, not by the copying of older "precedent," but by the growing up of new forms of construction and of fine art,—just, indeed, as change and new fashion in dress goes on or progresses, or the old ways die out.

And this brings us to a something beyond the mere construction, and directly into the regions of fine art and architecture. In this rough wooden style of building and construction there is no necessity for a thought about ornamental forms of any kind; yet will it be found that the natural instinct of man and his fondness for ornament and innate love of the pretty and handsome—to use a favourite modern word—is all over the wide world the same, for in and about the rude huts, consisting of but two rooms, a general living-room and a general bed-room, which serves with the living room, for the whole family, there are constant little evidences of artistic feeling, and opportunities for the designing faculties. What are generally known as wood or timber mouldings would seem to be common all over the world, for a square beam of timber with the sharp corners cut off is an ornamental beam; and if the end of it, as in a wall-plate or ridge-beam, projects beyond the wall surface or roof covering, we are quite sure that some beauty or fitness is seen to lie in it, or it would not be done. It is curious to see what a very little serves to give an ornamental—nay, an architectural, character to a rude wooden hut. It seems to have almost grown out of the ground, like the trees of the great forest around it, and to harmonise with the rough unclad nature around it. A little cluster of these rude huts within the shadows of the great pines is a picture wherein no sort of invention is needed to create an interest in it. It is in harmony with itself. But in contrast with this simple way of doing things, the great Baronial Hall itself may be instanced. It is almost a new building in the pet style of important villa architecture; all is quite new and clean, and, artistically speaking, out of all harmony with the rough pine-forest scenery around and about it. A Norman keep might fraternise with the surroundings, but not this fashionable villa! It is pure modernism taking possession of pure nature, and it would, perhaps, be difficult to find anywhere else such a contrast. We may mention here, as a curious fact, that the whole of the city of Christiana is supplied with water, and pure water too, from the lakes and water-courses, so that there are no water companies to harden the water by passing it through patent filtering apparatuses. There is a constant service. All the wood for fuel is got from these forests in vast quantities, though no impression seems to be made on the thick and luxuriant growth of the trees which supply it. Nature here seems to be having a fair fight of it, for the timber grows as fast as it is cut. For practical and economical reasons, even for nought else,

should these forests be cared for and prized; but surely still more so for their unique character.

Nothing, therefore, as it seems to us, can be more singular, and better worth a little cogitation, than this existence side by side of the very modern of to-day and the very old—nay, primeval,—state of things. These impenetrable and vast forests of which we are speaking stretch northward to the very sea itself for hundreds of miles; and huge portions of them are as inaccessible as are the forests of South America at the foot of the Andes. Not a little curious is it to think of on that account merely, for, for thousands of years they must thus have existed; but the curious thing for the readers of the *Builder* is, the strange fact of this primordial state of things existing in immediate juxtaposition with that most modern and newest of things, a newly-built house, and street, and city after the ways of modern Paris and London. No one can possibly look at a modernized city such as Christiana, or at a villa such as the Baronial Hall, without feeling something like sorrow at the idea of the total extinction of the old Scandinavian spirit and ways of work. Why should the old individualities of Europe be extinguished? and what is the Frenchman, that he should have it in him to give to others what they can so well find for themselves? and what is that art or art-manufacture which the whole world seems so glad to take from Paris, and which it thinks so superior to anything which it can do itself, and out of its own individual power, and from its own historic memories? Out of the town, and in the "fresh and beautiful land" to the north of it, is Stubal Castle, built "a long, long time ago," but the owner of it has determined to "lay down his castle, as of no use," "but," says the guide-book, "when you see the old castle, you will be a little sorry when you hear it is to be put down." You will indeed; for it shows how completely "progress" is putting down individuality, even in the cold of Scandinavia!

PENRITH CASTLE.

PENRITH CASTLE stands upon a slight elevation of old red sandstone gravel, about a furlong from the church and the old town of Penrith, and a few yards east of the modern railway station. Originally and always a simple structure of no particular military strength or architectural merit, its remains are now scanty, and chiefly remarkable for the excellence of their material and workmanship, and well known from their position in full view of one of the great highways of the country.

The castle is in plan a square, or nearly so, of about 125 ft. each way. It is composed of a stout and lofty curtain-wall, within and against which were built the rooms occupied by the garrison, and outside is an artificial and dry ditch, also rectangular in outline, and rather peculiar in the space left between it and the castle wall. On the west side this ditch has been removed in the formation of a deep road leading from the town to the station. On the south it remains, and beyond it are some excavations, which appear to be old, but are not very intelligible. On the east side the ditch is very perfect. About five yards intervene between its scarp and the foot of the curtain wall; and beyond, crowning the counterscarp, is rather a high bank, advantageously placed for those who intended to attack the wall with the weapons and engines of the Middle Ages. On the north front is a considerable platform, about half the area of the castle, and on the same level. This is defended towards the town by a natural slope, made somewhat steeper by art, but the ditch is continued in the rear of this, round the north-east angle, just west of which is a roadway, indicating the approach to the place. This approach was flanked by the north-east angle of the platform, and the ground beyond the ditch.

The earthworks on this quarter are so sharp and fresh, that they seem to have been deepened and strengthened to resist a modern attack from this quarter; and in that case the bank outside the east ditch may have been thrown up to protect the base of the curtain from being breached by cannon. Possibly the intention was to resist the Pretender's army in 1745.

The curtain, of which the ditch is the outwork, is about 30 ft. high and 5 ft. thick. It is built of blocks of the red sandstone of the district, of a deep colour, and grand appearance. These are squared, and laid in courses. The wall appears, wholly or in part, to have been crowned

by a corbel-table, of moderate projection, upon which rested the parapets. At some special points these corbels are bolder, and form machicolations, but more commonly their object was to add 6 in. in breadth to the rampart walk.

Along the east, and on the adjacent part of the north and south sides, the curtain is tolerably perfect. On the west side are some foundations, and a fragment of wall, of full height. At the south-east angle a square buttress, original, of about 3 ft. broad by 3 ft. 6 in. projection, is set diagonally, and caps the angle. In the middle of the east wall is a similar buttress, but set square. These have no bases or sets-off, and rise to the parapets. At the north-east angle seems to have been a bartizan, or square turret, projected upon corbels above; but the wall is quite plain below. The other two angles are gone; but the foundations show no trace of mural towers. Grose's plan (i. 48), though very incorrect, may be taken to show that late in the last century the walls were tolerably perfect; and that in the centre of the south wall, and at the south-west angle, were buttresses similar to those described above.

All traces of the gateway are gone; but the earthwork shows it to have been on the north front, rather near the east end. West of this some traces of windows seem to indicate the site of the hall, and part of a large half-round barrel-vault, abutting against the remains of the west wall, seems to have belonged to its substructure.

In the east wall, near its summit, are two large window-openings, about 6 ft. broad. The tracery is gone; but the arch of the recesses is flat, segmental, strengthened by two plain bold ribs.

There is no trace of any keep or detached central building. The head of a flat-topped window of two lights, trifolied, has been dug up and preserved. It seems to be Early Perpendicular. The general plan of the building and what remains of its vault and arches, seem to point to the Decorated period, during which both the round-headed and the flat segmental arch were largely used in this district. What remains seems of one date.

It has been suggested from the rectangular plan of the earthworks, and from the prevalence of Roman remains in the district, that the castle occupies the site of a Roman encampment, and that its material, said to have been taken from Mayburgh, was derived from some Roman building. This suggestion is, no doubt, perfectly possible. Certainly the material was not taken from Mayburgh, which never could have supplied ash in large quantities.

It is certain that there was no castle here during the early Norman times, or while the manor was the heritage of the kings of Scotland. From them it came to John Balliol, and was confiscated with his other English possessions late in the thirteenth century. The Nevilles of Raby then held it, and probably built the castle. Richard Duke of Gloucester had the castle and manor, and seems to have been often here. He probably made any pure Perpendicular additions of which evidence may remain.

G. T. C.

ON THE PROGRESSIVE USE OF IRON IN BUILDING.*

SOME acquaintance with iron is coeval with the first written records of man. Homer speaks of well-wrought iron (supposing *adipos* to be iron), and our version of the Scriptures mentions Tubal Cain as "an instructor of every artificer in brass and iron," and there is some evidence that pieces of ornamental ironwork were cast in the Middle Ages. Yet it is little more than a century ago (in 1755) that Smeaton first used large pieces of cast iron for constructing portions of mill and engine work, and twenty-seven years later pointed out that the prophecies of failure then made had not been fulfilled. Less than a century ago (in 1773) Mr. Pritchard, an architect of Shropshire, designed and subsequently carried into execution the celebrated cast-iron bridge at Colebrook Dale, and from that time the use of iron has crept onwards with a gradually-accelerating pace, until it threatens to become the conqueror of its more ancient rivals, stone and brick. At first the great strength of cast iron to resist compression, its small bulk, the ease of multiplying forms from one pattern, and its in-

compressibility, made it rapidly replace internal piers of brick and stone, and even timber posts. In timber buildings columns and stanchions soon came to be of cast iron, and where large openings were required with heavy weights over them, the arch and buttress were superseded by cast-iron girders. In 1796 Wilson soon erected a cast-iron bridge, in Sunderland, of 240 ft. span; in 1818, Rennie erected Southwark Bridge of the same span, the most graceful bridge that ever spanned a stream. Wrought iron had been used for pendant bridges at a much earlier date. A chain suspension-bridge is said to have been built in China as early as the first century. In Thibet, iron suspension-bridges are said to have been in use at an early period, and it must not be forgotten that Scamozzi notices suspension-bridges in Europe in 1615; but it was not until 1819 that Captain Brown built the suspension-bridge over the Tweed of 432 ft. span, and subsequently Telford put up the Menai of 560 ft. span.

We must not forget that these achievements in iron have owed their possibility to the gradual increasing knowledge of nature—a knowledge that has been rapidly progressing since the revival of letters. This knowledge of the laws of nature has been mainly due to the labours of philosophers: to Newton, to Leibnitz, to the Bernoullis, to Euler, to d'Alembert, to Dr. Young, were mainly owing the capability to execute the great works that have just been mentioned. Ware—who is still one of the authorities, if not the principal authority on vaults—investigated some of the principles of suspension and other iron bridges during the time that Telford was designing the Menai Bridge, and close upon his heels followed Tredgold, who collated what was known, besides adding his own experiments and investigations, and although these were imperfect, the knowledge he so imparted was the main cause of a much greater extension in the use of iron. The railways that were then beginning to be formed caused a great demand for iron, and the clumsy wooden roofs were rapidly superseded by those of iron. Sir Charles Fox paid particular attention to this subject, and some iron roofs were put up that almost vied in slenderness with the spider's web, and in many cases were as frail. Iron ship-building was invented or perfected by Ditchburn; and the boiler-plates, of which the ship's skin was formed, were soon destined to give rise to another novel application, whose brilliant results are still astounding us. After the fall of the mill at Oldham, and of several trussed cast-iron railway bridges, Hodgkinson's investigations were made public, and the ultimate capabilities of cast-iron were made known. Almost simultaneously the difficulty of bridging for railway traffic the Menai Straits at 105 ft. above high-water mark, suggested to Robert Stephenson the idea of an iron chimney-pot on a gigantic scale, and by the aid of the mathematical skill of Hodgkinson, the shrewdness and practical ability of Fairbairn, with the assistance of the accomplished staff of young engineers, of whom these were the chiefs, a wrought-iron girder of 450 ft. span, and of not more than 25 ft. in height, took in its interior the heaviest locomotives, carrying with them long trains of loaded trucks. This happy couple, wrought and cast iron, having been wedded in perfect equality, the most astounding results were obtained. The Great Exhibition of 1851 was perhaps the most startling event in building of modern times, and most of us can recollect the prophecies of its failure and collapse; the cast-iron columns were derisively called rain-water pipes, and the trellis girders were said to be so palpably insufficient that the engineers were obliged to cast a "tab to the whale," and put in extra braces of lath to deceive the eye, and quell the alarm in the public mind. The railway roofs grew from the modest spans of 30 ft., 40 ft., or 60 ft., to 120 ft., to 200 ft., of which no more splendid examples can be cited than that of the station at Birmingham and that of Cannon-street, and even these have been exceeded, I believe, by the wrought-iron ribbed roof of the Midland Railway Station, 240 ft. in span; but these works only show a minute part of the progress of iron. Iron light-houses, iron piles, iron cylinders, and every variety of iron girder, bowstring and lattice, Warren and Bow, plate and box, are used to construct every variety of bridge for railways; corrugated iron, buckled plates, and arched plates are largely used for walls, floors, and roofs, and castings have, I believe, reached the enormous weight of 1,000 tons. In short, iron is invading every branch of mechanical and con-

* By Mr. G. Aitchison; a paper read at the recent general Conference of Architects, and now published in a general "Report of the Proceedings" (9, Conduit-street). The paper on "Fire-resisting Materials," which follows, is from the same collection. Our readers will find ample return for their money if they purchase the "Report" of the whole Proceedings.

structive manufacture, and fills up the space between the steam hammer and the steel pen.

While on this subject, it must not be forgotten that these triumphs of iron, which have been mainly instrumental in altering the face of Europe, and almost of the world, are due to the Englishmen; they were the inventors of the steam-engine, the locomotive, the railway, the ships, steam-boats, the steam hammer, and the cast and the wrought-iron bridge. It may truly be said that for the last century, as far as physical progress can go, we have been "first in the race that leads to glory's goal." We are, and ever have been, an unartistic race, but it is also an unartistic period of humanity; no new creations in art have appeared; but there is one step we can take, and that is to throw off tradition and emancipate our minds, for in art whatever is not new is not true, and we should at least give up our schoolboy exercises and cease to paraphrase some old dead style. Let us dare to think for ourselves, even if our efforts are unsuccessful; let our works be uglier than they are, only let them be original; and if we can make no progress, let us be plainly simple or simply plain. In iron we have a perfectly new material untrammelled by old shapes or fitted to old arts. This age is a sort of Midas; everything it touches seems to turn into iron; architects only eschew it and cover it from sight, or seem to apologise to themselves and the world for being obliged to use it when they would have used brick or stone, and yet it is being forced on us; iron sheds, iron houses, and iron churches meet us at every turning, hideous if you please. Our problems are like those of pure geometry: we have to make things beautiful under certain restrictions, and why should we not boldly face the problem and unite our efforts in overcoming the difficulties that surround its use, and instead of letting it be our master make it become our slave. Cast-iron will take any form required: in that respect there is nothing further to ask from it, and it has everything to ask from the designer; its only defect is that at present we cannot get the sharpness of bronze because it is too hard to chisel and file; its other defects are that it rusts, that it transmits heat very rapidly, and in damp weather condenses moisture. If one-half the time that is expended in copying the mouldings and ornaments of Mediæval works were bestowed on endeavouring to solve these problems, we should have done them long ago. I appeal to the Mediævalists amongst us. Are you not taking the very opposite course to that followed by the men you imitate? Did not they set tradition aside and use their brains to throw old materials into a new shape, to acquire all the arts by which the materials they had could be made their servants and be fashioned to their wants, to invent new forms and new effects? Let us try to imitate their splendour and dexterity in construction, their unrivalled skill in perspective effects, their knowledge of the composition of masses and picturesqueness of outline, and their brilliant inventiveness; and not set up imitations of their works as monuments of our own imbecility, nor seek to make fetters for the present generation of the works of the most daring innovators the world has seen. Is it to be supposed that if the great Mediæval architects had possessed the powers of casting and rolling iron that we possess, they would have shown their incapacity to use them because the Romans were unacquainted with their use? Was it by servilely copying the Roman forms and making their civilisation fit into the discarded Roman buildings that their splendid original buildings were produced? They were not soldier-crabs to fit themselves into the empty shells of others, and if we really wish to imitate them it is by adopting the old and new materials to our present wants and our present civilisation. If we want art we must study the works of the artists. We must go to Greek, Arabic, and Italian works to learn how common forms are conventionalised and purified, for subtlety of proportion, grace of moulding, or amount and placing of ornament; but to create we must go only to ourselves, and not ignore the material or mental wants of this age, or else we shall be left further out from the tide of human progress than heralds, necromancers, astrologists, or professors of other nefarious arts. A stray nobleman or millionaire may have a fancy for a real Mediæval building, with real vaults and real Mediæval furniture, or even a church may be required to be built for some mediævalized clergyman, wherein all the wants of a modern church may

be defied; but the bulk of mankind cannot be forced to put up with things they do not want, because we may not have wit enough to go out of our Mediæval leading-strings. If an ordinary man wants a house with one upper floor made of iron, would he allow us to vault and buttress it? No: if we cannot use an iron girder and a flat brick arch, the builder in the next street, or the engineer, can; and though taste is at a very low ebb, yet all cultivated people prefer grace, simplicity, and elegance, to the mechanical complexity of Gothic cusping, or the coarse burlesquing of nature in Gothic foliage.

As it may be considered that something should be said on the use of iron by architects, I think I may say that as far as iron has been used constructively, the modern English architect has done very little. He has used the material as the engineers have done, and often with their aid; he, or they for him, have used some iron stanchions, girders, and roofs. One service has been rendered by iron for architecture: it has enabled it in the nineteenth century to rival the megalithic structure of early ages; the stone lintels at the North-Western Railway Station in Euston-square being held up, I believe, by iron girders. There are, however, some exceptions. Mr. Sydney Smirke constructed his dome for the reading-room at the British Museum of iron ribs filled in with thin brickwork. Subsequently, Brill's swimming-baths at Brighton were, I believe, domed in the same way. Iron columns are now being largely employed to support stone lintels and arches of buildings; Mr. Hopper, in an insurance office in Fleet-street, used ornamental cast-iron girders; my father used cast-iron for ornamental glazed screens at the Union Bank of London; and I have used ornamental skeleton staircases in Mark-lane, having removable stone or slate treads to be replaced when worn down. Architects building in the same neighbourhood have followed my example. I think Mr. Edmondson used tiles for the filling in of an iron-ribbed lighthouse; and I am told that many novel applications of iron, both constructive and ornamental, have been used by French architects, notably at the Catholic Church in Leicestershire, at the Library of St. Genevieve, at Paris; at the Church of St. Augustine, on the Boulevard Malesherbes; and also in the new room of the Imperial Library. I fancy that if architects would devote themselves more to the use of iron, they would find there was a great charm in designing the skeleton of their buildings in this material, and there is a great saving in the space otherwise occupied by walls. Once protect iron from rust, and what novel and beautiful buildings might be constructed of an iron framework filled in with glazed tiles on both sides, with a space between. What charming ceilings might be made of ornamented iron ribs filled in with small domes of china or pottery! What spans of rib and panel vaulting! What domes filled in with thick glass in beautiful patterns! I trust that architects will devote more consideration to the capabilities of this material for constructive and artistic purposes.

ON FIRE-RESISTING MATERIALS AND CONSTRUCTION WITH REFERENCE TO THE PROPOSED NEW BUILDING ACT NOW BEFORE THE HOUSE OF COMMONS.*

The term *fire-resisting materials* is new in a technical sense, as far as I know; the corresponding term in the present and previous Building Acts has been "incombustible" or "fireproof." The latter may be considered a misleading one, and particularly so, as we may concur in thinking with Professor Lewis, that there is no such thing as fireproof construction except brick arches on brick piers. But "fire-resisting" is very different, and I presume it is intended to mean such construction as will resist fire for some time, and may be for many purposes all that is requisite. The materials specified in the proposed new Building Act as fire-resisting materials are—

1. Brickwork constructed of good bricks well burnt, hard, and sound, properly bonded, and solidly put together with good mortar, compounded of good lime or cement in proper proportions, with sharp sand or other material, to the satisfaction of the district surveyor.

2. Oak and teak or other hard timber used

for beams or posts, or in combination with wrought-iron, such timber and such iron (if any) being protected by plastering in cement or other incombustible or non-conducting external coating.

3. Slate, tiles, brick, or terra-cotta, used for coverings or corbels.

4. Flagstones used for floors over arches, but not exposed on the underside and not supported at the ends only.

5. Concrete properly compounded used for filling in between joists of floors.

6. Granite and other stone suitable for building purposes, by reason of its solidity and durability.

One word as to these different materials. Firstly, it will have been noticed that cast-iron is not mentioned as a fire-resisting material, and that wrought-iron is only introduced in a very limited way; that is, in combination with timber, and to be protected by an external casing of non-conducting material. As to brickwork, we shall all agree that it is fire-resisting, and after the scientific opinion of Professor Lewis, you will think that oak, teak, and similar hard timber are practically fire-resisting for beams and posts. After the other carefully considered observations which we have heard, it will be agreed that stone is by no means fire-resisting. Professor Lewis has said that even granite is not fireproof: it may be sufficient as a fire-resisting material; but stone, particularly Yorkshire stone, is not fire-resisting. I have myself seen numerous instances of it, as well as of other laminated stones, becoming disintegrated and losing all strength through the action of heat. I think some other means of fire-resisting construction, not alluded to in the Act, might sometimes be advantageously used. A few years since I was asked to give evidence before a select Committee of the House of Commons on the Prevention of Fires, and I was asked if I could make any suggestion for fire-resisting construction, particularly with regard to houses where the ground-floors are used as shops and families occupy the floors above. Being thus called upon, I worked out an idea that had occurred to me, by merely making a slight addition to the ordinary construction. I proposed that under the joists of a ground-floor iron wire, No. 11 B. W. gauge, should be fixed about 6 in. apart, with staples driven into the joists, a centring of rough boarding to be supported under the joists just touching the wires. Concrete composed of coarse mortar well mixed with broken bricks and tiles (pieces not to exceed 1 cubic inch) to be well pressed down from the top, so as to rest on the rough centring and imbed the wires, the concrete to be 2½ in. thick. When the concrete is sufficiently set the centring to be removed and the ceiling floated and finished in the usual manner.

The additional cost of this construction, beyond the ordinary lath and plaster ceiling, was estimated in detail by a well-known London firm of builders at the sum of 11. 15s. per square of 100 ft.; but I am of opinion that if the plan were largely adopted, the extra cost would be considerably less, and that for ordinary houses it would not exceed 7s. or 8s., if used for one floor, that over the shop. The additional cost of ordinary pugging to floors would be about 18s. per square of 100 ft.

I would ask your attention to another mode of construction, which appeared to me as useful in the sense of fire-resisting for ordinary buildings. Many architects, particularly those resident in London, may have seen some of these large structures of combined dwellings erected during the last few years,—buildings of five, six, or seven floors in height. Some of these have been erected by a firm of builders (Messrs. Allen & Son, of Tabernacle-walk) upon a mode of construction which has been patented. Cement concrete is used as the principal material for the floors and roofs; also for lintels, the trends of stairs, and in other places where stone or iron is ordinarily used. The concrete is not solely depended upon for strength,—a framework of iron bars being introduced into the mass. I confess I do not quite understand the way in which these combined materials act; but I can inform you, from the inspection of many specimens, that an exceedingly strong construction is the result. The mode of proceeding is this:—The blocks for steps, lintels, &c., are made in moulds in which a framework of slight iron bars is first placed, according to the nature and intended use of the block; the concrete is then put in, and well rammed, and left to set. After the blocks are removed from the moulds they are left for at least a month to dry and season.

* By Mr. C. Fowler.

before being used. Cast-iron moulds are preferred where the number of blocks of the same pattern warrant their use, otherwise the moulds are made of wood. The concrete is formed with one part of selected Portland cement to seven parts of coarse breeze, a little fine stuff being put in first to form a good face where required. This material seems to stand the action of the weather and the London atmosphere very well, indeed better than almost any stone. The specimen produced is part of one of the rough lintels used in place of wood; from the absence of shrinkage and the roughness of surface they form excellent ties to the work. I have also seen a girder made in the same manner. There were two plates, each 6 in. deep and 3 in. thick, about 6 in. apart, which were held together by bolts. Such a girder might be supposed not to be able to carry any great weight, but it carried the wall for three stories of an ordinary dwelling-house, in addition to the floors: its bearing was 12 ft., and the whole bulk of the girder was about 1 ft. square; it was formed *in situ*; the iron plates went on to the bearing. The floors and roof are formed as follows:—The bearing is first reduced to 8 ft. or 10 ft. by light iron bearers. Light iron bars, generally from 2 in. to 2½ in. deep and ½ in. thick, are then placed in the direction of the bearing at intervals of 2 ft., and in the opposite direction they are connected together by ½ in. rods passing through holes punched in the bars. The whole framework is laid on the top of the girders, the ends being caulked on to slight T iron wall-plates, giving a good tie to the walls. Boarding is placed underneath, and cement concrete poured in, which completely imbeds the iron framework; in a few days the boarding is removed, and the whole construction forms a remarkably steady and solid floor. It is all of the same material, which is very cheap, as the breeze costs very little, and the quality used of Portland cement is only about 11. per cwt.

NORTHERN AND CENTRAL ITALY.

At the meeting of the Architectural Association on the 15th of December a paper, as we have already mentioned, was read by Mr. H. L. Florence, being "Notes on the Architecture—Ecclesiastical, Civil, and Domestic—of Part of Italy," "from where the little northern town of Como lies sheltered under the shadow of the Alpine hills, to those distant cities whence over the desolate mysterious Campagna looms the solitary dome marking the site of the Eternal City," and in the matter of time,—"from the epoch (eleventh century) when the strong faith and new dogmas of Mediæval Christianity threw into the quiet of the old world the germs of progress, and energy was shown by the West in the formation of a style of architecture of its own based upon reason and thought," down to the fourteenth century. The writer in the course of his studies abroad, as the holder of the Soane Medallion, accumulated a considerable number of measured drawings, general views of buildings in outline, and water colours, and, of course, many photographs; and some of these, illustrating the subjects of the paper, were exhibited on the walls, and apparently well appreciated. The conclusions of the paper,—not being formed during a short holiday and after desultory consideration, but in the course of systematic study of the actual buildings concerned,—are of some interest.

Mr. Florence commenced by pointing out the conditions and influences which moulded the architecture of Italy north of Rome up to the thirteenth century; tracing the development of the form and many of the details of the Mediæval church from the earliest Romanesque buildings; from Ravenna, over the yet unbridged interval of time to the buildings of the island of Torcello (Church, A.D. 1000); to San Miniato, Florence, commenced 1013, having clustered piers; then noticing the main features of the Pisan school—the cathedral, completed 1118; "the buildings not differing greatly in their interiors from the earlier Romanesque, yet having in many respects a tendency towards Mediæval forms."

Turning to the Lombardic school, "having well-marked characteristics and steadily progressing from the vigorous though rude examples at Pavia to the elegant churches at Verona," noting also specimens at Milan, Modena, Parma, Piacenza, &c., the churches of this time and district were found to contain vaulted roofs, incipient buttresses, clustered piers, open triforium galleries, also arcading surrounding the

domes at the crossings, under the nave-roof, most frequently round the eastern apse and sometimes following the slope of the main gables,—one of the most beautiful features in Lombard work. Early forms of window tracery also began to appear, and instead of the simple arched doorways of the earlier churches projecting porches often in two stories. "In Verona also are some of the earliest examples of coloured decoration, the courses being alternated, warm-coloured stone and red brick; coloured marble being also used in shafts, oills, vousoirs, bands, and strings, generally not in thin slabs, as in Venice, but in the solid block." Many of these features and the general forms made comparatively easy the further transitions afterwards made.

After describing specimens of the Pointed style at Assisi (commenced 1223), Vercelli (1219), Asti, &c., crossing the hills from Perugia to arrive at the sister cathedrals of Siena (1233) and Orvieto (1290), he found there "the most characteristic specimens of early Italian Pointed architecture, both entirely completed and both untrammelled by foreign influence; marked, however, by strong horizontalism in their composition, and notable for the amount of sculptural and other decoration lavished upon their façades, of great beauty and richness, though wanting in the dignity given to our northern cathedrals, by their western towers." In these and other Mediæval churches at Bologna, Florence, Verona, Venice, &c., are to be noticed certain, usual if not universal, divergencies from the northern art of the same period: thus, "while the northern races concentrated and counterpoised opposing forces on strong buttressed points, leaving but screen-walls tracered and glazed, fitted for the stained glass in which they delighted; by a complexity of parts and variety of projection creating mystery and strong light and shadow;—the Italians, on the contrary, cared little for such constructive methods, used as few piers as possible, walls thick enough to resist the thrust of vaults without buttresses, required but little light, their window openings being thus of simple form, rarely glazed, for these long, simple, solid walls glowed on the interior with frescoes and mosaics."

The following table illustrates the dimensions of two of the great churches, and the differing modulus in the width of the bay, as compared with a German and a French rival:—

	Height of Nave.	Width of Nave.	Span of Arches.	Diameter of Pier.	Diameter of Nave.
Cathedral at Florence 125	51	51	51	8	8
St. Petronio, Bologna 138	46	46	46	8	8
Ulm	129	44	16	8	8
Aixens	137	38	16	8	6.5

In the later Italian churches the triforium was absent; the elevatories had only small circular windows; the piers were generally of most simple forms; the vaulting quadripartite and highly domical; the prominent dome, a favourite feature here, though never adopted, or even essayed, by the northern architects. At Pisa, Pavia, Milan, Monza, Parma, Arezzo, Venice, Padua, Siena, may be found examples of varying date, and still, after many changes and fortunes, the dome is the chief glory and unrivalled excellence of the Renaissance. The octagonal-storied dome such as that crowning the Certosa at Pavia, and that at Chiaravalle, near Milan, was also used in places of the northern spire, which was rarely successfully carried out in Italy. The porches, with wagon-vaults on lintels and detached pillars; the peculiar plate tracery and wheel-windows also, in idea or in details, belong specially to Italian art.

Passing from the Ecclesiastical to the Civil and Domestic Architecture, the writer noticed in detail some of the town-halls,—"the exact counterparts of the civic buildings now erecting in so many of our chief towns; that is to say, in their requirements, for we rarely in our own time find that repose and dignity which mark even the humblest of the Italian examples. . . . There are few places which more recall the Middle Ages than the mountain city of Central Italy, perched as an eagle's nest upon high rocks, whose crags and cliffs formed defences stronger than could be built by the hand of man, surmounted by many-towered and battlemented walls, whence the far-extending valleys could be surveyed. In those times each city was a fortress, and every man a citizen and a soldier. Above the clustered hamlet, the suburban monastery, the city walls, rose the tower of the Podestà's palace and the cathedral,—the power of the State and the

Church. . . . The palace of the Jurisconsulti at Cremona was being restored when I was there last autumn. The lower arches, on being opened out, displayed a lower arch. The arches are shown built up in the sketch in Mr. Street's 'Brick and Marble Architecture,' by which this building is so well known." The towers, residences, terra-cotta and brick details, &c., were then treated of; and, in conclusion, Mr. Florence drew attention to what he considered a misapprehension of the Italian Mediæval work:—"It is not Gothic. I would suggest that no building wherein the round arch may be substituted throughout for the pointed, without in any way influencing its structural completeness, and progressive development of ideas, can really belong to the true Gothic; it must possess those characteristics forming a distinct type; and instead of being a subdivision of the great Northern school, may rank as an individual style by itself; named Pointed Romanesque, it would complete the long chain of art history from the Roman to the Renaissance."

In the discussion which followed, several points were noticed, and the opinion expressed that, although some of the main lessons of true Gothic art were only imperfectly learnt, or were frequently forgotten, by the architects of the buildings in the Pointed style in Italy, the difference between their architecture and that of the Northern nations is not in kind. That the coupling of piers, the recessing of arches, the all-pervading principle of subordination, the subdivision of labour,—each part having a distinct clearly-ordered office,—are to be found the true Gothic of Italy; that notwithstanding the failure to attain the unity of idea so completely realized in the most perfect works of France, England, and Germany, the same distinctive characteristics are to be seen; and that it is better, and is now becoming also more usual to call some of the twelfth-century architecture of Lombardy and elsewhere "Romanesque Gothic," than to attempt to class Siena, Orvieto, and Florence cathedrals,—on account of special proportions and prominence of horizontal lines and minor details,—with the architecture not yet leavened by Gothic principles that we have agreed to call Romanesque.

A WORD TO THE OWNER OF WARWICK CASTLE.

A PROPOSITION has been made, and, indeed, is being acted on, that, as Warwick Castle has been open to the public for several generations, the ruined portions should be rebuilt by a national subscription. The feeling which prompted this is very agreeable and creditable; but we are bound to say we do not find ourselves able to advocate the step recommended. In lieu of this, we venture to suggest to Lord Warwick a method by which he could conveniently accomplish the desired restoration himself.

Algernon, Duke of Northumberland, succeeded to the dukedom in 1847, at the age of 55. After passing a few years in improving the estates and the buildings upon them for others, he, at the age of 60, conceived the project of building for himself. To this end, he commissioned three architects to design plans for enlarging, restoring, rebuilding, and beautifying the three principal seats on his estates. To Barry he gave *Castle Blanche* for Northumberland House; to Burton, *Sion House*; to Salvin, *Alnwick Castle* (subsequently in conjunction with Camina). To each of these architects was assigned a fee of 500 guineas, with unlimited control as to the nature and extent and magnificence of the designs they were to prepare. After these designs were sent to the Duke, he elected to begin with Alnwick Castle. In 1854, at the age of 61, his Grace commenced this great work, and, setting aside a large portion of his income, carried it vigorously on for a period of ten years, thus spreading over that period the entire cost, which was over a quarter of a million of money. The Duke took such a lively interest in the works, and in everybody connected with them, that he sojourned frequently at the castle during their progress, and, while it was dismantled, made great personal sacrifices, by residing, with considerable discomfort, in small apartments in the *encinte* of the building. The Duke lived to see his work completed; for in 1864, at the age of 71, he tested the powers of the new kitchen by giving a magnificent banquet to about 1,000 people, who had been employed upon it; and after enjoying the pos-

session of his completed scheme a few months, he died, in January, 1865, at the age of 73, leaving a name behind him as one of the great builders of his time.

At a very early stage of this great work the Duke showed his indifference to the amount of time they were to occupy on an occasion when the body of labourers employed, thought, from the extent of the works, they would do well to strike,—and strike they did at a certain dinner-hour. The fact having been reported to the Duke, his Grace instantly replied, "Strike! Oh, let them strike, I am in no hurry;" and the men, on hearing of this, resumed their work within two hours of the strike.

Here, then, is an example to Lord Warwick. Let him commission an architect well versed as to conservation of ancient remains, and as to construction, decoration, and literary and sanitary knowledge. Let him give the architect *carte blanche* to prepare designs for what Warwick Castle ought to be, and estimates of the total cost. Let him then set aside annually a portion of his income, and proceed regularly and by degrees with the works. If they occupy ten, or twenty, or even fifty years, and Lord Warwick's son or grandson has to carry them on and complete them, he will thus have at least the satisfaction of retaining the castle in his family exclusively as their own.

BUILDINGS FOR MUSIC.

SIR,—It is no doubt desirable that this subject should receive full consideration on all sides; but the letter of "G. M." in your last is an unfortunate instance of the mistakes which people fall into in theorising on this subject without a knowledge of music as an art. "G. M." thinks it important to consider what amount of time disorders are allowed in proportion to concords, in order to see how echo will affect the music. He takes four bars from the music of four periods to illustrate this, which he thinks are "typical examples." Now, in the first place, to take isolated bits as these for such a purpose is about as reasonable as it would be to take two words out of Milton, and the same number out of Swift and Tennyson respectively, to illustrate the literary style of the seventeenth, eighteenth, and nineteenth centuries. His first example I have not opportunity of referring to at the moment of writing. In his second example, from Handel, he will probably be surprised to learn that the "strong discord between voice and instrument of 14 second," which he imagines he has discovered, does not exist at all, as the two sounds were never intended to be heard together! The *recitative* being a species of composition quite independent of strict time, the last note of the voice part and the first of the two concluding chords of the accompaniment, being both accented notes, were in Handel's time generally written under each other on the accented part of the bar, merely for convenience or from fashion; but the two chords were never intended to be played till the singer had finished his part (G. M. may satisfy himself on this point at any performance of one of Handel's oratorios); and as to the passage being "typical," Handel and his contemporaries would have shuddered at the bare idea of such a discord so placed. The next example, from the "Creation," shows that "G. M." has not a notion of the very essential distinction between "fundamental" and "passing" discords. The discords between voice and accompaniment in this case, which, in performance, would last about one-eighth of a second or less, instead of one-quarter, as he imagines (I do not know where he gets his notion of the time from), are merely part of an ornamental "figure" for the violins, which in execution is passed so lightly and rapidly over as never to be felt by the ear as a discord, nor did the composer mean that it should. The same remark exactly applies to the other example of what he calls a "gross discord" in Rossini, which would never be felt as a discord in execution, and which, again, goes twice as fast as he imagines. He has been looking at the accidental discords on the surface, instead of the fundamental progressions of the harmony; but even in regard to these, the question of the sequence of discords and concords is nothing to the purpose, in regard to the effect of echo: the question is, what difference of time separates the successive changes of sound, no matter whether concords or discords? A piece of music may be written entirely in pure harmonies, and if played in a building with a great deal of echo, so as to pro-

long the first harmony while the second is being played, there will at once be marked discord, even more marked, very likely, than with a composition containing mixed discords and concords. The fact is, the whole of "G. M.'s" musical remarks are, as any musician could have told him, sheer nonsense; and if acoustic theorists could only be got to believe that there is something in musical composition and execution which cannot be dissected by their mathematical formulae, they would be saved from making rather an absurd figure sometimes in the eyes of musical readers.

As to the proposition for a concert-room of radiating chambers, so as to provide against an extensive and prolonged echo, it might be interesting to see the experiment tried, if any one had money to spend on it, but it is probable that the result would not be such as to repay the expense; and that with the echo the audience would lose some of the music also, and the general effect be muffled and deficient in brilliancy. Plans and schemes which look perfectly logical and practical on paper, may be dissipated at once by the test of a single musical performance. For the present, it appears to me that one important step is to check the tendency to build over-large concert-rooms, which increase twenty-fold the difficulties arising from echo, which are not necessary to realise the greatest beauties of music, and which, by increasing the class of "monster" performances, tend to foster in the public mind the idea that "the more noise, the more music;" an idea which the Americans seem inclined to carry to its last pitch of absurdity. Keep our concert-rooms to a reasonable size, and echo presents little practical difficulty, but if we are to be content with nothing less than "Albert Halls" for our concerts, then farewell to all real enjoyment of music!—at least of such music as exists at present. H. H. S.

SOUTH-WEST LONDON SCIENCE AND ART CLASSES.

THE annual distribution of prizes to the students of these classes took place recently at the Albert Working Men's Club, Knightsbridge. The classes are held at this Club, at the National Schools, King-street, Chelsea, and at the Working Men's Club, Flood-street, Chelsea. Colonel Hogg, M.P., chairman of the Metropolitan Board of Works, presided, and handed each successful student his prize, saying at the same time a few words of commendation and encouragement. In the course of his remarks the chairman expressed surprise that the classes were not more numerously attended, especially considering the high average success attained by the students, who had obtained several medals, and the inducements offered in the way of local prizes by the generosity of private persons. The fees were very small; the knowledge imparted was not only of the greatest importance, but very interesting also; and he could not imagine what more working men wanted. He strongly recommended the men present themselves to join the classes, and to induce others to do so. He wished to impress on them that they owed it alike to themselves, to their order, and to the country, to strive after self-improvement. No pleasure was equal to the pleasure of conscious improvement, and no knowledge so valued or valuable as that which had been gained by some slight sacrifice and trouble. Men who spent all their leisure in amusement and idleness would never rise above their own rank, nor be much respected in it. Nor, in his opinion, would they deserve anything better. He hoped to find next year the classes considerably enlarged; and if a certain number more joined, and honestly confronted the examinations at the end, he would have great pleasure in subscribing 5*l.* for prizes, as a spur to their exertions.

Addresses were also delivered by Captain Mercier and Dr. John Mill, who both very ably enforced the necessity of technical education for the English workman.

A COUNTRY-HOUSE, BOWDON, CHESHIRE.

THIS house, built for Mr. Charles Johnson, occupies a good position overlooking the beautifully-forested park of Dunham, situated at Bowdon, a few miles distant from Manchester, and a favourite place of residence of the "merchant princes" of that city.

The accompanying plan will fully explain the general arrangement of the house.

The outside is faced with Burnley pier-points, the dressings being of Yorkshire stone. The whole of the building is celled, that part under the dining-room being lighted by means of areas, lined with glazed white bricks, and appropriated to the purposes of a billiard-room. The vestibule and staircase are warmed by means of hot water circulating in pipes and coils, fresh air from the outside being made to pass over the latter in such a way as to become well warmed before passing into the rooms above. The ventilation of the house has been effected by means of glazed pipes, built up between smoke-flues, and all collected in the roof into one shaft, in which is fixed a gas-jet, to assist the draught, if required, in sluggish weather,—a system which the architects have found, they say, very effective.

The contract for the house and stabling was taken by Mr. Cardwell, of Altrincham, for 5,442*l.* The architects were Messrs. Horton & Bridgford, of Manchester. The grounds have been simply but effectively laid out by Mr. John Shaw, landscape gardener, of Bowdon.

REFERENCES.

A. Carriage-house.	R. Cloak-room.
B. Harness-room.	S. Entrance.
C. Loose Box.	T. Area.
D. Stable.	U. Side-passage.
E. Stable-yard.	V. Safe.
F. Yard.	W. Service-room.
G. W.C.	X. Lavatory.
H. Debt.	Y. W.C.
I. W.C.	Z. Hall.
J. Coal.	1. Breakfast-room, 17 ft.
K. Manure.	by 22 ft.
L. Cook's Pantry.	2. Drawing-room, 27 ft.
M. Kitchen, 18 ft. by 16 ft.	3 in. by 17 ft., exclusive of Bay.
N. Scullery.	3. Dining-room, 26 ft. by 18 ft.
O. Butler's Pantry.	
P. Coach-house.	
Q. Stores.	

THE NEW REREDOS IN THE CHURCH OF ST. MARY REDCLIFF, BRISTOL.

FOR many years the easternmost arch on each side of the choir, opening to the eastern ambulatory, whence the lady-chapel was entered, was blocked up with masonry, with the view of strengthening that end of the church, which was then in a dangerous state. The ambulatory was thrown into the choir, the wall and windows above were covered up with three large pictures by Hogarth, and an external approach to the lady-chapel from the east end of the south aisle was formed. This part of the church having been made more secure, the masonry in the arches was removed, and the ambulatory was reformed by the restoration of the stone screen of the lady-chapel on one side, and the erection of a rough temporary wooden screen next the chancel on the other. The chancel remained in this indecorous condition for a long time, the general repairs of the fabric requiring all the available funds. By the exertions, however, of the vicar and the churchwardens, a separate subscription was raised, and a reredos, from the designs of Mr. George Godwin, of which we now give a view, has been erected.* The side screens have also been restored; the chancel has been paved with encaustic tiles and marble by Messrs. Simpson & Sons; and such other works have been done as were necessary to fit the place for its purpose.

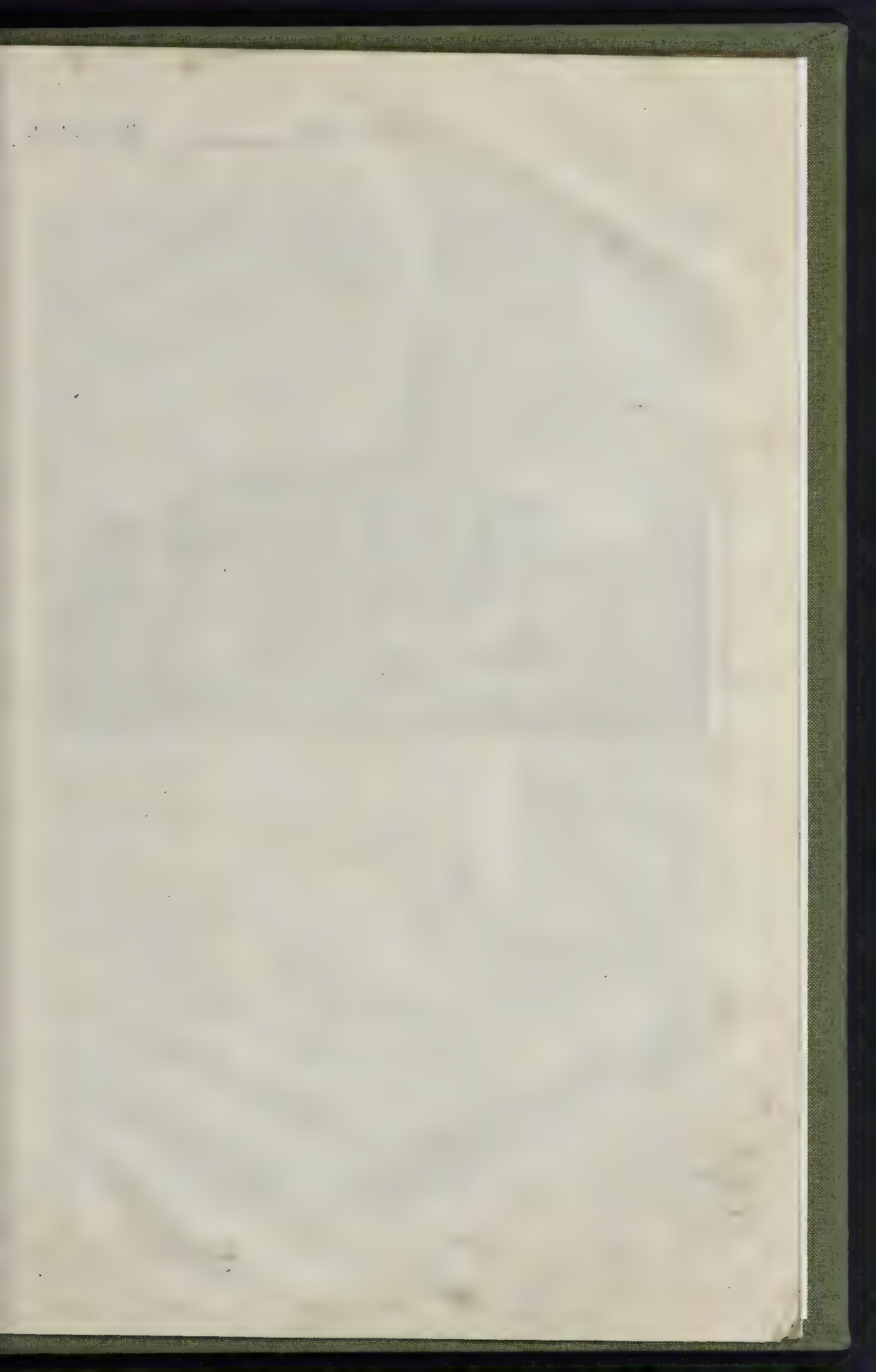
The reredos is of Caen stone, with the exception of four small shafts of red marble, and a small Greek cross and circle of mosaic work by Salvati, in the central tablet, and it has been admirably executed by Mr. William Rice, and the men engaged under him at the church. The capitals of the small columns, and the ornamentation round the arches, are all studied from natural flowers and foliage.

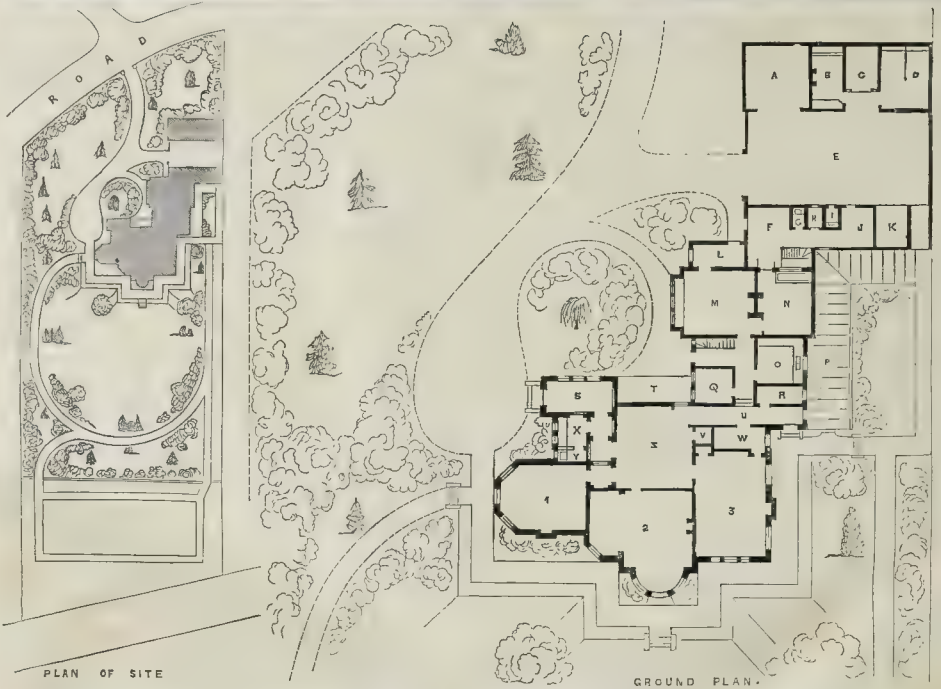
The reliefs in the panels, representing the miracle of the leaves and fishes, were executed by Mr. Forsyth, of London, and are very creditable to him.

The altar-table is of oak, of simple design, the top being formed out of a marble slab, formerly used in the same position.

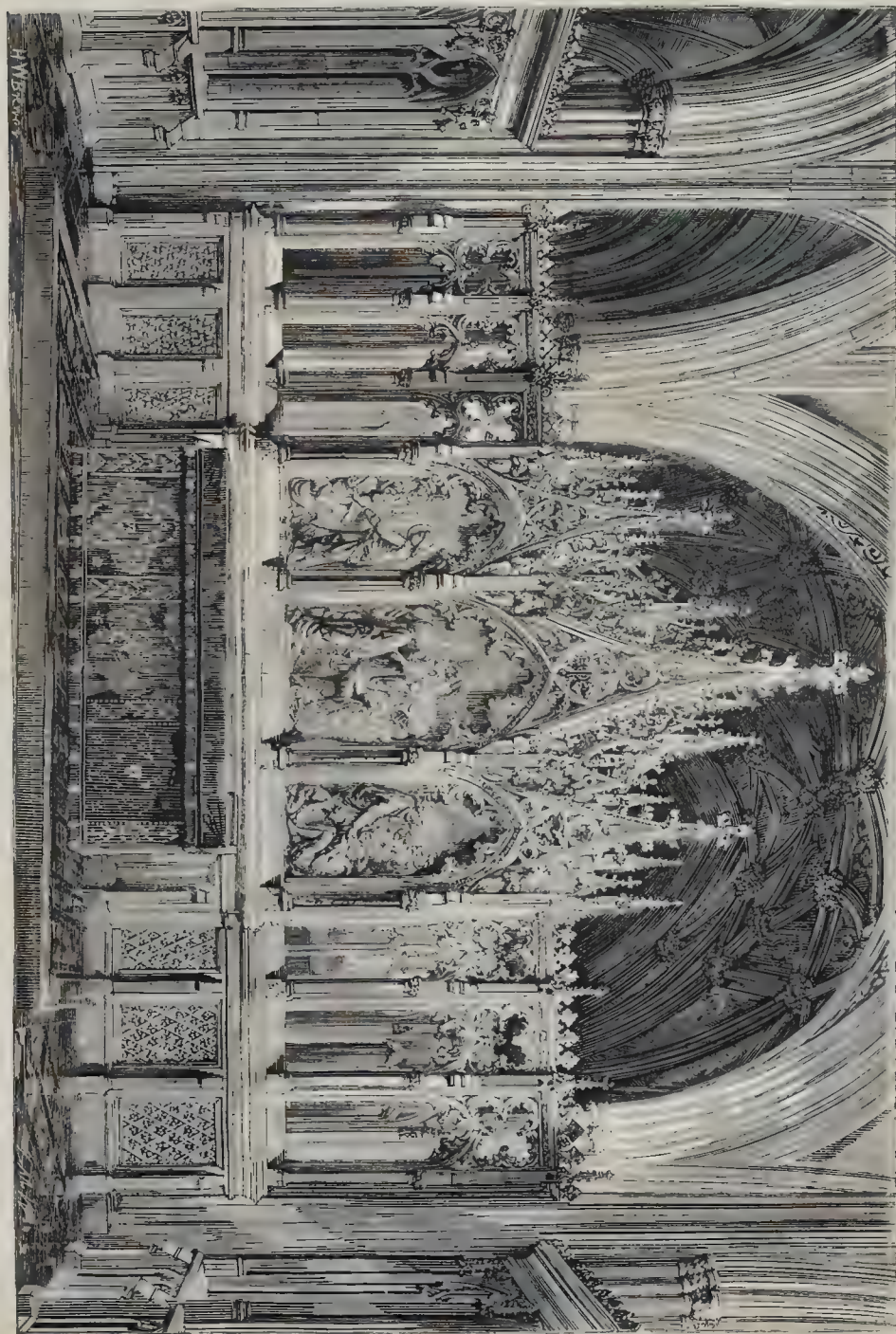
The vaulting of the lady-chapel seen above the reredos has been effectively decorated in colour and gilding, at the cost of the Freemasons of Bristol, by Messrs. Clayton & Bell. The drawing we have engraved was made from an excellent photograph produced by Mr. Francis Bedford.

* In a previous volume (xiv., p. 171) we published a design for the reredos and sedilia as at first determined on. Circumstances, including considerations of expense, led to the substitution of the design now carried out.





A COUNTRY HOUSE, BOWDON, CHESHIRE.—MESSRS. HORTON & BRIDGFORD, ARCHITECTS.



THE NEW REVEDOS IN THE CHURCH OF ST. MARY REDCLIFFE, BRISTOL.—MR. GEORGE GODWIN, ARCHITECT.

BOARD OF TRADE RAMIFICATIONS.

A PARLIAMENTARY paper just published contains information calculated to correct the erroneous impression that prevails to a considerable extent as to the nature of the contents of the portfolio of the President of the Board of Trade, and the business transacted, or rather directed, in and from his bureau. It is supposed by even some well-informed persons that the business of the Board of Trade is transacted in, and almost entirely confined to, certain premises in Whitehall-gardens. This is quite a mistake. The department has offices in various parts of London, and officers stationed in the most remote localities in the United Kingdom. The supreme authority in the department is vested in the president and the heads of various Government departments, including the Lord Chancellor, the Premier, the Chancellor of the Exchequer, the Speaker of the House of Commons, and others. The chief office is at Whitehall-gardens, but in London the Board has subordinate officers at Old Palace-yard, for the Standard Weights and Measures Departments; at 1, Whitehall, where the Design Registration, and Inspectors of Railways Offices are located; at 13, Serjeants'-inn, where the Joint Stock Companies Registration Office is situated; in Henrietta-street, Dublin; the Exchequer Chamber, Edinburgh; and at Truro, where there are assistant registrars; at New-street, Spring-gardens, where the City of London Gas Act officers have their office; at Adelaide-place, London Bridge, for the General Register and Record Office of Shipping and Seamen; with offices and officers at numerous ports throughout the United Kingdom.

The business of the establishment is divided into six departments,—the Commercial, the Statistical, the Railway, the Harbour, the Marine, and the Financial. The Harbour and the Marine departments employ the largest number of officials. At Ramsgate Harbour 71 persons are employed under the Board; at Holyhead, 28; at Dover, 9; at the Channel Islands, 5; and at Spurn Point, 2. There are 84 officers and servants on the home staff of the Register office of shipping and seamen, including 38 clerks, with from 100L to 500L per annum each; a registrar-general, with 900L per annum; and two boy-messengers, receiving 8s. and 12s. per week each. There are twenty local marine boards, at various ports,—that at Liverpool employing 64 persons. At numerous other ports collectors of customs and their staff perform the duties of the mercantile marine officers. The Board has 45 persons employed at 23 different localities, in connexion with the survey of steamships, the inspection of crew-spaces, lights, &c. The Board employs 7 authorised receivers of wreck at various ports. It provides 323 sets of rocket and mortar apparatus on the coasts of the United Kingdom for saving lives from shipwreck. The coast-guard officers and men living on the stations are assisted by 131 volunteers, companies, consisting of 2,228 men. In addition, there are nine volunteer brigades, for saving life with this apparatus, consisting of 600 men. There are 547 stations supplied with life-belts and lines, not included in the rocket and mortar stations, but under the charge of 75 inspecting officers of coast-guard, and 3 receivers of wreck. These stations include the most remote localities,—the Scilly Isles and Stornoway; Glasgow and Guernsey; Lerwick and Liverpool; Cork and Cardiff; Newcastle and Newport; London and Londonderry; St. Andrew's and Swansea; Plymouth and Padstow; Dublin and Dingle; &c.

At the head-quarters of the Board, in Whitehall-gardens, there are 100 permanent officials and servants, receiving salaries and wages of from 1,200L per annum to assistant secretaries, down to 1L a week paid to the assistant fire-lighter. The staff includes two professional members of the Harbour and the Marine Boards, who receive 800L per annum each. There are four railway inspectors, in two classes: two have salaries of 600L, rising to 800L per annum; and two with 800L, increasing to 1,000L a year. There are 18 senior clerks and 30 junior clerks on the permanent staff, with salaries of from 320L to 600L, and from 100L to 300L per annum. There are also about 50 temporary clerks and 40 civil-service writers occasionally employed. The draughtsman is paid 700L per annum. The warden of the standards has 900L per annum; the inspectors under the Alkali Act have, one 700L, and the other four,—for West Lancashire, Wales, and the south-west of England; for East Lancashire, Birmingham, &c.; for Newcastle;

and for Scotland and Ireland, 400L each. The registrar of designs has 600L, and the assistant registrar 400L per annum. There is an assistant secretary at the head of the office staff of three of the departments, a "chief" at the head of the statistical department, and an accountant at the head of the financial department. These officers receive from 800L to 1,000L per annum each. The three referees under the City of London Gas Act of 1868 have 700L per annum, and the examiner and the auditor 500L each. The Railway department has its powers conferred under no less than 71 general Acts of Parliament, of which 31 have been passed since 1850. The Harbour department has business thrown upon it by 31 general Acts passed since 1850, and the Marine department by 10 Acts. The salaries and expenses of the Board for 1870-71 amounted to 163,140L, and the fees and receipts for services rendered to 100,467L.

ST. ALBANS ABBEY CHURCH.

THE bells in the great central tower were rung for the first time for it, it is said, about forty years, on Thursday, the 21st inst. We read in the *Herts Advertiser* that "eight picked members of the College Youths, London, ascended the tower at half-past ten, and rang for the service peal 500 grandiose trebles, and during the day also rang several touches of Stedman treble-bob and grandseires, concluding at six p.m. with three firsts."

The bells have since been rung several times, to make the looked-for Christmas music. As indicating the confidence of the architect in the success, in the main, of the works carried on during the last year and more for strengthening the supports, and tying together the fabric of the tower, at one time, to all appearance, in imminent danger, this will doubtless be considered welcome news by the subscribers to the restoration fund, who have succeeded in preserving at least the most unique portion of this most interesting structure. Let us hope what has been done will be followed, in the course of next year, by the application of similar radical remedy to some other sadly too numerous shaky places throughout the building.

THE DECORATION OF ST. PAUL'S.

SIR.—The letter of Mr. Lupton in your last reveals some curious discrepancies between the sums promised for windows in St. Paul's, and the sums which the donors were ultimately invited to pay, which may well lead others to think twice before they commit themselves to furnishing a window. But I think that the artistic question is a much more important one than this, and one on which there is much stronger feeling among those who take any interest in that side of the question. The strictness of your correspondent as to the stone canopy and triumphal arch in the "Crucifixion" and "Conversion" windows are perfectly just, but they are beside the mark; for the point really to be deprecated is that we here have a really bad and false style of stained glass art stereotyped at a great expense in the windows already put up; and, not content with this, the committee, it is understood, are ordering a further batch of Munich windows for the rest of the apse, though they are gracious enough to intimate that this type of windows need not necessarily be used all over the church. I do not think the objection about "sending to foreign artists," &c., is of any weight; if we could get better art from the foreign artists, let us have it by all means. But the fact, in which nearly all English critics now concur, is that the whole system of stained-glass design as developed by the Munich school is based on a false principle,—that of making a picture of a window, instead of treating it as a transparent flat plane for transmitting light. However good the drawing of the figures may be, the treatment of stained glass in this manner can never be otherwise than vulgar in result, because it is an attempt to do what never can be done on glass except in a coarse and crude manner, and which, when done, looks out of place. The committee would have done much better in spending some of their funds in getting rid of the windows already in the apse, than in getting more of the same kind; and what we may expect from Munich next it is difficult to think of without a shudder, if one may judge from the specimens to be seen recently in the International Exhibition. It seems hopeless, however, to expect any dis-

crimination from the committee on this head, when their own surveyor and professional adviser, in his paper read before the Institute some months since, made the astounding observation that English stained-glass art had very much improved, "owing to the stimulus given to it by these very windows" now in the apse! The fact being patent, I should have thought, to every one that all that is good in modern English stained glass is the result of completely different principles and methods of working, carried to completely opposite results. As to the colours in the German windows, it is better to avoid so painful a subject altogether.

I am glad any one has commented on the dangerous precedent commenced by placing colossal figures in two of the spandrels under the dome. If figures are to be employed in this position, it would certainly appear that they must be somewhat larger than life, to be properly seen; but that the size of the present figures effectually dwarfs the architecture, when viewed in connexion with them, there can be no doubt. The question is whether the architecture is to be regarded as a mere frame for the future pictures, or as the principal interest in itself. If the latter, then, those who allowed colossal figures to be placed there were as short-sighted as Isaiah in the design is made to appear.

Those who do not live in London cannot, of course, see all that is going on in St. Paul's; but the impression produced by occasional visits and by accounts in the papers, is that the building is at present a kind of *corps vile* to try all sorts of heterogeneous experiments upon, with no very fixed aim. There may, of course, be (as astronomers say there is in the stellar system) a point whence all this seeming confusion may appear reduced to a uniform plan and object; it is to be hoped there is.

One thing ought to be strongly protested against,—viz., the practical (I do not say intentional) misrepresentation involved in using the term, "Completion of St. Paul's," in all the appeals made to the public for money in aid of the objects of the committee. The scheme put forth by them is not the completion, but the entire remodelling of the interior, decoratively. Do any of the committee pretend to say, seriously, that Wren only put stone pilasters and panels over the church as a temporary expedient, intending eventually to have them cut out, and marble substituted? And if they do not mean this, how can they honestly ask for subscriptions for a scheme which includes this, under the pretence of "completing" Wren's design? I say, that in using such a term they are, whether deliberately or not, completely misleading the public. Only the other day a provincial clergyman, a very liberal man with his money, mentioned to me, incidentally, that he had sent a subscription to the St. Paul's fund, and that he had only since then discovered what was really talked of as the ultimate intention of the committee. "If I had known it before," he added, "they should not have had a penny from me." This is likely to be the feeling of a good many subscribers, when they discover that, under pretence of "completing" Wren's design, they have been asked for their money towards a wholesale hacking and hewing and rebuilding of the interior, never contemplated by the architect, and which, if begun, will never be finished; that, in fact, they have only contributed to keep up the buzz of a tremendous bee which the committee have got into their bonnets.

A PROVINCIAL ARCHITECT.

"ROYAL VICTORIA PALACE THEATRE."

THE foolish name given to the old "Victoria" is not the only thing to which we are forced to object. First, however, let us mention, according to the card, that the whole of the interior has been re-arranged, so that of the old building the external walls and roof only remain. There are now three floors. The pit is entered on a level with the road, the old pit floor having been about 4 ft. above the level of the road. The first tier or dress-circle is reached by a centre stone staircase, leading from a spacious entrance-hall, laid with tiles. The gallery is gained by a stone staircase, on the left-hand side of the building. Over the entrance-hall is the saloon, 40 ft. by 22 ft., with an ornamental ceiling very badly painted.

There are three tiers of private boxes on both sides of the proscenium.

The upholstery has been executed in a somewhat elaborate style.

The decorations of the ceiling, proscenium, private boxes, box tier, and gallery fronts are in raised carton-pierre ornament. The ornamental mouldings of the ceiling (which is flat, with a ring of lights around it) are somewhat coarse and overlarge.

The wall spaces of the pit, first tier, and saloon, are completely covered with plates of silvered looking-glass of large dimensions, but we are unable to add, with the daily papers, that this "produces a most brilliant effect." On the first night the surface was covered with steam and often will be; moreover, large surfaces of looking-glass at night are always unsatisfactory.

Alterations will be needed in two very important respects: an inner lobby must be formed at the box entrance, to prevent the draughts which at present make the theatre in parts unbearable; and a large proportion of the seats in the boxes and gallery must be re-arranged so that the occupants may be able to see the stage.

Mr. J. T. Robinson was the architect; Mr. Thomas Snowdon, the contractor; and Mr. Watson his superintending foreman. Mr. Fullicks was clerk of the works.

Messrs. Deafies supplied the sunlight and float for the stage; and Messrs. Pashley, Newton, Young, & Co. executed the ornament and decorations, under the superintendence of Mr. H. Spry.

A NOTE FROM WEST BARBARY.

THE St. Austell (Cornwall) School Board, of which a baronet is the chairman, offer by public advertisement to "Architects, Builders, &c.," the magnificent sum of £1. for the plans and specifications "which meet with their approbation" for two schools to accommodate 200 children each, with two class-rooms adjoining, each for 50 more children.

"Special attention to be given to providing ample light and ventilation, with good drainage."

The plans and specifications to which the premium is awarded "to become the property of the Board."

Not a word about the ulterior employment of "architect, builder, &c.," for the best of all reasons:—£1. is to be the full remuneration for the best plans and specifications (if indeed any meet with "approbation") for school buildings to accommodate 500 children.

This precious advertisement is signed by the "Hon. Clerk." What the deuce does this cheap official mean by "£1.?" Presumably he has been to school himself, and it might have struck him that "and others" would have been sufficiently comprehensive without being quite so offensive as "£1."

However, the professional readers of the *Builder* will be eager to enter the lists for this capital prize!

. Architects who respond to this invitation must do so with the consciousness that they are helping to degrade their profession.

NEW PRIVATE BILLS.

THE standing orders of Parliament for the coming session provide that copies of bills to be petitioned for shall be deposited in the Private Bill Offices of Parliament and elsewhere, on or before December 31st. In compliance with this order, copies have been lodged of 303 Bills. In the last great culminating crisis of speculation,—1855,—there were 633 petitions for private Bills, the largest number ever known. The number of petitions sank after that year, but has been again increasing gradually since 1869, when the number of petitions was 212. In 1870, or for the session of that year, the number was 240; for the session of 1871, the number was 275.

The Bills deposited include the Mid-London line for an underground railway from Kilburn to the Marble Arch, thence eastwards to a junction with the Oxford-street and Holborn to a junction with the London, Chatham, and Dover line near Smithfield. From that locality, the line will pursue its course eastwards to a junction with the East London Railway at Whitechapel. Whether arrangements may be made with the Corporation of London or the Metropolitan Board of Works, to divide the cost or not, is not yet known; but this project affords an excellent opportunity for the construction of the new thoroughfare recommended some years since by Mr. Haywood. The new street would be a continuation eastwards of the great central traffic artery passing along Uxbridge-road, Oxford-

street, and Holborn. From the end of the Viaduct the new street would be continued for a mile and a quarter in a direct line to the Commercial-road and Whitechapel. It is proposed to have Mid-London stations at Commercial-road East, Whitechapel, Bishopsgate-street, Moorgate-street, St. Martin's-le-Grand, Holborn Viaduct, Lincoln's-inn-fields, near Tottenham-court-road, New Bond-street, the Marble Arch, and at Kilburn. The line must necessarily be costly, but a large traffic may confidently be depended upon from a communication carried across the centre of London to east and west. It will be well if the Board or the Corporation follow the lead given by the Metropolitan Board in the matter of the new street over the London Central Railway from Leicester-square to Oxford-street, towards which the Board is contributing 200,000*l.*

The Bills lodged include the opposing schemes of the Midland, the Great Northern, and the Manchester, Sheffield, and Lincolnshire Companies, for lines into each other's districts. The Bills are also deposited for the amalgamation of the London and North-Western with the Lancashire and Yorkshire Companies, and of the Midland with the Glasgow and South-Western. The Bill for the amalgamation of the Caledonian with the North British Company will not be presented in this session. Bills are deposited for six schemes for crossing the Severn,—one of them by a tunnel four miles in length, the other five by high level bridges of from two miles and a quarter to 800 yards in length. In connexion with one of these schemes,—the South Midland,—there will be 113 miles of new line constructed, with sixteen tunnels, aggregating about eight miles in all.

There is this year a fair proportion of Irish railway Bills, and as many as fourteen Bills connected with Glasgow.

OXFORD AND BERKS BRICK KILNS.

THE extensive kilns belonging to the Oxford and Berks Brick Company are built on Hoffman's patent principle. They are situated at Wolvercote, about two miles from Oxford. The site is ten acres in extent. About 1 ft. or 5 ft. below the surface is an inexhaustible supply of clay. The brick-yard is easily approached from the turnpike-road. The kiln is adapted for making all kinds of pipes, as well as bricks, and for burning lime. The saving effected in coal over that of the old system of brick-making is said to be some what considerable.

The kiln is of a circular form, and about 90 ft. in diameter. It has twelve chambers, in which the bricks are burnt. Each chamber is about 20 ft. long, 12 ft. wide, and 8 ft. high, and will contain about 12,000 bricks. Eleven of these chambers can be made available at the same time, consequently 132,000 bricks can undergo the process of burning at one time. In the centre of the kiln is a circular chimney, 90 ft. high. Its base is 18 ft. in diameter, and its top 10 ft. The chimney, as well as the other portions of the kiln, is built of bricks made by the company. In the kiln around the chimney, between the latter and the brick-chambers are a series of smoke-chambers, where the dampers are worked to regulate the draught through the bricks which are being burnt. The floor from one chamber to another are 2 ft. 6 in. high, and 18 in. wide, and in the upper part of each brick-chamber is a pipe to carry the steam from the bricks to the smoke-chamber. The whole of the chambers are lined with fire-bricks set in fire-clay. One of the peculiarities of this patent kiln is that the coal is supplied from the top, through a large number of feed-holes about 4 in. in diameter, over each of which is placed an iron cap. In the ordinary kilns coal is put in at the bottom, similar to a furnace. Over each brick-chamber are sixteen of these feed-holes, which are supplied with small quantities of coal at short intervals.

The bricks at this kiln are burnt with the common Staveley slack, about 2 cwt. of which is sufficient for 1,000 bricks. In the ordinary kiln, however, not only is the best coal used, but not less than 8 cwt. of it is required to be consumed to produce the same number of bricks. The kiln is intended shortly to be covered over, and after that work is accomplished greater facilities will be afforded for drying the bricks than at present exist. Instead of drying them in the open air, they will be placed on the top of the brick chambers of the kiln, and from which there is a moderate heat through the

arched roof. By this means 200,000 bricks may be dried at the same time, and the process of manufacturing them may then be carried on in all weathers. The total cost of this portion of the work has been about 1,500*l.* Since the company was established, up to about six months ago, a small ordinary machine was used, and it was capable of making about 10,000 bricks a day. This machine was driven by a 6-horse power engine. In June last the company purchased a new and powerful machine (Murray's patent) which is capable of making from 15,000 to 20,000 bricks daily. Its construction is somewhat of a peculiar kind. It consists of a large pug-mill, a pair of massive rollers for crushing the clay, and a patent cutting-off apparatus, which will cut bricks to any shape or size. The machine is also adapted to making pipes of any description, merely by putting on different dies, and is driven by a new and powerful double-cylinder 20-horse power engine, by Gibbons, of Wantage. It contains all the latest improvements. The machine is stationed near the mouth of the clay-pit, which is now about 40 ft. deep, and the engine a few yards from it. The clay is at present drawn up by horse power, but it is intended shortly to draw it up, and also pump the water from the pit, with the new engine.

ON THE PREVENTION OF NOXIOUS SEWAGE EMANATIONS.

THOSE who talk of drains or sewers being good which require to be flushed, if they speak of regular flushing as necessary for the removal of regular accumulations of deposit, do not know what good drainage is. Good tubular sewers or drains should be so constructed in size, form, and inclination to the run of water as to be self-cleansing, and to be always clear of deposit. I have made particular inquiries as to this point, and in every instance where the work has been done according to the instructions provided, it is declared that when taken up after considerable periods, they were found to be "as clean as when they were first put down." If in any instance it is otherwise, the fact is one to be inquired into. Dr. Carpenter declares that at Croydon, where the death-rate has been reduced about one-third by improved drainage, he has not known a case of typhoid fever where there were not some defects in the drainage works about the house or the premises connected with it. And so in other instances. The declaration of the officers in charge is that there is no smell from these self-cleansing channels, but that accidental stoppages occasionally occur, chiefly from servile carelessness in throwing down what ought not to be thrown down; and the officers declare that the only need of traps and ventilators is to guard against these accidents. As a rule, where there is smell from the drains or the sewers there is stagnant deposit.

The house drainage may be faultless, but in rural mansions it is commonly led to a covered tank in a garden, as in towns to a sewer or deposit, or to a side-looked dead end, where deposit is occasioned. There it is kept for long periods. In the old sewers in London it is frequently kept for more than a year, or until the sewer, unless periodically cleansed, is choked up. Fresh human excreta is innocuous. If it were not so, mankind in cities as they now are, would soon be destroyed. The period of noxious decomposition begins in this country, usually not later than about four days in the sewer-tank. Then it is, and there it is, in the distant tank, or in the sewer of deposit, that danger arises. In my report, in 1842, on the sanitary condition of the population, I stated that the position of the sewer of deposit (like the tank of deposit), as commonly constructed, was as the bulb of a retort, and that the house-drain, also usually of deposit, was as the neck, conveying the products of decomposition into the house, which was often, at night when shut up, as an inverted receiver for their collection. Of course, through a water-closet opening into a bedroom, the poisonous gases will be diffused there in conditions of more or less intensity. In certain barometric conditions, or when decomposition is ripe, the products are sometimes evolved from these retorts to an amount that overcomes all water-traps. I remember the instance of the owner of one large, palatial mansion, who wondered how, and to what malign influence it was to be ascribed, that, just at the time when he had a large party, and at no other time, abominable smells pervaded the house, which was a new and well-built one. The fact was, that the extra fires

and lights on the occasion, in winter time, when all outer doors and windows were closed, constituted a pump, lightening the pressure upon the water-traps or the house-drain, and brought up the products of decomposition from the sewers. If there had been no fires, the traps might have acted perfectly. I have known many first-class mansions to be in the worst conditions, in which a royal progress through them, attended by extra fires, would be a progress of danger to a susceptible person; the conditions being those in which foul air would be drawn in to commingle with the vitiated air from overcrowding, from lights, so as to create a more noxious mixture. First-class hotels on the Continent are, in these respects, often most dangerous places, where I have known frequent fatal cases occur from these causes. Dr. James Johnson, the editor of the *British Medical Review*, was killed (as he has described) by the air-poison in a house in Brighton, where he went for the recovery of his health.

Various means have been proposed and tried for combating the noxious gases evolved from the stagnant deposit. By some it has been proposed, as a complete remedy, to ventilate the neck of the sewer, the house drain, at its entrance into the house, and by a shaft lead up the gas and distribute it at the house-top. Where this has been done, sometimes through the water-spouts, the gas has been diffused with fatal effects amongst the occupants of the attic. Moreover, when the basement traps have been defective, and the warm-air pump within doors, as described, has been active, the gas has taken the shorter cut of going into the lower premises. By some engineers it is proposed to ventilate the gases nearer their source, at the sewer, or the tank of deposit, and carry them away by high shafts. Where this has been done, as it has been on the Continent, the gases thus diffused have been found to be nuisances in the suburban districts; a method of ventilation, in which people in the suburbs of Liverpool have had experience, in the ventilation of chemical works by tall chimneys. By one engineer a plan was proposed and tried of ventilating a sewer of deposit by means of a steam jet, with the result of a more rapid evolution of the gases than ever. By one engineer the plan was proposed and tried in Paris, of the ventilation of a sewer of deposit by an upcast shaft, or chimney, through fire. But the products distributed at a distance, if less noxious, were found to be a nuisance, and the process was abandoned. By some manufacturing chemists it is proposed to combat the noxious gases with disinfectants, the more correct name of which was proved to be deodorisers. By one of the General Board of Health were almost accused of manslaughter for not directing the general application of his preparation of an acetate of lead as a complete preventive. In the strength of his convictions, he, poor man, went with it to extinguish a cholera epidemic, and he was one of those who fell victims to it amidst his own preparations. By some chemists, charcoal powder was insisted upon as a specific. The crew of a ship sent loaded with it to the Crimea was attacked by the cholera, and the faces of the first victims were blackened by the charcoal powder they had been unloading.

The difference of condition between the stagnant sewerage, which is putrid and kills fish, and that of fresh sewerage from self-cleaning drains and sewers, which, when discharged into rivers, feeds them and augments their numbers, is not remembered. The most effectual course is not to combat with the gases when produced, but to prevent their production—to prevent the poison pits, and the need of their various materials and services for guarding against them.

EDWIN CHADWICK.

"DRAINAGE v. FEVER."

SIR.—At this time, when the sympathy and alarm of the whole nation have been aroused by the sad visitation of his Royal Highness the Prince of Wales, now happily subsiding, it is quite opportune to offer a few remarks on the state of our domestic sanitary matters. I do not for a moment believe in the oft-and-recommended of the *Spectator*, to "hang a few plumbers for murder," as an antidote. We must look more to ourselves. As a practical man, I have been many a time and oft much surprised to observe, in passing along our streets, and casting an eye on the areas below, fronting not only the most moderate of dwellings, but also in some of the highest class West-end mansions,

the bell-gratings of the iron traps left off, and in many instances nowhere to be seen, being lost, through ignorance or carelessness in replacing them after the very common but objectionable practice of flushing down all refuse when washing the areas, and forthwith is improvised a permanent, though unseen, fountain, as it were, of miasma, for the delectation of all open windows above, the same being, by the natural air-current of the street, duly turned into the rooms. I also well know, from constant experience, that the same practice exists in sinks, lavatories, and back-yards to an incredible extent, without any notice being taken of the same. In many houses, also, in bedrooms, where a water-supply exists, as also in butlers' pantries, where glass, china, and decanters are washed, and left inverted to drain, the same neglect prevails, or the duly fastened grating of the waste simply covers an opening into a pipe untrapped, and frequently into a cesspool of stagnant accumulations. Too often the inconvenience is merely looked upon as "an unpleasant smell," and is treated accordingly with a dose of chloride of lime, or other disinfectant, and so the question is for the time settled, or supposed so to be. I had occasion to know of an elegant villa near the Regent's Park, where the upper floor corridor, with three or four bedrooms on either side, had on the landing of the staircase an apparently very convenient covered sink, with water laid on, from which the ewers and water-bottles of the said bedrooms, as well as those on the floor below, were daily filled; the said sink had the grating of the waste firmly braced in, and constantly emitted the most offensive miasmatic effluvia, the said waste having been duly (or rather unduly) conveyed through the outer wall by a simple short length of pipe into the outside stack pipe, the lower end of which was plunged and cemented through the area pavement below into an untrapped cesspool drain. I knew also of an instance, in the immediate vicinity of Buckingham Palace, where for years the illness, fever, and general failing of health of the occupants of some half-dozen tidy-looking dwellings had formed the theme of conversation and notoriety. On being applied to in the matter, I found to my astonishment that the entire water supply of the tenements in question was a leaden pipe running from the main to the cottages, which actually passed through and under the soil of the privies. The pipe had been for a long time positively rotten, and in parts perforated by decay, and luted, as it were, by the soil itself; so that the supply had been for years impregnated with undeodorised organic matter; and the same most assuredly by flux and reflux permeating (no matter in how homoeopathic a degree) the supply of the entire locality. Going from "Omega" to "Alpha," I had the honour, some two years since, of being consulted by H.E.H. the Grand Duchess of Mecklenburg Strelitz, on the sad state of the internal atmosphere of the new palace at Nonnenhof, one of the most magnificent residences in all Germany, which, at almost endless cost, had for years occupied the highest English and Continental talent in its erection and decorations. On proceeding thither personally to examine into the matter, I found that everything connected with the closet and water-supply had been got up with the most costly outlay and appliances, as regarded style and appearances, but the sanitary arrangements were an utter mockery and sham, painfully corroborated by the tainted air of the entire interior, as though that part of the affair was quite of a subordinate character; and I had to return to England, and, taking with me a whole array of proper apparatus and accessories, proceed again to Mecklenburg, and take up the entire existing arrangements and remodel the same throughout, with, I am happy to say, every desired result, as I have the honour of holding the written testimonial of her Royal Highness, acknowledging the same. Such instances as the above exist all over England, as is patent to most practical men, and should be looked to. In many cases it has arisen from a species of apathy as regards the unseen of the household so long as the ornamental, the decorative, or the admirable is satisfied; or else there must exist a sad lack of information as to the really simple principles of the whole question. Again, during the last twelve months, it has fallen to my lot to undo and remedy very sadly defective drainage in one of the most extensive West-end hotels, where the great cost of erection ought to have insured perfection, but misplaced provisions and complication of access

to the same had together conspired to create very serious annoyance, and would have been worse but for the unflagging attention of the management, combined with the purity and salubrity of the site. However, all this is amended, and is now as it should be, changed and perfect. I believe, sir, that all the regulations of the Board of Works, of the district authorities, or of local orders, will go for nothing in doing away with this state of things, unless a proper house-to-house visitation is made from the mansion to the hovel, and reports duly made, unmasking that which requires remedying, and from which the Board of Works, or other authorities, may base their imperative orders for amelioration. Further, if proprietors about to build, or alter (whether mansion or estate), will only give the professional gentleman architects whose aid they enlist a proper discretion, the latter, who well understand both the matter and its importance, will assuredly issue such details of drainage in the specification as will leave the contractor or his plumbers but little option in the matter, and a good result will ensue. Even the trashy so-called pan-closets of commerce (so aptly alluded to by Mr. T. Saffield, in his letter in your number for December 23rd) will become cashiers, as all architects are fully conversant with the productions of many first-class firms, and would, upon principle, recommend none other.

HENRY R. WAGNER.

"JACK PLANE."

WILLIAM RANDALL, whose death by accident we mentioned in our last with much regret, has left his wife and seven children unprotected. Some of the master-builders may be willing to show their appreciation of the good, from their point of view, his letters were calculated to do; and we willingly mention, at the request of a correspondent, that the family live at No. 34, Swinton-street, Gray's-inn-road, Messrs. Henson, Brothers, of No. 4, York-place, Portman-square, say that Mr. Randall worked in their firm for the last fourteen years, and that they always found him an industrious, well-conducted man. They will willingly receive any contributions that may be forwarded to them.

BRICK.

THE reference to the "Glossary of Architecture," given in the *Builder*, p. 952, has forced upon my attention a point which I had purposely avoided, as open to misconception. We have to consider how the word "brick" was first introduced to England, and to avoid confusing it with the word *tile*.

The Romans used tiles of all sorts, but they were not *real* bricks, in the modern sense of the word; a *tile* is derived from the Latin word *tegula*, "a tile," shelter, or covering; brick is said to be a corruption from *imbrex*, *imbricis* a synonym for *tegula*; it means the gutter-tile, or roof-tile; from this we have our modern word to imbricate, or "work with tiles."

The author of "Domestic Architecture in England" (Oxford, 1859) writes—"The earliest use of moulded bricks has not yet been investigated."—Part II, p. 238.

Further,—"It appears that there is no mention of brick in any ancient building account. . . . The silence of early records on this subject . . . may be accounted for by supposing that bricks continued to be made in the Roman fashion, and passed by the name of tiles."—Turner's "Domestic Architecture," p. xxvi. (Oxford, 1851).

Your correspondent, Mr. Bedo, quotes an inquiry, at Faversham, temp. Hen. III. It is open to question what these bricks were, and I suppose, it would be called "ancient" in Mr. Turner's sense. His date, 1216-1273, covers the alleged date of Little Wenham Hall, Suffolk, to which he also refers; but unfortunately other authorities state that this mansion was built in 1569. There are dates of erections at different epochs; it is a matter of great interest to ascertain to which era the "bricks" really belong.

My view of the matter is, that the art of tile-making, as introduced by the Romans, was never quite lost in England; that brickwork, in its modern sense, "to imbricate," first arose from the custom of giving houses a facing of *tile*, pendant along the front wall to keep out the weather; and that, subsequently, baked bricks, called *baksteen*, *i.e.*, baked stone, were introduced from Flanders.

We have "Tylers" in plenty, but no patronym in brick. Lydgate, circa 1460, uses both:—

"—made of tyles hard of bake
Fro touch of fire to save the Scripture."

"Eke in pillars of bricks full hard y-bake
Which were up set, long, large, and huge."

It might appear that both words are used in the same sense, but that the first quotation has reference to a tiled fireplace, and we know that moulded bricks were used before 1460.

A. HALL.

IMPROVEMENTS IN SALT MAKING.

Two years ago a visitor to the Salt Works of Messrs. Hamer & Davies, at Winoham, near Northwich, noticed what appeared to be some decided improvement in the salt-boiling and evaporating process. Letters patent had been taken out for the machinery invented, to effect the work which has usually to be done by hand labour under peculiarly disadvantageous circumstances, from the heat and steam in which the salt-boilers had to be enveloped during the process of "drawing the pans." The firm have had three pans at work on the improved principle since, and the members of the trade have been allowed ample opportunity of inspecting the process.

During the period which has since elapsed other improvements have been added at the works. The salt on being taken from the pans, instead of being put into carts and taken into the store by men, is now put on to a travelling carriage or elevator, and carried up into the roof of the storehouse, where it is tipped so as to fill the store on all sides equally, by which the salt is kept cleaner and in better condition from not having to be handled until loaded into boats or railway trucks. A further improvement has now been effected at these works in the manufacture of salt of any description. The first have obtained a patent for supplying the evaporating pans with heated brine, instead of allowing it to flow into the pans in its natural cold state. The advantages of this improvement are that it enables the firemen to keep the pans at a more equable temperature with less labour, and consequently with less damage to the pans and furnaces. This contrivance is ingeniously carried out by throwing the exhaust steam from the engine or from the steam boiler into a large tube, this tube having a second one through its centre, which contains the brine on its passage to the evaporating pans, thereby heating the brine, and at the same time condensing the steam. This condensed steam then becomes very hot water, which is used to feed the steam-engine boiler, and thus a very small quantity of fresh water is needed for the boiler, and considerable less mud and scale is generated, an important desideratum where the water supply is very impure. These improvements appear to be working satisfactorily.

The point which suggests itself as most important is the desirability of devising means for saving the men, and, in some cases, women, from the degrading occupation to which they are subjected in salt-boiling.

THE INSTITUTION OF CIVIL ENGINEERS.

THE Report at the last annual general meeting stated that, in the past session, an address had been presented by a numerous body of members and associates, recommending that the number of the council should be increased from seventeen to twenty, the maximum permitted by the charter; that two of such additional councillors should be from the class of members and one from the class of associates, and that each and every year two of the members and two of the associates of council should become ineligible for re-election until after the expiration of one year. The result of the deliberations of the council on this proposal was in effect, that the suggested increase in the number of their body was neither necessary nor desirable for efficient administration, and that the compulsory retirement every year of the two senior members, for that must have been the ultimate result of the measure as proposed, would, in their opinion, be prejudicial and disadvantageous to the interests of the Institution. A requisition having been made for a special meeting of members only, to consider the question, such meeting was accordingly convened, and certain modifications finally were adopted.

Owing to the increasing number of applications for admission into the Institution, and for transfer from the class of associate to that of member, the council had had under consideration the rules and regulations respecting the qualifications of candidates. These seemed to be amply sufficient, if strictly adhered to, to insure the election only of those whose avocations and antecedents were such as to render them worthy of the privilege. It had, however, been pointed out that in every case the statement of qualifications must embrace a full and consecutive narrative of the career of the candidate, and that the proposer and secondors must have a personal knowledge of the details of the qualifications upon which the application was based. During the past session 11 associates had been transferred to the class of members. The elections had comprised 26 members and 102 associates, together 128, while the deductions due to deaths, resignations, and erasures amounted to 45, leaving an effective increase of 83, being at the rate of 5 per cent. in the twelve months. There had been 50 admissions to the class of students attached to the Institution, and 20 had been removed from the list from various causes, so that the net increase was 30 or 17 per cent. There were on the books on the 30th of November last 14 honorary members, 724 members, 1,048 associates, and 203 students, together 1,989, as against 945 ten years ago.

ACCIDENTS.

Arundel.—A young man has been killed by a fall from a scaffold at the new Roman Catholic church now in course of erection here. The deceased was a labourer. About half a dozen men had just fixed a large stone on the top of the building, about 60 ft. from the ground, and the deceased went down on his hands and knees on the upper scaffold to jump down on to a lower scaffold which is five boards wide, each board being 9 in. wide. The deceased got down backwards, and on reaching the lower scaffold he fell backwards from the scaffold to the ground. He was quite senseless, and died in about ten minutes. The deceased had been spoken to by Mr. Addis, the foreman, and re-proved for his recklessness. A verdict of accidental death was returned by the coroner's jury.

Newcastle-upon-Tyne.—At Danston, on the south side of the River Tyne, a new engine-factory has been blown to the ground by a hurricane; the walls were only two bricks in thickness. The workmen received timely warning by the swaying of the walls, and ran out of the way; but Mr. Archer, senior, a proprietor of the factory, and a boy were buried in the ruins. They were extricated after considerable difficulty. Mr. Archer was in an unconscious state, and very seriously injured about the feet and head. He, however, is expected to recover. In Newcastle and Gateshead considerable damage has been done to property by the gale.

BRADFORD COVERED MARKET.

THE works for the covered market which is now being built were let in December, 1869, for 12,500*l.*; but this structure is only a part of the Kirkgate market scheme, as it only extends from Kirkgate to the first opening in Darley-street; whereas the complete scheme provides for its being carried forward to Godwin-street above. Messrs. Lockwood & Mawson are the architects, their plans having obtained the first prize offered by the Corporation for market designs. The building is in the Italian style of architecture, the principal ornamentation being at the Kirkgate front, where is the main entrance to the building. The interior is arranged on the pavilion principle, and there are four avenues. It is 45 ft. high, the roof being supported by light iron columns and arches, and so arranged that the northern light is principally admitted. There is ample provision for ventilation, and keeping the place cool during hot weather. Altogether the market will cost 20,000*l.*, exclusive of internal fittings; but as yet the Corporation have not entered into contracts for the erection of the second portion. When the scheme is completed there will be thirty exterior shops, eleven in Godwin-street, eleven in Darley-street, and eight in Kirkgate. Ten of these shops are now in course of erection, and they will form the finishing of the Kirkgate front of the market. The contracts for building these shops were let in June last for the sum of 7,950*l.*; and it is

expected they will yield an aggregate rental of 1,400*l.* or 1,500*l.* a year.

The covered market, according to the original terms of the contract, was to have been finished in March of the present year; but difficulties as to the delivery of the ironwork, and some other unforeseen circumstances, caused considerable delay with the work. During the past few months, however, the progress has been more rapid, and workmen are now engaged in fixing the roof. This portion of the market stands upon the ground previously occupied by the Manor Hall and the ground immediately adjoining. The site has the disadvantage of a steep gradient, necessitating the ascent of a considerable number of steps from Kirkgate entrance (thirty, it is said), and a like number will have to be descended from Godwin-street when that part of the building is erected. Some carved work has been executed on the front of the Kirkgate entrance, including two figures representing the "Goddess of Plenty" and the "Goddess of Flowers."

In connexion with the market,—forming, in fact, a portion of the exterior buildings of the covered market,—another block of buildings is approaching completion in Godwin-street. It is three stories in height, and has lofty attics. The block begins with the line of the street opposite the "Butter Cross," and extends to the line of James-street. The central portion of the building is intended as a market tavern. The roofing of the building has just been completed, and it is expected the whole of these premises will be ready for occupancy by March next. The works for the erection of this block were let about fourteen months ago for the sum of 4,400*l.*; and are expected to yield to the Corporation a yearly income of 600*l.* or 700*l.*

AS TO TOWN HALLS.

SIR,—Our city being at this moment without a public hall suited to its requirements, a meeting was held a short time since to consider the advisability of erecting one. A committee was appointed to take the initiatory steps, to which I have the honour to act as secretary. My object in trespassing upon your courtesy is to ask if any of your readers, among whom are doubtless many who have had experience in similar buildings, can and will kindly give me a leading hint or two as to the approximate cost and construction of a building capable of seating 1,500 to 2,000 people, and easily convertible into a concert-room, theatre, ball-room, sale-room, &c.; or probably some one might be able to inform me where there is a building of this character which one or more of our committees could inspect. Should you be able to afford space for my request, I shall be most grateful.

Curtille.

CHARLES WYNN.

LETTER-BOXES AND BUILDERS.

SIR,—Will you kindly give space for these few remarks in answer to the letter-box question in your last number? With all deference to the Postmaster-General, I am bound to say that he has never been a builder, or he would be more considerate for them. A builder is now required to almost furnish a house for a tenant: he is bound to put cupboards or presses in nearly every room in the house, to put up a window with curtains, to fix sideboards, fit up the house with gas, find a place for a bed, and many other items to spare furniture: so that in reality a tenant has nothing whatever to give him an interest to stay in the house any longer than he has made it dirty and uninhabitable,—then he prefers a new house. This letter-box question is a matter of interest between the tenant and Postmaster-General, and has nothing whatever to do with the landlord.

W. E.

LEEDS BRIDGE IMPROVEMENT: ARBITRATION CASE.

AN arbitration on property belonging to Mr. William Enaley, agreed to be purchased by the Corporation, to enable them to carry out the improvement in connexion with the Leeds new bridge, has been gone into at the town-hall. Mr. Richard Gouthwaite, of Lumby, was the arbitrator. The property consists of shops at the south-east side of Leeds Bridge, and some warehouses being, &c.

Mr. Shaw, in opening the case for the claimant, said that the Corporation had agreed that the compensation should include not only the value of the property, but also Mr. Enaley's interest in the bed of the River Aire, and damages for a trespass by the contractor for the bridge.

Mr. Thomas Newsum, of Leeds, land surveyor, stated that the property was in a most excellent situation, and on the traffic side of the bridge. The land on which the buildings were erected was worth 10*l.* 10*s.* per yard. The property which was occupied produced a rental of 316*l.* 10*s.*, and the unoccupied portion was worth 100*l.* per annum. He thought that the estate was let at a very low rental. The front portion of the property was worth twenty-four years' purchase, and the back part twenty years' purchase. That would amount to 9,156*l.*; to this, in an ordinary case, would have to be added 10 per cent. for compulsory purchase, but he was of opinion this was a case where 20 per cent. ought to be given, considering the advantages the Corporation would obtain in the erection of the new bridge by the purchase of this property; that would make a total of 10,987*l.* 4*s.*, exclusive of the damages to be awarded for trespass.

Mr. George Corson, of Leeds, architect, valued the land at 10*l.* per yard, or 5,330*l.*; the buildings were worth 3,818*l.* 15*s.*, making a total of 9,948*l.* 15*s.*, which, with 20 per cent. for compulsory sale, would make 10,958*l.* 17*s.* 7*d.*

Mr. Thomas Whitley, of Leeds, builder, agreed with the evidence of Mr. Corson.

For the Corporation.—Mr. Thomas Fenwick, of Leeds, surveyor, said he had valued the estate and considered that the fair rental of the property, occupied and unoccupied, was 340*l.*, from this he would deduct 30*l.* 15*s.* for repairs and painting, making a net annual rent of 309*l.* 15*s.* Part of the property was "rented yearly," and the remaining eighteen years' purchase. The total value was 6,791*l.*, to which he would add 10 per cent., or 679*l.* for compulsory taking, which would make a total of 6,370*l.* His own opinion that 5*s.* per yard was a fair value for the land.

Mr. Christopher Dresser, of Leeds, architect; Mr. Perkins, of Leeds, architect; and other witnesses, gave similar evidence.

The arbitrator reserved his decision.

CAMBERWELL VESTRY HALL COMPETITION.

Sir,—A letter, signed "Another Competitor," appeared in your last week's issue, in which was a statement that, "according to the *South London Press*, six out of the eight selected designs could not be placed on the list." As our case was one of the designs in which this supposed defect was discovered by the critic of the local paper mentioned, we shall be glad if you will allow us to state that the editor of the *South London Press* has since been good enough to correct the error into which he had fallen, and inserted in his paper, dated the 23rd inst., an article admitting that, upon the point mentioned, we had been unfairly criticised.

THE AUTHORS OF DESIGN MARKED "THOROUGH."

THE ORDNANCE SURVEY AND THE BRITISH MUSEUM.

Sir,—It appears, from the *Saturday Review*, December 18, 1871, that, according to the statement of Mr. Stanford, the publisher of these maps, the complete map of England and Wales, one inch to a mile, is now published, with the text of the engraving in 110 divisions. It appears, also, from this statement, that, besides the "Ordnance Plan of London," on the scale of 5 feet to a mile,—there is a "New Ordnance Plan of London," and its environs, on the scale of 25 3/4 in. to a mile.

Various parish estate maps have been published, of Scotch and Irish parishes, as well as those of twenty-five in Hampshire, Kent, and Surrey, and 6 in county maps of Hampshire, Kent, and Middlesex. Under the Copyright Act, I believe that the publisher is now compelled, under a penalty, to send a copy of all maps published by the British Museum Library within a certain time after publication; but many of the above-mentioned maps are not yet indexed, nor are those of Jerusalem, and other cities and towns in England and Wales, already published.

C. S. COOKE.

"CLOSETS."

Sir,—I fully endorse all that is said by Mr. Safford in respect of the pan-closet, which is, I have after a good deal of experience come to consider, a great mistake; for why should we seek to retain a nuisance, only covered by a trap which is so very liable to be disturbed, and so that no trap at all!

It is, however, proverbially easy to find fault; perhaps hardly so to provide a remedy. I, however, suggest that which I found, in building my own house, to fully answer the purpose, viz.—Let the lower end of the soil-pipe, when it joins the town drain, pass through a common syphon-trap; continue this pipe (mine was of stoneware, and was covered over with a wooden cover) to the top of the nearest stack of chimneys, when the orifice must be covered by a grating to keep out the birds; then a simple closet (I mean only the earthenware pan and its connection with this pipe) is all that is required; with also an arrangement for the supply of water; but a little water will then clear the trap, and it is only necessary to use so much water as it takes to clear it.

In building my house I used the pan-closet, and in due course experienced the defects of it; it is only some months since that the idea of substituting the simple earthenware pan and trap occurred to me, and it is I think right; for we certainly do not need the "container" to store up that which would be far better away.

J. J. FRANKS, C.E.

ARCHITECTS AND EMPLOYERS.

Sir,—We are in the middle of a little trouble, and cannot exactly see how to get out of it. As we have been to more than one solicitor, and they tell us they cannot explain the law upon the point, as it is a very unusual one, perhaps you will kindly tell us, in your opinion, what ought to be done, and no doubt your reply will satisfy all parties concerned.

A gentleman, whom we will call Brown, is building a house; he employs an architect, whom we will call Jones, who advertises the job for public competition. Jones, sen. (who is Jones, the architect's father), succeeds in getting the job, and during the progress there were so many alterations made, that by this time no one can tell which are extras and which are not. The money was to be paid in draws, which were not made, whether that once in eleven weeks. These were made upon certificate from the architect. Brown now thinks he has paid cash enough, and refuses to pay the last three amounts certified by the architect, he being the builder's son. Brown thinks he is favouring the builder too much. Now, we want to know if Brown has any right to refuse to pay these certificates when presented, and if so, if there cannot be a writ issued against him at once for the whole of the amount declared due by these certificates, as we presume if an architect certifies for more than a job is worth, he, and only he, is an architect, he being the employer. I may here say, that after the conditions and specification were signed, showing the builder and architect being father and son, the architect's employer thought he would have an agreement, and appoint a referee for himself and one for the builder, who, if they could not agree, were to call in an umpire, whose decision should be binding; but two days before the agreement was signed by Brown and the builder, the architect writes to Brown, and says he cannot recognise such agreement at all, as it would divert him of all power

as the architect; nevertheless, Brown and the builder sign this agreement as to referees, &c.

The job is now nearly completed, and, as Brown refuses to part with any more money upon certificate, they all have a meeting, and the two referees appoint a builder as umpire, and order him to measure the work, and send if there has been too much money paid or not. To this the architect objects, and says no one has any business to measure, or do anything until the job is completed, and his final certificate given, and refuses to give up the plans for that purpose.

The builder's creditors are pushing him on all sides, and in case he gets into difficulties, will not Brown be answerable for any damage or expenses the builder may sustain through refusing to pay these said architect's certificates, the amount which is now owing upon them being 800*l.*, and the job up to this time has cost over 3,000*l.*

If you can give a reply to this in your next issue, it would very greatly oblige all parties concerned, I know, and I think will be considered conclusive, and your opinion abided by, and thus save the matter drifting into the Law Courts.

C. A. B.

Notwithstanding our correspondent's belief, we feel sure our opinion, if it were given without further information, would not satisfy all parties, nor would they be wise to bind themselves to it. The architect under ordinary circumstances is the employer's agent, and can bind him. But in this case the employer, by the second agreement, takes the matter, to say in other words, of binding himself and the exact bearing and weight of the two documents would have to be considered together. The moral of the story is, that an architect should avoid employing himself to do the work of him, if he decides to retain his employer's entire confidence. However honourable he may be, the fear that he is "running with the hare and hunting with the hounds" is pretty sure to arise.

SCHOOLS OF ART AND OF SCIENCE.

Manchester School of Art.—The annual meeting and distribution of prizes, in connexion with this society, were held in the Royal Institution, Moyle-street. Mr. Tom Taylor distributed the prizes. In course of his address he said,—

"What I wish to insist upon here to-night is, that they were not mistaken who originally insisted on the importance of teaching the young men of this country to get into living and fruitful contact with industry in this country. At least, if they were mistaken, I think it must have been in expecting too speedy a recognition of great truths, and too rapid a reduction of them to action. They did not over-estimate the value of the crop for which they were sowing the seed, though they may have looked for the harvest too soon. Or were they really mistaken as to the quality of the soil? In England really ground in which art will not grow, except as an exotic? Shall we acquiesce in that conclusion, which a few have maintained, and which many, I fear, secretly hold, as a more or less complete conviction? I, for one, do not believe it."

The financial statement showed that for the year the receipts amounted to 600*l.* 10*s.* 2*d.*, and the payments to 991*l.* 13*s.* 7*d.*, which left a balance now owing of 139*l.* 0*d.*, including a deficit last year of 10*l.*

Newcastle School of Science and Art.—The annual meeting of this institution was held in the Town-hall. There was a large and influential attendance. The chair was taken by the Rev. J. S. Broad. The report of the head master (Mr. J. P. Bacon) said,—"The school has continued to progress. The attendance has been greater, and the results, as shown by the number of prizes awarded, are in excess of last year. I take this opportunity of remarking, that should the interest which is now manifested in the school increase,—and I see no reason why it should not,—at no very distant day more accommodation will be required for our classes than we at present possess." The report of the teachers of the science classes (Messrs. Ainsworth and Brade) stated that, "in November, 1870, a class for the study of chemistry was opened at the laboratory of the sugar refinery, Newcastle, and attended by fourteen students. At the examination held in May last, all who sat were successful." The statement of accounts showed that the receipts had been 97*l.* 2*s.* 4*d.*, and that the balance now in hand was 10*s.* 7*d.*

BUILDERS' DIFFERENCES.

ANOTHER list of tenders, which appeared in your journal of Saturday last, induces me, as one of the public, to ask for some explanation of a difficulty, which, I confess, to my unenlightened understanding, seems by no means easy to solve.

I allude to the extraordinary differences in amount between the higher and lower tenders for building works, even in cases where the plans and specifications have been carefully prepared, and the quantities supplied at the expense of the employer.

In the case of the Challey New Union, I observe that the highest tender is 17,139*l.*, while the lowest is 9,251*l.*,—a difference of no less than 7,214*l.*, or about seven-nineteenths of the higher figures.

Nor is this at all a singular or extreme instance. In former publications of your journal I have frequently observed still more glaring

inequalities of prices; and I remember some months ago being much struck by some forcible observations which were made in your columns upon this subject.

Notwithstanding these observations, however, and letters which have also appeared from time to time in your columns of such a nature as to invite at least some explanation from the building community, I am not aware that the faintest attempt has been made by any member of the trade to reconcile or explain what naturally appears to the unenlightened public a very startling anomaly.

One would have supposed that the prices of labour and materials were, in these days, as well known and regulated as the price of provisions, and that it would be almost as imprudent and dangerous for a builder as for a butcher or baker, to charge a profit of 70, 80, or even 100 per cent. beyond his fellows in the same trade; and yet, if the tenders to which I have alluded are, as they profess to be, genuine quotations of prices for works to be executed,—if 6,000*l.* be a fair price for one man, and leaves him a fair or even any profit, what profit must another man look for, who demands 10,000*l.* for the self-same amount of work?

I hope I may be forgiven for inviting attention to this subject, inasmuch as it is to me, as to many others of the public, a matter of very serious interest. I have paid many thousands of pounds to various builders, and I probably shall have to pay many thousands more; and I must candidly confess, that, in making my choice of the best men to employ, I should (prudent and naturally, as it seems to me) avoid dealing with builders whose prices and profits appear to exceed so enormously the prices and profits of the others in the same way of business.

I trust this letter may really elicit some reasonable explanation of my difficulty.

A LANDOWNER.

CHURCH-BUILDING NEWS.

Bristol.—St. Clement's Church, which has undergone extensive repairs and additions, has been re-opened for divine worship. The work of church renovation has been going on for two years. The south wall having been found in a dangerous condition, it was pulled down; an arched similar to that on the north side has been erected, and a new south aisle added. The north aisle has been re-roofed to correspond with the south one, and the windows of the clerestory over both have been enlarged and filled with stained glass. A carved reredos and pulpit, of Bath stone, have also been provided. The lighting of the church has been improved by the provision of four coronas hanging from the ceiling of the chancel and the nave, the roof of both having been re-covered with stained and varnished boards. The tower has been raised 30 ft., the total height contemplated when funds are forthcoming being 90 ft. Mr. Lloyd has been the architect, and Mr. J. W. King, of Clifton, the builder. The total cost has been 1,800*l.*, and 400*l.* of this amount remain to be raised.

Overton, North Wales.—The ancient church of Overton was recently re-opened by the Bishop of St. Asaph, after having undergone a restoration. The nave and aisles have been re-roofed. The walls and pillars have been cleared of whitewash, bringing to use the red sandstone of which they are constructed. The architects suspected (finding there was no base to the pillars) that the original floor existed beneath, and on examination found it to be so, and thus brought the bases to light, which naturally improved the proportions of the interior. In addition a clerestory has been raised over the nave, and an entirely new roof has also been constructed of hammer-beam construction, and the bays between principals boarded in a vaulted form. The church has been re-seated with low, open benches, having sloping seats and leaning backs, and attention has been paid to comfort and accommodation for kneeling. The organ, with seats for the choir, has been removed from the west to the east end of the north aisle, to a small chamber constructed for the purpose. The music, as well as the voice of the preacher, has been aided, it is said, by the new roofs being boarded. Externally, the pinnacles and parapet of the north aisle have been removed. The roof, finished with plain eaves and buttresses, completed with a temple eoped water-table, and the projection of the organ-chamber beyond the transept, gives it a distinctive form it did not

before possess. These works, as well as the alterations to the chancel carried out a year or two ago, have been completed under the charge of Messrs. W. M. Toulon & Cronk, architects, London and Sevenoaks, by Mr. John Edge, builder.

Wath-upon-Dearne.—The work of interior restoration of All Saints' Church, Wath-upon-Dearne, has now been completed by the erection at the east end of the chancel of a carved stone reredos. The reredos extends across the eastern wall, the central portion being slightly raised, and surmounted by a carved cornice, between canopied buttresses, while the side portions form a tracered wall arcade. Under the window, in a canopied and crooketed niche, over the communion-table, is represented in relief the Gospel incident recorded by St. Luke, the Supper of our Lord with the two Disciples at Emmaus. The design was by Mr. Charles Hadfield, of the firm of M. E. Hadfield & Son, and the style is that which prevailed at the beginning of the sixteenth century, the late Perpendicular or Tudor period. It has been designed so as to harmonise with the rest of the chancel fittings, and with the stained window below which it stands. The material is Caen stone, and the carving was done by Mr. Earp, of London, from the architect's designs.

DISSENTING CHURCH BUILDING NEWS.

Gorton.—The Brookfield (Unitarian) Church at Gorton has been opened. The church is erected in place of the old chapel, which will shortly be taken down. It fronts the Hyde-road, on a site adjoining the present schools and burial-ground; the grounds (which are now being laid out and planted) are enclosed by a stone wall, with iron railing and gates towards the road, at the end of which is a keeper's house, and on the other sides with walls of a plainer character. The main entrance to the church is through the tower, on the north side, the lower part forming the porch. Above is a ringing-chamber and belfry, containing a peal of eight bells (by Messrs. Mears & Stainbank, of London). The tower is of more ornamental and elaborate character than was at one time intended, and is finished with a spire, which rises to a height of 150 ft. from the ground. At the angles are carved the emblems of the four Evangelists, "The Angel, Lion, Bull, and Eagle." The building is Geometric Decorated. It is faced with stone on the outside, having ashlar dressings of Darleydale stone; and the spire is wholly built of the same description of stone. The church consists of a nave, 77 ft. long, 21 ft. wide; north and south aisles, each 70½ ft. long, 10½ ft. wide, making a total width of 42 ft. inside; chancel, 25 ft. long, 19 ft. wide, the communion being raised above the floor of the nave by three steps; organ-chamber on the north side of the chancel, and vestry on the south side. There is also a porch on the south side, near to the schools, and convenient for the use of the teachers and scholars. The church contains sittings for 264 adults, 162 children, and 24 singers in the choir; in all, 450 persons. Internally there are polished red granite columns between the nave and the aisles (which divide the length into six bays), and to the shafts of the chancel arch; the arches being all of stone. The chancel floor is laid with encaustic tiles. The roofs are of pitch pine, with the timbers exposed to view, and the internal woodwork generally, including the seats in the nave and aisles, is also of pitch pine, stained and varnished; but the choir stalls and wood fittings in and adjoining to the chancel are of oak. All the windows are filled with stained glass, in geometrical patterns, by Messrs. Lavers, Barrand, & Westlake, of London; and the east window in the chancel, containing four lights, is of a more elaborate design, having in each light a device formed by the palm, lily, rose, and vine, with suitable texts, the lower part being of grisaille work, and "The Lamb" in octafold above. The church will be lighted by six brass cornices, suspended from the nave roof, and a larger one in the chancel, with two brass standards (one on each side of the communion-table). These are all the work of Messrs. Thomason & Co., as is the metal work generally. A large organ has been built by Mr. Jardine, of Manchester. The church is heated by Messrs. Haden & Son, on the hot-air system. The building has been erected by the general contractors, Messrs. Clay & Sons, of Audenshaw. Mr. Thomas Worthington, of Manchester, was the architect, under whose direction the whole of the work has been carried out. The

cost of the church (exclusive of the keeper's house, boundary walling, and some other outside work), will be defrayed by Mr. Richard Peacock, of Gorton.

SCHOOL-BUILDING-NEWS.

Cambridge.—St. Matthew's School-room for the poor and populous ecclesiastical division of Barnwell, designated the St. Matthew's district, has been opened. The situation of the building is in Norfolk-street. It stands on a slight eminence immediately at the back of the cemetery. The building, which partakes of the Gothic style of architecture, is of white brick, with slated roof, and is devoid of any great amount of ornamentation. The dimensions of the main room are 70 ft. by 30 ft., with an elevation of 14 ft. to the eaves, and 27 ft. to the ridge, thus giving a roof of 13 ft. The interior of the roof is covered with match-boarding, which, with the seven cross-beams, of Memel timber, are simply varnished. At each end of the school-room is a triplet window, and four pairs of lights facing Norfolk-street. The floor is boarded, and at one end there is a raised platform (20 ft. by 7 ft.) clear of the entrance. The whole building is warmed by hot-air flues, laid flush in the floor, and covered with iron grating. A class-room (14 ft. by 20 ft.), is to be erected on the south side of the school-room, with which there will be internal communication. The builder was Mr. John Dixon, organist of St. Matthew's Church. The cost of the building is 400l.; that of the ground, 144l.

New Malden.—The boys' new National School at Malden, has been formally opened. School accommodation has been provided for 327 children. A portion of buildings has been occupied for some time past as a mixed school for 207 girls and infants, but now another room has been built for 120 boys. The architect was Mr. Freshwater, of Malden; and the builders were Messrs. Spearing & Stewart, Sarbiton.

Kingston.—The temporary national schools, in connexion with St. Paul's, Norbiton, are about to give place to larger and more substantial buildings, the first stone of which has been laid by the Bishop of Winchester. The plans, which have been prepared by Mr. C. L. Luck, architect, Surbiton, show accommodation for 140 boys, 123 girls, and 156 infants. Each school will have a separate class-room. The buildings, which are to be erected in the Borough-road, will be constructed with red bricks, with tiled roof. The total cost is estimated at 1,700l. The builders are Messrs. Todd & Saunders, Kingston Hill.

Urmston.—The foundation-stone of new schools, in connexion with the Bridgewater-street circuit of the Wesleyan Methodist body, situated in Urmston-lane, Urmston, Stretford, has been laid. When finished, the schools will accommodate 250 children, in classes; and when used as a chapel, as it will be until the requirements of the village demand greater accommodation, it will seat more than 300 adults. There is one room, 53 ft. by 30 ft., internally, and three class-rooms, the largest of which is 18 ft. by 15 ft. The style of architecture will be a simple and early type of Gothic. One of the principal features in the building will be a bell-tower, 60 ft. high. The cost of the structure is expected to be about 1,750l. The architects are Messrs. Fuller & Cusitt, of London; and the builder is Mr. Mark Foggett, Cheetham.

PROVINCIAL NEWS.

Torquay.—A building of considerable architectural pretensions has just been erected on the site of a house recently taken down upon the Strand. The building is erected almost entirely of warm-tinted Hamhill stone, the springers and alternate stones of the window arches being of worked limestones. The style of architecture is what has been called Victorian, being of a freely treated classical type, and supposed to be well adapted for street architecture as well as for domestic purposes. The whole of the works have been executed with rapidity. The shop front is of bronze, and, with the revolving shutters, has been made and put up by Messrs. Bunnett & Company, of London. The bronze sashes are surmounted by ornamental capitals, with spandrels in the same materials. The columns to the mullions of the first-floor windows are of red Dartmoor granite, which is like Aberdeen granite. The capitals and keystones on each story are carved, and the pilasters to the upper windows are further enriched by the

introduction of carved festoons of flowers. Under these windows, again, is a series of colossal busts, in circular panels. The two central ones are female heads, emblematic of "Peace" and "Plenty." The others display a variety of subjects. A helmeted bust dedicated to "War," resembles Bismarck. An old bearded and thoughtful head is entitled "Science." Mr. J. Watson, of Torquay, was the architect of the building, and Mr. Peter Blampy, of Torquay, the contractor. The cost is something like 2,000l. The sculpture and the other stone carving are from the chisel of Mr. Harry Hems, of Exeter.

FROM SCOTLAND.

Rosslyn.—An improvement has been carried out by the County Road Trust in the formation of an iron bridge over the North Esk, which has just been completed by Messrs. Gibson & Tate, Bainfield Ironworks, Edinburgh. It is of malleable iron, and is made to carry heavy traffic. It has been erected under the immediate personal superintendence of Mr. Gibson. The bridge is constructed on the lattice-girder principle, and measures 123 ft. long, in two spans of 64 ft. each, by 16 ft. wide, supported in the centre on one stone pier. The lattice-girders stand 6 ft. high at the highest part, and consist of two heavy T beams, bound together by lattice-work. The table of the lower T beam of the two lattice-girders forms the rest for the transverse beams, which consist of malleable iron I-girders, on which the flooring—of creosoted red wood planks—is laid, with a skiffing 12 in. deep, and topped with a layer of Mitchell's concrete. The work has been executed after the design and drawings of Mr. E. Elmslie Sang, C.E., Edinburgh.

Dalkeith.—While three men were engaged in taking down a wall in White's-close, it gave way at the foundation, and, falling upon the men, completely buried two of them. The wall was part of an old building which Mr. Ritchie, builder, Bonnyrigg, was employed to remove for the purpose of making way for the erection of a new house. The wall was 11 ft. high, upwards of 30 ft. long, and from 1½ ft. to 2 ft. thick. At first they commenced to take the wall down bit by bit, but finding this a difficult task, they resolved to undermine the ground on the one side near the foundation, and try by this means to at once bring the fabric to the ground. It was while they were proceeding with the undermining operations that the whole stretch of masonry fell. The work of extricating the two sufferers from the rubbish was speedily effected. Neither of them, though they had sustained serious bruises, had bones broken.

Dundee.—A gable, 50 ft. high and 20 ft. wide, above the side wall of a new house building in Dundee, was blown down lately by a violent gale. The falling wall knocked down an adjoining house, in which two families lived. The occupants of one house left before the accident, and so escaped; but the other family, consisting of five persons, were overtaken by the falling stones. Two were killed in bed; the others were only a little injured.

STAINED GLASS.

Chesterfield Church.—Mr. Constable has been commissioned to execute in stained glass the west window of this church, as a memorial of the late Rev. Alexander Poole, B.A., the first incumbent of the church. His design was selected from several others in competition.

Lismahagow Church (Scotland).—A large work in stained glass, executed by Messrs. Ballantine & Son, of Edinburgh, has been fitted up in their saloon, George-street, on view previously to its removal to Lismahagow parish church. There are three upright compartments, with a semi-circular space above stretching over the entire width of the three lights, forming together a window of the Italian classic style. The illustrations are all taken from the works of eminent masters in sacred art. The central compartment contains the Descent from the Cross, adapted from the celebrated picture by Rubens in Antwerp Cathedral. The figures are nearly life size. In the compartments on either side are figures of Moses and St. Paul, the former adapted from Michelangelo, and the latter from Raffaele. In the large arch inclosing the upper part of the window is the Ascension, by Raffaele. The donor of the window was Mr. J. B. Greenshields, of Kerec.

PATENTS CONNECTED WITH BUILDING.

IRRIGATION CONDUITS.—*H. Doulton*. Dated 1st December, 1870.—The bottom or invert of the conduit or channel is formed of an earthenware trough obtained by dividing a socket or butt pipe into two equal parts longitudinally. The division is partly made before the pipe is burned, by preference, by knives or sharp edges attached to the dies, and the separation into two troughs is afterwards completed. The upper parts of the conduit or channel are formed of angular tiles made with longitudinal passages through them to lighten them and to cause them to burn better. These angular tiles also are first made as pipes which are partly divided before burning, and the separation is completed afterwards. One face of each angular tile forms the coping, and the other the side or wall of the conduit or channel. The invert and sides may be laid on concrete, or, where the soil admits, they may simply be laid in a suitable trench with supporting bricks on either side to sustain the coping.

WALLS.—*G. Marshall*. Dated 24th March, 1871.—The novelty of this invention consists in building walls 9 in. in, with considerably less material than is now used in ordinary 9-in. walls. These walls have also the advantage of being hollow, thus rendering the buildings free from damp. The extra length in the brick and the square section are also features of novelty.

WINDOWS FOR MANUFACTORIES.—*T. G. Webb*. Dated 28th March, 1871.—This invention relates to making windows of pressed blocks of glass fitted with "butt" joints.

WATER-CLOSET CISTERNS.—*T. Hall*. Dated 29th March, 1871.—The inventor constructs cisterns without valves, and instead he divides the cistern by a water-tight partition, not quite the full depth of the cistern, and on the top edge of this partition he hinges a trough or dish. This trough is arranged to lie in a horizontal position over one of the compartments which is provided with an ordinary ball tap for supplying the cistern with water in the usual manner, and a small hole is made in the bottom of the trough, so that water will pass through the said hole and rise in the trough in the same level as the water in the cistern. An outlet pipe is provided in the other compartment of the cistern to which the pipe to conduct water to a closet is to be connected. A lever and wire or cord is attached to the trough or dish, and when a discharge of the water is required to the closet by actuating the communicating wire or cord, either directly by hand, or by arrangement with closet-seat, or by a lever and handle as heretofore, the trough will be tilted or tipped, and the water therein thrown over into the discharge compartment, from whence it will pass to the closet, and the trough by its own gravity will rectify itself and become refilled ready for the next occasion required.

HEATING APARTMENTS.—*T. E. Clarke*. Dated 29th March, 1871.—The object of this invention is to increase the heating surface of open and closed fireplaces, and thereby to utilise a larger percentage of the heat given off by the burning fuel than is at present obtained from open and closed fireplaces used in the heating of apartments.

COOKING RANGES.—*H. E. Mines*. Dated 29th April, 1871.—The invention consists in carrying off the smoke and products of combustion from close ranges by a flue or flues separate from the chimney or passage through which the effluvia from the cooking escapes, so that the latter passage can always remain open without interfering with the draught of the fire.

LOCKS AND LATCHES.—*J. Invery*. Dated 1st May, 1871.—Construction of mortise locks or latches having tubular casings capable of being inserted in round holes, with means of increasing the stroke of the bolt. Construction of spring latches with sliding or rocking bolts acted on by the pull or push of the knobs or handles, and modification of the same for being acted on by turning the knobs or handles.

WINDOW GLASS.—*W. V. Baines*. Dated 2nd May, 1871.—This invention consists in making glass for windows in lengths, with an ornamental border or edge at or near the top side.

CONCRETE BUILDINGS.—*H. Bird*. Dated 3rd May, 1871.—According to this invention, a mould, or part thereof, is formed of slabs or plates, or ornamental or plain pieces of glass, opaque or transparent; concrete is filled into this mould, and the slabs or plates form a permanent facing to the wall. When it is desired that the concrete should not adhere to the mould, paper is interposed.

CONSTRUCTION OF WALLS, FLOORS, &c.—*E. Chadwick*. Dated 3rd June, 1871.—Walls and floors are made of tiles rebated at the edges, so as to be joined together laterally, and held by means of cross ties.

ILLUMINATING GRATINGS AND GLASSES FOR THE SAME.—*T. Hyatt*. Dated 3rd June, 1871.—This invention relates to various combinations of glass and steel, or other metal for forming illuminating roofs and gratings; also to the introduction of wire netting into the plates and glasses; also to inserting the glass directly in such gratings in a heated plastic state; also to the use of Portland or other like cement for fixing in the glasses in conjunction with putty; also to the "chilling" the glass-protecting metal knobs of illuminating gratings; also to the combination of corrugated metal and plain glass, or vice versa, for ventilating purposes, and the use of removable cup-shaped glasses on illuminating metal roofs for the same purpose; also to the construction of illuminating mosaic lights composed of glass, fitted together flush at the edges on a metal frame, and retained in place either by rebating the glass, or by the use of undercut knobs or projections at the intersecting angles in the grating.

LOCKS AND KEYS.—*H. E. Hutchins*. Dated 8th June, 1871.—According to this invention the bolt of the lock is retained in its unlocked position by a lever and spring, the former having at one end a rounded nose taking into an indent in the bolt. When the bolt is in its locked position the nose of the lever is pressed into a slot in the bolt. The other end of the lever is formed with a slot wherein works a pin on a screw catch which slides in the key-tube. The key is made in two parts, one within the other, or the key is of usual construction, and a catch attached to it, or a slit is formed in the end.

IRON SHUTTERS.—*H. R. Minns*. Dated 8th June, 1871.—The features of novelty of this invention consist in connecting the edges of the strips or laths of iron shutters together by bending or turning over the edges, so that they shall hook or lock into each other; also in so connecting together the said strips or sections of a shutter as they shall slide and lie side by side when out of use in a box formed to receive them.

MANUFACTURE OF FIRE-BRICKS, &c.—*S. J. Payne*. Dated 5th December, 1871.—A mixture of silicious sand and what is commonly called London loam with plastic clay, pipe clay, or potters' clay, flint, or flint gravel, with an addition, either in the mixture of the materials or by rubbing or dipping the made goods in any stage of their manufacture, with a powder, or into a solution, composed of caustic lime, lime, and cement. The inventor does not intend to confine himself to any definite proportions of the materials, but desires to use them in such manner and way as he shall find it suitable to make any articles required, either burnt or unburnt, wet or dry.

Books Received.

Queen Charlotte Islands: a Narrative of Discovery and Adventure in the North Pacific. By FRANCIS POOLE, C.E. Edited by JOHN W. LYNDON. London: Hurst & Blackett. 1872.

MR. POOLE, who had been engaged in prospecting and mining operations in Canada, proceeded in 1862 to Victoria, the capital of Vancouver Island, off the coast of British Columbia, where he was engaged, after a severe prospecting tour, as mining engineer to a new company, named the Queen Charlotte Mining Company, for turning to account the valuable mineral resources of the Queen Charlotte Islands, lying like Vancouver Island, off the coast of British Columbia. The speculation was not successful; the "white savages," as Mr. Poole calls them, whom he took with him to commence the work, having struck work, or mutilated, rather, in the face of hostile Indians, and in a locality where there was not a single white man in existence besides the blockheads themselves, and their employer, Mr. Poole. The Indians, of course, took advantage of this squabble among the white men; and, although some of them were both friendly and faithful, it was with difficulty that Mr. Poole wound up the scheme and retired from the contest, as it may be fitly enough called.

The author having since suffered much from a broken constitution, has been unable to prepare his careful diaries for the press, and this Mr. Lyndon, author of "Ninety-Three;

or, the Story of the French Revolution," has done for him; the result being an entertaining story of adventure and discovery connected with a British territory which has never advanced even to the title of a British colony, although it has been in our possession now for about 100 years. Yet the islands are said to form a healthy and picturesque district, rich in natural resources, and well adapted for colonization, as this volume shows. "Even the Admiralty survey is still wanting. There they lie, waste and fallow, yet marvellously productive, and awaiting nothing but Anglo-Saxon capital, enterprise, and skill, to return manifold profit to those who will embark in the venture."

VARIORUM.

THE last number for the present year of *Nouvelles Annales de la Construction* (49, Quai des Augustines, Paris) includes some notes on the reconstructions now going on in the French capital, with illustrations showing the aspect of certain blocks after the fire, and the aspect that has now been given to them.—*Il Politecnico* (7, Via Lupatella, Milano) addresses itself to engineers and architects, and will be found interesting and useful by those who desire to know what is being said and done in Italy.—The current number of the *Leisure Hour*, speaking of "Birmingham Jewellery," says:—"An article was formerly made by one man; the gold was beaten out by him to the thickness required, and hammered into the proper form; the edges were filed that they might join correctly, and it was then soldered and completed. Now, many persons are employed, and many articles of a kind produced together; the gold is rolled by steam to the proposed gauge, blanks are cut out and struck to shape on a die by the screw-press, and the several parts have then only to be put together and 'finished.' In the 'gilt toy' branch, the aim is to produce good and cheap imitations of fine and costly jewelry, and the die and the press easily effect this. A looker worth from fifteen to thirty shillings in gold can be manufactured in gilt metal for a penny; and one which some time since had a considerable run, and was made with hinges and clasp in the form of a book, with good likenesses of the Prince and Princess of Wales, was sold wholesale for about a halfpenny."—The "Household Edition" of the Works of Charles Dickens has now reached its seventh part.—"Warne's Cookery Book for the Million" gives a considerable amount of information for a penny.—Cassell's "Illustrated Almanac," *Old Merry's Monthly* (Warne), and *Little Folks*, only need naming; the last is a capital journal for children.—"London to Lancashire, with a preface by Sir Charles Trevelyan, Bell & Daldy, Covent-garden. 1872." This penny pamphlet is a reprint of recent letters, &c., relating to the existing demand for the labour of women and children in Lancashire, by which, under the auspices of Mr. Holland, of 139, Belgrave-street, Stepney, and other gentlemen, London young women, widows, and children, have already greatly benefited.

Miscellanea.

The Relation of Science to Agriculture.

At a special meeting of the Newcastle Farmers' Club a paper by Mr. J. J. Stockley, consulting engineer, Harton, was read. It was the first of a series, and related chiefly to the advance of agricultural chemistry from the time of Davy, when for the crude ideas on the application of chemical science to agriculture hitherto held was substituted true and demonstrable philosophy, opening out a field of research of some of the master-minds of the last and present generation. Then followed improved agricultural mechanism, crowned by the application of steam as the motive power; and we have now a combination of practical and theoretical skill at work in the interests of the masses, which has so rapidly expanded and altered the art of cultivation as to give rise to the hopeful expression, "Notwithstanding all that has been done, agriculture is still in its infancy." If this be true, it affords a cheering prospect to those who, looking on agriculture as a profession, see full scope for all their energies and powers of observation, coupled with a fair chance of substantial reward for every judicious and well-matured step in advance.

Interior of a Greek Church in Hungary.

The inside of the church, as is generally the case with those of the Greek persuasion, was very bare, and without the smallest division in its aisles. It was also without any seats in the middle. It was divided by two screens into three parts. The screen to the east was of iron, and much the most elaborate. It entirely concealed the altar, which, however differed little in appearance and ornament from that of a Roman Catholic Church. Between the two screens there were seats or stalls against the wall, those nearest the altar-screen projecting forwards, and being altogether distinct. One was intended for the bishop. There was also a reading-desk, and a place for the choir. With these exceptions, the floor was unoccupied, and entirely without benches or chairs. The books of the service were in the old Romain character, a curious mixture of Greek and Slavonic, nearly incomprehensible to me. This character is not much used in modern printed books, but is always found in inscriptions, and also in books of any antiquity. The portion of the church behind the altar-screen (corresponding with the choir in our churches) appeared to be used partly as a vestry and partly for the performance of some services out of sight. The various vestments were hanging up behind the screen, and there was no attempt at order or arrangement. There was a table used for registry and other purposes where writing is required. The altar was prepared for use, with candlesticks, &c., but without decoration, and the whole affair seemed as little effective as possible. None but the priests are in this part of the church, in sight of the congregation. The screen at the end opposite the altar was low and incomplete. Behind it was a miscellaneous collection of banners and other apparatus for processions and various odds and ends for church purposes. Here, also, everything was disorderly and dirty. Several pictures in frames were placed here, and these are put out on stands or easels when service is performed, for the worship of the people. They were mere faces, with a background of gilding. The walls of the central part of the building I observed to be decorated by pictures, painted in fresco, in imitation panels. These frescoes represent, with a rude attempt at perspective, some of the events of our Saviour's life, and the history of certain favourite saints. They were modern, and not worse than similar works in Roman Catholic parish churches in country villages in France and Germany.—*Instead's Short Trip in Hungary.*

Erection of a New Dispensary at Lower Norwood.—The Lambeth Guardians, acting upon the powers conferred upon them by the Metropolitan Poor Act of 1867, have just decided to erect a large dispensary at Lower Norwood for the whole of that portion of the parish of Lambeth comprised between Weston-hill on the south, Tulse-hill on the north, Rosendale-road on the east, and St. Julian's-road on the west, and which covers an area extending over several miles. We understand that the guardians have resolved that the building shall be a handsome architectural edifice, containing an ample number of apartments and offices not only for the more immediate purposes of dispensing, but also for the residences of the medical men in charge, and also for the accommodation of patients.

New Buildings in South London and Imperfect Drainage.—A subject of serious importance, in connexion with the sanitary condition of South London has just come to the knowledge of the local authorities, and which, it is said, accounts to a great extent for the lengthened continuance of typhoid and other fevers in the district. It is stated that a very large number of new buildings, even in the principal thoroughfares, are not connected with the street sewer. If this be correct, a heavy responsibility attaches to those who let houses with a knowledge of this state of things, and it behoves all persons who take new houses to look to their drains.

The Metric System.—The Lord Mayor has received at the Mansion House a deputation of gentlemen connected with the City, to present a requisition requesting him to hold a meeting at the Mansion House in favour of the adoption for public use of the metric system of weights and measures. The Lord Mayor expressed his sense of the importance of the subject to such a city as London, and granted the use of the Egyptian Hall for a meeting on Wednesday, January 17, promising to preside.

Bells for St. Peter's, Ashton.—A presentation has been made of a pair of bells to St. Peter's, Ashton, by Mr. George Hoginbottom. The bells were made by Messrs. Mears & Stainbank. The peal is to be hung by Mr. Thomas Hooper, of Woodbury, Devonshire. The flooring of the belfry has been entirely renewed for their reception with oak timber, and the beams strengthened with boiler-plates, by Mr. Crabtree, of Ashton. The large bells are cast without canons, which fasten the bell to the stock, and also without staples under the crown. These are usually left on to couple the clappers to. This makes a considerable difference in the weight of the bells, and reduces the tenor to 19½ cwt., which, if made with canons, &c., would be 20 cwt. The bells are fastened to the stocks, and the clapper staples are made of strong Low Moor wrought iron, made by Mr. John Povey, of Ashton. This is considered an improvement, and renders the bell more perfect in the solidity of its metal, as by leaving off the canons in the casting it dispenses with the difficulty of cooling an unequal thickness of metal. The gross weight of the peal is 80 cwt. 0 qr. 4 lb. The cost of the bells, exclusive of hanging, headstocks, wheels, frames, &c., is 560l., and the clappers will cost 10l. 10s. extra. The whole of the cost, with other incidental expenses, will amount to about 950l. gross, but 100l. will be allowed for the old bell.

Death of the "Manchester Peabody."—We have to announce the death of Mr. Robert Barnes, of Manchester. Mr. Barnes, who was seventy-one years of age, had been in delicate health for some time, and died rather suddenly on Monday morning at his residence, Oakley, Fallowfield. Intended originally for the English Church, Mr. Barnes early became connected with a cotton-spinning business, and succeeded, while yet in middle age, in realising a very large fortune. This to him, however, meant, more than anything else, the opportunity of alleviating human suffering. Among the various charitable enterprises with which his name is bound up is the Convalescent Home at Cheadle, towards which he paid 26,000l.; the Industrial Training Home for Outcast Children at Heaton, Mersey, towards which he laid out 14,000l.; and the House of Recovery at Mossal, towards the establishment of which he gave 5000l. During the period while he was mayor of Manchester, he erected numerous drinking-fountains over the city; and he likewise altered and added greatly to the Bridgewater-street Wesleyan Chapel there.

Telegraphing by Telegraph Cards.—The idea was recently started that a system of post-card telegrams might be adopted, which would prove a boon to the general public. A pattern card was ordered, and has been approved of. On the one side it bears an impressed shilling stamp, with printed directions,—as in the case of a post-card,—that the address of the person for whom the message is intended should be written on that side. On the other there is a space for the name and address of the sender, and fine lines ruled for four words each, which are to constitute the message of twenty words. An order for an immense number of these cards has been issued, and they are at this moment being printed, and will shortly be for sale. A card may be dropped into the nearest pillar-box, and one of the regulations in connexion with this new system will be that immediately on receipt of the message at the post-office to which it is taken it shall be "wired."

Torquay Drainage.—An address to the ratepayers of Torquay by Mr. E. Appleton has been printed and circulated. The local Board's scheme is to turn the sewage into the sea at Hophore, near Mendford, at a cost of 30,000l. (Mr. Bazalgette engineer). The author, in common with many others, is at a loss to reconcile Mr. Bazalgette's present scheme with his recommendations in 1868; hence the present address. Mr. Appleton urges the utilisation of the sewage by irrigation, and points out how it can be done at Torquay, making use of Mr. Bazalgette's estimates, &c. "Let us, then, pause," says Mr. Appleton, "and consider well whether we be wise in adopting a scheme which will cast into the sea—and perhaps cause a nuisance—that which we are informed, on the highest authority, is intrinsically worth upwards of 7,000l. a year." He refers to the rumour that Government are to bring in a Bill to enable money to be borrowed for sewage works, and repaid by small instalments running on to seventy-five years.

The Amalgamated Society of Engineers.

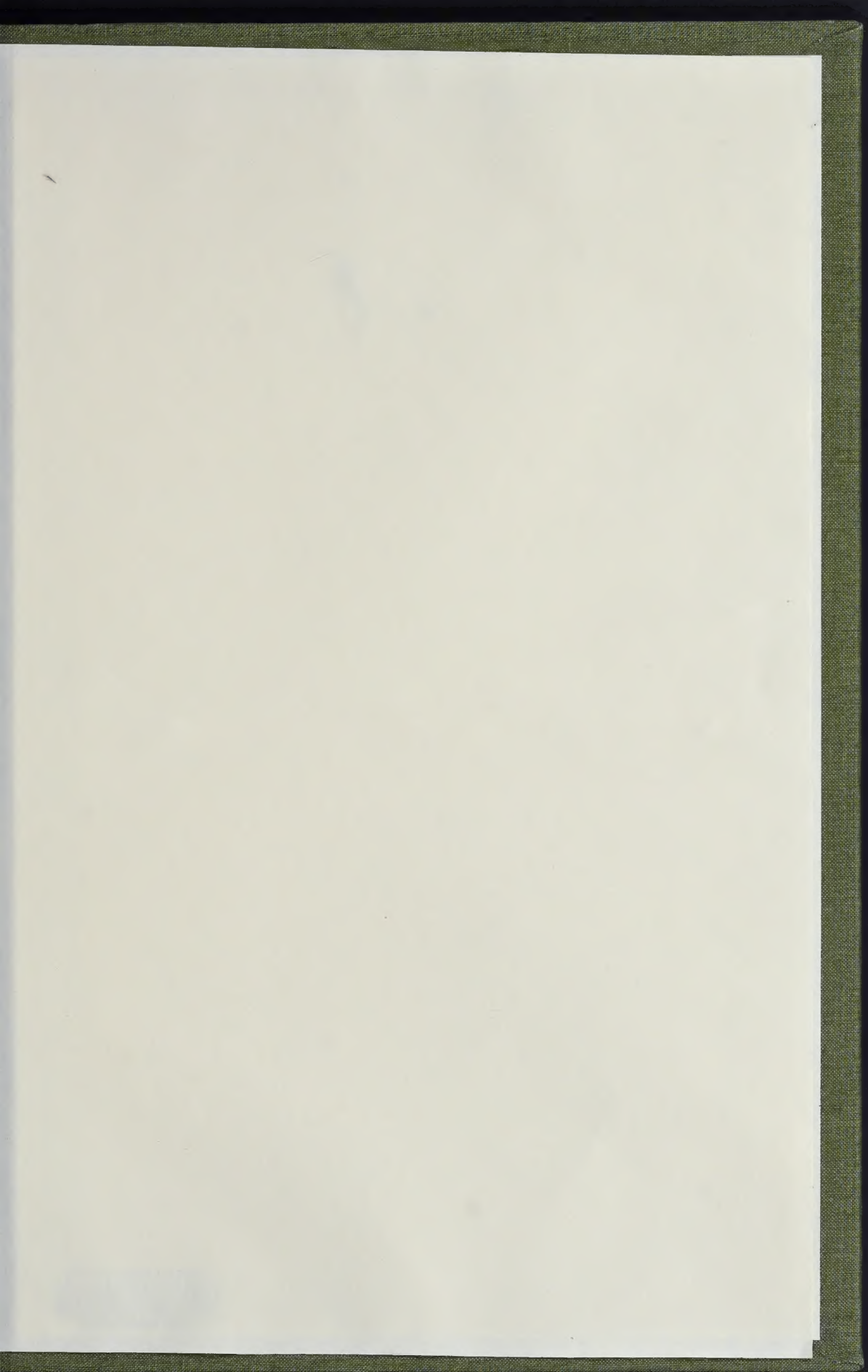
We extract the following from the monthly report for December:—"We have much pleasure in submitting this month's report, inasmuch as the returns from which it is compiled are clearly indicative of the continued prosperity of our trade throughout every district in the kingdom. This month our entire number on donation benefit is 262; whereas in last month's report it was 235. This small increase of twenty-seven is nothing in comparison with what might have been reasonably anticipated from the approaching close of the year, and the casual stoppages caused by the nine-hours movement. As this is our last monthly report for 1871, we take the opportunity of reviewing our position as a society, in order to show how prosperous it appears as compared with a few previous years. In December, 1867, the number on donation benefit amounted to 3,129; in 1868, to 2,771; in 1869, to 2,420; and in 1870, to 969; whereas, as stated above, at present it is only 262; add to this our rapid increase during this year, which has already been augmented by 2,810 members, and it will be seen that we have abundance of reason to be thankful for our present position. We may add that we have every reason to believe that nearly the whole of the employers throughout the trade will have conceded the nine hours by the 1st of January, 1872. It is gratifying to find that this reduction in the hours of labour has been attained without weakening the good feeling between employers and workmen."

Pre-Historic Fortifications.—At a meeting held recently of the Archaeological Section of the Midland Institute, Birmingham, Mr. Lawson Tait delivered an address upon "Pre-historic Fortifications." The president (Mr. S. Timmins) occupied the chair. Mr. Tait, after some introductory remarks, observed that the first indication of fortification was what they might naturally expect, viz., a fortified hillock, men finding that upon an elevated position they had an advantage in the use of their weapons. Thus they found that the earlier fortifications were hill forts. The well-known Roman forts with which this country abounded, were not such as he classed amongst pre-historic fortifications, because pre-historic meant such as they had no historic knowledge of. He also pointed out that the first structures were not intended for permanent residence, as forts now were.

Materials for Paper.—At the last meeting of the Society of Arts a paper was read by Mr. Robert Johnson, "On Esparto," including practical remarks on the nature, cultivation, past history, and future prospects of the plant; also, on the importance to the paper-making trade of prompt and vigorous measures for its preservation. Various speakers followed the reading of the paper, and from the general observations made it appeared that, as it took about fifteen years to bring the plant to maturity, the establishment of new esparto growing districts would not bring the relief to the paper trade which was required in providing an immediate supply of some cheap and good material. The fibre of wood had been tried, but proved, it was said, a failure, and must be regarded simply in the light of adulteration, the same as china-clay.

The Milkwood Hall Estate at Brixton. The large estate near Loughborough-road, between Herne-hill and the Brixton-road, formerly known in connexion with the Suburban Dwellings Company, but which has now been named the Milkwood Hall Estate, has just been laid out by Messrs. Habershon & Fite, architects, for the erection of a good class of houses; and the estate, which is upwards of nine acres in extent, will shortly be covered with dwellings, several hundreds in number. The contract for the construction of the sewers, drains, and roads, has just been let, the lowest tender out of thirteen sent in being 2,048l. by Mr. Bloomfield.

Fall of a Chimney in Havre.—A telegram, dated December 22, says:—"Last evening, during a storm of extreme violence, a colossal chimney situated at the side of the principal court-yard of the spinning-mill known as the Filature Courant, belonging to M.M. Courant & Co., in the Rue Demidoff, constructed of masonry and weighing 30 tons, was severed at its base by the force of the wind, and fell with a violent shock upon the workshops surrounding the court-yard. Several persons were killed, and the material damage amounts to 300,000 francs."



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